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of the United Nations

AGRIS
Handbook on the Agricultural Integrated Survey

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Acronyms

AAU	Agricultural Area Utilized
AGRIS	Agricultural Integrated Survey
AH	agricultural holding
CAPI	Computer-Assisted Personal Interview
CPC	Central Product Classification
EAP	Economically Active Person
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FDES 2013	Framework for the the Development of Environment Statistics 2013
GHG	greenhouse gas
GIS	Geographic Information System
GMO	Genetically Modified Organism
GPS	Global Positioning System
GSARS	Global Strategy to improve Agricultural and Rural Statistics
GWSM	Generalized Weight Share Method
HH	household
IDA	International Development Association
ILO	International Labour Organization
ISCED	International Standard Classification of Education
ISCO	International Standard Classification of Occupations
ISF	Integrated Survey Framework
ISIC	International Standard Industrial Classification of All Economic Activities
LSMS-ISA	Living Standards Measurement Study – Integrated Surveys on Agriculture
MEA	Machinery, Equipment and Assets
MSCD	Minimum Set of Core Data
MSF	Multiple Frame Sampling
NGO	non-governmental organization
PAPI	Paper-and-Pen-Interview
PME	Production Methods and the Environment
PPP	Plant protection product
PRN	Permanent Random Number
PSU	Primary Sampling Unit
SDG	Sustainable Development Goal
SEEA	System of Environmental-Economic Accounting
SNA	System of National Accounts
SSU	Secondary Sampling Unit
UN	United Nations
UNFPA	United Nations Population Fund
UNSC	United Nations Statistical Commission
UNSD	United Nations Statistics Division
UNSG	United Nations Secretary-General
WASDE	World Agricultural Supply and Demand Estimates
WCA 2020	World Census of Agriculture 2020

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7 U.S. Department of Agriculture (USDA)
8 World Bank

1

Chapter 1

Surveying farms in the 21st century

1.1. AN EVOLVING DATA ECOSYSTEM

At a time when the Internet provides immediate answers to any query by individuals, and when some parts of the world live in, sustain and enjoy an unprecedented data revolution, the knowledge of agricultural productions, stocks and forecasts at world, national, local or farm levels remains a challenge. Although there is no doubt that agricultural resources and ever-evolving technologies are currently capable of feeding the world's population, governments, the business sector and citizens remain vulnerable to potential problems linked to local food and feed shortages, abnormal rain or heat effects, abnormal prices, and to the consequences of export bans or climate change. Obtaining data on these factors remains difficult, especially when data must be collected at farm level.

In parallel with near-real-time agricultural information systems based on remote sensing and other connected sensors, the availability of standardized and validated international reference databases (such as FAOSTAT) is necessary when new information is to be placed in the perspective of historical trends. Traditionally, such agricultural statistics have been derived from three main sources: censuses (such as the recommended decennial agricultural census; FAO, 2015), monographs on typical farms (for example, the AgriBenchmark on costs of production, Isermeyer (2012) or extension service reports) and annual surveys (such as the June Agricultural Survey of the U.S. Department of Agriculture, or USDA; Cotter *et al*., 2010). Worldwide, their general quality has been declining systematically mainly due to budget limitations, which implies the need to make drastic choices on the indicators being monitored (see for example the core variables designated by the Global Strategy to improve Agricultural and Rural Statistics, hereafter Global Strategy; World Bank, FAO & UN, 2011), as well as on the search for more cost-efficient data collection (multiframe estimators, integration of administrative data) and better analysis methods (use of GIS tools).

While Agricultural Integrated Survey (AGRIS) data sets will be primarily used in designing and monitoring policies at country level, international reference databases will also benefit from them, as better quality indicators will be derived from AGRIS sources and be made available.

1.2. THE CHALLENGE OF PRODUCING THE RIGHT DATA TO MEET PRIORITY NEEDS IN POLICY-MAKING, MARKET MANAGEMENT AND RESEARCH SUPPORT

User-oriented agricultural statistics aim to serve the three broad need categories of policy-making, market management and research support. This led the Global Strategy to improve Agricultural and Rural Statistics (hereafter, GSARS or Global Strategy) to identify core variables dealing with crop and livestock productions, associated socio-economic data and the territorial land cover environment for inclusion in its proposed Minimum Set of Core Data (MSCD)[1]. Quality farm-level microdata collected through farm surveys based on sound methodologies is essential to produce this MSCD, which can ultimately inform the above three categories of data users.

Policy-makers usually rely on the results of studies using general or partial equilibrium models (M'Barek *et al*., 2012) to draw inferences on the consequences of decisions interfering with the law of markets. The models iteratively seek market equilibrium between demand and offer in function of the quantities and prices of commodities competing for economic resources, limited by production factors such as land, manpower and capital. The model's equations mimic the behaviour of economic agents through parameters called elasticities. The main categories are demand, supply and substitution elasticities that are specific to each commodity, which in some models lead to thousands of parameters being estimated from econometric studies. In addition, the variables involved in the equations represent quantities (number of ha or of animals), monetary values (meat imports or exports in terms of United States dollars, costs of production) or even qualitative information (risk accepted, soil type). These must be known as precisely as possible for a time series spanning over the past 15-20 years and their internal coherence is essential to the identification of solutions to the equation system.

The data sources are international databases managed by organizations such as the Food and Agriculture Organization of the United Nations (FAO), the World Bank, the European Union (EU) and the USDA, and that are fed by a wide variety of sources: national censuses, monographs, administrative data, remote sensing, and surveys, including farm surveys. However, the quality of these databases is generally limited by outliers, conflicting data sources, missing or obsolete source data, often because of the absence of recent surveys. The importance of these models and associated databases becomes clear once their content (for example, the variables they contain) and their coverage (time span and countries) is examined. The GTAP-9, by far the most frequently used Computable General Equilibrium (CGE) model, covers 140 countries and 57 commodities for the years 2004, 2007 and 2011 (note the time lag between the current year and the most recent data available). For intra-country analysis, the IFPRI social accounting matrices are among the most relevant databases and include 60 countries from Africa, Asia and South America; however, in this case too, the most recent data is rather old, referring to 2012.

Market management, shaped by ministries of agriculture and by the private sector, also relies on the availability of recent and reliable agricultural statistics, including farm surveys. Although the trade in agricultural commodities represents only a small part of production (23 percent for wheat and 8 percent for rice in 2015), the rigidity of food demand elasticity induces a high impact of productions on price volatility such that the monthly USDA's World Agricultural Supply and Demand Estimates (WASDE) reports are prepared in the greatest secrecy, released at fixed dates and times during the day, and have a direct impact on establishing international prices. Import and export strategies, budgetary planning, and price support measures are recurrent priorities of national authorities that require past and current agricultural statistics. Likewise, the multinational food industry and speculation investment funds rely on the public good provided by the statistical system to optimize their production choices in function of consumer choices, as well as their short- or long-term investment strategies. Such studies often concentrate only on the agricultural sector, and the models involved tend to be based on partial equilibrium (PE). These studies are used for planning and post-evaluation, and require regional data. They can be considered as the most important studies for national governments.

1 See table 1 in World Bank, FAO & UN (2011).

Research support is the third most important user-oriented goal of agricultural statistics. The academic scientific work based on open-access databases is essential for both policy-makers and market researchers. Thousands of scientific papers are published monthly. In addition to data validation, this work delivers so-called secondary statistics, which are results of micro-econometric analysis allowing for the development and validation of new economic hypotheses, and providing estimations of most of the parameters of the PE and CGE models referred to above (such as IFPRI's IMPACT or Purdue's GTAP; see Nelson *et al*., 2014). In this context, access to microdata is an essential requirement. Researchers tend to field their own small-scale survey whenever possible, attempting to mimic the methodologies applied by trusted sources. Duplication in data collection is high, and there is a great need for increased methodological transparency on the part of official national data agencies to enable better alignment and foster data harmonization.

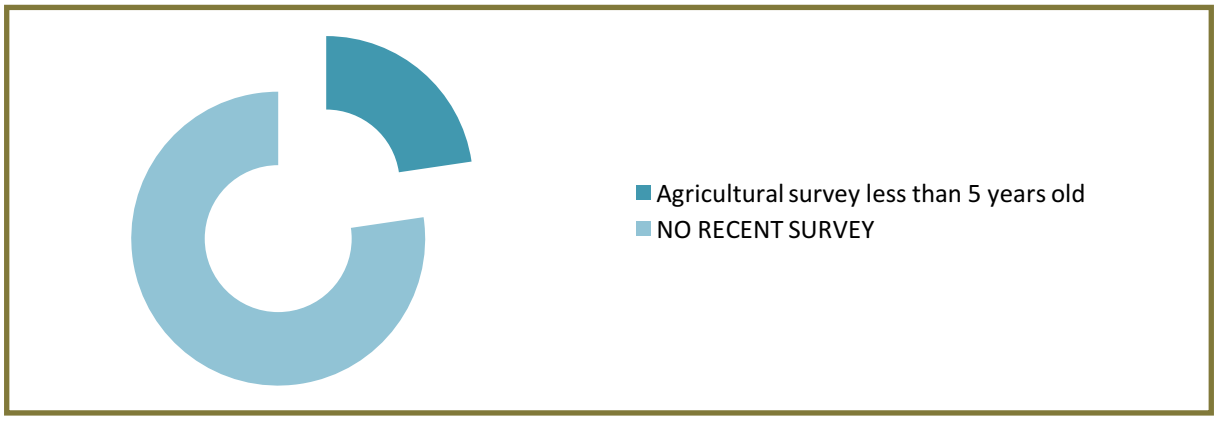
In summary, four main pillars of agricultural statistics have been identified: crops and livestock production, farms' socioeconomics, cost of production, and national agricultural accounts. Primary microdata are required to run the microanalysis at the individual farm level, and macroanalysis models require aggregated secondary data, including the national agricultural account which, based partially on administrative data, provides the value of imports, exports and taxation, and is usually structured in social accounting matrices. In all cases, good quality data is an essential condition and do require quality farm-level surveys to be regularly organized. The quality of these surveys and of the data they generate can be assessed in terms of objectivity (absence of bias), reliability (known precision), cleanness (absence of outliers), completeness (minimum of missing data), timeliness (availability of preceding period) and coherence (integrated survey).

Summarizing user needs, most countries still lack the databases required to run the economic models that provide the essential inputs into policy-making, market management and research support. Generally, the available data are more than five years old, a factor that weakens any analysis. Coherence among data series is often poor, due to the lack of integration of data sources. Too many countries must address missing data rates that hamper the robustness of the analysis. Finally, as very few stochastic models exist, the precision of the data is rarely debated, although sensitivity analyses have widely proved that "garbage in means garbage out". Considering that the vast majority of the content of databases is provided by costly surveys, improving data collection and surveys in developing countries should be within the priorities of most countries.

1.3. CURRENT STATE OF FARM-LEVEL INFORMATION SYSTEMS IN DEVELOPING COUNTRIES

The need for more, better, cheaper and faster statistical data in the agricultural and rural sector generally is widely recognized. While some progress on accessing existing information has been made in recent years, thanks to the traction of the open data movement, critical gaps on data production remain in many countries. These gaps are largely explained by an absence of quality data collection, whether through censuses or surveys. Some countries have yet to successfully leverage the technical and institutional innovations available for the industrialization of statistical production. Indeed, the vast majority of the 75 countries[2] that are currently eligible for IDA resources have not conducted any agricultural annual survey, as shown in figure 1.1. below:

FIGURE 1.1. THE LACK OF AGRICULTURAL SURVEYS AND CENSUSES IN IDA COUNTRIES.



Existing data gaps are often filled by "guesstimates" and other unreliable calculations. Alternatively, small-scale *ad hoc* surveys are conducted, which do not allow for inference on the country's total farm population, nor for monitoring progress over time. However, this approach entails very high transaction costs. This is the case in several countries where several small-scale surveys are undertaken without much statistical harmonization, thereby generating conflicting estimates and eventually confusing data users. This further increases the burden on individuals, agricultural holdings and data systems, and does not guarantee the data quality required by users. In addition, the approach prevents any monitoring of policy frameworks and does not support further investment in agriculture. Ultimately, it constitutes an obstacle to the accountability and transparency required by functioning markets and democracies.

This situation is not specific to agricultural statistical systems, as statistical systems in general suffer from underinvestment, undercapacity and underperformance in far too many developing countries. However, agricultural statistical systems suffer from additional constraints linked with institutional isolation and technical complexity. Overall, the scores for the most common statistical capacity indicator show that the global and regional situation is improving on average (UNSG, 2016; annex). However, anecdotal evidence suggests that the governmental capacity for producing basic statistics has in fact declined in several developing countries in recent decades. This reflects the fact that donors and the governments of developing countries have occasionally lost interest in enhancing developing governments' capacity to produce basic statistics. An independent evaluation noted that in the entire continent of Africa, only four countries were capable of producing basic statistics on agriculture (FAO, 2008). Other studies observed that international demand for statistics often supersedes local demand, an issue that indeed strikes at the very heart of the challenge (OPM, 2009).

2 http://ida.worldbank.org/about/borrowing-countries.

The Global Strategy was endorsed in 2010 by the United Nations Statistical Commission (UNSC), to address these concerns relating to poor data availability or quality and the lack of capacity in developing countries (WB, FAO & UN, 2011). A study conducted by FAO and the African Development Bank under the context of the Global Strategy (FAO & AfDB, 2017) showed that the implementation of the Action Plan of the Global Strategy has had a measurable positive impact on the capacity of countries to produce the required minimum set of agricultural statistics as stipulated in the objectives of the Strategy. Progress has also been made with regard to data collection, with several countries being supported by the World Bank in implementing quality panel surveys based on the LSMS-ISA methodology. However, there remains much to be done to raise the quality of agricultural statistics in developing countries. This can only be done by dual support from the data production side and the data usage side, fuelled by sustained national demand for better agricultural data. More than ten African countries have identified the design and implementation of AGRIS as a priority[3] to quickly produce the key agricultural data required by users. Demand has also been expressed by several countries in Asia and the Pacific region and in Latin America. Alignment with national priorities as identified in national statistical strategies[4] and work programs must be an overarching principle in the implementation of AGRIS to ensure the long-term sustainability of data systems.

AGRIS, being a ten-year integrated survey program, lays the foundations for the creation of an efficient agricultural statistical system. Together with the agricultural census which it complements, a versatile agricultural market information system, and an appropriate use of remote sensing and administrative data, AGRIS is a cornerstone for the establishment of a comprehensive rural information system.

1.4. BUILDING COST-EFFICIENT INTEGRATED STATISTICAL INFORMATION SYSTEMS

Considering that surveys are currently the most cost-efficient method for collecting multipurpose agricultural statistics, AGRIS aims to meet the needs of national statistical institutes that are willing to comply with the Global Strategy's recommendations.

AGRIS proposes a ten-year modular data collection scheme based on a master frame (GSARS, 2015b), ensuring data coherence in time and among thematic sets of core variables. The options for building the master frame are left to the discretion of the national authorities, as they all inherit very different systems. If a decennial agricultural census is operational, it will naturally provide the basis for the elaboration of the master frame. If only a household population census is performed periodically, the inclusion of a targeted agriculture module will enable the derivation of the agriculture master frame for the household sector. In other cases, the construction of an area frame (points or segments) will provide an efficient solution. In all scenarios, the geolocalization of sampling units will be necessary, and multiple frames will generally improve frame quality by merging list and area frames with administrative sources (especially for the non-household sector).

3 Global Strategy & AfDB. 2015. *Identification of technical assistance needs in agricultural statistics of African countries*: Action Plan for Africa of the Global Strategy. Joint Global Strategy-AfDB Report: Rome.

4 Examples of these strategies include the Strategic Plans for Agriculture and Rural Statistics designed in the context of the Global Strategy, as well as the generic National Strategies for the Development of Statistics.

Bearing in mind the growing challenges linked with survey nonresponse, missing data and poor data quality connected with long questionnaires, AGRIS recommends a modular approach. The Core Module is expected to provide, on a yearly basis, data the importance of which justifies asking such time of farmers (mainly, data on crops and livestock productions). Prefilled digital forms accessible on tablets will facilitate the interview process and shorten the time needed for data access and analysis. Questions will be limited to the core variables, and any item collected will be subject to a priori data analysis and user identification. In addition, a series of Rotating Modules will take place at varying frequencies, when possible based on the samples of the Core Module. These Rotating Modules bring additional knowledge on thematic domains: Economy, Labour, Production Methods and the Environment, and Machinery, Equipment and Assets.

Recommendations on sampling strategies are issued at two levels. First, commercial farms are separated from households, which favours the design of a two-stage stratified plan for households and a one-stage stratified sampling for commercial holdings. Second, sample rotation in time should take place, to limit survey burden and allow for the analysis of longitudinal panel data, which is particularly efficient when observers are interested in the estimation of evolution of trends.

Working with Horvitz-Thomson estimators, AGRIS insists on the importance of unbiased estimation and the capacity to quantify sampling variance. Adopting stratified sampling or probability-proportional-to-size sampling, a relative precision of a maximum of 10 percent should be obtained by ensuring an adequate sample size and by choosing the smallest administrative estimation level so that the expected relative precision can be achieved with sample sizes compatible with the available budget.

Finally, the link with SDGs is acknowledged (UN, 2017), the proposed set of AGRIS Generic Questionnaires will generate basic data for monitoring the relevant SDGs. Among the 232 SDG indicators, AGRIS provides essential and direct information for four SDG indicators and essential but indirect information for another 15 SDG indicators (see chapter 2 for more details).

The ongoing data revolution, a significantly changed global context through the 2030 agenda and the need to use development cooperation more effectively and in an evidence-based manner have led to a surge in international support for data collection and statistics elaboration. In this context, a vision of the Agricultural Statistics in 2030 must be shaped. Open-access and up-to-date information systems should certainly be the goal. Structured as an information system, data integration should be a requirement satisfied by integrated data collection based on the geolocation of the sampling or declarative units. Such an approach will allow for cross-referencing at the micro-level of the records and variables from various sources (decennial survey-census, annual or periodic surveys, administrative data, expert opinions and crowdsourcing). Efficiency should be a keyword, considering that affordable new technology (mobile phones, tablets, GPS, cloud storage) allows to reduce respondent burden, survey redundancy, and data entry errors and delays, while introducing facilities for a real-time quality check and a paper-free approach. This enables the achievement of higher quality at a lower price, as long as a drastic screening is conducted at the same time to reject any data collection efforts whose cost is not justified by a gain in terms of data analysis. Data validation should also be part of the process, ensuring that nonresponses are adequately imputed, the anonymization of micro-data is scientifically optimized and breaks in time series are smoothed by multivariate methods.

2

Chapter 2
AGRIS in a nutshell

2.1. RATIONALE

The need for more and better-quality statistical data on a more economical and faster basis in the agricultural and rural sectors is widely recognized. While some progress on accessing existing information has been made in recent years, thanks to the traction of the open data movement, critical gaps on data production persist in many countries. As detailed further in chapter 1, these gaps largely result from an absence of quality data collection efforts, whether censuses or surveys. Some countries have yet to successfully leverage the technical and institutional innovations available for the industrialization of statistical production. Indeed, the majority of IDA countries have not conducted agricultural censuses or annual surveys for the past 15 years.
The Global Strategy to improve Agricultural and Rural Statistics (hereafter, Global Strategy) was endorsed in 2010 by the United Nations Statistical Commission (UNSC) to address these concerns relating to poor data availability or quality and the lack of capacity in developing countries (WB, FAO & UN, 2011). The Global Strategy is a coordinated effort to provide a conceptual and institutional framework for the production of data; to establish a Minimum Set of Core Data (MSCD) required to meet the basic and emerging demands of national development policies; to develop cost-effective methodologies for data production and use; and to establish the necessary governance structures and capacities.

As one of the main features of cost-effective methods, AGRIS is designed to help national agencies accelerate the production of quality disaggregated data on the technical, economic, environmental and social dimensions of agricultural holdings[1]. AGRIS builds on the previous work of the Global Strategy to present a unique opportunity to channel these methodological innovations and achieve real impacts on data systems on the ground.

1 "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" (FAO, 2015).

The data generated by AGRIS is meant to inform policy design and implementation, improve market efficiency and support research. AGRIS constitutes an invaluable data source and provides the framework for designing, monitoring and evaluating any agricultural or rural policy or investment. The proposed generic AGRIS questionnaires cover most of the farm-level MSCD data requirements. They also provide basic data for monitoring the relevant indicators for the Sustainable Development Goals (SDGs), a set of goals adopted by countries on 25 September 2015 to end poverty, protect the planet, and ensure prosperity for all as part of a new sustainable development agenda[2]. Each goal envisages specific targets to be achieved over the next 15 years, and each of these targets has specific indicators[3]. AGRIS provides essential and direct information for the following four 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
- 2.4.1: Proportion of agricultural area under productive and sustainable agriculture
- 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

AGRIS contributes to the following 15 additional SDG indicators, on the subpopulation of the population associated with agricultural holdings only:

- 1.1.1: Proportion of population below the international poverty line, by sex, age, employment status and geographical location (urban/rural)
- 1.2.1: Proportion of population living below the national poverty line, by sex and age
- 1.2.2: Proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions
- 1.3.1: Proportion of population covered by social protection floors/systems, by sex, distinguishing children, unemployed persons, older persons, persons with disabilities, pregnant women, newborns, work-injury victims and the poor and the vulnerable
- 1.4.1: Proportion of population living in households with access to basic services
- 1.4.2: Proportion of total adult population with secure tenure rights to land, with legally recognized documentation and who perceive their rights to land as secure, by sex and by type of tenure
- 1.5.1: Number of deaths, missing persons and directly affected persons attributed to disasters per 100 000 population
- 2.5.2: Proportion of local breeds, classified as being at risk, not-at-risk or unknown level of risk of extinction
- 5.5.2: Proportion of women in managerial positions
- 5.b.1: Proportion of individuals who own a mobile telephone, by sex
- 7.1.1: Proportion of population with access to electricity
- 8.7.1: Proportion and number of children aged 5-17 years engaged in child labour, by sex and age
- 9.1.1: Proportion of the rural population who live within 2 km of an all-season road
- 9.c.1: Proportion of population covered by a mobile network, by technology
- 17.8.1 Proportion of individuals using the Internet

AGRIS, being a ten-year integrated sample survey program, lays the foundations for the creation of an efficient agricultural statistical system. Together with the agricultural census that it complements, a versatile agricultural market information system, and an appropriate use of remote sensing and administrative data, AGRIS is a cornerstone in the establishment of a comprehensive rural information system. AGRIS is not meant to replace specialized surveys, whether in terms of commodities (such as rice or export fruit surveys) or of geography (nomadic livestock surveys, horticulture surveys, etc.).

2 http://www.un.org/ga/search/view_doc.asp?symbol=A/RES/70/1&Lang=E.
3 https://unstats.un.org/sdgs/metadata/.

Without AGRIS, existing data gaps can only be filled by ad hoc suboptimal mechanisms with high transaction costs. This would further increase the burden on individuals, agricultural holdings and data systems, and would not guarantee the data quality required by users. Ultimately, this would prevent any monitoring of policy frameworks and constitute an obstacle to the accountability and transparency required by functioning markets.

2.2. THE AGRIS STATISTICAL UNIT: THE AGRICULTURAL HOLDING

The agricultural holding

The statistical unit of AGRIS is the agricultural holding, as an independent producer of agricultural products. The definition proposed for AGRIS is that established by FAO in its World Census of Agriculture 2020 programme (or WCA 2020; FAO, 2015).

> "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".

The agricultural holding is under single management, exercised by the holder.

Using the System of National Accounts (SNA 2008) terminology, farms can be grouped into those that are (1) defined as household units (holdings in the household sector); and (2) all other institutional units engaged in agricultural production (holdings in the non-household sector), such as corporations and government institutions. In most countries, the majority of agricultural production is in the household sector. The concept of "agricultural holding" is therefore closely related to the concept of "household". Both subpopulations should be covered by AGRIS, as household and non-household sector holdings.

Coverage and use of threshold

AGRIS should cover all relevant agricultural activities pursued by agricultural holdings in a country. Thresholds can be fixed by implementing national agencies with the objective of covering the largest possible share of agricultural production and to exclude the very small agricultural holdings that contribute little to total agricultural production. Preferably, these thresholds should be decided before the agricultural census is conducted, and should be retained for all surveys conducted between two censuses. The benefits of establishing thresholds need to be carefully assessed; if operational simplicity and budget savings are obvious advantages, disadvantages include the impossibility to meet the need to monitor small-scale holdings, often of primary policy concern.

AGRIS and farm typology

A farm typology enables classification of agricultural holdings by multiple dimensions, aiming to achieve a better understanding of the farm structures and production diversity between countries and within a country. Farm typology is particularly useful for more efficient targeting in agricultural and rural policies and investments.

A farm typology is an important element for an efficient agricultural statistical system at national level. The classification of farms into homogeneous types will (1) enable analysis of their structure, performance and sustainability; (2) allow for the formulation, implementation and evaluation of policies that focus on different aspects of sustainable development; and (3) at the national level, provide elements for more efficient sample design and data matching through stratification of the vastly diversified population of agricultural holdings.

A farm typology is created on the basis of individual data (microdata) relating to agricultural holdings. An existing farm typology may be applied to data generated by AGRIS for enhanced analysis by type – this may have consequences for the choice of sampling strategy. Data generated by AGRIS can be used to design a useful farm typology. In this regard, the key dimensions for all such typologies are farm size, commodity specialization, market orientation and diversification. The AGRIS Core and Rotating Modules can indeed generate these data from year 1 of implementation. Further details are available in Annex 3 on farm typology.

2.3. DATA COLLECTION

2.3.1. Timing for data collection: the AGRIS cycle

AGRIS is synchronized with the agricultural census and operates over a ten-year cycle. AGRIS seeks to decrease the burden of conducting censuses by scheduling the collection of thematic data over this time frame. This will contribute to a more regular flow of data, which would be more in line with the limited capacities currently in place for the production and use of statistics.

AGRIS consists of a collection of questions that can be classified into one of two main categories: a core section and a rotating section. The core section (also referred to as the 'Core' or 'Core Module') is an enhanced production survey that also focuses on a range of different themes, which remain largely the same in each survey round. The rotating section (which comprises several 'Rotating Modules') is devoted to specific themes, the implementation frequency of which will vary among countries with different agricultural systems and data demand priorities.

The following table summarizes a possible module flow for the four recommended Rotating Modules: 'Economy', 'Labour', 'Production Methods and Environment', and 'Machinery, Equipment, Assets'. The financial and human resources required to sustain and implement such an arrangement is relatively stable over the ten-year cycle, making it a viable set-up for a data producing agency. The flexible, modular nature of AGRIS makes it easy to modify this proposed setting and thus enhance its national relevance and its cost-effectiveness. Additional Rotating Modules may also be added to respond to additional specific data needs.

TABLE 2.1. RECOMMENDED AGRIS MODULE FLOW.

	Years	1	2	3	4	5	6	7	8	9	10
Core Module	Agricultural holding (AH) Roster	•	•	•	•	•	•	•	•	•	•
	Crop + livestock production	•	•	•	•	•	•	•	•	•	•
	Other key variables	•	•	•	•	•	•	•	•	•	•
Rot. Module 1	Economy	•		•		•		•		•	
Rot. Module 2	Labour		•				•				
Rot. Module 3	Production Methods and the Environment				•				•		
Rot. Module 4	Machinery, Equipment and Assets	•				•					

To enhance respondent recall and provide timely information for market efficiency and decision-making, data collection could be conducted several times during the year. This is particularly true for the Core Module in countries with several crop periods. Rotating Modules, in particular the Economy and Labour Modules, could also require several waves of data collection during their years of implementation. Subsampling plans could be used to accommodate budget constraints, while producing more frequent data with different levels of statistical significance.

Survey-to-survey imputation methods can be a cost-effective way to fill some of the data gaps in the AGRIS scheme above, or between AGRIS and other relevant surveys (such as stand-alone labour force surveys). The key challenges for survey-to-survey imputation are that the two types of surveys (or modules) must be designed in a similar way (including questions asked), and the model parameters must not change over time.

2.3.2. Data collection mode

In the context of developing countries, improving data quality – and in particular accuracy and timeliness – remains a top priority. Face-to-face interviews carried out by professional enumerators remain the best means of quality data collection. When required, data collection could include the use of self-reported logbooks (or SMS logbooks), for example in the case of multiple harvest seasons or livestock data (Core Module), or cost of production (Economy Rotating Module). The use of Computer-Assisted Personal Interview (CAPI) technologies is recommended to improve data quality and timeliness. Add-on devices to the mobile CAPI-enabled platforms could be used to perform a number of direct measurements – whether geocoding and plot area measurements (GPS), or measurements relating to the environment (leaf cover indices, soil and water characteristics, etc.). The AGRIS Generic Questionnaires proposed in chapter 4 are all available in CAPI format (see Annex 5 on CAPI and the Survey Solutions).

BOX 1. THE BENEFITS OF CAPI-BASED SURVEY DATA COLLECTION,

The AGRIS toolkit leverages CAPI technologies to align with modern data collection practices. In contrast to traditional Paper-and-Pen-Interview (PAPI) methods, during CAPI interviews the data are entered into a tablet application instead of written on paper. Mainly as a result of this difference, CAPI technologies have been shown to **reduce costs, improve data quality, maximize the timeliness of results, and in some countries, improve the overall experience**.

Reducing costs

PAPI interview methods bear certain costs that are alleviated or minimized by using CAPI. Because PAPI interviews require responses to be first written on a paper questionnaire, the data must then be digitized by being manually entered or scanned and computer-read into a data entry form. Furthermore, several countries require that completed paper questionnaires be stored for years prior to disposal. However, printing, data entry, and storage are a major source of costs and can also introduce non-sampling errors. These costs are minimized using CAPI and data entry errors can be almost entirely eliminated.
However, CAPI does require start-up fixed costs of purchasing equipment and variable costs associated with data transfer. Studies indicate that these costs are offset by the reduced cost of printing, data entry and storage (Rahija *et al.*, 2016; Zhang *et al.*, 2012; King *et al.*, 2013; Leisher, 2014). An experimental study by Cayers *et al* in 2010 found that the additional fixed costs of equipment and data transfer were offset by savings when approximately 4,000 respondents were involved. However, in a ten-year survey program such as AGRIS, the equipment will be used for multiple years, thus maximizing the cost-effectiveness of CAPI and the sustainability of the survey program even for smaller sample sizes.

Improve data quality

CAPI allows the survey designer to incorporate data validation checks into the questionnaire, and strictly manages the flow through the questionnaires using skip patterns. Furthermore, it automates the coding of responses – a factor which improves data quality and eliminates a potential source of error. Common types of data validation checks ensure that consistent data are collected, and that values fall within a given expected range. For example, in the AGRIS Core Module questionnaire, validation checks are used to ensure that the total number of hours worked in a specific activity do not exceed the total number of hours worked for all activities. Furthermore, validation is used to avoid potential data entry errors. For example, the age of the holder is unlikely to exceed 100 years. If a value is entered into the questionnaire which violates such a condition, a warning message is shown to the enumerator.

Complex questionnaires such as AGRIS often contain many skip patterns, which can be challenging for enumerators to follow; this may add to respondent burden and constitute a source of error. CAPI allows the questionnaire designer to strictly enforce skip patterns based on the answers provided to previous questions. For example, if the holding reports producing livestock, subsequent questions on the income and costs associated with livestock production will be posed; conversely, if no livestock production is reported, livestock-associated questions will not be posed. Accordingly, this common source of burden and error can be eliminated completely. In Rahija *et al.*, 2016, the Ugandan Bureau of Statistics (UBOS) reported major data quality improvements between wave 1 of the National Panel Survey, which was administered using PAPI, and subsequent waves, implemented using CAPI. Indeed, consistency checks were cited as a primary source of the improvement.

Maximize timeliness

As previously mentioned, during data collection with CAPI, the data are digitized during the interview and undergo predefined data quality checks simultaneously. This implies that the post-data-collection entry stage required for PAPI is completely eliminated. Furthermore, time spent cleaning data is minimized as the data quality checks performed during the interviews minimize data entry and consistency errors. The result is that the data are ready to be analysed and used for policy-making months sooner than would be the case with a PAPI questionnaire.

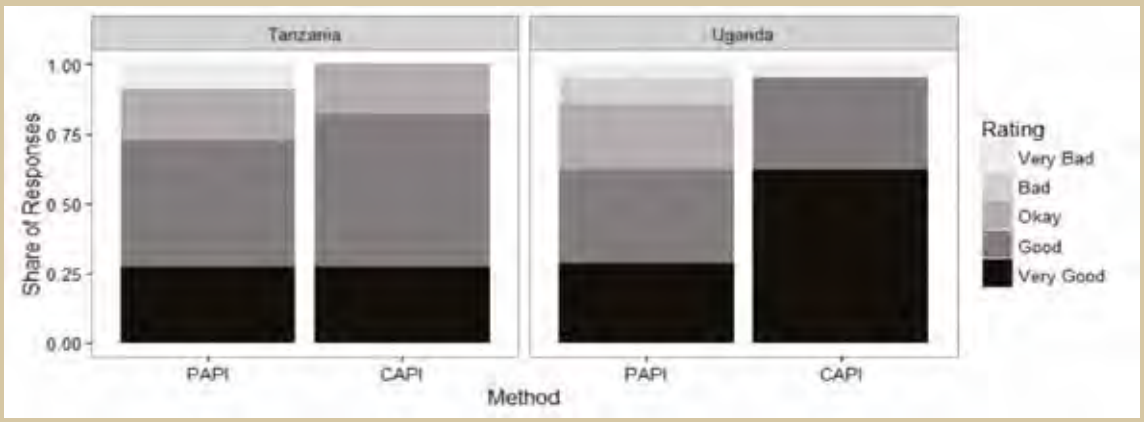
The 2016 Community Survey of South Africa included a sample of approximately 1.3 million households across the country. The fieldwork took place over six weeks at the beginning of 2016, and results were already published and distributed on 30 June 2016 (Statistics South Africa, 2016).

Enhancing the enumerator's experience

Enumerators are perhaps the most important individuals in the data collection process. Thus, their preferences should be closely considered. PAPI requires them to carry a great deal of paper questionnaires into the field and to be well organized to keep track of which have been completed, which require return visits, which can be given to the supervisor for review, etc. Using CAPI, the enumerator is only required to carry a tablet, which manages all of the questionnaires automatically. Accordingly, it makes their job easier. In addition, it creates a more secure environment for the protection of respondent data, by reducing the risk of loss of questionnaires during collection and transmission.

A small survey of enumerators that have used both CAPI and PAPI was administered in Uganda and in the United Republic of Tanzania asking to compare their experiences. The results signal a more positive enumerator experience when CAPI is used.

FIGURE 2.1. ENUMERATOR EXPERIENCE RATING OF CAPI AND PAPI SURVEYS.



Source: Rahija *et al.*, 2016.

It should be noted that appropriate computer and CAPI application training will be required for survey interviewers in addition to survey-specific training, and application support will need to be provided during collection to assist interviewers with any technical problems that may arise.
CAPI questionnaires are proposed for the AGRIS Generic Questionnaires. They are available in the Survey Solution package and can be accessed at https://solutions.worldbank.org.

SOURCES

King, J., Buolamwini, J., Cromwell. E., Panfel. A., Teferi T. *et al.* 2013. A Novel Electronic Data Collection System for Large-Scale Surveys of Neglected Tropical Diseases. PLoS ONE, 8(9): e74570.

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Rahija, M., Mwisomba, T., Kamwe, M., Muwonge, J. & Pica-Ciamarra, U. 2016. *Are tablet-based surveys a cost-effective alternative to paper surveys in developing countries? A cost comparison from sample surveys in Kenya, Tanzania, and Uganda*. Paper prepared for the Seventh International Conference on Agricultural Statistics (ICAS VII), 26–28 October 2016. Rome.

Statistics South Africa. 2016. *About Community Survey*. Available at: http://cs2016.statssa.gov.za/?page_id=135. Accessed on 12 July 2017.

The systematic use of the GPS coordinates locating holdings and plots is recommended, to accelerate the ground-truthing of complementary remote sensing information systems.

Mixed-mode data collection is another possibility for implementing national agencies. Combining face-to-face interviews with phone (or web) surveys could also be an option, especially for the segment on commercial farms. However, this has not been tested in the design of the current proposed methodology and any potential benefits (mostly, cost savings) should be carefully assessed against the possible data quality issues.

2.3.3. Sampling

The AGRIS sampling strategy, including the sample size, will be decided by the implementing national agencies, based on the sample frames available, the capacity to design and implement complex sampling techniques and corresponding fieldwork, the budget available and the ultimate data accuracy and disaggregation required.

Specific and detailed sampling guidelines are proposed in chapter 5 of this handbook, based on the advanced research conducted by the Global Strategy on Master Sampling Frame and on the Integrated Survey Framework (ISF) (see GSARS, 2014b and GSARS, 2015b, as well as http://gsars.org/en/resource-center/ for further details).

Different theoretical and practical issues relating to frames exist and, in many countries, still limit surveying options and eventually reduce data quality and usability. The nature of these issues ranges from generic (such as frame coverage, for list frames in particular) to more specific (such as the poor accuracy of livestock statistics based on area frames).

The AGRIS sampling strategy is versatile, capable of meeting the needs of the various national situations. In a nutshell, the strategy is articulated around the following elements:

- Stratified multistage random sample for farms from the household sector, based on a list frame when relevant or on an area frame (points or segments);
- Stratified simple random sample for farms of the non-household sector;
- Panel sampling to enable longitudinal analyses; and
- Subsampling for Rotating Modules.

Seasonality is a key dimension in agriculture. The correct timing of data collection is of critical importance. The appropriate use of subsamples and panels will allow AGRIS to capture some seasonality factors. Methodological options to administer data collection only once or several times a year are provided, for both the Core and the Rotating Modules.

For each given year, there are many analytical and operational benefits to having the same farms surveyed for the Rotating Modules scheduled for that year and the Core Module. When possible, subsamples of the Core Module should be considered. This is further detailed in chapter 5 of this handbook.

2.3.4. AGRIS generic questionnaires

Generic, stand-alone, comprehensive questionnaires

In this handbook, generic AGRIS questionnaires are proposed for each module. They are generic in the sense that they will require further customization by the implementing national agencies before implementation. Customization is required for different reasons, including:

- To increase their relevance given the priority policy matters in the country.
- To increase their relevance given the types of farms in the country and the different agricultural systems in place. An existing farm typology may help to fine-tune the questionnaires, in particular skip patterns.
- To increase their relevance given the respondents' level of knowledge. This is of primary concern in developing countries where farmers, including holders, are often illiterate. Questionnaires should only include questions that can be answered by farmers, and that can generate quality data. This is particularly true for AGRIS, which does not propose objective measurements by default. Field tests should be implemented to support this customization.
- To increase their relevance given the current survey system in place.
- To adjust the questionnaires' size to the available AGRIS budget and sampling strategy. Questions that will generate estimates with an unacceptable variance should be deleted from questionnaires.

The generic AGRIS questionnaires proposed in this handbook are standalone versions. One questionnaire is available for the Core Module, the Economy Module, and each of the other Rotating Modules. There are obvious interconnections between these standalone modules, as further detailed in the relevant chapters of this handbook. However, the standalone versions make it easier for implementing national agencies to customize the generic AGRIS package to their specific needs, especially if they already have a good production survey in place. Annual integrated questionnaires (for example, questionnaires for the combined Core and Rotating Module(s)) matching the recommended AGRIS module flow presented in table 1.1. above will be made available in the next version of this handbook. These annual integrated questionnaires will be most useful to implementing national agencies that wish to adopt the AGRIS package as a whole.

The generic AGRIS questionnaires proposed in this handbook are comprehensive versions. They were designed to generate relevant data on a wide range of priority topics. However, implementing national agencies may wish to reduce the size of their customized AGRIS questionnaires and drop some of the proposed parts. The methodological notes (see chapter 4) provide guidance for conducting such reductions for some of the Rotating Modules.

Relevant international statistical frameworks applied and used in AGRIS

The AGRIS generic methodology is proposed as a public good to statistical agencies for their further customization and implementation. The resulting data are meant to be used in a coherent way, to make meaningful subnational, regional and international aggregations and comparisons. In this context, the AGRIS methodology relies extensively on several internationally endorsed statistical frameworks, such as statistical classifications, and is articulated with other relevant data collection programs (such as the FAO-promoted WCA 2020). The AGRIS methodology, including the questionnaires' content, design and implementation (by means of CAPI), benefited from different data collection innovations brought about by the implementation of the Global Strategy and the Research Program of the LSMS-ISA program, promoted by the World Bank.

The scope of activities in AGRIS is defined under ISIC rev. 4; the products covered by AGRIS are based on the UN Central Product Classification (CPC) version 2.1, adapted for the AGRIS context.

Beyond the essential articulation in terms of timing between the ten-year AGRIS cycle and the frame building from the agricultural census, the AGRIS methodology is linked – to the extent possible – to the WCA 2020 in terms of relevant items, definitions and classifications. For example, the Indicative Crop Classification (ICC, version 1.1), based on the CPC ver. 2.1, is used for crops grown in both the WCA and AGRIS.

The System of National Accounts, 2008 (SNA 2008) is a statistical framework that provides a comprehensive, consistent and flexible set of macroeconomic accounts for policy-making, analysis and research purposes. The SNA defines the enterprise and the establishment as two main types of economic production units. With the purpose of achieving coherence with SNA 2008, AGRIS adopts the principle that the agricultural holding is to be treated as equivalent to an establishment unit under the SNA. The definitions of household and non-household sectors in agriculture are also developed within the SNA framework.

The land-use classes proposed in AGRIS are harmonized with the land use classification of the SEEA 2012 Central Framework. Some adaptation of the classes with agricultural land use was introduced in the AGRIS context to better capture all types of land used for crop production.

2.4. TOPICS COVERED

AGRIS covers different technical, economic, environmental and social dimensions of agricultural holdings through its Core Module and its four Rotating Modules on Economy, Labour, Production Methods and the Environment, and Machinery, Equipment and Assets. The following tables list the proposed topics covered by each module. Further details are provided in chapter 3 (on data items), which introduce the AGRIS Generic Questionnaires.

AGRIS collects sex-disaggregated data on key topics through both the Core and the Rotating Modules. This entails a more refined identification of male- and female-headed households and will help to assess women's contribution to agriculture through labour and their access to and control of productive assets, resources and services.

In addition to these holding-level questionnaires, national authorities may find it useful to administer an individual-level questionnaire, which refers to selected individuals associated with selected holdings. The objectives and data items for this type of questionnaire are explained in annex 4 of this handbook.

The Core Module will collect data on the following topics:

CORE MODULE

Section 1: The holding

Part 1.1: Survey preparation
Part 1.2: Identification of the holding
Part 1.3: Agricultural activity

Section 2: Characteristics of the holders and managers

Section 3: Crop production during the reference period

Part 3.1: Crop production and destinations
Part 3.2: Area utilized
Part 3.3: Crop production modes
Part 3.4: Intentions for crop production for the 12 months after the reference period

Section 4: Livestock production during the reference period

Part 4.1: Raising activities and production
Part 4.2: Raising practices
Part 4.3: Intentions for livestock production for the 12 months after the reference period

Section 5: Economy during the reference period

Part 5.1: Other activities of the holding
Part 5.2: Shocks

Section 6: Households of the holders and co-holders

Part 6.1: Sociodemographic characteristics of the households of the holders and co-holders

Section 7: Labour used by the holding

Part 7.1: Work on the holding by the holder and his/her household members
Part 7.2: Work on the holding by external workers

Section 8: Household dwelling and assets

Section 9: End of the survey

Part 9.1: Survey timing
Part 9.2: Respondent opinion of survey burden

The four AGRIS Rotating Modules will collect data on the following topics:

ROTATING MODULE: ECONOMY

Section 1: Main characteristics of the agricultural holding

Part 1.1: Identification of the agricultural holding
Part 1.2: Land
Part 1.3: Livestock

Section 2: Income for the agricultural holding during the reference period

Part 2.1: Income from agricultural production
Part 2.2: Aquaculture and fishery production by the agricultural holding
Part 2.3: Forestry production by the agricultural holding
Part 2.4: Other sources of income directly related to the agricultural holding
Part 2.5: On-farm processing of agricultural products by the agricultural holding
Part 2.6: Other diversification activities by the agricultural holding
Part 2.7: Electricity produced by the agricultural holding
Part 2.8: Subsidies and transfers received, related to the agricultural holding
Part 2.9: Household members' sources of income not related to the agricultural holding

Section 3: Expenses of the agricultural holding during the reference period

Part 3.1: Resource inputs used by the agricultural holding
Part 3.2: Inputs and services used for crop production
Part 3.3: Inputs and services used for livestock and poultry production
Part 3.4: Labour inputs used by the agricultural holding
Part 3.5: Other inputs used by the agricultural holding
Part 3.6: Taxes and licenses paid

Section 4: Investments, financial and insurance costs

Part 4.1: Capital investments
Part 4.2: Loans and financing
Part 4.3: Insurance

Section 5: Marketing and storage

Part 5.1: Destination of commodities produced
Part 5.2: Main commercial networks
Part 5.3: Agricultural markets and marketing
Part 5.4: Storage for agricultural products

ROTATING MODULE: LABOUR

Section 1: Overview of the holding activities and labour

Part 1.1: Identification of the agricultural holding
Part 1.2: Activities of the agricultural holding during the reference year

Section 2: Household members: Time worked, main activities, payments and benefits for the work on the holding

Part 2.1: Agricultural work on the holding in the past N months
Part 2.2: Work on other economic activities on the holding in the past N months
Part 2.3: Payments for work on the holding
Part 2.4: Benefits for the work on the holding

Section 3: External workers: demographic characteristics, time worked, main activities, payments and benefits for the work on the holding

Part 3.1: Demographic characteristics
Part 3.2: External managers and external, paid, long-term employees by age group and sex
Part 3.3: External, paid, casual workers by provenience
Part 3.4: Time worked over the past N months
Part 3.5: Main activities
Part 3.6: Payments for the work on the holding
Part 3.7: Benefits for the work on the holding

Section 4: Contractors

Part 4.1: Work on the holding and payments for work on the holding

ROTATING MODULE: PRODUCTION METHODS & ENVIRONMENT

Section 1: General information

Part 1.1: Identification of the agricultural holding
Part 1.2: Prospects for development of the holding

Section 2: Use of natural resources during the reference period

Part 2.1: Energy sources during the reference period
Part 2.2: Soil management during the reference period
Part 2.3: Irrigation and drainage during the reference period

Section 3: Crop production methods during the reference period

Part 3.1: Use of fertilizers during the reference period
Part 3.2: Use of plant protection products during the reference period
Part 3.3: Crop and seed varieties during the reference period
Part 3.4: Permanent crops during the reference period
Part 3.5: Pollination practices during the reference period
Part 3.6: Rice cultivation during the reference period

Section 4: Livestock production methods during the reference period

Part 4.1: Animal breeding and reproduction during the reference period
Part 4.2: Use of veterinary products and traditional methods during the reference period
Part 4.3: Animal housing during the reference period
Part 4.4: Equipment and transportation of animals during the reference period
Part 4.5: Feed and use of pastures during the reference period
Part 4.6: Watering of animals during the reference period
Part 4.7: Manure management during the reference period

Section 5: Certified organic farming and conversion to organic certification during the reference period

Section 6: Agroforestry during the reference period

Section 7: Access to and use of information services, infrastructure and communal resources during the reference period

Part 7.1: Agricultural information during the reference period
Part 7.2: Infrastructure (transportation, communication and access to facilities) during the reference period
Part 7.3: Access to communal resources during the reference period

Section 8: Greenhouse gas and environmental issues during the reference period

Section 9: Adaptation to climate change and mitigation strategies during the reference period

Section 10: Waste management during the reference period

ROTATING MODULE: MACHINERY, EQUIPMENT, ASSETS

Section 1: Machinery and equipment used by the holding during the reference period

Part 1.1: Identification of the agricultural holding
Part 1.2: Manually operated equipment
Part 1.3: Animal-powered equipment
Part 1.4: Machine-powered equipment

Section 2: Non-residential buildings or structures used by the holding during the reference period

Part 2.1: Non-residential buildings or structures used for crops – purpose, volume/area and tenure
Part 2.2: Non-residential buildings or structures used for livestock – purpose, volume/area and tenure

Section 3: Selected assets owned by the household during the reference period

Part 3.1: Land and livestock
Part 3.2: Household dwelling
Part 3.3: Drinking water
Part 3.4: Household assets

2.5. DATA ACCESS

When AGRIS is initiated at the country level, a detailed release calendar should be published by the implementing national agency to announce the survey outputs and the conditions under which they will be available to each category of users. This release calendar should be user-friendly and consistent with both the national dissemination policy in place and international best practices (such as open-data protocols).

Implementing national agencies are encouraged to maintain a DDI-compliant[4] AGRIS Microdata Catalogue, in line with the practices of and tools made available by the International Household Survey Network[5]. In addition to all relevant metadata, questionnaires and survey outputs, the catalogue should provide easy and safe access to anonymized microdata, for research purposes. The exact access terms for each survey data set should be in line with national legislation, in particular that regarding privacy.

2.6. AGRIS CUSTOMIZATION AND IMPLEMENTATION AT COUNTRY LEVEL

AGRIS is designed as a national survey program to be implemented by national agencies with an official mandate to produce statistical data. This handbook proposes the basic elements of a generic AGRIS methodology, which should be further customized and tested before implementation. Guidelines for performing such customization are available in chapter 4 (containing questionnaires and methodological notes) and chapter 5 (on sampling).

Alignment with national priorities and capacity-building

Alignment with national priorities as identified in national statistical strategies[6] and work programs should be the overarching principle governing the implementation of AGRIS. AGRIS is a unique opportunity to strengthen national systems and to enforce national and international statistical standards, thus contributing to the enhancement of statistical capacity and literacy.

4 www.ddialliance.org/.
5 www.ihsn.org.
6 Examples of these strategies include the Strategic Plans for Agriculture and Rural Statistics currently being designed in the context of the Global Strategy, as well as the generic National Strategies for the Development of Statistics.

3

Chapter 3
AGRIS data items

This chapter presents the data items covered in each of the AGRIS modules (Core Module and Rotating Modules).

The data items are further developed into generic AGRIS questionnaires, presented in chapter 4 of this handbook.

3.1. AGRIS CORE MODULE: MEASUREMENT OBJECTIVES AND DATA ITEMS

MEASUREMENT OBJECTIVE

In line with the overall AGRIS strategy, the AGRIS Core Module is an annual sample farm survey having the main objective of measuring a key set of indicators related, in particular, to the volume of agricultural production. This would enable the identification of trends and changes in a timely manner and to make some forecasts on future scenarios and farmers' expectations. The survey is normally fielded once a year, after the main harvest, and captures productions for the last agricultural year. It has a specific reference date or period for selected data items, in particular relating to livestock. In some countries with multiple campaigns, several waves of data collection could be carried out. In addition, the Core Module measures key social, economic and technical dimensions of the holding.

The table below provides a high-level summary of the data items in the Core Module. It is followed by a second table that further elaborates upon these data items.

Identification and general characteristics of the holding
Location, holder, manager, respondent, land tenure, main activity, main destination
Production methods
General, crop production methods, livestock production methods
Agricultural productions
Crops: production during the reference period, by harvest
Crops: intentions for the next 12 months
Livestock: number of animals and herd' s movements
Meat, milk, eggs and other animal products
Livestock: intentions for the next 12 months
Aquaculture and fisheries
Forestry
Economy
Other activities of the holding
Income
Production shocks and coping mechanisms
Demographics [HH-sector AH only]
Labour
Labour input on the holding by holder/household members and external workers
Household dwelling and assets [HH-sector AH only]

DATA ITEMS IN DETAIL

Identification and general characteristics of the holding	
	Identification and location of the holding
	Details on the respondent for the holding
	Legal status of the holder and the holding
	Recording of the main agricultural activities/events of the holding (No, never; yes, only occasionally; yes, systematically)
	Land tenure types on the holding
	Main production focus of the holding in economic terms (crops/livestock/mix)
	Main intended destination of production of the holding
Characteristics of the Holders and Managers	
Identification of the Holder/Co-holders	
	Type of holder (civil person/group of civil persons/legal person) Name Contact details (for follow-up) Sex Age Nationality/indigenous group (Country-specific responses) Educational attainment Share of working time spent working on the holding Gainful activities outside of the holding (Y/N)
Identification of the Manager of the holding	
	Name Contact details (for follow-up) Sex Age Relationship to holder Nationality/indigenous group (country-specific responses) Educational attainment Share of working time spent working on the holding Gainful activities outside of the holding (Y/N)
Production methods	
	Number of parcels used for agricultural production
	Area of holding according to land use types Temporary crops Temporary fallow Kitchen gardens and backyards Permanent crops Permanent meadows and pastures
	Irrigation: area equipped in working order
	Irrigation: area irrigated at least once during the reference period
	Drainage: area equipped in working order
	Area in organic farming
	Non-agricultural land on the holding Farm buildings and farmyards Forest and other wooded land Aquaculture on the holding Other land (unutilized, rocks, wetlands, etc.)
	Use of fertilizers (Y/N), by crop
	Use of PPP (Y/N), by crop
	Variety diversity and type of seeds, by crop Number of varieties grown (one, more than one) Share of seed by type (certified, modern varieties; uncertified varieties) Genetically Modified Organisms (GMOs) (Y/N)

	Major feeding practices by livestock type Only grazing Mainly grazing, with some feeding Mainly feeding, with some grazing Only feeding
	Whether the holding is engaged in contract farming (Y/N)
	If yes, share of crop/livestock covered by type of contract (production contract, marketing contract), by crop and livestock type
Agricultural productions – Crops	
	For the reference period, all crops (for each crop in the [CROP LIST])
	List of crops cultivated on the holding
	Number of harvests, by crop
	Continuous crops – production by crop during last six months
	Destination of the crop production, by harvest: own-use, selling, other
	Most recent harvest, for each crop cultivated:
	Harvest start date and duration
	Area planted
	Area harvested
	Irrigation (Y/N)
	Quantities harvested
	Yields obtained, as compared to the same harvest of the previous year
	Quantities owned by the holding and still in stock before the last harvest
	Mixed cropping
	For crops harvested more than once in the last 12 months, for each additional harvest, by crop:
	Harvest start date
	Area planted
	Area harvested
	Irrigation (Y/N)
	Quantities harvested
	Mixed cropping
	Destination of each crop from all harvests in the reference period
	Intentions in the next 12 months, all crops (for each crop in the [CROP LIST])
	Planting intentions
	Reasons for major changes, as compared to the reference period
	Plans to introduce new crops in the upcoming period, by crop
Agricultural productions – Livestock	
	Reference period (or reference date), all livestock raised on the holding, by species
	Livestock numbers, by species
	Number of animals on the reference day
	Number of births (during the reference period)
	Number of animals acquired (during the reference period)
	Number of animal deaths (during the reference period)
	Number of animals slaughtered on the holding (during the reference period)
	Number of animals slaughtered in a slaughterhouse (during the reference period)
	Number of animals sold or given alive (during the reference period); unit price of last sale
	Number of animals used for traction or draught purposes (for applicable species)

Agricultural production – Meat, milk, eggs and other animal products	
	Production of meat, by species
	Total weight of animals slaughtered on the holding (carcass)
	Total weight of animals slaughtered in a slaughterhouse (carcass)
	Destination of the meat produced
	Production of raw milk, by species
	Production of raw milk, by species, share by end use, unit price used in the last sale – reference period by respondent choice
	Average duration of lactation per year, by species
	Young animals' access to suckle (Y/N)
	Production of eggs, by species
	Production of eggs, by species, by end use (own use, eggs for renewal, sold, other), unit price used in the last sale, – reference period by respondent choice
	Average number of days per year to get eggs, by species
	Honeybees
	Number of hives and quantity of honey produced
	Other animal products
	Production and unit price used in the last sale for shorn wool, pulled wool, non-carded animal hair, silkworm cocoons, furs, animal skins, other
	Intentions for the next 12 months
	Intentions to raise in the upcoming period, by livestock type
	Reasons for major changes, as compared to the reference period
	Plans to introduce new livestock in the upcoming period, area, by livestock type
	Reasons for introductions
Aquaculture and fisheries	
	Presence of aquaculture on the holding (Y/N)
	Total production of aquaculture products, by type and according to end use
	Unit price of the last sale for aquaculture products sold
	Engagement of the holding in fisheries (own account) (Y/N)
	Total production of fish, by type and according to end use
	Unit price of the last sale for fishery products sold
Forestry	
	Presence of forestry production on the holding (Y/N)
	Total production (quantity) of forestry products and indication if there were sales, by product type
Economy – Income	
	Other activities of the holding and their contribution to the total income
	Contribution of other activities to the total income of the holding, comparison with previous year, by other activity
	Share of agricultural income (from crops and livestock) in total household income (HH sector AH only)
	Contribution of agricultural income to the total household income, comparison with previous year
	Whether the holding has a bank account (Y/N)
Access to information	
	Information sources used for agricultural information
	Channels used to consult agricultural information
	Participation in a farmers' association (Y/N)
	Participation in a producer/commercial cooperative (Y/N)
Production shocks and coping mechanisms	
	Top three severe production and household shocks that hit the holding in the reference period
	For each shock: Holding's main response to the shock experienced

	Self-reported recovery from the shocks (Y/N)
	Self-reported ability to better cope with future shocks (Y/N)
	Perception of the severity of recent shocks compared to the past
Demographics *[HH-sector AH only]*	
	For each household member (holder and co-holder households):
	Sex Age Relationship to the household head Marital status Educational attainment For school-age children only: school attendance during current/last school year (Y/N) Completion of formal training on agriculture (Y/N) Participation in decision-making (Y/N) Work on the holding (Y/N)
Labour	
	Number of household members and external workers working on the holding in the reference period, by category of worker and season
	Labour input on the holding provided by household members and external workers, by category of worker, by season, by status (full-time, part-time), by main activity (crop cultivation, raising livestock, non-agricultural activities)
	Identification of household members who received pay for their work on the holding
	Shortage of workers during peak periods (Y/N)
	Use of contractors (Y/N)
	If yes, main activities and whether wholly or partially carried out by contractor
Housing dwelling and assets *[HH-sector AH only]*	
	Type of dwelling
	Ownership of a bank account (Y/N)
	Household member(s) owning a bank account (ID codes)
	Access to key services by the household

3.2. AGRIS ROTATING MODULE – ECONOMY: MEASUREMENT OBJECTIVES AND DATA ITEMS

MEASUREMENT OBJECTIVE

In line with the overall AGRIS strategy, the AGRIS Rotating Module on Economy measures key aspects of agricultural incomes and expenditures and provides information on productivity at the agricultural holding level.

The Economy Rotating Module is normally fielded together with the Core Module, every other year. It can be fielded in one wave or in two waves.

The table below provides a high-level summary of the data items in the Economy Module. It is followed by a second table that further elaborates upon these data items.

Identification and general characteristics of the holding
Income of the agricultural holding
Agricultural income
Income from processing of agricultural products and diversification activities
Subsidies and transfers received, linked to the agricultural production of the holding
Other sources of income for the household, not linked to the holding [HH-sector AH only]
Expenses of the agricultural holding
Expenses linked with agricultural production
Other inputs
Taxes and licenses
Investment, financing and insurance
Capital investment
Loans and financing
Insurance
Marketing, commercial networks and storage

DATA ITEMS IN DETAIL

Identification and general characteristics of the holding	
	Agricultural land area, by land tenure type
	Livestock ownership Number of animals on the reference day, by species and by ownership type
Income of the agricultural holding	
	Agricultural income - Crops
	Quantities produced, sold, by crop type
	Average price received OR Total value of sales, by crop type
	Agricultural income – Livestock
	Number of live animals sold, by type of animal
	Average price received OR Total value of sales, by animal type
	Agricultural income – Animal products
	Quantities produced, sold, by product type (unpackaged, fresh milk; eggs; honey; shorn wool; pulled wool; non-carded animal hair; silkworm cocoons; furs; animal skins; other)
	Average price received OR Total value of sales, by product type
	Aquaculture, fisheries and forestry income
	Other sources of income directly related to the agricultural holding
	Income from on-farm processing of agricultural products
	Quantities produced, total value of sales by processing type
	Plans for development of on-farm processing capacity (Y/N), constraints to development (Y/N), type of constraints
	Income from diversification activities
	Total income, by diversification activity type
	Income from production of electricity from renewable sources
	Subsidies and transfers received, related to the holding
	Total value of subsidies received, by type
	Direct subsidies Indirect subsidies
	Total value of transfers received
	Provider of the transfer Household member receiving the transfer Household member deciding on the use of the transfer
	Other sources of income for the household, not linked to the holding [HH sector AH only]
	Income from other businesses operated
	Salaries/wages from employment of household members not linked to the agricultural holding
	Other net income, by source
Expenses of the agricultural holding	
Expenses linked with the agricultural production	
	Resource inputs: total expenditures
	Natural resources – land and water: total expenditures
	Renting agricultural land and buildings (including grazing fees) Water
	Energy: total expenditures
	Fuel and lubricants Electricity Other

	Labour input used by the holding
	Total salaries, wages and retributions paid, by type of worker
	For each type of worker, quantity of product shared for in-kind payments, by type of product shared
	Indication of other arrangements for labour
	Other inputs and services for crop production
	Seeds and plants: total expenditures, quantities used and purchased Fertilizers: total expenditures, quantities used and purchased PPPs: total expenditures, quantities used and purchased Contracts and services: type of payment (without payment, in-kind, other arrangement, cash), total expenditures for cash payments, by type of contract or service
	Other inputs and services for livestock production: total expenditures
	Type of payment (without payment, in-kind, other arrangement, cash) and total expenditures for cash payments, by type of input/service Feed, supplements and hay Veterinary services and drugs Semen and breeding fees Livestock purchases Contracts and services related to livestock Other
	Other inputs
	Total expenditures:
	Repairs and maintenance (machinery/equipment/vehicles, farm buildings/fences) Rental and leasing of farm machinery/equipment/vehicles Other
	Indicator if animal-powered equipment and machine-powered equipment is used
	Taxes and licenses: total expenditures
	Land tax Other taxes Licences
Investment, financing and insurance	
	Capital investments
	Total expenditures for capital items and improvements, by type
	Loans and financing
	Total amount of cash loans repaid
	Whether the holding obtained any loans during the reference period (Y/N)
	If yes: Loan type (cash, in-kind) by loan provider Total value of the loans by loan type (cash, in-kind)
	Household member(s) responsible for negotiation and payment of the largest loan
	Main use of the largest loan
	Household member(s) who decided how to use the largest loan
	Insurance
	Whether the holding was covered by insurance
	Type of insurance coverage (collective agricultural, individual agricultural, other)
	Payments or reimbursements received from insurance contracts
	Insurance premium paid

	Insurance related to crop production Insurance related to livestock production Other agricultural insurance paid
	The main insurance type needed but not purchased:
	Crop losses Livestock losses Revenue losses Other insurance related to crop or livestock production Not applicable/all needed insurance was purchased
	Reasons for not signing up for this insurance
Marketing, commercial networks and storage	
	Destination of crop production, percentage by product
	Destination of animal products (excluding meat), percentage by product
	Most important commercial network, by product reported sold
	Travelling time to nearest agricultural market to sell products, by aggregated groupings (crops, livestock/animal products)
	Average frequency of travelling to the market to sell products, by aggregated groupings (crops, livestock/animal products)
	Person responsible for deciding what produce to sell (crops, livestock/animal products) (HH-sector AH only)
	Person responsible for selling produce on markets (crops, livestock/animal products) (HH-sector AH only)
	Ability to store agricultural products to wait for better market conditions, by groups of products (Y/N)
	Type of storage holding has access to for cereal and grain crops, and ownership
	Type of storage holding has access to for groups of products (root crops, fruits and other vegetables, meat, milk and milk products, other agricultural products)

3.3. AGRIS ROTATING MODULE – LABOUR: MEASUREMENT OBJECTIVES AND DATA ITEMS

MEASUREMENT OBJECTIVE

In line with the overall AGRIS strategy, the AGRIS Rotating Module on Labour measures (i) the volume of labour input in the agricultural holding provided by household members, external workers and contractors - and (ii) the organization of labour on the holding.

The Labour Rotating Module is normally fielded together with the Core Module, two times over the AGRIS ten-year cycle. It is a holding-based questionnaire. It can be fielded in one wave, or multiple waves. However, multiple waves entail associated trade-offs in terms of operational costs (higher) and data quality (better), in particular linked to the use of shorter recall periods. Considering the challenges posed by long recall periods, it is recommended to administer this module in at least two visits. The number of visits and the exact timing are country-specific, as they depend upon the seasonal calendar of each country.

The table below provides a high-level summary of the data items in the Labour Module. It is followed by a second table that further elaborates upon these data items.

Activities of the agricultural holding during the reference period	
Household members: time worked and main activities [HH-sector AH only]	
	Agricultural work, for each household member
	Work on other economic activities of the holding, for each household member
Household members: payments and benefits for the work on the holding [HH-sector AH only]	
External workers: demographic and educational profile, by worker type	
External workers: time worked and main activities, by worker type	
External workers: payments and benefits for the work on the holding, by worker type	
Contractors: activities carried out and payments	

The Labour Rotating Module could be complemented by an optional individual-level add-on questionnaire (not covered in this note).

DATA ITEMS IN DETAIL

Activities of the agricultural holding during the reference period	
	Activities performed during the reference period
	Agricultural activities *Non-agricultural/Other economic activities*
	For each activity reported
	Months activity was carried out Type of workers involved: Household members External managers External, paid, long-term employees External, paid, temporary workers External, paid, casual workers Unpaid external workers Contractors
	Identification of peak months for agricultural activities over the reference period
	Need for more workers (Y/N)
	If yes, main reason for the lack of workforce
	Consequences of the labour shortage on the farming activities
Household members: time worked and main activities [HH sector AH only]	
	Agricultural work (Y/N), for each household member
	If yes, position on the holding (holder/co-holder; manager; worker, with no decision-making role)
	Time worked
	Main agricultural activity (from list of agricultural activities)
	Work on other economic activities of the holding, for each household member
	Involvement in non-agricultural activities related to the holding (from list of non-agricultural/other economic activities)
	Time worked on all non-agricultural activities
Household members: payments and benefits for the work on the holding [HH sector AH only]	
Payment received for the work on the holding (Y/N)	
	If yes, Payment modality
	In cash only In-kind only In cash and in-kind
	Last payment in cash
	Value Corresponding period of time worked
	Last payment in-kind
	Value Corresponding period of time worked
	Benefits for the work performed on the holding
	Pension fund (Y/N)
	Health insurance (Y/N)
	Total value of contributions for pension funds and health insurance
External workers: demographic characteristics	
Identification of the types of external workers on the holding	
	External managers External, paid, long-term employees External, paid, temporary workers External, paid, casual workers Unpaid external workers
For each worker type, number by age group and sex (adult males, adult females, children)	
	For external, paid, casual workers, number by provenience

External workers: time worked and main activities	
For each type of external worker (adult males, adult females and children):	
	Time worked on the holding for each month
	Number of workers for whom "agriculture" was the main activity
	Number of workers for whom "other economic activities" were the main activity
	Two main agricultural activities performed (from list of agricultural and non-agricultural activities presented)
	Number of workers by group of occupations (ISCO), excluding external, casual workers
External paid workers: payments and benefits	
For each type of paid external worker (adult males, adult females and children):	
	Payments for work on the holding
	Frequency Corresponding cash payment Corresponding in-kind payment Number of workers paid only in-kind
	Benefits for work performed on the holding
	Number of workers who received contributions to a pension fund Number of workers who received health insurance Total value of contributions for pension funds and health insurance Indication of other benefits provided Estimated value of other benefits provided
Contractors	
Use of contractors (Y/N)	
	If yes, corresponding activities contracted out (from list of activities presented above)
	Total value of payments made to contractors
	Last payment made to a contractor
	Value Corresponding period of time worked Corresponding activities/tasks

3.4. AGRIS ROTATING MODULE PRODUCTION METHODS AND THE ENVIRONMENT: MEASUREMENT OBJECTIVES AND DATA ITEMS

MEASUREMENT OBJECTIVE

In line with the overall AGRIS strategy, the AGRIS Rotating Module on Production Methods and the Environment measures key aspects of agricultural production methods at the agricultural holding level. It collects key data necessary to assess the impact of agricultural activities on the environmental, the social and economic sustainability of farming, GHG emissions, etc. This module provides useful elements for an analysis of the costs of production of different types of agricultural production methods.

The survey is fielded twice over the AGRIS ten-year cycle, in years 4 and 8. One wave of data collection is envisaged.

The table below provides a high-level summary of the data items in the Production Methods and the Environment Module. It is followed by a second table that elaborates in more detail, the data items provided by the module.

General information	
Use of natural resources	
	Energy sources
	Land use
	Soil management
	Irrigation and drainage
Crop production methods	
	Fertilizers
	Plant protection products (PPP)
	Crop and seed varieties
	Permanent crops
	Pollination practices
	Rice cultivation
Livestock production methods	
	Type of production system (derived)
	Animal breeding and reproduction, veterinary products and traditional methods
	Animal housing, equipment and transportation of animals
	Feed and use of pastures, watering of animals
	Manure management
Certified organic farming	
Agroforestry	
Access to and use of information services, infrastructure and communal resources	
	Agricultural information
	Infrastructure (transportation, communication and access to facilities)
	Access to communal resources
Greenhouse gas and environmental issues	
Adaptation to climate change and mitigation strategies	
Waste management	

DATA ITEMS IN DETAIL

General information		
Prospects for development of the holding		
	Prospects for development in the next 2-3 years	
		Holding is stable, no major changes or developments planned Holding will develop, no major obstacles identified Holding will not develop, due to certain constraints Holding will likely stop agriculture
	Main constraints on holding's development	
		Access to land Access to water Access to financial resources Access to machinery and equipment Access to labour Access to other agricultural inputs Not enough demand/buyers for products of the holding Selling prices are too low Decreasing soil fertility Natural disasters Lack of safety, thefts, etc. Poor transportation and/or infrastructure Other
Use of natural resources		
Energy sources		
	Identification of energy sources used by the holding	
		Network electricity Petroleum fuels Coal Natural gas Propane Biomass Biogas or methane Solar energy Wind energy Hydro force Other energy or fuel None
Soil management		
	Agricultural Area Utilized (AAU) by main land use types (area)	
		Temporary crops Temporary fallow Temporary meadows and pastures Kitchen gardens and backyards Permanent crops Permanent meadows and pastures
	Tillage methods on outdoor arable land (area)	
		Conventional tillage Conservation (low) tillage Zero-tillage (no tillage)
	Soil cover on outdoor arable land (area)	
		Bare soil Plant residues Cover crop or intermediate crop Next seasonal crop

	Indication of other soil conservation practices on the holding	
		Crop rotation Fallowing or shifting cultivation Vegetative strips Liming Terraces Wind breaks and hedges Rotational grazing Other practices and features to reduce soil erosion, salinity, compaction, drainage of soil water, etc.)
	Burning of crop residues	
		For each crop burned, area sown and indicator of share of area burned
	Burning of other areas	
		Whether slash-and-burn was used for clearing land during the reference period (Y/N)
		Whether various land types were burned (temporary fallow, forest or other wooded land, unutilized agricultural area) (Y/N)
		If yes, indicator or share of area burned (same categories presented above)
	Crop residues used for feed and/or bedding	
		Identification of crops from which residues were used for feed and/or bedding. For each, area sown and share of area from which the crop residue was used for feed and/or bedding
	Renewal of pasture areas during the reference period (Y/N)	
		If yes, area renewed and indication of renewal activities undertaken
	Other soil-related information	
		Conduct of soil analysis during reference period (Y/N) Conduct of soil analysis in the past five years (Y/N) Soil changes, water accumulation
Irrigation and drainage		
	Identification of fully controlled irrigation methods used during the reference period, and importance in holding's overall use of irrigation	
		Surface irrigation (flooding, furrows) Sprinkler irrigation Drip irrigation Spray or microsprinkler irrigation Bubbler irrigation Other
	Identification of sources of irrigation water used during the reference period and importance in holding's overall use of irrigation	
		On-farm ground water On-farm surface water Off-farm surface water (lakes, rivers, watercourses) Municipal water supply or other water network Treated wastewater Reservoir (used to avoid flooding) Other
	Use of rainwater collected during the reference period for the purpose of irrigating (Y/N) and use of other water-saving practices (Y/N)	

	Identification of partially controlled irrigation methods used	
		Equipped wetland and inland valley bottoms Equipped flood recession cultivation Spate irrigation Other None of the above
	Irrigation used by type and by season (Y/N), and irrigated area by land use type	
		Temporary crops, single irrigation Temporary crops, multiple irrigations Permanent crops Temporary meadows and pastures Permanent meadows and pastures
	Identification of payment terms for irrigation carried out during the reference year	
		No payment for water Lump sum Fee based on irrigated land area Fee based on volume of water used Other
	Area equipped with irrigation in working order by irrigation type (fully controlled irrigation system, partially controlled irrigation system)	
	Whether drains were present on the holding during the reference period (Y/N)	
Crop production methods		
Fertilizer		
	Use of fertilizers on the holding during the reference period (Y/N)	
	If no, reasons (too expensive, not available, other)	
	If yes, identification of types of fertilizers applied	
		Mineral fertilizers Organo-mineral fertilizers Organic fertilizers Biofertilizers Solid dung Liquid manure Slurry Other
	For each type of fertilizer applied	
		Area applied by land use type
		Quantity applied by land use type
Plant Protection Products (PPPs)		
	For each crop where PPPs were used, area and quantity by PPP type	
		Insecticides Herbicides Fungicides Rodenticides Other
	Use of natural pests against disease or for weed control during the reference period (Y/N)	
Crop and seed varieties		
	Number of varieties and share by variety type, for each temporary crop	
		Number of crops and varieties
		Share by variety type Modern varieties, certified seed Modern varieties, uncertified seed Traditional varieties, uncertified seed

		Use of genetically modified (GM) seed (Y/N)
		Use of seeds adapted to local conditions and stresses (Y/N) Share by source Produced on the holding Obtained at exchanges within the community Purchased from local market Purchased from seed company Received as a donation
Permanent crops		
	For each permanent crop in compact plantation	
		Location Number of varieties grown Year established (age derived) Trees per area (density) Whether there was production from the plantation (Y/N) Number of trees in production
	For each permanent crop grown in scattered trees/plants	
		Number of varieties grown Estimated number of trees/plants Whether there was production from scattered trees/plants (Y/N) Number of trees in production
Pollination practices		
	Identification of practices and features to enhance pollination	
		Planting of wildflower-rich fallows or strips (such as “bee pastures”) Presence of flowering hedgerows Use of nectar-producing cover crops Use of dedicated nectar and pollen seed mixes Provision of nesting sites (“bee hotels” for many bees, or nesting tubes for megachilid bees) Protection of existing ground-bee nesting sites or trees in which wild species of bees nest Use of managed honeybee hives Use of managed stingless bee hives Use of managed bumblebee boxes Use of managed leafcutter nesting sites Other
Rice cultivation		
	Number of rice cultivating cycles over the last 12 months	
	Average interval between cultivating cycles in weeks/months	
	Type of rice cultivated	
	For each type of rice	
		Length of growing period
		Irrigation methods before the growing period Flooded pre-season Not flooded pre-season
		Irrigation methods and water regimes during the growing period Irrigated, continuously flooded Irrigated, intermittently flooded Regularly rain-fed Deep water Drought-prone
	Identification of the organic amendments added to the soil before cultivation of rice	
		Straw, incorporated shortly before cultivation (30 days or less) Straw, incorporated long before cultivation (more than 30 days) Compost Farmyard manure Green manure Other

	Identification of rice planting techniques	
	Planting/seeding rates (number of plants/weight of seeds per area unit)	
Livestock production methods[1]		
Reproduction		
	Identification of animal reproduction techniques by species	
		Natural mating Artificial insemination Dam was purchased pregnant Dam was exchanged pregnant Other
	Identification of main provider of breeding services	
		Private veterinarian Public veterinarian Self-provision Other
Veterinary products and traditional methods		
	Identification of veterinary services used by the holding, by species	
		Reproduction Curative treatment Preventative medicine
	Identification of hormones and antibiotics used on livestock, by species	
	Identification of traditional medicine applied on livestock, by species	
		Reproduction Curative Preventative Other None of the above
Animal housing		
	Identification of the type of animal housing system used during the reference period, by species	
		Cattle and buffaloes Open/no housing Stanchion-tied stable, with solid dung or liquid manure/slurry Loose housing, with solid dung or liquid manure/slurry Other, including boxes sometimes used for young animals
		Pigs Open/no housing On partially or completely slatted floors On straw-beds (deep litter loose housing) Other
		Sheep and goats Open/no housing Traditional barns or buildings Shelter Other
		Poultry Open/no housing On straw-beds (deep litter loose housing) Battery cage Other
	Whether housing reported was used to house both humans and livestock (Y/N)	

1 Type of livestock production system (not asked directly)
Grazing system (Extensive: nomadic or totally pastoral; semi-nomadic/transhumant; Intensive: sedentary pastoral or ranching; mixed system; Irrigated; Rain-fed; Industrial system

	Identification of ventilation systems used in livestock buildings	
		Fans switched on automatically Fans switched on manually Passive ventilation (side curtains, free air or vent panels) Other None of the above
	Whether there were filters on vents and/or vent fans to control dust emissions in buildings used to house pigs or poultry (Y/N/NA)	
	Whether there were temperature controls in the buildings used to house livestock (Y/N/NA)	
Equipment and transportation of animals		
	Transhumance of animals, by type of animal	
	Whether cross-border transhumance was practiced during the reference period (Y/N)	
	Whether live animals were transported from the holding to "the destination" during the reference period (Y/N)	
	For each species transported to "the destination"	
		Main transportation method used to transport animals to "the destination" By foot By road with motor vehicles By rail vehicles Other
		Frequency of transportation to "the destination"
	For each draft animal species (equidae, cattle, buffaloes, camelidae)	
		Whether the animals were used for transport or draft power on the holding during the reference period (Y/N)
		Number used for transporting people, goods, etc.
		Number used for draft animal power (ploughing, farming, etc.)
Feed and use of pastures		
Feed		
	For each species	
		Share by feeding practice during the reference period Only grazing, including scavenging Mainly grazing, including scavenging with some feeding Mainly feeding with some grazing, including scavenging Only feeding (zero grazing or scavenging)
		Share by feed fed during the reference period Forages, including roughages Crops and agro-industrial by-products, including concentrate Swill and household wastes
		Whether supplements were fed (Y/N)
	Share by source, for each type of feed	
		Produced on the holding Common pasture Purchased Exchanged Received for free
	Quantity of fodder (forages, including roughages) purchased during the reference period, by type	
		Hay Wrapped grass Grass or hay silage Maize (grain) Maize silage Other
	Months during which purchased feed was used to feed livestock	

Use of pastures		
	For each species (or grouping of species)	
		Grazing on the holding
		Grazing on a common pasture
	Amount of manure (free fall) that was collected from pasture to be used as fuel	
Watering of animals		
	Whether the main source of water for watering livestock was the same for all seasons (Y/N)	
	For each species	
		Main source of water during the dry season Borehole Well Dam or lake River, spring or stream Rainwater harvesting Other
		Main source of water during the rainy season
	Whether problems were encountered in watering livestock during the reference period (Y/N)	
		If yes, months in which problems were encountered
		Identification of the main problem encountered Restricted access to water sources Lack of water in usual water sources Poor quality of usual water sources Other
		Identification of the solution implemented to provide water to livestock during problematic periods
		For water sources far from the holding Whether water for livestock was transported by truck (Y/N)
		If yes, months in which water was transported by truck
		For each month, frequency of transporting water by truck
Manure management		
	Identification of types of manure produced on the holding during the reference period	
		Solid manure Liquid manure Slurry
	Whether manure was purchased or received from other holdings and used on this holding (Y/N)	
		If yes, quantity of manure purchased or received from other holdings and share by payment terms
	Whether manure produced on the holding was sold or given to others (Y/N)	
		If yes, quantity of manure sold or given and share by payment terms
	Manure management system by type of manure	
		Number of months that manure was managed using each manure management system
		For solid manure and liquid manure Digester (biogas reactor) Anaerobic lagoon Aerobic lagoon Aerobic treatment Other For slurry Digester (biogas reactor) Slurry tank
		Share of the manure storage system that was covered (to keep off rain or reduce emissions of manure gases)

	Quantity of manure produced on the holding, by use	
		For fuel (including heating) For construction For feed
Certified organic farming and conversion to organic certification		
	Whether the holding produced certified organic crops during the reference period (Y/N)	
	Whether the holding was in conversion to organic certification of crops during the reference period (Y/N)	
	Whether the holding plans to obtain organic certification for at least one crop production cycle in the next 2–3 years (Y/N)	
	Whether the holding produced certified organic livestock during the reference period (Y/N)	
	Whether the holding was in conversion to organic certification of livestock during the reference period (Y/N)	
	Whether the holding plans to obtain organic certification for at least one livestock production cycle in the next 2-3 years (Y/N)	
Agroforestry		
	Whether there were agroforestry practices on the holding during the reference period (Y/N)	
		If yes, identification of the types of agroforestry Agro-sylvicultural area (crops and trees) Sylvo-pastoral area (trees and livestock) Agro-sylvo-pastoral areas (crops, trees and livestock)
	For each type of agroforestry	
		Area Main type of trees
	Whether there was forest or other wooded land created on the holding by planting trees during the reference period (Y/N)	
		If yes, area planted
Access to and use of information services, infrastructure and communal resources		
Agricultural information during the reference period		
	Types of information used on the holding during the reference period	
		Crop rotation and other sustainable agricultural practices Crop types to be produced Use of fertilizers and/or PPPs Crop health issues Livestock health issues Livestock feed issues Livestock breeding Availability of inputs (including machinery and equipment) Prices of inputs Prices of outputs Weather forecasts affecting production Other environmental information
	For each type of information used	
		Main source Government or extension service Other individual farmer Farmers' group or association NGO or non-governmental project Trader or market stakeholder Other

	For each source of information	
		Main method used for consulting information source Face-to-face discussions Telephone calls Radio Television Internet or SMS Press or newspapers Other
	Information on the instructions for the application of PPPs (Y/N) and on the dangers to health associated with such application (Y/N)	
	Monitoring of market conditions before selling products from the holding (Y/N)	
	Number of visits made to the holding by an extension officer, veterinarian or animal health assistant during the reference period	
	Main reason for not having more visits to the holding by extension officers, veterinarians or animal health assistants	
Infrastructure (transportation, communications and access to facilities)		
	Types of vehicle available on the holding during the reference period	
	Public transportation	
		Types of public transportation infrastructure available near the holding: Bus station Train station Boat/ferry terminal None of the above
		Travelling time to the nearest public transportation station (hours and minutes), by season
	Access to facilities	
		Agricultural products collection network during the reference period (Y/N)
		Shared food storage facility during the reference period (Y/N)
		Agricultural processing facility during the reference period (Y/N)
		Travelling time to the nearest public transportation station (hours and minutes), by season
	Communications	
		Types of communications services and systems available to the holding during the reference period: Internet Telephone Radio Television None of the above
		Information on specific development projects being carried out in the holding's community or neighbourhood during the reference period (Y/N)
		If yes, whether the holding participated in the project (Y/N)
		If holding did not participate, the main reason why the holding did not participate
		Availability of facilities for repairing agricultural machinery in the holding's neighbourhood during the reference period (Y/N)
		If yes, whether the holding used the repair facilities (Y/N) If no, main reason why the holding did not use the repair facilities
Access to communal resources		
	Communal grazing land in the holding's neighbourhood during the reference period (Y/N)	
		If yes, whether the holding used the communal grazing land (Y/N) If no, the main reason for not using the communal grazing land

	Communal forest or other wooded land in the holding's neighbourhood during the reference period (Y/N)	
		If yes, whether the holding used the communal forest or other wooded land (Y/N) If no, the main reason for not using the communal forest or other wooded land
	Communal area under water for aquaculture in the holding's neighbourhood during the reference period (Y/N)	
		If yes, whether the holding used the communal area under water for aquaculture (Y/N) If no, the main reason for not using the communal area under water for aquaculture
	Communal irrigation facilities in working order in the holding's neighbourhood during the reference period (Y/N)	
		If yes, whether the holding used the communal irrigation facilities (Y/N) If no, the main reason for not using the communal irrigation facilities
Greenhouse gas and environmental issues		
	Location in an officially protected area during the reference period (Y/N)	
	Sustainable forest management during the reference period (Y/N)	
	Contaminated sites on the holding during the reference period (Y/N)	
	Involvement in an organization (cooperative, association, etc.) for environmental protection programs during the reference period (Y/N)	
	Main agricultural concern for the holding	
		Lack of water Floods Air pollution Soil pollution Extreme temperatures (cold or heat) Other None
	Usual disposal method for dead animals during the reference period	
		Buried on the holding Incinerated Composted Collected by off-farm collection service Other
	Fines for environmental pollution paid during the reference period (Y/N)	
Adaptation to climate change and mitigation strategies		
	Whether natural extreme events or disasters hit the holding during the reference period (Y/N)	
	If yes, Number of human impacts People killed People injured People rendered homeless People evacuated Other	
	Type and severity of economic impacts Loss of revenue Loss due to disruption of production Other economic impacts	

	Type and severity of physical impacts Area lost Crop losses Livestock losses Aquaculture losses Biomass losses Building damages or losses Other physical losses	
	Indication of practices of the holding during the reference period to adapt to climate change Multicropping Shifting cultivation Use of traditional agricultural heritage practices and knowledge Use of traditional crop and animal varieties Use of seeds adapted to local conditions and stresses Use of new practices or technologies Other	
Waste management		
	Indication of methods used during the reference period to manage the wastewater generated by the holding	
		Discharged to a constructed retention or holding pond Discharged to a septic or sewer system Discharged to a vegetative filter strip or constructed wetland Applied to agricultural land Included in the liquid manure system Not managed, removed through natural drainage Other
	For wastewater by type (after treatment, without treatment), share of the wastewater generated by the holding that was discharged into the environment	
	Indication of types of waste generated by the holding during the reference period and its treatment Organic waste - Non-hazardous organic waste - Hazardous organic waste Inorganic waste - Non-hazardous inorganic waste - Hazardous inorganic waste	
		For each waste type Indication of the treatments used by the holding for the waste generated on the holding Waste taken away from the holding by a professional Waste kept on the holding, by type of treatment

3.5. AGRIS ROTATING MODULE MACHINERY, EQUIPMENT AND ASSETS: MEASUREMENT OBJECTIVES AND DATA ITEMS

MEASUREMENT OBJECTIVE

In line with the overall AGRIS strategy, the main objective of the AGRIS Rotating Module on Machinery, Equipment and Assets is to measure the types, numbers, age and ownership of the machinery and equipment used on the farm. For household-sector farms, the survey also measures key assets and their ownership, and therefore complements or further details the corresponding sections of the Core Module.

The survey is normally fielded twice over the ten-year cycle, in years 1 and 5. It basically covers the agricultural year (12 months).

The table below provides a high-level summary of the data items in the Machinery, Equipment and Assets Module. It is followed by a second table that further elaborates upon these data items.

Machinery and Equipment	
	Types and quantities in use, tenure, owners, age of owned equipment
	Manually operated equipment
	Animal-powered equipment
	Machine-powered equipment for general farm use
	Machine-powered specialized agriculture machinery and equipment
Non-residential buildings or structures used by the holding	
	Types, purpose, area/volume, tenure
	Used for crops
	Used for livestock
Assets (HH-sector AHs only)	
	Land and livestock ownership
	Household dwellings
	Drinking water
	Household assets

DATA ITEMS IN DETAIL

Machinery and Equipment		
Manually operated equipment		
	Numbers used, numbers owned, identification of owners *(HH-sector AHs only)* by equipment type	
Animal-powered equipment		
	Numbers used, numbers owned, average age (for owned equipment), identification of owners *(HH-sector AH only)*, by equipment type	
Machine-powered equipment by type		
	By machinery/equipment type,	
		Number by tenure
		Average age (for owned or co-owned equipment)
		Identification of owners (for owned or co-owned equipment) *(HH-sector AHs only)*
	Machinery/equipment types	
		Machines for general farm use
		Tractors, bulldozers and other vehicles
		Land preparation and planting equipment
		Crop maintenance equipment
		Crop harvesting equipment
		Post-harvest equipment
		Equipment for livestock production
		Irrigation equipment (indication whether owned by the holding and average age only)
Non-residential buildings or structures used by the holding		
Non-residential buildings or structures used for crops (by main groups)		
Buildings for storing crops (including seeds)		
	By storage crop type	
		Capacity
		Tenure
	Storage by crop types	
	Purpose and storage volume/area	
Buildings for crop-related activities		
	By crop-related activity type	
		Area
		Tenure
Non-residential buildings or structures used for livestock (by main groups)		
Buildings for livestock-related activities		
	By livestock-related activity type	
		Area
		Tenure
	Type of tenure	
Building or structures used to house both humans and livestock		
	Whether any buildings or structures were used to house both humans and farm animals (Y/N)	

Selected assets owned by the household *[HH-sector AHs only]*	
Land and livestock	
	Identification of household members who owned agricultural land operated
	Identification of household members who owned livestock, by livestock type
Household dwelling	
	Tenure
	If owned, identification of household members who owned the dwelling
	Main material used for the walls of the dwelling
	Main material used for the roof of the dwelling
	Main material used for the floor of the dwelling
Drinking water	
	Main source of drinking water
	Location of the main source of drinking water In own dwelling In own yard/plot Elsewhere If elsewhere, time to go to the water source, collect water and come back (hours, minutes)
	Identification of those who usually collect the water
	Whether water from the source was not available for at least one full day in the past two weeks (Y/N)
	Whether the household does anything to the water to improve its safety to drink (Y/N)
Household assets	
	Identification of household members who owned household items, by item type Country-specific responses

4

Chapter 4

AGRIS Generic Questionnaires and methodological notes

This chapter presents the AGRIS Generic Questionnaires and their associated methodological notes. The questionnaires have been developed on the basis of data items presented in chapter 3 of this handbook.

As mentioned in previous chapters, the Generic Questionnaires present a package covering the desired statistical information to be produced by a national agricultural statistics system. They may be customized before implementation by the national statistical agencies in charge of agricultural statistics, to best meet national needs and international commitments.

AGRIS CORE MODULE

Global Strategy to improve Agricultural and Rural Statistics

AGRIS QUESTIONNAIRE
CORE MODULE

Version 1.1, September 2017

SECTION 1: THE HOLDING

PART 1.1: SURVEY PREPARATION

ID code of the holding
Name and surname of the holder or legal name of the holding
Legal status of the holding
Address: region, district, town, enumeration area, legal address, phone number, type of address (plot, house, agricultural building)
GPS coordinates: longitude, latitude

Surveyor first name: ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐ **Surname:** ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐ **Surveyor number:** ☐☐☐☐☐☐

Start time of the survey: ☐☐ hour ☐☐ minutes

Questions Q01 and Q02 below will be answered by the surveyor.

Q01. Did I find a farm at the same address or same name?
◯ 0 No → **Go to Section 9. Explain in the comments box how you tried to find the holding and stop the questionnaire.**
◯ 1 Yes

Q02. Did I find somebody from the holding who accepted to answer?
◯ 0 No → **Go to Section 9. Explain in the comments box how you tried to obtain acceptance and why the person does not want to answer and stop the questionnaire.**
◯ 1 Yes → **Introduce the survey using the text below:**

TEXT TO READ:
I represent the [SURVEY INSTITUTE]. We are conducting a survey about agricultural production in all regions of [COUNTRY].
You are aware that people speak much about the current situation of agriculture in[COUNTRY]. To have an exact idea of what is really going on, there is no other way than to survey the conditions of thousands of holdings in various categories. Only after summarizing all of these responses can we have a real picture of the agriculture of [COUNTRY].
For that purpose, [number of] holdings have been chosen at random as in a lottery. One of these holdings proved to be yours. The authenticity of the results of the whole survey will depend on your sincerity and exactness when answering the questions of this questionnaire on the activities and production of your holding.
We assure you that your personal responses will not be disclosed and after all these questionnaires are processed by a computer, they will be used only in a summary way.
If you have any questions in connection with this survey, you are welcome to telephone the number indicated on the visit card of our organization that I leave for you here.
I express my gratitude for your participation in this survey in advance.

Q03. Record the following information about the respondent.
Q03a First name . . . ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐
Q03b Surname . . . ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Q03c Sex
◯ 1 Male
◯ 2 Female

Q03d What is your function on the agricultural holding?

(Fill in one circle only)
◯ 1 Holder (legal and/or economically responsible for the holding) → **Explain the detailed survey objectives using the text below.**
◯ 2 Co-holder (legal and/or economically co-responsible for the holding) → **Explain the detailed survey objectives using the text below.**
◯ 3 Manager (responsible for the day-to-day decisions on the farming operations) → **Explain the detailed survey objectives using the text below.**
◯ 4 Employee or Household member working on the holding → **Explain the detailed survey objectives using the text below, then ask the following question:**

Are you able to answer questions for the agricultural holding?
◯ 0 No → **Find another survey respondent and go back to Q02.**
◯ 1 Yes

◯ 5 Household member not working on the holding → **Find another survey respondent and go back to Q02.**
◯ 6 Other (specify ____________________) → **Find another survey respondent and go back to Q02.**

TEXT TO READ:
This survey collects information about the means of production of agricultural holdings in the whole country and whatever the holdings' sizes. Questions will focus mainly on areas used, crops and fruit production, animals raised, meat, milk and eggs produced, persons working on the holding, other activities of the holding, income, expenditures and shocks. The reference period for the survey is the last complete agricultural year (country-specific start date and end date). (Note: if the survey is being conducted near the end of the current agricultural year, this will be the reference period).

Q03e Respondent's address (street) . . . . . ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐
Q03f Respondent's address (village, town) . . ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Q03g Telephone number (cell phone) . . . . ☐☐☐☐☐☐☐☐☐☐☐
Q03g Telephone number (landline) . . . . . ☐☐☐☐☐☐☐☐☐☐☐

Q03i E-mail address . . . . ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Q04. Is the holding currently growing any crops or fruits, or raising animals, or did it do so during the reference period?
◯ 0 No → **Go to Q05.**
◯ 1 Yes → **Go to Q07.**

Q05. Has the holding ceased its activity without any transfer of its means of production?

- ◯ 0 No → **Go to Q07.**
- ◯ 1 Yes

Q06. Will the holding resume its activity?

- ◯ 0 No → **Go to Section 9. Explain the situation in the comments box and stop the questionnaire.**
- ◯ 1 Yes

Q07. Are there any changes concerning the information known about the holding?

- ◯ 0 No → **Go to Part 1.2 Q10**
- ◯ 1 Yes

Q08. What changes occurred?

(Fill in one circle only)

- ◯ 1 Change of legal status → **Go to Part 1.2 Q10**
- ◯ 2 Transfer of all means of production to another single holding → **Go to Part 1.2 Q10**
- ◯ 3 Transfer of all means of production to several holdings → **Go to Q09a.**
- ◯ 4 Fusion or merger with one or several other holdings → **Go to Q09b.**
- ◯ 5 No change in legal status or address but some information must be corrected → **Go to Part 1.2 Q10**

Q09a. How many new holdings were created with the means of production of the original holding? . . . . ☐☐☐

Go to Part 1.2 Q10 *to record answers of the holding having the same address as the previous one or, if not possible, the holding having acquired the main part of the means of production.*

Q09b. How many other holdings merged with the original holding? . . . . ☐☐☐

Go to Part 1.2 Q10 *to record answers of the holding having the same address as the previous one or, if not possible, the holding having acquired the main part of the means of production.*

PART 1.2: IDENTIFICATION OF THE HOLDING

Q10. What is the legal status of the Holder?

(Fill in one circle only)
- ◯ 1 Civil person/natural person
- ◯ 2 Group of civil persons/natural persons
- ◯ 3 Legal person

Q11. What is the legal status of the holding?

(Fill in one circle only)
- ◯ 1 (Country-specific response option)
- ◯ 2 (Country-specific response option)
- ◯ 3 (Country-specific response option)

If Q10 = 1 or 2 GO TO Q12, otherwise GO TO Q14

Q12. Answer the following questions about the Holder/Co-holders.

Q12a First name . . . [ ]
Q12b Surname . . . [ ]

Q12c Sex
- ◯ 1 Male
- ◯ 2 Female

Q12d PERSONAL ID of the Holder . . . . . [ ]

Q13. Address of the Holder
Q13a. Region . . . . . [ ]

Q13b. District . . . . . [ ]

Q13c. Village or town name . [ ]
GO to Q15

Q14. What is the legal name of the holding? . . . . [ ]

Q15. Enumeration area of the holding . . . [ ]

Q16. Holding Serial Number . . . . . [ ]

Q17. Address of the holding
- ◯ 1 Same as the address of the Holder → **Go to Q18.**
- ◯ 2 Different from the address of the Holder

Q17a Address (street) . . . . . [ ]
Q17b Village, town . . . . [ ]
Q17c. Region . . . . . [ ]

Q17d. District . . . . . [ ]
Q17e. Main telephone number of the holding . [ ]

Q18. What is the main location type of the address reported above?

(Fill in one circle only)
- ◯ 1 Household dwelling (for HH sector) and farm, including dwelling and agricultural buildings
- ◯ 2 Main agricultural building
- ◯ 3 Main agricultural parcel

Q19. What are the GPS coordinates corresponding to the address of the holding?

Q21a Latitude . . . . . [ ] ° [ ] . [ ]
Q21b Longitude . . . . . [ ] ° [ ] . [ ]

Q20. What is the official identification number of the holding in the national business register? . . . . [ ]

Q21. What are the other administrative identification numbers of the holding?

Q21a Livestock . . . . . [ ]
Q21b Wine production . . . . . [ ]
Q21c Organic production . . . . . [ ]
Q21d Other (specify [ ]) . . . . . [ ]

Q22. What is the identification number of the holding from the last agricultural census? (Can be prefilled) [ ]

PART 1.3: AGRICULTURAL ACTIVITY

Q23. **Does the holding record its agricultural activity or finances on registers or logbooks?**

(Fill in one circle only)
- ◯ 1 No, never → Go to Q25.
- ◯ 2 Yes, only occasionally or partially → Go to Q25.
- ◯ 3 Yes, systematically

Q24. What information is systematically registered?

(Fill in all that apply)
- ◯ 1 Area cultivated/harvested
- ◯ 2 Crop production
- ◯ 3 Livestock production
- ◯ 4 Unit prices, amounts sold and total sales by product
- ◯ 5 Input quantities used (seeds, fertilizers, plant protection products, etc.)
- ◯ 6 Detailed quantities and prices of inputs bought
- ◯ 7 Workers' time
- ◯ 8 Workers' payment
- ◯ 9 Other (specify [ ])

Q25. What is the tenure of the agricultural land used by the holding during the reference period?

(Fill in all that apply)
- ◯ 1 Owned with written documentation (includes a title deed, a will, a purchase agreement, etc.)
- ◯ 2 Owned without written documentation
- ◯ 3 Rented-in, leased or sharecropped with written agreement
- ◯ 4 Rented-in, leased or sharecropped without written agreement
- ◯ 5 State or communal land used with written agreement (certified use rights)
- ◯ 6 State or communal land used without written agreement (uncertified use rights)
- ◯ 7 Occupied/squatted without any permission
- ◯ 8 No agricultural land

Q26. From an economic perspective, what is the holding's main agricultural focus for the reference period?
*** Answer based on the economic value of your activities, not the time spent on activities.**

(Fill in one circle only)
- ◯ 1 Mainly crop production
- ◯ 2 Mainly livestock production → Go to Q28.
- ◯ 3 A mix of crop and livestock production → Go to Q29.

Q27. From an economic perspective, what is the main cropping activity?
*** The main cropping activity is the one with the highest economic value.**

(Fill in one circle only)
- ◯ 1 Production of annual field crops (cereals, oilseeds, protein crops, root crops, tobacco, cotton, etc.) → Go to Q29.
- ◯ 2 Production of vegetables, mushrooms, flowers, ornamental plants, etc. → Go to Q29.
- ◯ 3 Production of grapes for wine → Go to Q29.
- ◯ 4 Production of fruits → Go to Q29.
- ◯ 5 Production of other perennial crops (cacao, coffee, etc.) → Go to Q29.
- ◯ 6 Mixed cropping (no real prevalence of a specific crop activity) → Go to Q29.

Q28. From an economic perspective, what is the main livestock activity?
*** The main livestock activity is the one with the highest economic value.**

(Fill in one circle only)
- ◯ 1 Raising ruminant livestock for meat (cattle, sheep, goats, etc.)
- ◯ 2 Raising non-ruminant livestock for meat (pigs, poultry, etc.)
- ◯ 3 Production of eggs
- ◯ 4 Production of milk
- ◯ 5 Mixed livestock (no real prevalence of a specific livestock activity)

Q29. What is the main intended destination of your agricultural production?

(Fill in one circle only)
- ◯ 1 Producing primarily for sale (selling 90% or more)
- ◯ 2 Producing mainly for sale, with some own consumption (selling more than 50% and up to 90%)
- ◯ 3 Producing mainly for own consumption, with some sales (selling more than 10% and up to 50%)
- ◯ 4 Producing primarily for own consumption (selling 10% or less)

Comments on SECTION 1:

SECTION 2: CHARACTERISTICS OF THE HOLDERS AND MANAGERS

CASE 1: THE HOLDER IS A CIVIL/NATURAL PERSON (SECTION 1, PART 1.2, Q10=1)

Q01. Provide the following information on the Holder.

Q01a First name . . . . . .
Q01b Surname . . . . . .

Q01c Contact number (preferably cell phone) . . .

Q01d Sex
- ◯ 1 Male
- ◯ 2 Female

Q01e Age in completed years . . . . . .

Q01f Nationality

(Fill in one circle only)
- ◯ 1 Local country
- ◯ 2 Neighbouring country
- ◯ 3 Other

Q01g Indigenous group

(Fill in one circle only)
- ◯ 1 (Country-specific response option)
- ◯ 2 (Country-specific response option)
- ◯ 3 (Country-specific response option)
- ◯ 4 None of the above

Q01h Highest level of education completed

(Fill in one circle only)
- ◯ 1 None
- ◯ 2 Less than primary
- ◯ 3 Primary
- ◯ 4 Lower secondary
- ◯ 5 Upper secondary
- ◯ 6 Tertiary/post-secondary

Q01i Share of working time spent working on the holding

(Fill in one circle only)
- ◯ 1 Less than half (< 40 %)
- ◯ 2 About half (40%-59%)
- ◯ 3 Most/almost all (60%-99%)
- ◯ 4 All (100%)

Q01j Does the Holder have another gainful activity outside of the holding?
- ◯ 0 No
- ◯ 1 Yes

Q01k Is the Holder also the Manager?
- ◯ 0 No → **Go to Q02.**
- ◯ 1 Yes → **Go to SECTION 3.**

Q02. Provide the following information on the Manager.

Q02a First name . . . . . .
Q02b Surname . . . . . .

Q02c Contact number (preferably cell phone) . . .

Q02d Sex
- ◯ 1 Male
- ◯ 2 Female

Q02e Age in completed years . . . . . .

Q02f Link with the Holder

(Fill in one circle only)
- ◯ 1 Wife/husband or consensual union partner
- ◯ 2 Other member of the household
- ◯ 3 External

Q02g Nationality

(Fill in one circle only)
- ◯ 1 Local country
- ◯ 2 Neighbouring country
- ◯ 3 Other

Q02h Indigenous group
(Fill in one circle only)
- ◯ 1 (Country-specific response option)
- ◯ 2 (Country-specific response option)
- ◯ 3 (Country-specific response option)
- ◯ 4 None of the above

Q02i Highest level of education completed

(Fill in one circle only)
- ◯ 1 None
- ◯ 2 Less than primary
- ◯ 3 Primary
- ◯ 4 Lower secondary
- ◯ 5 Upper secondary
- ◯ 6 Tertiary/post-secondary

Q02j Share of working time spent working on the holding

(Fill in one circle only)
- ◯ 1 Less than half (< 40 %)
- ◯ 2 About half (40%-59%)
- ◯ 3 Most/almost all (60%-99%)
- ◯ 4 All (100%)

Q02k Does the Manager have another gainful activity outside of the holding?
- ◯ 0 No
- ◯ 1 Yes

CASE 2: THE HOLDER IS A GROUP OF CIVIL/NATURAL PERSONS (SECTION 1, PART 1.2, Q10=2)

Q03. What is the number of civil/natural persons who are members of the Holder group? . . . ☐☐

REPEAT Q04. FOR ALL CO-HOLDERS (number reported in Q03).

Q04. Provide the following information for Co-Holder 1.

Q04a First name . . . . . .
Q04b Surname . . . . . .

Q04c Contact number (preferably cell phone) . . .

Q04d Sex
- ◯ 1 Male
- ◯ 2 Female

Q04e Age in completed years . . . . . .

Q04f Nationality

(Fill in one circle only)
- ◯ 1 Local country
- ◯ 2 Neighbouring country
- ◯ 3 Other

Q04g Indigenous group

(Fill in one circle only)
- ◯ 1 (Country-specific response option)
- ◯ 2 (Country-specific response option)
- ◯ 3 (Country-specific response option)
- ◯ 4 None of the above

Q04h Highest level of education completed

(Fill in one circle only)
- ◯ 1 None
- ◯ 2 Less than primary
- ◯ 3 Primary
- ◯ 4 Lower secondary
- ◯ 5 Upper secondary
- ◯ 6 Tertiary/post-secondary

Q04i Share of working time spent working on the holding

(Fill in one circle only)
- ◯ 1 Less than half (< 40 %)
- ◯ 2 About half (40%-59%)
- ◯ 3 Most/almost all (60%-99%)
- ◯ 4 All (100%)

Q04j Does the Co-Holder 1 have another gainful activity outside of the holding?
- ◯ 0 No
- ◯ 1 Yes

Q04k Is the Co-Holder 1 also the Manager?
- ◯ 0 No
- ◯ 1 Yes

Q05. If there is no Manager among the Co-Holders, provide the following information on the Manager.

Q05a First name . . . . . .
Q05b Surname . . . . . .

Q05c Contact number (preferably cell phone) . . .

Q05d Sex
- ◯ 1 Male
- ◯ 2 Female

Q05e Age in completed years . . . . . .

Q05f Link with one of the Holders

(Fill in one circle only)
- ◯ 1 Wife/husband or consensual union partner
- ◯ 2 Other member of the household
- ◯ 3 External

Q05g Nationality

(Fill in one circle only)
- ◯ 1 Local country
- ◯ 2 Neighbouring country
- ◯ 3 Other

Q05h Indigenous group

CASE 2: THE HOLDER IS A GROUP OF CIVIL/NATURAL PERSONS (SECTION 1, PART 1.2, Q10=2)

Q03. What is the number of civil/natural persons who are members of the Holder group? . . . ☐☐

REPEAT Q04. FOR ALL CO-HOLDERS (number reported in Q03).

Q04. Provide the following information for Co-Holder 1.

Q04a First name . . . . . .
Q04b Surname . . . . . .

Q04c Contact number (preferably cell phone) . . .

Q04d Sex
- ◯ 1 Male
- ◯ 2 Female

Q04e Age in completed years . . . . . .

Q04f Nationality

(Fill in one circle only)
- ◯ 1 Local country
- ◯ 2 Neighbouring country
- ◯ 3 Other

Q04g Indigenous group

(Fill in one circle only)
- ◯ 1 (Country-specific response option)
- ◯ 2 (Country-specific response option)
- ◯ 3 (Country-specific response option)
- ◯ 4 None of the above

Q04h Highest level of education completed

(Fill in one circle only)
- ◯ 1 None
- ◯ 2 Less than primary
- ◯ 3 Primary
- ◯ 4 Lower secondary
- ◯ 5 Upper secondary
- ◯ 6 Tertiary/post-secondary

Q04i Share of working time spent working on the holding

(Fill in one circle only)
- ◯ 1 Less than half (< 40 %)
- ◯ 2 About half (40%-59%)
- ◯ 3 Most/almost all (60%-99%)
- ◯ 4 All (100%)

Q04j Does the Co-Holder 1 have another gainful activity outside of the holding?
- ◯ 0 No
- ◯ 1 Yes

Q04k Is the Co-Holder 1 also the Manager?
- ◯ 0 No
- ◯ 1 Yes

Q05. If there is no Manager among the Co-Holders, provide the following information on the Manager.

Q05a First name . . . . . .
Q05b Surname . . . . . .

Q05c Contact number (preferably cell phone) . . .

Q05d Sex
- ◯ 1 Male
- ◯ 2 Female

Q05e Age in completed years . . . . . .

Q05f Link with one of the Holders

(Fill in one circle only)
- ◯ 1 Wife/husband or consensual union partner
- ◯ 2 Other member of the household
- ◯ 3 External

Q05g Nationality

(Fill in one circle only)
- ◯ 1 Local country
- ◯ 2 Neighbouring country
- ◯ 3 Other

Q05h Indigenous group

(Fill in one circle only)
- ◯ 1 (Country-specific response option)
- ◯ 2 (Country-specific response option)
- ◯ 3 (Country-specific response option)
- ◯ 4 None of the above

Q05i Highest level of education completed

(Fill in one circle only)
- ◯ 1 None
- ◯ 2 Less than primary
- ◯ 3 Primary
- ◯ 4 Lower secondary
- ◯ 5 Upper secondary
- ◯ 6 Tertiary/post-secondary

Q05j Share of working time spent working on the holding

(Fill in one circle only)
- ◯ 1 Less than half (< 40 %)
- ◯ 2 About half (40%-59%)
- ◯ 3 Most/almost all (60%-99%)
- ◯ 4 All (100%)

Q05k Does the Manager have another gainful activity outside of the holding?
- ◯ 0 No
- ◯ 1 Yes

CASE 3: THE HOLDER IS A LEGAL PERSON (SECTION 1, PART 1.2, Q10=3)

Q06. What is the number of civil/natural persons participating in the capital of the company? . . . . . [ ][ ]

Q07. What is the number of legal persons participating in the capital of the company? . . . . . [ ][ ]

Q08. How many Managers are associated with the holding? . . . . . [ ][ ]

REPEAT Q09. for each MANAGER (number reported in Q08) .

Q09. Provide the following information for each Manager.

Q09a First name . . . . . .
Q09b Surname . . . . . .

Q09c Contact number (preferably cell phone) . . . [ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ]

Q09d Sex
- ◯ 1 Male
- ◯ 2 Female

Q09e Age in completed years . . . . . [ ][ ][ ]

Q09f Nationality

(Fill in one circle only)
- ◯ 1 Local country
- ◯ 2 Neighbouring country
- ◯ 3 Other

Q09g Indigenous group

(Fill in one circle only)
- ◯ 1 (Country-specific response option)
- ◯ 2 (Country-specific response option)
- ◯ 3 (Country-specific response option)
- ◯ 4 None of the above

Q09h Highest level of education completed

(Fill in one circle only)
- ◯ 1 None
- ◯ 2 Less than primary
- ◯ 3 Primary
- ◯ 4 Lower secondary
- ◯ 5 Upper secondary
- ◯ 6 Tertiary/post-secondary

Q09i Share of working time spent working on the holding

(Fill in one circle only)
- ◯ 1 Less than half (< 40 %)
- ◯ 2 About half (40%-59%)
- ◯ 3 Most/almost all (60%-99%)
- ◯ 4 All (100%)

Q09j Does the Manager have another gainful activity outside of the holding?
- ◯ 0 No
- ◯ 1 Yes

Comments on SECTION 2:

SECTION 3: CROP PRODUCTION DURING THE REFERENCE PERIOD DD/MM/YYYY to DD/MM/YYYY

PART 3.1: CROP PRODUCTION AND DESTINATIONS

Q00. Did the holding grow crops during the reference period, whatever the production or destination?

- ◯ 0 No → Go to Q00a.
- ◯ 1 Yes → Go to Q01.

Q00a. What was the area of the holding used for other pruposes than crop production?

	Area	Unit of measure	Conversion factor to a standard unit	Area calculated in standard unit
Kitchen gardens and backyards				
Farm buildings and farmyards				
Forest and other wooded land				
Aquaculture on the holding				
Other land (unutilised, rocks, wetlands, etc.)				

Q00b. Do you plan to introduce crops in the upcomming period?

- ◯ 0 No → Go to section 4.
- ◯ 1 Yes → Go to Q17a, Q17b and Q17c.

Q01. Would you be confident in providing an estimate of the area of your holding?

- ◯ 0 No → Please give the best estimations you can to the following questions.
- ◯ 1 Yes

Q02. How many parcels did you use for agricultural production (for crops and livestock) during the reference period?

Q03. What crops were produced on the holding during the reference period?

*** Report all crops grown, regardless of the quantity harvested (even zero).**
*** Report associated crops grown on the same parcel.**
*** See crop list.**

	Crop name	Crop code
[CROP 1]		
[CROP 2]		
[CROP 3]		
[CROP 4]		
[CROP 5]		
[CROP 6]		
[CROP 7]		

Q04. Answer the following questions about [CROP].

Q04a Were fertilizers used on [CROP]?

- ◯ 0 No
- ◯ 1 Yes

Q04b Were plant protection products used on [CROP]?

- ◯ 0 No
- ◯ 1 Yes

Q04c Did the holding have a stock of [CROP] stored just before the last harvest?

*** Include only stock owned by the holding.**
*** Include stock stored on the holding and off of the holding.**

- ◯ 0 No → Go to Q04f.
- ◯ 1 Yes

	Quantity	Unit of measure	Conversion factor to a standard unit	Quantity calculated in standard unit
Q04d How much [CROP] was stored on the holding				
Q04e How much [CROP] was stored at a location off of the holding				

Q04f How many harvests of [CROP] were there in the reference period?

(Fill in one circle only)

- ◯ 1 Continuous harvest → Go to Q05.
- ◯ 2 One harvest → Go to Q06.
- ◯ 3 Two harvests → Go to Q06.
- ◯ 4 Three harvests → Go to Q06.
- ◯ 5 Four harvests → Go to Q06.
- ◯ 6 No harvest → Go to NEXT CROP.

Q05. Answer the following questions on continuous harvest [CROP].

*** The reference period for questions on continuous harvest crops is the last six months.**

	Area	Unit of measure	Conversion factor to a standard unit	Area calculated in standard unit
Q05a What area of [CROP] was planted in the last six months?				

Q05b Was [CROP] irrigated during the last six months?

- ◯ 0 No
- ◯ 1 Yes

	Quantity	Unit of measure	Conversion factor to a standard unit	Quantity calculated in standard unit
Q05c What was the quantity of [CROP] harvested in the last six months?				

Q05d How was the production of [CROP] compared to the previous six months?

(Fill in one circle only)
- ◯ 1 Similar
- ◯ 2 Greater
- ◯ 3 Lower

Q05e Was [CROP] cultivated together with other crops (at the same time in the same parcel)?
- ◯ 0 No → Go to Q10.
- ◯ 1 Yes, for all of the crop → Go to Q10.
- ◯ 2 Yes, for a part of the crop → Go to Q10.

Q06. Answer the following questions about the most recent harvest (Harvest 1) of [CROP].
*** Include crops harvested at least once during the reference period.**
*** Exclude continuous harvest crops.**

Q06a When did the last harvest start for [CROP]? . . . Y Y Y Y / M M / D D

Q06b How many days did the harvest of [CROP] last? . . ☐☐ days

Q06c Was [CROP] irrigated during this harvest season?
- ◯ 0 No
- ◯ 1 Yes

	Area	Unit of measure (see codes)	Conversion factor to a standard unit	Area calculated in standard unit
Q06d What area of [CROP] was planted?				
Q06e What area of [CROP] was harvested?				

	Quantity	Unit of measure	Conversion factor to a standard unit	Quantity calculated in standard unit
Q06f What was the quantity of [CROP] harvested?				

Q06g How was the yield of [CROP] compared to the same harvest of the previous year?

(Fill in one circle only)
- ◯ 1 Similar
- ◯ 2 Greater
- ◯ 3 Lower

Q06g Was [CROP] cultivated together with other crops (at the same time in the same parcel)?
- ◯ 0 No
- ◯ 1 Yes, for all of the crop
- ◯ 2 Yes, for a part of the crop

FOR CROPS THAT HAD ONE HARVEST IN THE LAST REFERENCE PERIOD (Q04f=2) → Go to Q10.
FOR CROPS THAT HAD MORE THAN ONE HARVEST IN THE LAST REFERENCE PERIOD (Q04f=3, 4, 5) → Go to Q07.

Q07. Answer the following questions about the harvest before the most recent harvest (penultimate) (Harvest 2) of [CROP].
*** Include crops harvested at least twice during the reference period .**
*** Exclude continuous harvest crops.**

Q07a When did the penultimate harvest (Harvest 2) start for [CROP]? . . . . . Y Y Y Y / M M / D D

Q07b Was [CROP] irrigated during this harvest season?
- ◯ 0 No
- ◯ 1 Yes

	Area	Unit of measure (see codes)	Conversion factor to a standard unit	Area calculated in standard unit
Q07c What area of [CROP] was planted?				
Q07d What area of [CROP] was harvested?				

	Quantity	Unit of measure	Conversion factor to a standard unit	Quantity calculated in standard unit
Q07e What was the quantity of [CROP] harvested?				

Q07f Was [CROP] cultivated together with other crops (at the same time in the same parcel)?
- ◯ 0 No
- ◯ 1 Yes, for all of the crop
- ◯ 2 Yes, for a part of the crop

FOR CROPS THAT HAD TWO HARVESTS IN THE LAST REFERENCE PERIOD (Q04f=3) → Go to Q10.
FOR CROPS THAT HAD MORE THAN TWO HARVESTS IN THE LAST REFERENCE PERIOD (Q04f=4, 5) → Go to Q08.

Q08. Answer the following questions about the antepenultimate harvest (Harvest 3) of [CROP].
*** Include crops harvested at least three times during the reference period .**
*** Exclude continuous harvest crops.**

Q08a When did the antepenultimate harvest (Harvest 3) start for [CROP]? . . . . . Y Y Y Y / M M / D D

Q08b Was [CROP] irrigated during this harvest season?
- ◯ 0 No
- ◯ 1 Yes

	Area	Unit of measure (see codes)	Conversion factor to a standard unit	Area calculated in standard unit
Q08c What area of [CROP] was planted?				
Q08d What area of [CROP] was harvested?				

	Quantity	Unit of measure	Conversion factor to a standard unit	Quantity calculated in standard unit
Q08e What was the quantity of [CROP] harvested?				

Q08f Was [CROP] cultivated together with other crops (at the same time in the same parcel)?
- ◯ 0 No
- ◯ 1 Yes, for all of the crop
- ◯ 2 Yes, for a part of the crop

FOR CROPS THAT HAD THREE HARVESTS IN THE LAST REFERENCE PERIOD (Q04f=4) → **Go to Q10.**
FOR CROPS THAT HAD FOUR HARVESTS IN THE LAST REFERENCE PERIOD (Q04f=5) → **Go to Q09.**

Q09. Answer the following questions about the oldest harvest (Harvest 4) of [CROP] during the reference period.
*** Include crops harvested at least four times during the reference period .**
*** Exclude continuous harvest crops.**

Q09a When did the oldest harvest (Harvest 4) start for [CROP]? Y Y Y Y / M M / D D

Q09b Was [CROP] irrigated during this harvest season?
- ◯ 0 No
- ◯ 1 Yes

	Area	Unit of measure (see codes)	Conversion factor to a standard unit	Area calculated in standard unit
Q09c What area of [CROP] was planted?				
Q09d What area of [CROP] was harvested?				

	Quantity	Unit of measure	Conversion factor to a standard unit	Quantity calculated in standard unit
Q09e What was the quantity of [CROP] harvested?				

Q09f Was [CROP] cultivated together with other crops (at the same time in the same parcel)?
- ◯ 0 No
- ◯ 1 Yes, for all of the crop
- ◯ 2 Yes, for a part of the crop

Q10. Answer the following questions about the destinations of the holding's production from all harvests during the reference period.
*** Use the same unit of measure that was reported for quantities in previous questions.**

	Quantity	Unit price of the last sale	Unit used to describe the price
Q10a What was the quantity of [CROP] for own use? *** Include farm use for seeds or animal feed.** *** Include household and other family use.**			
Q10b What was the quantity of [CROP] sold?			
Q10c What was the quantity of [CROP] used as pay for labour as wages?			
Q10d What was the quantity of [CROP] given to service or input providers for pay (land, seeds, plant protection products, fertilizers, etc.)?			

PART 3.2: AREA UTILIZED

Q11. What was the area used for the following agricultural purposes?
*** Refer to the last harvest for Q11a to Q11e.**

Agricultural area utilized	Area	Unit of measure	Conversion factor to a standard unit	Area calculated in standard unit
Q11a Temporary crops under greenhouses or high shelters				
Q11b Temporary crops outdoors or under low shelters				
Q11c Temporary fallow				
Q11d Temporary meadows and pastures				
Q11e Kitchen gardens and backyards				
Q11f Permanent crops under greenhouses or high shelters				
Q11g Permanent crops outdoors or under low shelters				
Q11h Permanent meadows and pastures				
Total agricultural area utilized (AAU) *(calculated)*				

Q11i Do you confirm that the calculated area corresponds to the holding's total agricultural area utilized?
- ◯ 0 No → **Ask Q11 again.**
- ◯ 1 Yes

	Area	Unit of measure	Conversion factor to a standard unit	Area calculated in standard unit
Q11j Area equipped for irrigation in working order				
Q11k Area equipped with soil drainage in working order				
Q11l Area in organic farming (part of the AAU calculated above)				

Q12. If there is area equipped for irrigation in working order, did you irrigate during the reference period?
- ◯ 0 No
- ◯ 1 Yes

Q13. Was there land used for the following purposes?

Q13a Farm buildings and farmyards
- ◯ 0 No
- ◯ 1 Yes

Area

Q13b Forest and other wooded land
- ◯ 0 No
- ◯ 1 Yes

Area

Q13c Aquaculture on the holding (area not included in Q11)
- ◯ 0 No
- ◯ 1 Yes

Area

Q13d Other land (unutilized, rocks, wetlands, etc.)
- ◯ 0 No
- ◯ 1 Yes

Area

PART 3.3: CROP PRODUCTION MODES

Q14. Answer the following questions about the type of seeds used for [CROP].

*** Include all temporary crops.**
*** Exclude perennial crops and permanent pastures.**

Q14a How many varieties of [CROP] were used?

(Fill in one circle only)
- ◯ 1 One variety
- ◯ 2 More than one variety

		Percent
Q14b	What share of the [CROP] seed consisted in certified modern varieties?	___ %
Q14c	What share of the [CROP] seed consisted in uncertified varieties?	___ %
	Total	1 0 0 %

Q14d If certified varieties of [CROP] were used, were any of them Genetically Modified Organisms (GMO)?
- ◯ 0 No
- ◯ 1 Yes

THE ANSWER TO THIS QUESTION WILL DETERMINE IF Q15a ETC. WILL BE ASKED FOR CROP1 AND SUBSEQUENT CROPS.

Q15. Does the holding have any production and/or marketing contracts for any crops?
- ◯ 0 No → **Go to Q16. DO NOT INCLUDE Q15 OR ITS SUBQUESTIONS FOR ANY SUBSEQUENT CROPS**
- ◯ 1 Yes → **Go to Q15a.**

For each of crops identified in Q06, answer the following questions:

Q15a Does the holding have a production and/or marketing contract for [CROP]?
- ◯ 0 No → **Go to next crop, after the last crop grown go to Q16.**
- ◯ 1 Yes → **Go to Q15b.**

Q15b Does the holding have a production contract for [CROP]?
- ◯ 0 No → **Go to Q15d.**
- ◯ 1 Yes → **Go to Q15c.**

Q15c Does the production contract cover 100% of the [CROP] grown by the holding (exclusive contract)?
- ◯ 0 No
- ◯ 1 Yes

Q15d Does the holding have a marketing contract for [CROP]?
- ◯ 0 No → **Go to next crop, after the last crop grown go to Q16.**
- ◯ 1 Yes → **Go to Q15e.**

Q15e Does the marketing contract cover 100% of the [CROP] grown by the holding (exclusive contract)?
- ◯ 0 No
- ◯ 1 Yes

PART 3.4: INTENTIONS FOR CROP PRODUCTION FOR THE 12 MONTHS AFTER THE REFERENCE PERIOD

Q16. For each of the crops identified in Q06 answer the following questions about planting intentions for [CROP].

Q16a What area do you plan to dedicate to [CROP] in the upcoming period?

(Fill in one circle only)
- ◯ 1 Similar → **Go to Q17.**
- ◯ 2 Greater
- ◯ 3 Lower
- ◯ 4 None

16b What is the main reason for changes in the intended area of [CROP]?

(Fill in one circle only)
- ◯ 1 Crop rotation
- ◯ 2 Technical
- ◯ 3 Economic
- ◯ 4 Other (specify [ ])

Q17. Do you plan to introduce OTHER crops in the upcoming period (crops not identified in Q06)?
- ◯ 0 No → **Go to SECTION 4.**
- ◯ 1 Yes

Q17a What other crops do you plan to introduce in the upcoming period?

	Crop name	Crop code
[CROP 1]		
[CROP 2]		
[CROP 3]		
[CROP 4]		

	Area	Unit of measure (see codes)	Conversion factor to a standard unit	Area calculated in standard unit
Q17b What area of [CROP] do you plan to cultivate?				

Q17c What is the main reason for the planned introduction of [CROP]?

(Fill in one circle only)
- ◯ 1 Crop rotation
- ◯ 2 Technical
- ◯ 3 Economic
- ◯ 4 Other (specify [ ])

THE SERIES OF CROP-RELATED QUESTIONS WILL BE ASKED FOR EACH OF THE CROPS IDENTIFIED IN Q06. ONCE COMPLETE FOR ALL CROPS, PROCEED TO SECTION 4.

Comments on SECTION 3:

SECTION 4: LIVESTOCK PRODUCTION DURING THE REFERENCE PERIOD DD/MM/YYYY to DD/MM/YYYY

PART 4.1: RAISING ACTIVITIES AND PRODUCTION

TEXT TO READ:
This section of the questionnaire is about livestock and poultry on the holding.
Report for all animals on the holding, regardless of ownership, including those that are boarded (animals in pension), owned by another member of the household, custom-fed or fed under contract.

Q01. Do you register the main events about the livestock you raise (births, sales, production, etc.)?
- ◯ 0 No → **Please give the best estimations you can to the following questions.**
- ◯ 1 Yes

PART 4.1.1: EQUINE LIVESTOCK

Q02. Were equines raised on the holding during the reference period (12 months)?
- ◯ 0 No → **Go to Q08.**
- ◯ 1 Yes

Q02a What equines were raised on the holding during the reference period?

(Fill in all that apply) ***RESPONSE = [EQUINE]***
- ◯ 1 Saddle or racing mares
- ◯ 2 Other mares
- ◯ 3 Saddle or racing horses (excluding mares)
- ◯ 4 Other horses (excluding mares)
- ◯ 5 Mules or hinnies
- ◯ 6 Asses
- ◯ 7 Other equines (specify [ ])

THE FOLLOWING QUESTIONS (Q03 to Q07) WILL BE ASKED FOR EACH OF THE EQUINE TYPES IDENTIFIED IN Q02a.

Q03. Answer the following questions about [EQUINE].

		Number of animals
Q03a	Number of [EQUINE] as of today	

Q04. Answer the following questions about the changes in [EQUINE] numbers during the reference period (12 months).

		Number of animals	Unit price of the last sale	Unit of measure
Q04a	Number of births (for young EQUINE only)			
Q04b	Number of live animals bought or received (including exchanged)			
Q04c	Number of animal deaths (from natural causes, illness, etc.)			
Q04d	Number of live animals sold, used as pay or wages for labour, given to landlord as rent, given for other reasons, exchanged			

Q05. Answer the following questions about the production of meat from [EQUINE] during the reference period (12 months).

Q05a Were any [EQUINE] slaughtered for meat **on the holding** during the reference period (12 months)?
- ◯ 0 No → **Go to Q05d.**
- ◯ 1 Yes

		Number of animals slaughtered	Total carcass weight obtained	Unit of measure
Q05b	Answer the following about [EQUINE] slaughtered on the holding.			

Q05c Is the carcass weight reported above measured or estimated?
- ◯ 1 Measured
- ◯ 2 Estimated

Q05d Were any [EQUINE] slaughtered for meat **in a slaughterhouse** for the holding during the reference period (12 months)?
- ◯ 0 No → **Go to Q06.**
- ◯ 1 Yes

		Number of animals slaughtered	Total carcass weight obtained	Unit of measure
Q05e	Answer the following about [EQUINE] slaughtered in a slaughterhouse.			

Q05f Is the carcass weight reported above measured or estimated?
- ◯ 1 Measured
- ◯ 2 Estimated

Q06. Answer the following questions about the destinations of the holding's production of [EQUINE] meat during the reference period - slaughtered on the holding or in a slaughterhouse

*** Use the same unit of measure that was reported for quantities in previous questions.**

		Quantity	Unit price of sale	Unit used to describe the price
Q06a	What was the quantity of [EQUINE] meat for own-use ?			
Q06b	What was the quantity of [EQUINE] meat sold?			
Q06c	What was the quantity of [EQUINE] meat used as pay for labour as wages?			
Q06d	What was the quantity of [EQUINE] meat given to service or input providers (in payment for feed, veterinary products, etc.) ?			

		Number of animals
Q07.	What is the number of [EQUINE] used for traction or draught purposes?	

PART 4.1.2: BOVINE CATTLE

Q08. Were bovine cattle raised on the holding during the reference period (12 months)?
- ◯ 0 No → **Go to Q21.**
- ◯ 1 Yes

Q08a What cattle were raised on the holding during the reference period?

(Fill in all that apply) *RESPONSE = [CATTLE]*
- ◯ 1 Dairy cows
- ◯ 2 Other cows
- ◯ 3 Cattle less than one year old
- ◯ 4 Other cattle (bulls, etc.)

THE FOLLOWING QUESTIONS (Q09 to Q13) WILL BE ASKED FOR EACH OF THE CATTLE TYPES IDENTIFIED IN Q08a.

Q09. Answer the following questions about [CATTLE].

		Number of animals
Q09a	Number of [CATTLE] as of today	

Q10. Answer the following questions about the changes in [CATTLE] numbers during the reference period (12 months).

		Number of animals	Unit price of the last sale	Unit of measure
Q10a	Number of births (for Q08a = 3)			
Q10b	Number of live animals bought or received (including exchanged)			
Q10c	Number of animal deaths (from natural causes, illness, etc.)			
Q10d	Number of live animals sold, used as pay or wages for labour, given to landlord as rent, given for other reasons, exchanged			

Q11. Answer the following questions about the production of meat from [CATTLE] during the reference period (12 months).

Q11a Were any [CATTLE] slaughtered for meat **on the holding** during the reference period (12 months)?
- ◯ 0 No → **Go to Q11d.**
- ◯ 1 Yes

		Number of animals slaughtered	Total carcass weight obtained	Unit of measure
Q11b	Answer the following about [CATTLE] slaughtered on the holding.			

Q11c Is the carcass weight reported above measured or estimated?
- ◯ 1 Measured
- ◯ 2 Estimated

Q11d Were any [CATTLE] slaughtered for meat **in a slaughterhouse** for the holding during the reference period (12 months)?
- ◯ 0 No → **Go to Q12.**
- ◯ 1 Yes

		Number of animals slaughtered	Total carcass weight obtained	Unit of measure
Q11e	Answer the following about [CATTLE] slaughtered in a slaughterhouse.			

Q11f Is the carcass weight reported above measured or estimated?
- ◯ 1 Measured
- ◯ 2 Estimated

Q12. Answer the following questions about the destinations of the holding's production of [CATTLE] meat during the reference period - slaughtered on the holding or in a slaughterhouse

*** Use the same unit of measure that was reported for quantities in previous questions.**

		Quantity	Unit price of sale	Unit used to describe the price
Q12a	What was the quantity of [CATTLE] meat for own use ?			
Q12b	What was the quantity of [CATTLE] meat sold?			
Q12c	What was the quantity of [CATTLE] meat used as pay for labour as wages?			
Q12d	What was the quantity of [CATTLE] meat given to service or input providers (in payment for feed, veterinary products, etc.)?			

FOR THOSE THAT REPORTED FEMALES Q08a=1, 2, ASK Q13.

Q13. Are any cows in lactation now?
- ◯ 0 No → **Go to Q15.**
- ◯ 1 Yes

Q13a. How many cows are in lactation ?

Q14. When did the lactation period start? Y Y Y Y / M M / D D

Q15. What is the average period of time during the year in which you can get milk from a lactating female? (Include all lactation periods)

Q15a What is the time unit?

(Fill in one circle only)
- ◯ 1 Day
- ◯ 2 Week
- ◯ 3 Month

Q15b What is the number of time units per year for which you can get milk from a lactating female? per year

Q16. Do you allow calves to suckle directly from a cow?

(Fill in all that apply)
- ◯ 0 No
- ◯ 1 Yes, with the mother or with a suckler cow

Q17. For milk production, what is the period for which you prefer to answer questions?

*** The period selected will be used to answer a number of questions on milk production.**

(Fill in one circle only)

- ◯ 1 Daily average on a typical day
- ◯ 2 Yesterday (if the cows are in lactation)
- ◯ 3 Last week (if the cows are in lactation)
- ◯ 4 The reference period (12 months)

Q18. What was the production of raw milk in the period selected above? . . . . [ ][ ][ ][ ][ ][ ][ ][ ] . . [ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ]

Quantity of raw milk **Unit of measure**

Q19. Report the share of milk used in the following ways:

		Percent
Q19a	Own use for human consumption	[ ][ ][ ] %
Q19b	Processed on the holding into milk products	[ ][ ][ ] %
Q19c	Given to young animals	[ ][ ][ ] %
Q19d	Sold as raw milk	[ ][ ][ ] %
Q19e	Other (specify [ ]) . .	[ ][ ][ ] %
	Total	1 0 0 %

Q19f If the share of raw milk sold (Q19d) is greater than 0%, answer the following about the milk sold.

Unit price of the last sale [ ][ ][ ][ ][ ][.][ ][ ] . **Unit of measure** [ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ]

Q20. What is the number of [CATTLE] used for traction or draught purposes? . . . [ ][ ][ ][ ][ ][ ]

Number of animals

PART 4.1.3: BUFFALOES

Q21. Were buffaloes raised on the holding during the reference period (12 months)?
- ◯ 0 No → **Go to Q34.**
- ◯ 1 Yes

Q21a What buffaloes were raised on the holding during the reference period?

(Fill in all that apply) *RESPONSE = [BUFFALO]*
- ◯ 1 Dairy females
- ◯ 2 Other females
- ◯ 3 Buffaloes less than one year old
- ◯ 4 Other buffaloes (bulls, etc.)

THE FOLLOWING QUESTIONS (Q22 to Q26) WILL BE ASKED FOR EACH OF THE BUFFALO TYPES IDENTIFIED IN Q21a.

Q22. Answer the following questions about [BUFFALO].

	Number of animals
Q22a Number of [BUFFALO] as of today	

Q23. Answer the following questions about the changes in [BUFFALO] numbers during the reference period (12 months).

	Number of animals	Unit price of the last sale	Unit of measure
Q23a Number of births (for Q21a = 3)			
Q23b Number of live animals bought or received (including exchanged)			
Q23c Number of animal deaths (from natural causes, illness, etc.)			
Q23d Number of live animals sold, used as pay or wages for labour, given to landlord as rent, given for other reasons, exchanged			

Q24. Answer the following questions about the production of meat from [BUFFALO] during the reference period (12 months).

Q24a Were any [BUFFALO] slaughtered for meat **on the holding** during the reference period (12 months)?
- ◯ 0 No → **Go to Q24d.**
- ◯ 1 Yes

	Number of animals slaughtered	Total carcass weight obtained	Unit of measure
Q24b Answer the following about [BUFFALO] slaughtered on the holding.			

Q24c Is the carcass weight reported above measured or estimated?
- ◯ 1 Measured
- ◯ 2 Estimated

Q24d Were any [BUFFALO] slaughtered for meat **in a slaughterhouse** for the holding during the reference period (12 months)?
- ◯ 0 No → **Go to Q25.**
- ◯ 1 Yes

	Number of animals slaughtered	Total carcass weight obtained	Unit of measure
Q24e Answer the following about [BUFFALO] slaughtered in a slaughterhouse.			

Q24f Is the carcass weight reported above measured or estimated?
- ◯ 1 Measured
- ◯ 2 Estimated

Q25. Answer the following questions about the destinations of the holding's production of [BUFFALO] meat during the reference period - slaughtered on the holding or in a slaughterhouse

*** Use the same unit of measure that was reported for quantities in previous questions.**

	Quantity	Unit price of sale	Unit used to describe the price
Q25a What was the quantity of [BUFFALO] meat for own use ?			
Q25b What was the quantity of [BUFFALO] meat sold?			
Q25c What was the quantity of [BUFFALO] meat used as pay for labour as wages			
Q25d What was the quantity of [BUFFALO] meat given to service or input providers (in payment for feed, veterinary products, etc.)?			

FOR THOSE THAT REPORTED FEMALES Q21a=1, 2, ASK Q26.

Q26. Are buffalo females in lactation now?
- ◯ 0 No → **Go to Q28.**
- ◯ 1 Yes

Q26a. How many buffalo females are in lactation ?

Q27. When did the lactation period start? Y Y Y Y / M M / D D

Q28. What is the average period of time during the year in which you can get milk from a lactating female? (Include all lactation periods)

Q28a What is the time unit?

(Fill in one circle only)
- ◯ 1 Day
- ◯ 2 Week
- ◯ 3 Month

Q28b What is the number of time units per year for which you can get milk from a lactating female? per year

Q29. Do you allow young buffaloes to suckle directly from a female?

(Fill in all that apply)
- ◯ 0 No
- ◯ 1 Yes, with the mother or with a suckler buffalo female

Q30. For milk production, what is the period for which you prefer to answer questions?

*** The period selected will be used to answer a number of questions on milk production.**

- ◯ 1 Daily average on a typical day
- ◯ 2 Yesterday (if lactation is ongoing)
- ◯ 3 Last week (if lactation is ongoing)
- ◯ 4 The reference period (12 months)

Q31. What was the production of raw milk in the period selected above? . . . . **Quantity of raw milk** [ ] . . **Unit of measure** [ ]

Q32. Report the share of milk used in the following ways:

		Percent
Q32a	Own use for human consumption	%
Q32b	Processed on the holding into milk products	%
Q32c	Given to young animals	%
Q32d	Sold as raw milk	%
	Total	100 %

Q32e If the share of raw milk sold (Q32d) is greater than 0%, answer the following about the milk sold. **Unit price of the last sale** [ ] . **Unit of measure** [ ]

Q33. What is the number of [BUFFALO] used for traction or draught purposes? . . . **Number of animals** [ ]

PART 4.1.4: CAMELS AND CAMELIDS

Q34. Were camels or camelids raised on the holding during the reference period (12 months)?
- ◯ 0 No → Go to Q47.
- ◯ 1 Yes

Q34a What camelids were raised on the holding during the reference period?

(Fill in all that apply) *RESPONSE = [CAMELID]*
- ◯ 1 Camels
- ◯ 2 Llamas or vicugnas
- ◯ 3 Other camels and camelids (specify [ ])

THE FOLLOWING QUESTIONS (Q35 to Q46) WILL BE ASKED FOR EACH OF THE CAMELID TYPES IDENTIFIED IN Q34a.

Q35. Answer the following questions about [CAMELID].

	Number of animals
Q35a Number of [CAMELID] as of today	

Q36. Answer the following questions about the changes in [CAMELID] numbers during the reference period (12 months).

	Number of animals	Unit price of the last sale	Unit of measure
Q36a Number of births			
Q36b Number of live animals bought or received (including exchanged)			
Q36c Number of animal deaths (from natural causes, illness, etc.)			
Q36d Number of live animals sold, used as pay or wages for labour, given to landlord as rent, given for other reasons, exchanged			

Q37. Answer the following questions about the production of meat from [CAMELID] during the reference period (12 months).

Q37a Were any [CAMELID] slaughtered for meat **on the holding** during the reference period (12 months)?
- ◯ 0 No → Go to Q37d.
- ◯ 1 Yes

	Number of animals slaughtered	Total carcass weight obtained	Unit of measure
Q37b Answer the following about [CAMELID] slaughtered on the holding.			

Q37c Is the carcass weight reported above measured or estimated?
- ◯ 1 Measured
- ◯ 2 Estimated

Q37d Were any [CAMELID] slaughtered for meat **in a slaughterhouse** for the holding during the reference period (12 months)?
- ◯ 0 No → Go to Q38.
- ◯ 1 Yes

	Number of animals slaughtered	Total carcass weight obtained	Unit of measure
Q37e Answer the following about [CAMELID] slaughtered in a slaughterhouse.			

Q37f Is the carcass weight reported above measured or estimated?
- ◯ 1 Measured
- ◯ 2 Estimated

Q38. Answer the following questions about the destinations of the holding's production of [CAMELID] meat during the reference period - slaughtered on the holding or in a slaughterhouse

*** Use the same unit of measure that was reported for quantities in previous questions.**

	Quantity	Unit price of sale	Unit used to describe the price
Q38a What was the quantity of [CAMELID] meat for own-use ?			
Q38b What was the quantity of [CAMELID] meat sold?			
Q38c What was the quantity of [CAMELID] meat used as pay for labour as wages?			
Q38d What was the quantity of [CAMELID] meat given to service or input providers (in payment for feed, veterinary products, etc.)?			

Q39. Are any [CAMELID] females in lactation now?
- ◯ 0 No → Go to Q41.
- ◯ 1 Yes

Q39a. How many [CAMELID] females are in lactation ? [ ]

Q40. When did the lactation period start? Y Y Y Y / M M / D D

Q41. What is the average period of time during the year in which you can get milk from a lactating female? (Include all lactation periods)

Q41a What is the time unit?

(Fill in one circle only)
- ◯ 1 Day
- ◯ 2 Week
- ◯ 3 Month

Q41b What is the number of time units per year for which you can get milk from a lactating female? [ ] per year

Q42. Do you allow young [CAMELID] to suckle directly from a female?

(Fill in all that apply)
- ◯ 0 No
- ◯ 1 Yes, with the mother or with a suckler [CAMELID] female

Q43. For milk production, what is the period for which you prefer to answer questions?
*** The period selected will be used to answer a number of questions on milk production.**

(Fill in one circle only)
- ◯ 1 Daily average on a typical day
- ◯ 2 Yesterday (if lactation is ongoing)
- ◯ 3 Last week (if lactation is ongoing)
- ◯ 4 The reference period (12 months)

Q44. What was the production of raw milk in the period selected above? . . . . **Quantity of raw milk** [ ][ ][ ][ ][ ][ ][ ][ ] . . **Unit of measure** [ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ]

Q45. Report the share of milk used in the following ways.

		Percent
Q45a	Own use for human consumption	[ ][ ][ ] %
Q45b	Processed on the holding into milk products	[ ][ ][ ] %
Q45c	Given to young animals	[ ][ ][ ] %
Q45d	Sold as raw milk	[ ][ ][ ] %
Q45e	Other (specify [ ])	[ ][ ][ ] %
	Total	1 0 0 %

Q45f If the share of raw milk sold (Q45d) is greater than 0%, answer the following about the milk sold. **Unit price of the last sale** [ ][ ][ ][ ][ ].[ ][ ] . **Unit of measure** [ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ]

Q46. What is the number of [CAMELID] used for traction or draught purposes? . . . **Number of animals** [ ][ ][ ][ ][ ][ ]

Q43. For milk production, what is the period for which you prefer to answer questions?

*** The period selected will be used to answer a number of questions on milk production.**

(Fill in one circle only)

- ◯ 1 Daily average on a typical day
- ◯ 2 Yesterday (if lactation is ongoing)
- ◯ 3 Last week (if lactation is ongoing)
- ◯ 4 The reference period (12 months)

Q44. What was the production of raw milk in the period selected above? . . . . [ ][ ][ ][ ][ ][ ][ ][ ] . . [ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ] (Quantity of raw milk / Unit of measure)

Q45. Report the share of milk used in the following ways.

		Percent
Q45a	Own use for human consumption	[ ][ ][ ] %
Q45b	Processed on the holding into milk products	[ ][ ][ ] %
Q45c	Given to young animals	[ ][ ][ ] %
Q45d	Sold as raw milk	[ ][ ][ ] %
Q45e	Other (specify [ ])	[ ][ ][ ] %
	Total	1 0 0 %

Q45f If the share of raw milk sold (Q45d) is greater than 0%, answer the following about the milk sold. [ ][ ][ ][ ][ ].[ ][ ] (Unit price of the last sale) [ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ] (Unit of measure)

Q46. What is the number of [CAMELID] used for traction or draught purposes? . . . [ ][ ][ ][ ][ ][ ] (Number of animals)

PART 4.1.5: SHEEP

PLEASE NOTE THAT FOR THIS PART THE REFERENCE PERIOD IS 6 MONTHS

Q47. Were sheep raised on the holding during the reference period **(6 months)**?
- ◯ 0 No → Go to Q59.
- ◯ 1 Yes

Q47a What sheep were raised on the holding during the reference period?

(Fill in all that apply) *RESPONSE = [SHEEP]*
- ◯ 1 Dairy females
- ◯ 2 Other females
- ◯ 3 Sheep less than one year old
- ◯ 4 Other sheep (rams, etc.)

THE FOLLOWING QUESTIONS (Q48 to Q51) WILL BE ASKED FOR EACH OF THE SHEEP TYPES IDENTIFIED IN Q47a.

Q48. Answer the following questions about [SHEEP].

		Number of animals
Q48a	Number of [SHEEP] as of today	

Q49. Answer the following questions about the changes in [SHEEP] numbers during the reference period (6 months).

		Number of animals	Unit price of the last sale	Unit of measure
Q49a	Number of births (for Q47a = 3)			
Q49b	Number of live animals bought or received (including exchanged)			
Q49c	Number of animal deaths (from natural causes, illness, etc.)			
Q49d	Number of live animals sold, used as pay or wages for labour, given to landlord as rent, given for other reasons, exchanged			

Q50. Answer the following questions about the production of meat from [SHEEP] during the reference period (6 months).

Q50a Were there any [SHEEP] slaughtered for meat **on the holding** during the reference period (6 months)?
- ◯ 0 No → Go to Q50d.
- ◯ 1 Yes

		Number of animals slaughtered	Total carcass weight obtained	Unit of measure
Q50b	Answer the following about [SHEEP] slaughtered on the holding.			

Q50c Is the carcass weight reported above measured or estimated?
- ◯ 1 Measured
- ◯ 2 Estimated

Q50d Were there any [SHEEP] slaughtered for meat **in a slaughterhouse** for the holding during the reference period (6 months)?
- ◯ 0 No → Go to Q50g.
- ◯ 1 Yes

		Number of animals slaughtered	Total carcass weight obtained	Unit of measure
Q50e	Answer the following about [SHEEP] slaughtered in a slaughterhouse.			

Q50f Is the carcass weight reported above measured or estimated?
- ◯ 1 Measured
- ◯ 2 Estimated

Q50g How is the production compared to the first 6 months of the reference period?

(Fill in one circle only)
- ◯ 1 Similar
- ◯ 2 Greater
- ◯ 3 Lower

Q51. Answer the following questions about the destinations of the holding's production of [SHEEP] meat during the reference period - slaughtered on the holding or in a slaughterhouse

*** Use the same unit of measure that was reported for quantities in previous questions.**

		Quantity	Unit price of sale	Unit used to describe the price
Q51a	What was the quantity of [SHEEP] meat for own-use ?			
Q51b	What was the quantity of [SHEEP] meat sold?			
Q51c	What was the quantity of [SHEEP] meat used as pay for labour as wages?			
Q51d	What was the quantity of [SHEEP] meat given to service or input providers (in payment for feed, veterinary products, etc.)?			

FOR THOSE THAT REPORTED FEMALES Q47a=1, 2, ASK Q52.

Q52. Are any sheep females in lactation now?
- ◯ 0 No → Go to Q54.
- ◯ 1 Yes

Q52a. How many sheep females are in lactation? ☐☐☐

Q53. When did the lactation period start? Y Y Y Y / M M / D D

Q54. What is the average period of time during the year in which you can get milk from a lactating female? (Include all lactation periods)

Q54a What is the time unit?
(Fill in one circle only)
- ◯ 1 Day
- ◯ 2 Week
- ◯ 3 Month

Q54b What is the number of time units per year for which you can get milk from a lactating female? . . [ ][ ][ ] per year

Q55. Do you allow lambs to suckle directly from a female?

(Fill in all that apply)
- ◯ 0 No
- ◯ 1 Yes, with the mother or with a suckler sheep

Q56. For sheep milk production, what is the period for which you prefer to answer questions?
*** The period selected will be used to answer a number of questions on milk production.**

(Fill in one circle only)
- ◯ 1 Daily average on a typical day
- ◯ 2 Yesterday (if we are in a lactation period)
- ◯ 3 Last week (if we are in a lactation period)
- ◯ 4 Six months
- ◯ 5 Twelve months

Q57. What was the production of raw sheep milk in the period selected above? . . . **Quantity of raw milk** [ ][ ][ ][ ][ ][ ][ ][ ] . . **Unit of measure** [ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ]

Q58. Report the share of milk used in the following ways.

		Percent
Q58a	Own use for human consumption	[ ][ ][ ] %
Q58b	Processed on the holding into milk products	[ ][ ][ ] %
Q58c	Given to young animals	[ ][ ][ ] %
Q58d	Sold as raw milk	[ ][ ][ ] %
Q58e	Other (specify [ ])	[ ][ ][ ] %
	Total	1 0 0 %

Q58f If the share of raw milk sold (Q58d) is greater than 0%, answer the following about the milk sold. **Unit price of the last sale** [ ][ ][ ][ ][ ] . [ ][ ] . **Unit of measure** [ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ]

PART 4.1.6 GOATS

PLEASE NOTE THAT FOR THIS PART THE REFERENCE PERIOD IS 6 MONTHS

Q59. Were goats raised on the holding during the reference period (6 months)?
- ◯ 0 No → Go to Q71.
- ◯ 1 Yes

Q59a What goats were raised on the holding during the reference period?

(Fill in all that apply) *RESPONSE = [GOAT]*
- ◯ 1 Dairy females
- ◯ 2 Other females
- ◯ 3 Goats less than one year old
- ◯ 4 Other goats (bucks, etc.)

THE FOLLOWING QUESTIONS (Q60 to Q63) WILL BE ASKED FOR EACH OF THE GOAT TYPES IDENTIFIED IN Q59a.

Q60. Answer the following questions about [GOAT].

	Number of animals
Q60a Number of [GOAT] as of today	

Q61. Answer the following questions about the changes in [GOAT] numbers during the reference period (6 months).

	Number of animals	Unit price of the last sale	Unit of measure
Q61a Number of births (for Q59a = 3)			
Q61b Number of live animals bought or received (including exchanged)			
Q61c Number of animal deaths (from natural causes, illness, etc.)			
Q61d Number of live animals sold, used as pay or wages for labour, given to landlord as rent, given for other reasons, exchanged			

Q62. Answer the following questions about the production of meat from [GOAT] during the reference period (6 months).

Q62a Were any [GOAT] slaughtered for meat **on the holding** during the reference period (6 months)?
- ◯ 0 No → Go to Q62d.
- ◯ 1 Yes

	Number of animals slaughtered	Total carcass weight obtained	Unit of measure
Q62b Answer the following about [GOAT] slaughtered on the holding.			

Q62c Is the carcass weight reported above measured or estimated?
- ◯ 1 Measured
- ◯ 2 Estimated

Q62d Were any [GOAT] slaughtered for meat **in a slaughterhouse** for the holding during the reference period (6 months)?
- ◯ 0 No → Go to Q62g.
- ◯ 1 Yes

	Number of animals slaughtered	Total carcass weight obtained	Unit of measure
Q62e Answer the following about [GOAT] slaughtered in a slaughterhouse.			

Q62f Is the carcass weight reported above measured or estimated?
- ◯ 1 Measured
- ◯ 2 Estimated

Q62g How is the production compared to the first 6 months of the reference period?

(Fill in one circle only)
- ◯ 1 Similar
- ◯ 2 Greater
- ◯ 3 Lower

Q63. Answer the following questions about the destinations of the holding's production of [GOAT] meat during the reference period - slaughtered on the holding or in a slaughterhouse

*** Use the same unit of measure that was reported for quantities in previous questions.**

	Quantity	Unit price of sale	Unit used to describe the price
Q63a What was the quantity of [GOAT] meat for own-use ?			
Q63b What was the quantity of [GOAT] meat sold.			
Q63c What was the quantity of [GOAT] meat used as pay for labour as wages			
Q63d What was the quantity of [GOAT] meat given to service or input providers (in payment for feed, veterinary products, etc.)			

FOR THOSE THAT REPORTED FEMALES Q59a=1, 2, ASK Q64.

Q64. Are any goat females in lactation now?
- ◯ 0 No → Go to Q66.
- ◯ 1 Yes

Q64a. How many goat females are in lactation ? ☐☐☐

Q65. When did the lactation period start? Y Y Y Y / M M / D D

Q66. What is the average period of time during the year in which you can get milk from a lactating female? (Include all lactation periods)

Q66a What is the time unit?

(Fill in one circle only)
- ◯ 1 Day
- ◯ 2 Week
- ◯ 3 Month

Q66b What is the number of time units per year for which you can get milk from a lactating female? . . [ ][ ][ ] per year

Q67. Do you allow kids to suckle directly from a female?

(Fill in all that apply)
- ◯ 0 No
- ◯ 1 Yes, with the mother or with a suckler goat

Q68. For milk production, what is the period for which you prefer to answer questions?
*** The period selected will be used to answer a number of questions on milk production.**

(Fill in one circle only)
- ◯ 1 Daily average on a typical day
- ◯ 2 Yesterday (if lactation is ongoing)
- ◯ 3 Last week (if lactation is ongoing)
- ◯ 4 Six months
- ◯ 5 Twelve months

Q69. What was the production of raw milk in the period selected above? . . . . **Quantity of raw milk** [ ][ ][ ][ ][ ][ ][ ][ ]. . **Unit of measure** [ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ]

Q70. Report the share of milk used in the following ways:

		Percent
Q70a	Own use for human consumption	[ ][ ][ ] %
Q70b	Processed on the holding into milk products	[ ][ ][ ] %
Q70c	Given to young animals	[ ][ ][ ] %
Q70d	Sold as raw milk	[ ][ ][ ] %
Q70e	Other (specify [ ])	[ ][ ][ ]
	Total	1 0 0 %

Q70f If the share of raw milk sold (Q70d) is greater than 0%, answer the following about the milk sold. **Unit price of the last sale** [ ][ ][ ][ ][ ].[ ][ ]. **Unit of measure** [ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ]

PART 4.1.7 OTHER RUMINANTS

Q71. Were other ruminants raised on the holding during the reference period (12 months)?
- ◯ 0 No → **Go to Q74.**
- ◯ 1 Yes

Q71a What other ruminants were raised on the holding during the reference period?

(Fill in all that apply) *RESPONSE = [OTHER RUMINANT]*
- ◯ 1 Species 1 (specify [ ])
- ◯ 2 Species 2 (specify [ ])
- ◯ 3 Species 3 (specify [ ])

THE FOLLOWING QUESTIONS (Q72 and Q73) WILL BE ASKED FOR EACH OF THE OTHER RUMINANT TYPES IDENTIFIED IN Q71a.

Q72. Answer the following questions about [OTHER RUMINANT].

		Number of animals
Q72a	Number of [OTHER RUMINANT] as of today	[ ][ ][ ][ ][ ][ ]

Q73. Answer the following questions about the changes in [OTHER RUMINANT] numbers during the reference period (12 months).

		Number of animals	Unit price of the last sale	Unit of measure
Q73a	Number of births	[ ][ ][ ][ ][ ][ ]		
Q73b	Number of live animals bought or received (including exchanged) . .	[ ][ ][ ][ ][ ][ ]		
Q73c	Number of animal deaths (from natural causes, illness, etc.)	[ ][ ][ ][ ][ ][ ]		
Q73d	Number of live animals sold, used as pay or wages for labour, given to landlord as rent, given for other reasons, exchanged . .	[ ][ ][ ][ ][ ][ ]. .	[ ][ ][ ][ ][ ].[ ][ ]. .	[ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ]

PART 4.1.8 PIGS

PLEASE NOTE THAT FOR THIS PART THE REFERENCE PERIOD IS 6 MONTHS

Q74. Were pigs raised on the holding during the reference period (6 months)?
- ◯ 0 No → Go to Q79.
- ◯ 1 Yes

Q74a What pigs were raised on the holding during the reference period?

(Fill in all that apply) *RESPONSE = [PIG]*
- ◯ 1 Piglets
- ◯ 2 Breeding sows
- ◯ 3 Other pigs (boars, etc.)

THE FOLLOWING QUESTIONS (Q75 to Q78) WILL BE ASKED FOR EACH OF THE PIG TYPES IDENTIFIED IN Q74a.

Q75. Answer the following questions about [PIG].

	Number of animals
Q75a Number of [PIG] as of today	

Q76. Answer the following questions about the changes in [PIG] numbers during the reference period (6 months).

	Number of animals	Unit price of the last sale	Unit of measure
Q76a Number of births (for Q74a = 1)			
Q76b Number of live animals bought or received (including exchanged)			
Q76c Number of animal deaths (from natural causes, illness, etc.)			
Q76d Number of live animals sold, used as pay or wages for labour, given to landlord as rent, given for other reasons, exchanged			

Q77. Answer the following questions about the production of meat from [PIG] during the reference period (6 months).

Q77a Were there any [PIG] slaughtered for meat **on the holding** during the reference period (6 months)?
- ◯ 0 No → Go to Q77d.
- ◯ 1 Yes

	Number of animals slaughtered	Total carcass weight obtained	Unit of measure
Q77b Answer the following about [PIG] slaughtered on the holding.			

Q77c Is the carcass weight reported above measured or estimated?
- ◯ 1 Measured
- ◯ 2 Estimated

Q77d Were there any [PIG] slaughtered for meat **in a slaughterhouse** for the holding during the reference period (6 months)?
- ◯ 0 No → Go to Q77g.
- ◯ 1 Yes

	Number of animals slaughtered	Total carcass weight obtained	Unit of measure
Q77e Answer the following about [PIG] slaughtered in a slaughterhouse.			

Q77f Is the carcass weight reported above measured or estimated?
- ◯ 1 Measured
- ◯ 2 Estimated

Q77g How is the production compared to the first 6 months of the reference period?

(Fill in one circle only)
- ◯ 1 Similar
- ◯ 2 Greater
- ◯ 3 Lower

Q78. Answer the following questions about the destinations of the holding's production of [PIG] meat during the reference period - slaughtered on the holding or in a slaughterhouse

*** Use the same unit of measure that was reported for quantities in previous questions.**

	Quantity	Unit price of sale	Unit used to describe the price
Q78a What was the quantity of [PIG] meat for own-use ?			
Q78b What was the quantity of [PIG] meat sold?			
Q78c What was the quantity of [PIG] meat used as pay for labour as wages?			
Q78d What was the quantity of [PIG] meat given to service or input providers (in payment for feed, veterinary products, etc.)?			

PART 4.1.9 RABBITS

PLEASE NOTE THAT FOR THIS PART THE REFERENCE PERIOD IS 3 MONTHS

Q79. Were rabbits raised on the holding during the reference period (3 months)?
- ◯ 0 No → Go to Q84.
- ◯ 1 Yes

Q79a What rabbits were raised on the holding during the reference period?

(Fill in all that apply) *RESPONSE = [RABBIT]*
- ◯ 1 Breeding females
- ◯ 2 All other rabbits

THE FOLLOWING QUESTIONS (Q80 to Q83) WILL BE ASKED FOR EACH OF THE RABBIT TYPES IDENTIFIED IN Q79a.

Q80. Answer the following questions about [RABBIT].

		Number of animals
Q80a	Number of [RABBIT] as of today	

Q81. Answer the following questions about the changes in [RABBIT] numbers during the reference period (3 months).

		Number of animals	Unit price of the last sale	Unit of measure
Q81a	Number of births (for Q79a = 2)			
Q81b	Number of live animals bought or received (including exchanged)			
Q81c	Number of animal deaths (from natural causes, illness, etc.)			
Q81d	Number of live animals sold, used as pay or wages for labour, given to landlord as rent, given for other reasons, exchanged			

Q82. Answer the following questions about the production of meat from [RABBIT] during the reference period (3 months).

Q82a Were any [RABBIT] slaughtered for meat **on the holding** during the reference period (3 months)?
- ◯ 0 No → Go to Q82d.
- ◯ 1 Yes

		Number of animals slaughtered	Total carcass weight obtained	Unit of measure
Q82b	Answer the following about [RABBIT] slaughtered on the holding.			

Q82c Is the carcass weight reported above measured or estimated?
- ◯ 1 Measured
- ◯ 2 Estimated

Q82d Were any [RABBIT] slaughtered for meat **in a slaughterhouse** for the holding during the reference period (3 months)?
- ◯ 0 No → Go to Q82g.
- ◯ 1 Yes

		Number of animals slaughtered	Total carcass weight obtained	Unit of measure
Q82e	Answer the following about [RABBIT] slaughtered in a slaughterhouse.			

Q82f Is the carcass weight reported above measured or estimated?
- ◯ 1 Measured
- ◯ 2 Estimated

Q82g How is the production compared to the other period of the reference year?

(Fill in one circle only)
- ◯ 1 Similar
- ◯ 2 Greater
- ◯ 3 Lower

Q83. Answer the following questions about the destinations of the holding's production of [RABBIT] meat during the reference period - slaughtered on the holding or in a slaughterhouse

*** Use the same unit of measure that was reported for quantities in previous questions.**

		Quantity	Unit price of sale	Unit used to describe the price
Q83a	What was the quantity of [RABBIT] meat for own-use ?			
Q83b	What was the quantity of [RABBIT] meat sold?			
Q83c	What was the quantity of [RABBIT] meat used as pay for labour as wages?			
Q83d	What was the quantity of [RABBIT] meat given to service or input providers (in payment for feed, veterinary products, etc.)?			

PART 4.1.10 POULTRY

PLEASE NOTE THAT FOR THIS PART THE REFERENCE PERIOD IS 3 MONTHS

Q84. Was poultry raised on the holding during the reference period (3 months)?
- ◯ 0 No → Go to Q93.
- ◯ 1 Yes

Q84a What poultry types were raised on the holding during the reference period?

(Fill in all that apply) *RESPONSE = [POULTRY]*
- ◯ 1 Broilers
- ◯ 2 Laying hens
- ◯ 3 All other chickens
- ◯ 4 Turkeys
- ◯ 5 Ducks
- ◯ 6 Geese
- ◯ 7 Guinea fowls
- ◯ 8 Pigeons
- ◯ 9 Ostriches or emus
- ◯ 10 Other poultry (specify [ ])

THE FOLLOWING QUESTIONS (Q85 to Q92) WILL BE ASKED FOR EACH OF THE POULTRY TYPES IDENTIFIED IN Q84a.

Q85. Answer the following questions about [POULTRY].

	Number of animals
Q85a Number of [POULTRY] as of today	

Q86. Answer the following questions about the changes in [POULTRY] numbers during the reference period (3 months).

	Number of animals	Unit price of the last sale	Unit of measure
Q86a Number of births (without Q84a = 2)			
Q86b Number of live animals bought or received (including exchanged)			
Q86c Number of animal deaths (from natural causes, illness, etc.)			
Q86d Number of live animals sold, used as pay or wages for labour, given to landlord as rent, given for other reasons, exchanged			

NOTE - EXCLUDE LAYING HENS (Q84 =2) FROM Q87.

Q87. Answer the following questions about the production of meat from [POULTRY] during the reference period (3 months).

Q87a Were any [POULTRY] slaughtered for meat **on the holding** during the reference period (3 months)?
- ◯ 0 No → Go to Q87d.
- ◯ 1 Yes

	Number of animals slaughtered	Total carcass weight obtained	Unit of measure
Q87b Answer the following about [POULTRY] slaughtered on the holding.			

Q87c Is the carcass weight reported above measured or estimated?
- ◯ 1 Measured
- ◯ 2 Estimated

Q87d Were any [POULTRY] slaughtered for meat **in a slaughterhouse** for the holding during the reference period (3 months)?
- ◯ 0 No → Go to Q87g.
- ◯ 1 Yes

	Number of animals slaughtered	Total carcass weight obtained	Unit of measure
Q87e Answer the following about [POULTRY] slaughtered in a slaughterhouse.			

Q87f Is the carcass weight reported above measured or estimated?
- ◯ 1 Measured
- ◯ 2 Estimated

Q87g How is the production compared to the other period of the reference year?

(Fill in one circle only)
- ◯ 1 Similar
- ◯ 2 Greater
- ◯ 3 Lower

Q88. Answer the following questions about the destinations of the holding's production of [POULTRY] meat during the reference period - slaughtered on the holding or in a slaughterhouse

*** Use the same unit of measure that was reported for quantities in previous questions.**

	Quantity	Unit price of sale	Unit used to describe the price
Q88a What was the quantity of [POULTRY] meat for own-use ?			
Q88b What was the quantity of [POULTRY] meat sold?			
Q88c What was the quantity of [POULTRY] meat used as pay for labour as wages?			
Q88d What was the quantity of [POULTRY] meat given to service or input providers (in payment for feed, veterinary products, etc.)?			

NOTE - EXCLUDE BROILERS (Q84 = 1) AND "ALL OTHER CHICKENS" (Q84= 3) FROM Q89.

Q89. What is the average number of days during the year for which you get eggs from a [POULTRY]? (Include all egg production periods) [ ] days per year

Q90. For egg production, what is the period for which you prefer to answer questions?
*** The period selected will be used to answer a number of questions on egg production.**

(Fill in one circle only)
- ◯ 1 Daily average on a typical day
- ◯ 2 Yesterday (if an egg production period is currently ongoing)
- ◯ 3 Last week (if an egg production period is currently ongoing)
- ◯ 4 Three months
- ◯ 5 Twelve months

	Quantity	Unit of measure
Q91. What was the production of [POULTRY] eggs in the period selected above?		

Q92. Report the share of [POULTRY] eggs used in the following ways.

		Percent
Q92a	Own use for human consumption	%
Q92b	Eggs used for renewal	%
Q92c	Sold	%
Q92d	Other (specify)	%
	Total	100 %

	Unit price of the last sale	Unit of measure
Q92e If the share of [POULTRY] eggs sold (Q92c) is greater than 0%, answer the following about the eggs sold.		

PART 4.1.11 INSECTS

Q93. Were insects raised on the holding during the reference period (12 months)?
- ◯ 0 No → **Go to Q98.**
- ◯ 1 Yes

Q93a What insect types were raised on the holding during the reference period?

(Fill in all that apply) *RESPONSE = [INSECT]*
- ◯ 1 (Country-specific option)
- ◯ 2 (Country-specific option)
- ◯ 3 (Country-specific option)
- ◯ 4 Other insects (specify)

THE FOLLOWING QUESTIONS (Q94 to Q97) WILL BE ASKED FOR EACH OF THE INSECT TYPES IDENTIFIED IN Q93a.

Q94. Answer the following questions about [INSECT].

	Volume or weight	Unit of measure
Q94a Volume or weight of [INSECT] as of today		

Q95. Answer the following questions about the changes in [INSECT] numbers during the reference period (12 months).
*** Use the same unit of measure as in Q94a above.**

		Volume or weight
Q95a	Volume or weight of insects propagated on the holding	
Q95b	Volume or weight of live insects bought or received (including exchanged)	
Q95c	Volume or weight of insect deaths (from natural causes, illness, etc.)	
Q95d	Volume or weight of live insects sold, used as pay or wages for labour, given to landlord as rent, given for other reasons, exchanged	

	Volume or weight	Unit of measure
Q96. What was the production of [INSECT] during the reference period?		

Q97. Report the share of [INSECT] used in the following ways.

		Percent
Q97a	Own use for human consumption	%
Q97b	Insects processed on the holding	%
Q97c	Sold insects	%
	Total	**100 %**

	Unit price of the last sale	Unit of measure
Q97d If the share of [INSECT] sold (Q97c) is greater than 0%, answer the following about the production sold		

ONCE COMPLETE FOR ALL INSECT TYPES, PROCEED TO PART 4.1.12

PART 4.1.12 OTHER ANIMALS AND ANIMAL PRODUCTS

Q98. Were honeybees raised on the holding during the reference period (12 months)?

◯ 0 No → **Go to Q99.**
◯ 1 Yes

Q98a Number of beehives in production in the holding . . . . . [ ][ ][ ][ ][ ] beehives

Q98b Production of honey during the reference period . . . . . [ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ] . . . **Quantity** [ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ] **Unit of measure**

Q99. Answer the following questions about other animals and animal products produced during the reference period (12 months).

	Produced?	Production during the reference period	Unit of measure (see codes)	Unit price used in the last sale	Unit of price measurement
Shorn wool	**No** ◯ **Yes** ◯ → . .	[ ][ ][ ][ ][ ][ ][ ][ ] . .	[ ][ ][ ][ ] . .	[ ][ ][ ][ ] . [ ][ ] . .	[ ][ ][ ][ ][ ][ ][ ][ ]
Pulled wool	**No** ◯ **Yes** ◯ → . .	[ ][ ][ ][ ][ ][ ][ ][ ] . .	[ ][ ][ ][ ] . .	[ ][ ][ ][ ] . [ ][ ] . .	[ ][ ][ ][ ][ ][ ][ ][ ]
Non-carded animal hair	**No** ◯ **Yes** ◯ → . .	[ ][ ][ ][ ][ ][ ][ ][ ] . .	[ ][ ][ ][ ] . .	[ ][ ][ ][ ] . [ ][ ] . .	[ ][ ][ ][ ][ ][ ][ ][ ]
Silkworm cocoons	**No** ◯ **Yes** ◯ → . .	[ ][ ][ ][ ][ ][ ][ ][ ] . .	[ ][ ][ ][ ] . .	[ ][ ][ ][ ] . [ ][ ] . .	[ ][ ][ ][ ][ ][ ][ ][ ]
Furs	**No** ◯ **Yes** ◯ → . .	[ ][ ][ ][ ][ ][ ][ ][ ] . .	[ ][ ][ ][ ] . .	[ ][ ][ ][ ] . [ ][ ] . .	[ ][ ][ ][ ][ ][ ][ ][ ]
Animal skins	**No** ◯ **Yes** ◯ → . .	[ ][ ][ ][ ][ ][ ][ ][ ] . .	[ ][ ][ ][ ] . .	[ ][ ][ ][ ] . [ ][ ] . .	[ ][ ][ ][ ][ ][ ][ ][ ]
Other (snails, frogs, etc.) (Specify..) . .	**No** ◯ **Yes** ◯ → . .	[ ][ ][ ][ ][ ][ ][ ][ ] . .	[ ][ ][ ][ ] . .	[ ][ ][ ][ ] . [ ][ ] . .	[ ][ ][ ][ ][ ][ ][ ][ ]

PART 4.2: RAISING PRACTICES

THE SERIES OF QUESTIONS ON RAISING PRACTICES WILL BE ASKED FOR EACH OF THE LIVESTOCK TYPES IDENTIFIED THROUGHOUT SECTION 4. ONCE COMPLETE FOR ALL LIVESTOCK TYPES, PROCEED TO PART 4.3.

Q100. Identify the major feeding practices for the [LIVESTOCK] during the reference period (DD/MM/YYYY to DD/MM/YYYY)

(Fill in one circle only)

◯ 1 Only grazing
◯ 2 Mainly grazing, with some feeding
◯ 3 Mainly feeding, with some grazing
◯ 4 Only feeding

QUESTION Q101 IS TO BE ASKED IN THE FIRST CYCLE (FOR LIVESTOCK in general) ONLY.
THE ANSWER TO THIS QUESTION WILL DETERMINE IF Q101a ETC. WILL BE ASKED FOR LIVESTOCK1 AND SUBSEQUENT LIVESTOCK TYPES.

Q101 Does the holding have a production and/or marketing contract for, at least one livestock type?

◯ 0 No → **Go to Q102.**
◯ 1 Yes → **Go to Q101a.**

Q101a Does the holding have a production contract for [LIVESTOCK]?

◯ 0 No → **Go to Q101c.**
◯ 1 Yes → **Go to Q101b.**

Q101b Does the production contract cover 100% of the [LIVESTOCK] grown by the holding (exclusive contract)?

◯ 0 No
◯ 1 Yes

Q101c Does the holding have a marketing contract for [LIVESTOCK]?

◯ 0 No → **Go to next livestock type or to Q102 after the last type.**
◯ 1 Yes → **Go to Q101d.**

Q101d Does the marketing contract cover 100% of the [LIVESTOCK] grown by the holding (exclusive contract)?

◯ 0 No
◯ 1 Yes

PART 4.3: INTENTIONS FOR LIVESTOCK PRODUCTION FOR THE 12 MONTHS AFTER THE REFERENCE PERIOD

THE SERIES OF LIVESTOCK-RELATED QUESTIONS WILL BE ASKED FOR EACH OF THE LIVESTOCK TYPES IDENTIFIED THROUGHOUT SECTION 4. ONCE COMPLETE FOR ALL LIVESTOCK, PROCEED TO Q103.

Q102. Answer the following questions about production intentions for [LIVESTOCK].

Q102a How many head of [LIVESTOCK] do you plan to raise in the upcoming period?

(Fill in one circle only)
- ◯ 1 Similar → **Go to Q103.**
- ◯ 2 Greater → **Go to Q103.**
- ◯ 3 Lower → **Go to Q103.**
- ◯ 4 None → **Go to Q103.**

Q102b What is the main reason for changes in the number of [LIVESTOCK]?

(Fill in one circle only)
- ◯ 1 Technical
- ◯ 2 Economic
- ◯ 3 Other (specify [ ])

QUESTION Q103 IS TO BE ASKED IN THE LAST CYCLE OF [LIVESTOCK] ONLY.

Q103. Do you plan to begin raising other livestock in the upcoming period?
- ◯ 0 No → **Go to SECTION 5.**
- ◯ 1 Yes

Q103a What types of livestock do you plan to introduce in the upcoming period?

	Livestock type	Livestock code
[LIVESTOCK 1]		
[LIVESTOCK 2]		
[LIVESTOCK 3]		
[LIVESTOCK 4]		

Q103b What is the main reason for introducing [LIVESTOCK]?

(Fill in one circle only)
- ◯ 1 Technical
- ◯ 2 Economic
- ◯ 3 Other (specify [ ])

Comments on SECTION 4:

SECTION 5: ECONOMY DURING THE REFERENCE PERIOD (DD/MM/YYYY to DD/MM/YYYY)

PART 5.1: OTHER ACTIVITIES OF THE HOLDING

Q01. Indicate other activities engaged in by the holding during the reference period.

(Fill in all that apply) *RESPONSE = [OTHER ACTIVITY]*

- ◯ 31 On-farm processing of agricultural products:
  - ◯ 31.11 Grain milling: production of flour, groats, meal or pellets of wheat, rye, oats, maize (corn) or other cereal grains
  - ◯ 31.12 Rice milling: production of husked, milled, polished, glazed, parboiled or converted rice; production of rice flour
  - ◯ 31.13 Processing and preserving of fruit and vegetables
  - ◯ 31.14 Manufacture of crude vegetable oil: olive oil, soyabean oil, palm oil, sunflower seed oil, cottonseed oil, rape, colza or mustard oil, linseed oil, etc.
  - ◯ 31.15 Manufacture of wine
  - ◯ 31.16 Distillation of spirit drinks
  - ◯ 31.17 Manufacture of tobacco products (cigars, chewing tobacco, etc.)
  - ◯ 31.21 Processing and preserving meat
  - ◯ 31.22 Manufacture of dairy products
  - ◯ 31.23 Manufacture of leather and related products
- ◯ 32 Selling of holding's products at the market/shop (incl. preparation, packaging and transport of processed products)
- ◯ 33 Production of forestry products
- ◯ 34 Production, processing and preserving of fish, crustaceans and molluscs
  - ◯ 34.11 Production of fish, crustaceans and molluscs
  - ◯ 34.12 Processing and preserving of fish, crustaceans and molluscs
- ◯ 35 Production of renewable energy
- ◯ 36 Contractual work for other holdings using the production means of this holding
- ◯ 37 Accommodation, restaurant, catering and other leisure/educational activities
- ◯ 38 Making handicrafts
- ◯ 39 Training of animals
- ◯ 41 Management and/or administration for the agricultural holding
- ◯ 99 Other (specify [ ])
- ◯ 0 None

THE FOLLOWING SERIES OF QUESTIONS WILL BE ASKED FOR EACH OF THE OTHER ACTIVITY TYPES IDENTIFIED IN Q01

Q02. Identify the contribution of the [OTHER ACTIVITY] to the holding's total income during the reference period.

(Fill in one circle only)

- ◯ 1 Significant
- ◯ 2 Marginal

Q03. How would you rate the contribution of [OTHER ACTIVITY] to the holding's income, compared to the previous year?

(Fill in one circle only)

- ◯ 1 Similar
- ◯ 2 Greater
- ◯ 3 Lower

Q04. Is the holding engaged in aquaculture?

- ◯ 0 No → **Go to Q07.**
- ◯ 1 Yes

Q04a Identify the aquaculture species raised.

	Aquaculture species	Aquaculture code
[AQUACULTURE 1]		
[AQUACULTURE 2]		
[AQUACULTURE 3]		
[AQUACULTURE 4]		

RESPONSE = [AQUACULTURE]

THE FOLLOWING QUESTIONS (Q05 and Q06) WILL BE ASKED FOR EACH OF THE AQUACULTURE TYPES IDENTIFIED IN Q04a

Q05. What was the production of [AQUACULTURE] in the reference period? . . . [ ] Quantity . [ ] Unit of measure

Q06. Report the share of [AQUACULTURE] used in the following ways.

	Percent
Q06a Own use for human consumption	%
Q06b Sold	%
Total	100 %

Q06c If the share of [AQUACULTURE] sold (Q06b) is greater than 0%, answer the following . . . . . [ ] Unit price of the last sale . [ ] Unit of measure

ONCE COMPLETE FOR ALL AQUACULTURE PROCEED TO Q07.

Q07. Is the holding engaged in fishery activities?

- ◯ 0 No → **Go to Q10.**
- ◯ 1 Yes

Q07a Identify the fishery species fished.

	Fishery species	Fishery code
[FISHERY 1]		
[FISHERY 2]		
[FISHERY 3]		
[FISHERY 4]		

RESPONSE = [FISHERY]

THE FOLLOWING QUESTIONS (Q08 and Q09) WILL BE ASKED FOR EACH OF THE FISHERY SPECIES IDENTIFIED IN Q07a

Q08. What was the production of [FISHERY] in the reference period? . . . Quantity [ ] . Unit of measure [ ]

Q09. Report the share of [FISHERY] used in the following ways.

		Percent
Q09a	Own use for human consumption	[ ] %
Q09b	Sold	[ ] %
	Total	1 0 0 %

Q09c If the share of [FISHERY] sold is greater than 0%, answer the following. . . . . Unit price of the last sale [.] . Unit of measure [ ]

ONCE COMPLETE FOR ALL FISHERY SPECIES PROCEED TO Q10.

Q10. Is the holding engaged in forestry activities?
- ◯ 0 No → **Go to Q13.**
- ◯ 1 Yes

Q10a Identify the forestry products produced.

(Fill in all that apply) *RESPONSE = [FORESTRY]*
- ◯ 1 Timbers
- ◯ 2 Energy wood (biomass wood used for energy - heating, cooking)

THE FOLLOWING QUESTIONS (Q11 and Q12) WILL BE ASKED FOR EACH OF THE FORESTRY PRODUCTS IDENTIFIED IN Q10a

Q11. What was the production of [FORESTRY] in the reference period? . . . Quantity [ ] . Unit of measure [ ]

Q12. Was there a sale of [FORESTRY] in the reference period?
- ◯ 0 No
- ◯ 1 Yes

ONCE COMPLETE FOR ALL FORESTRY PRODUCTS PROCEED TO Q13.

Q13. What share of the household's total income is accounted for by agricultural income (income from crops and livestock)? (for holdings in the household sector only)

(Fill in one circle only)
- ◯ 1 None/close to 0 (Less than 10%)
- ◯ 2 Less than half (10%-39%)
- ◯ 3 About half (40%-59%)
- ◯ 4 Most/almost all (60%-99%)
- ◯ 5 All (100%)

Q14. How would you rate the contribution of agricultural income to the total income of the holding compared to the previous year?

(Fill in one circle only)
- ◯ 1 Similar
- ◯ 2 Greater
- ◯ 3 Lower

Q15. What were your main information sources used for agricultural information during the reference period?

(Fill in all that apply)
- ◯ 1 Government or other public institutions
- ◯ 2 Other individual farmers
- ◯ 3 Farmers' groups or associations
- ◯ 4 Non-governmental organizations (NGO) or non-governmental project
- ◯ 5 Trader or market stakeholder
- ◯ 6 Other (specify [ ])

Q16. How did you consult this information during the reference period?

(Fill in all that apply)
- ◯ 1 Direct discussion
- ◯ 2 Telephone (including calls and texts)
- ◯ 3 Radio
- ◯ 4 Television
- ◯ 5 Internet
- ◯ 6 Press
- ◯ 7 Other (specify [ ])

Q17. Does the holding participate in a farmers' association?
- ◯ 0 No
- ◯ 1 Yes

Q18. Does the holding participate in a commercial or producer cooperative?
- ◯ 0 No
- ◯ 1 Yes

Q19. Does the holding have a bank account?
- ◯ 0 No
- ◯ 1 Yes

PART 5.2 SHOCKS

Q20. Did any severe shocks hit the holding or household during the reference period (DD/MM/YYYY to DD/MM/YYYY)?

- ◯ 0 No → **Go to SECTION 6.**
- ◯ 1 Yes

Q21. Identify the three most severe shocks experienced.

Fill in a maximum of three and rank by importance:
Most severe = 1
2nd most severe = 2
3rd most severe = 3 *RESPONSE = [SHOCK]*

Production shocks:

- [ ] 1 Drought or erratic rains
- [ ] 2 Floods
- [ ] 3 Landslides
- [ ] 4 Extreme temperatures (too hot or too cold)
- [ ] 5 Unusually high level of crop pests
- [ ] 6 Unusually high level of livestock diseases
- [ ] 7 Unusually low prices for agricultural output
- [ ] 8 Unusually high prices for agricultural inputs
- [ ] 9 Theft of agricultural assets, outputs, money or valuables
- [ ] 10 Other (specify [ ])

Household shocks:

- [ ] 11 Unusually high food prices
- [ ] 12 Reduction in the earnings of salaried household member(s) or loss of employment of salaried household member(s)
- [ ] 13 Serious illness or accident or death of household member(s)
- [ ] 14 Break-up of household
- [ ] 15 Conflict or violence
- [ ] 16 Other (specify [ ])

THE FOLLOWING QUESTION WILL BE ASKED FOR EACH OF THE TOP 3 SHOCK TYPES IDENTIFIED IN Q21.

Q22. What was the holding's main response to [SHOCK]?

- ◯ 1 Sold land and/or buildings
- ◯ 2 Sold crops and/or livestock
- ◯ 3 Sold holding's other assets including machinery and equipment
- ◯ 4 Found other work, not on the holding
- ◯ 5 Received help from government
- ◯ 6 Received help from NGOs or other organizations
- ◯ 7 Reduced expenses for the holding (labour costs, capital costs, etc.)
- ◯ 8 Received help from relatives (*for holdings in the household sector only*)
- ◯ 9 Reduced expenses for the household (on health, education, etc.) (*for holdings in the household sector only*)
- ◯ 10 None of the above

ONCE COMPLETE FOR THE SHOCKS IDENTIFIED, PROCEED TO QUESTION 23.

Q23. Has the holding fully recovered from the shocks?

- ◯ 0 No
- ◯ 1 Yes

Q24. Do you feel that the holding is now better able to cope with the shocks?

- ◯ 0 No
- ◯ 1 Yes

Q25. What is your general perception of the level of severity of shocks compared to the past?
(Fill in one circle only)

- ◯ 1 Similar
- ◯ 2 Greater
- ◯ 3 Lower

Comments on SECTION 5:

SECTION 6: HOUSEHOLDS OF THE HOLDERS AND CO-HOLDERS

PART 6.1 SOCIO-DEMOGRAPHIC CHARACTERISTICS OF THE HOUSEHOLDS OF THE HOLDERS AND CO-HOLDERS

SECTION 6 IS ONLY TO BE ASKED FOR HOLDINGS WHERE THE HOLDER IS A CIVIL/NATURAL PERSON OR GROUP OF CIVIL/NATURAL PERSONS (SECTION 1, Q10 = 1 or 2)

Q00. **(IF SECTION 1 Q10 = 2)** How many households were in this holding during the reference period? . ☐☐

IF THE HOLDERS ARE A GROUP OF CIVIL/NATURAL PERSONS (SECTION 1 Q10 = 2) THE QUESTIONS IN THIS PART ARE TO BE ASKED FOR EACH HOUSEHOLD IDENTIFIED IN Q00. LIST THE INDIVIDUALS WHO NORMALLY LIVE AND EAT IN THE HOLDER(S)' HOUSEHOLD(S), STARTING WITH THE HEAD OF THE HOUSEHOLD.

Q01. What is the number of individuals who normally live and eat in the holder household? . . . ☐☐

Q02. Identify the head of the household.

Q02a Household number . . . . . ☐☐☐☐☐☐☐
Q02b Household member number . . . . . ☐☐☐☐☐☐☐

RESPONSE = [NAME]

Q02c First name . . . . . ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐
Q02d Surname . . . . . ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Q03. Identify the next household member.

Q03a Household number . . . . . ☐☐☐☐☐☐☐
Q03b Household member number . . . . . ☐☐☐☐☐☐☐

RESPONSE = [NAME]

Q03c First name . . . . . ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐
Q03d Surname . . . . . ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

REPEAT Q03. FOR HOUSEHOLD MEMBER 3, 4, 5, ETC.
IF Q00 > 1 REPEAT Q01 to Q03 FOR EACH HOUSEHOLD
THE FOLLOWING QUESTION (Q04) WILL BE ASKED FOR EACH OF THE NAMES IDENTIFIED ABOVE.

Q04. Answer the following questions about [NAME].

Q04a [NAME]'s Sex
- ◯ 1 Male
- ◯ 2 Female

Q04b What is the relationship of [NAME] to the head of the household?

(Fill in one circle only)
- ◯ 1 Head of household
- ◯ 2 Wife/husband or consensual union partner
- ◯ 3 Child/adopted child
- ◯ 4 Grandchild
- ◯ 5 Niece/nephew
- ◯ 6 Father/mother
- ◯ 7 Sister/brother
- ◯ 8 Son-in-law/daughter-in-law
- ◯ 9 Brother-in-law/sister-in-law
- ◯ 10 Grandfather/grandmother
- ◯ 11 Father-in-law/mother-in-law
- ◯ 12 Others - Other relative
- ◯ 13 Others - Servant/servant's relative
- ◯ 14 Others - Lodger/lodger's relative
- ◯ 15 Others - Other non-relative

Q04c Does [NAME] answer for himself/herself?
- ◯ 0 No → **Go to Q04d.**
- ◯ 1 Yes → **Go to Q04f.**

Q04d What is the Household number of the person who answers questions about [NAME]? . . . . . ☐☐☐☐☐☐☐
Q04e What is the Household member number of the person who answers questions about [NAME]? . . ☐☐☐☐☐☐☐

Q04f [NAME]'s age, in completed years . . . . . ☐☐☐

Q04g What is [NAME]'s marital status?

(Fill in one circle only)
- ◯ 1 Married
- ◯ 2 Consensual union
- ◯ 3 Separated
- ◯ 4 Divorced
- ◯ 5 Widowed
- ◯ 6 Never married

IF [NAME]'S AGE IS HIGHER THAN 5, ASK Q04h; OTHERWISE, GO TO Q04i.

Q04h What is the highest level of education that [NAME] has completed?

(Fill in one circle only)
- ◯ 1 None
- ◯ 2 Less than primary
- ◯ 3 Primary
- ◯ 4 Lower secondary
- ◯ 5 Upper secondary
- ◯ 6 Tertiary/Post-secondary

IF [NAME]'S AGE IS LESS THAN 24, ASK Q04i; OTHERWISE, GO TO Q04j.

Q04i Did [NAME] attend school during the current/last school year?
- ◯ 0 No
- ◯ 1 Yes

IF [NAME]'S AGE IS GREATER THAN 15, ASK Q04j; OTHERWISE, GO TO Q04k.

Q04j Has [NAME] ever received any formal training on agriculture?
- ◯ 0 No
- ◯ 1 Yes

IF [NAME]'S AGE IS GREATER THAN 15, ASK Q04k; OTHERWISE, GO TO Q04l.

Q04k Does [NAME] participate in decisions concerning crops and livestock (what/when to plant/harvest; what to grow/raise, etc.)?
- ◯ 0 No
- ◯ 1 Yes

Q04l Has [NAME] worked on this holding during the reference period, even for one day?
- ◯ 0 No
- ◯ 1 Yes

THE SERIES OF QUESTIONS WILL BE ASKED FOR EACH OF THE NAMES IDENTIFIED IN QUESTION 2, 3, ETC. ONCE COMPLETE FOR ALL NAMES, PROCEED TO SECTION 7.

Comments on SECTION 6:

SECTION 7: LABOUR USED BY THE HOLDING

PART 7.1 WORK ON THE HOLDING BY THE HOLDER AND HIS/HER HOUSEHOLD MEMBERS

SECTION 7 IS ONLY TO BE ASKED FOR HOLDINGS WHERE THE HOLDER IS A CIVIL/NATURAL PERSON OR GROUP OF CIVIL/NATURAL PERSONS (SECTION 1, Q10 = 1 or 2)

IF [NAME]'S AGE IS GREATER THAN 15, AND THEY HAVE WORKED ON THE HOLDING DURING THE REFERENCE PERIOD FOR AT LEAST ONE DAY (Q04l = Yes), ANSWER THE FOLLOWING QUESTIONS.

Q01. Report [NAME]'s time and activities on the holding during the **MAIN** season.

Q01a Number of months . . . . . [ ][ ]
Q01b Average number of days per month . [ ][ ]
Q01c Average number of hours per day . . [ ][ ]

Q01d What were [NAME]'s main tasks on the holding during the **MAIN** season?

(Fill in one circle only)
- ◯ 1 Crop cultivation (all crops, including horticulture crops)
- ◯ 2 Raising livestock
- ◯ 3 Non-agricultural activities related to the holding

Q02. Report [NAME]'s time and activities on the holding during the **LOW** season.

Q02a Number of months . . . . . [ ][ ]
Q02b Average number of days per month . [ ][ ]
Q02c Average number of hours per day . . [ ][ ]

Q02d What were [NAME]'s main tasks on the holding during the **LOW** season?

(Fill in one circle only)
- ◯ 1 Crop cultivation (all crops, including horticulture crops)
- ◯ 2 Raising livestock
- ◯ 3 Non-agricultural activities related to the holding

Q03. Did [NAME] receive a payment for the work on the holding (wage, salary, commission, tips or any other pay)?
- ◯ 0 No
- ◯ 1 Yes

THE SERIES OF QUESTIONS WILL BE ASKED FOR ALL OF THE NAMES IDENTIFIED IN PART 6.1 WHOSE AGE IS GREATER THAN 15, AND WHO WORKED ON THE HOLDING DURING THE REFERENCE PERIOD FOR AT LEAST ONE DAY (PART 6.1 Q04l = Yes). ONCE COMPLETE FOR ALL SUCH NAMES, PROCEED TO PART 7.2.

PART 7.2 WORK ON THE HOLDING BY EXTERNAL WORKERS

Q04. Did the holding have any paid or unpaid workers who were not part of the household(s) of holder(s) during the reference period?

- ◯ 0 No → **Go to Q08.**
- ◯ 1 Yes

Q05. Identify the types of workers providing labour to the holding during the reference period.
*** Include paid and unpaid workers**

(Fill in all that apply) *RESPONSE = [WORKER CATEGORY]*

- ◯ 1 External manager
- ◯ 2 External paid, long-term employees (hired permanently - for more than a season)
- ◯ 3 External, paid, temporary workers (hired for a season or less)
- ◯ 4 External, paid, casual workers (hired on daily or weekly basis)
- ◯ 5 Unpaid external workers (mutual helpers, unpaid trainees, volunteers, unpaid relatives living in another household, etc.)

THE FOLLOWING QUESTIONS (Q06 and Q07) WILL BE ASKED FOR EACH OF THE WORKER CATEGORIES IDENTIFIED IN Q05.

Q06. Report [WORKER CATEGORY]'s time and activities on the holding during the **MAIN** season.

Q06a Total number of [WORKER CATEGORY] in the **MAIN** season. . . . . [ ][ ]

Q06b Total number of [WORKER CATEGORY] that worked FULL time during the **MAIN** season . . [ ][ ][ ]

Q06c Total number of [WORKER CATEGORY] that worked PART time during the **MAIN** season . . [ ][ ][ ]

Q06d What were [WORKER CATEGORY]'s main tasks on the holding during the **MAIN** season?

(Fill in one circle only)

- ◯ 1 Crop cultivation (all crops, including horticulture crops)
- ◯ 2 Raising livestock
- ◯ 3 Non-agricultural activities related to the holding

Q07. Report [WORKER CATEGORY]'s time and activities on the holding during the **LOW** season.

Q07a Total number of [WORKER CATEGORY] in the **LOW** season. . . . . [ ][ ]

Q07b Total number of [WORKER CATEGORY] that worked FULL time during the **LOW** season . . [ ][ ][ ]

Q07c Total number of [WORKER CATEGORY] that worked PART time during the **LOW** season . . [ ][ ][ ]

Q07d What were [WORKER CATEGORY]'s main tasks on the holding during the **LOW** season?

(Fill in one circle only)

- ◯ 1 Crop cultivation (all crops, including horticulture crops)
- ◯ 2 Raising livestock
- ◯ 3 Non-agricultural activities related to the holding

ONCE COMPLETE FOR ALL WORKER CATEGORIES, PROCEED TO Q08.

Q08. Do the holding experience a shortage of workers during the peak periods?

- ◯ 0 No
- ◯ 1 Yes

Q09. Did the holding hire contractors over the reference period, even for a minor service?

- ◯ 0 No → **Go to SECTION 8.**
- ◯ 1 Yes → **Go to Q10.**

Q10. What were the main activities wholly or partially carried out by the contractor(s)?

ACTIVITY NAMES AND CODES ARE FOUND IN ANNEX 1.1c *RESPONSE = [ACTIVITY]*

	Activity name	Activity code
[ACTIVITY 1]		
[ACTIVITY 2]		
[ACTIVITY 3]		
[ACTIVITY 4]		
[ACTIVITY 5]		
[ACTIVITY 6]		
[ACTIVITY 7]		

THE FOLLOWING QUESTION WILL BE ASKED FOR EACH OF THE ACTIVITIES IDENTIFIED IN Q10.

Q11. Was [ACTIVITY] wholly or partially carried out by a contractor?

(Fill in one circle only)

- ◯ 1 Wholly carried out by a contractor
- ◯ 2 Partially carried out by a contractor

THE QUESTION WILL BE ASKED FOR EACH OF THE ACTIVITIES IDENTIFIED IN Q10. ONCE COMPLETE FOR ALL ACTIVITIES, PROCEED TO SECTION 8.

Comments on SECTION 7:

SECTION 8: HOUSEHOLD DWELLING AND ASSETS

PART 8.1 HOUSEHOLD DWELLING AND ASSETS

SECTION 8 IS ONLY TO BE ASKED FOR HOLDINGS WHERE THE HOLDER IS A CIVIL/NATURAL PERSON OR GROUP OF CIVIL/NATURAL PERSONS (SECTION 1, Q10 = 1 or 2)

Q01 to Q04 have to be repeated for every co-holder (Section 1, Q10 = 2)

Q01. Report the type of holder dwelling.

(Fill in one circle only)
- ◯ 1 Detached house
- ◯ 2 Semi-detached house
- ◯ 3 Flat or apartment in an apartment block
- ◯ 4 Room(s) in a building or compound house
- ◯ 5 Store
- ◯ 6 Basement or garage
- ◯ 7 Servants' house
- ◯ 8 Other (specify [ ])

Q02. Does anyone in the household have a bank account?

- ◯ 0 No → **Go to Q04.**
- ◯ 1 Yes

Q03. Report the household members who have a bank account?

(List up to 3 household members, using Household member number)

HM number 1	
HM number 2	
HM number 3	

Q04. Report which items and services the household has.

(Fill in all that apply)
- ◯ 1 Electricity
- ◯ 2 Landline telephone
- ◯ 3 Cell phone
- ◯ 4 Radio
- ◯ 5 Television
- ◯ 6 Internet
- ◯ 0 None of the above

Comments on SECTION 8:

4.1. AGRIS CORE MODULE METHODOLOGICAL NOTE

Introduction

This note provides an overview of the Core Module, presents its structure and content, and proposes definitions and classifications. It is meant to provide survey managers and operational staff with an understanding of the Core Module within the broader context of AGRIS – which also fits into the larger context of a national statistical system. This methodological note also discusses some issues relating to survey implementation and customization to country specificities.

- **Subchapter 4.1.1** outlines the key elements underlying the Core Module: the measurement objectives, coverage and collection, timing and reference periods for the module. It explains how the module can respond to the data needs of priority international development initiatives in the agriculture and rural sectors.
- **Subchapter 4.1.2** introduces the structure and overall articulation of the Core Module. It presents selected indicators that can be generated from the module.
- **Subchapter 4.1.3** provides methodological notes and discusses options for customization for specific parts and questions of the Core Module questionnaire. It provides definitions and introduces relevant classifications. The classifications are further detailed in annex 1.

4.1.1. Context, measurement objectives, statistical unit, reference periods and units of measure

4.1.1.1. The Core Module in the context of AGRIS

AGRIS is designed as a ten-year integrated sample survey program. The annual Core Module (a sample-based survey) is at the foundation of AGRIS, as it collects basic frame information on holdings and on those operating them, as well as data on the agricultural production of crops and livestock. A set of four Rotating Modules provides thematic data on economy, labour, production methods and the environment, and machinery, equipment and assets. These Rotating Modules complement the Core Module data, and can be integrated not only with the core, but also with each other to provide a rich data set covering all aspects of agricultural holdings.

Table 4.1 outlines the recommended flow of modules over the ten-year period.

TABLE 4.1. RECOMMENDED AGRIS MODULES FLOW.

	Years	1	2	3	4	5	6	7	8	9	10
Core Module	Agricultural Holding roster	●	●	●	●	●	●	●	●	●	●
	Crop production	●	●	●	●	●	●	●	●	●	●
	Livestock production	●	●	●	●	●	●	●	●	●	●
Rot. Module 1	Economy	●		●		●		●		●	
Rot. Module 2	Labour		●				●				
Rot. Module 3	Production Methods and the Environment				●				●		
Rot. Module 4	Machinery, Equipment and Assets	●				●					

The Core Module of the AGRIS program focuses mainly on the annual agricultural production of agricultural holdings. The questions in the module relate primarily to the agricultural holding activities, with some questions focusing on the household and household members. This is the case because for the agricultural holdings in the household sector, there are often economic interdependencies between households and the agricultural holdings with which they are associated.

Sampling recommendations for the Core Module are provided in chapter 5 of this handbook, which discusses the AGRIS sampling strategy. Data are meant to be collected in the field directly from survey respondents using CAPI techniques. A CAPI version of the AGRIS Core Module Generic Questionnaire is available in the Survey Solutions package (see annex 5 on CAPI and Survey Solutions).

4.1.1.2. The Core Module and international statistical frameworks

International statistical frameworks applied and used by the AGRIS Core Module

The AGRIS generic methodology is proposed as a public good to statistical agencies for their further customization and implementation. The resulting data are meant to be used in a coherent way to make meaningful subnational, regional and international aggregations and comparisons. In this context, the AGRIS methodology relies extensively on several internationally endorsed statistical frameworks, such as statistical classifications, and is articulated with other relevant data collection programs (such as the FAO-promoted WCA 2020; FAO, 2015). The AGRIS methodology, including the questionnaires' content, design and implementation (by means of CAPI), has benefited from various data collection innovations brought about by the implementation of the Global Strategy to improve Agricultural and Rural Statistics (Global Strategy) and the Research Program of the World Bank-promoted LSMS-ISA programme.

The scope of activities in AGRIS is defined under ISIC rev. 4 (see annex 1-1); the products covered by AGRIS are based on the CPC ver. 2.1, adapted for the AGRIS context (see annex 1-3).

Beyond the essential articulation in terms of timing between the ten-year AGRIS cycle and the frame building on the basis of an agricultural census, the AGRIS methodology is linked to the WCA 2020 in terms of relevant items, definitions and classifications. For example, the Indicative Crop Classification (ICC ver. 1.1), based on the CPC ver. 2.1, is used for crops grown (see annex 1-2) in both the WCA 2020 and AGRIS.

The System of National Accounts 2008 (SNA 2008) is a statistical framework that provides a comprehensive, consistent and flexible set of macroeconomic accounts for policy-making, analysis and research purposes. The SNA 2008 defines the enterprise and the establishment as two main types of economic production units. With the purpose of achieving coherence with the SNA 2008, AGRIS adopts the principle that the agricultural holding is treated as being equivalent to an establishment unit under the SNA. The definitions of the household sector and of the non-household sectors in agriculture are also developed within the SNA framework (see annex 1-4).

The land use classes proposed in AGRIS are harmonized with the land use classification of the SEEA 2012 Central Framework. Some adaptation of those classes in light of agricultural land use was introduced to better capture all types of land used for crop production.

The International Standard Classification of Education (ISCED) is the standard framework used to cross-nationally categorize and report on comparable education statistics. As national education systems vary in terms of structure and curricular content, this classification ensures the comparability of data on education in order to understand and properly interpret the inputs, processes and outcomes of education systems from a global perspective. The ISCED

2011 classification was adopted by the UNESCO General Conference at its Thirty-Sixth Session in November 2011 (UNESCO, 2012). The ISCED 2011 is used in AGRIS modules to collect data related to the highest level of education completed for holders, managers and household members (see annex 1-7).

Using AGRIS data: relevant international statistical demand frameworks

Sustainable Development Goal indicators

On 25 September 2015, countries adopted a set of goals to end poverty, protect the planet, and ensure prosperity for all as part of a new sustainable development agenda[1]. Each goal has specific targets to be achieved over the next 15 years, all with specific indicators[2]. AGRIS, including through its Core Module, provides essential and direct information for the following four 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
- 2.4.1: Proportion of agricultural area under productive and sustainable agriculture
- 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

AGRIS contributes to the following 15 additional SDG indicators, on the subpopulation of the population associated with agricultural holdings only:

- 1.1.1: Proportion of population below the international poverty line, by sex, age, employment status and geographical location (urban/rural)
- 1.2.1: Proportion of population living below the national poverty line, by sex and age
- 1.2.2: Proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions
- 1.3.1: Proportion of population covered by social protection floors/systems, by sex, distinguishing children, unemployed persons, older persons, persons with disabilities, pregnant women, newborns, work-injury victims and the poor and the vulnerable
- 1.4.1: Proportion of population living in households with access to basic services
- 1.4.2: Proportion of total adult population with secure tenure rights to land, with legally recognized documentation and who perceive their rights to land as secure, by sex and by type of tenure
- 1.5.1: Number of deaths, missing persons and directly affected persons attributed to disasters per 100 000 population
- 2.5.2: Proportion of local breeds, classified as being at risk, not-at-risk or unknown level of risk of extinction
- 5.5.2: Proportion of women in managerial positions
- 5.b.1: Proportion of individuals who own a mobile telephone, by sex
- 7.1.1: Proportion of population with access to electricity
- 8.7.1: Proportion and number of children aged 5-17 years engaged in child labour, by sex and age
- 8.8.1: Frequency rates of fatal and nonfatal occupational injuries, by sex and migrant status
- 9.1.1: Proportion of the rural population who live within 2 km of an all-season road
- 9.c.1: Proportion of population covered by a mobile network, by technology
- 17.8.1: Proportion of individuals using the Internet

1 http://www.un.org/ga/search/view_doc.asp?symbol=A/RES/70/1&Lang=E.
2 https://unstats.un.org/sdgs/metadata/.

EXAMPLES

Indicator 2.3.1 is a measure of the volume of production per labour unit by classes of farming/pastoral/forestry enterprise size. This is an essential element for measuring productivity[3]. To calculate the measure, the following variables are required:

a. **Volume of production**: a measure of agricultural production in a country. While collecting physical measures of the production of an array of agricultural products is relatively easy, aggregating them is difficult because it would require adding the different weights or volumes related to a variety of agricultural products, for example milk and wheat. For this reason, production is often measured as the monetary value of the agricultural production.

   AGRIS sources:

   Core Module

   Agricultural production is collected in physical quantities. A value can be obtained directly for quantities of products sold. For production destined for farm or household use, or for payment for labour or inputs, a value can be derived by applying a price to the quantities reported for those purposes. Section 3 (part 3.1 – Crop production and destinations) and section 4 (part 4.1 – Livestock raising activities and production) provide information on quantities of products by destination.

   Economy Module

   The detailed reporting of prices of products sold in section 2 (section 2 – Income from the agricultural holding) and of the destination of production in section 5 (in part 5.1 – Destination of commodities produced) provide an estimate of a value of production and of the percentage share of commodities sold, used for the household, used to pay for farm inputs (labour or other inputs) and used for the farm as inputs (seed or feed). Therefore, it provides potential indicators to be used for the calculation of the volume of production in value terms. The shares reported can be applied to the quantities produced and the dollar values as reported in section 2 (part 2.1 – Income from agricultural production).

b. **Labour unit**: a measure of the paid and unpaid labour used for agricultural production. Measures could include the number of economically active persons (EAPs) or number of person-hours.

   AGRIS sources:

   Core Module

   The number of persons and number of days are provided in section 7 (part 7.1 – Work on the holding by the holder and household members and part 7.2 – Work on the holding by external workers).

   Labour Module

   The number of persons and person-hours, which can be calculated by summing the responses given in section 2 (part 2.1 – Household members) and section 3 (part 3.4 – External workers).

3 FAO. 2001. *Agricultural investment and productivity in developing countries. Chapter: Agricultural Investment, Production Capacity and Productivity*. Social and Economic Development Paper 148. FAO Publication: Rome. Available at: http://www.fao.org/docrep/003/x9447e/x9447e03.htm. Accessed 14 January 2017.

c. **Classes of farming/pastoral/forestry enterprise size**: key variables with which to classify enterprises – these could be land area, number of animals, economic size, etc.

AGRIS sources:
Core Module
section 1 (Organization type), section 3 (Agricultural area utilized) and section 4 (Number of animals) provide potential indicators.

Economy Module
section 1 (part 1.1 – Identification, incl. organization type; part 1.2 – Agricultural area utilized; part 1.3 – Number of animals), and section 2 (Income and sales) may potentially provide information.

d. **Variables to classify "small-scale food producers"** and support the definition adopted. Such variables could include land area, number of animals, economic size and organization type (household-based vs commercial).

AGRIS sources:
Core Module
section 1 (Organization type), section 3 (Agricultural area utilized) and section 4 (Number of animals) provide potential indicators.

Economy Module
section 1 (part 1.1 – Identification, incl. organization type; part 1.2 – Agricultural area utilized, part 1.3 – Number of animals), and section 2 (sales class – parts to be determined depending on whether solely agricultural income, or other income for the holding is to be included in the classification) provide potential indicators.

e. **Gender and indigenous status** of the holders of agricultural holdings

AGRIS sources:
Core Module
section 2.

Minimum Set of Core Data (MCSD)

The Global Strategy is a coordinated effort to provide a conceptual and institutional framework for the production of data, to establish an MSCD required to meet the basic and emerging demands of national development policies, to develop cost-effective methodologies for data production and use, and to establish the necessary governance structures and capacities.

The MSCD covers three dimensions:

- Economic: outputs, trade, resources, inputs, prices, agro-processing; final expenditure; rural infrastructure
- Social: employment status, education level, household composition, family workers, sex-disaggregated data
- Environmental: soil degradation, water population, greenhouse gases (GHGs), agricultural practices on water use, land use, etc.

The proposed set of AGRIS questionnaires generate approximately two-thirds of the MSCD data requirements. AGRIS generates all the MSCD-relevant data that has to be collected at farm level.

4.1.1.3. Measurement objectives and scope

The primary objective of the Core Module is to produce the main annual indicators linked to agricultural production:

- Main productions (quantities and yields)

All significant agricultural production should be covered by this module.

In addition, the Core Module includes questions related to:

- Structures of production (legal framework, structural and conjunctural difficulties)
- Means of production (labour force, land use, livestock)
- Economy (prices, income, information, other gainful activities)
- Demographic and social aspects of households linked to agricultural activities

The scope of AGRIS is defined under ISIC (rev.4), as follows:
Section: A – Agriculture, forestry and fishing
Division: 01 – Crop and animal production, hunting and related service activities

- 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

The detailed ISIC description for these activities can be found in annex 1-1 to this handbook. The annex provides information at the Section, Division, Group and Class levels of the classification, along with explanatory notes.

4.1.1.4. Statistical unit and coverage

The agricultural holding

The statistical unit of AGRIS, including its Core Module, is the agricultural holding, as an independent producer of agricultural products. The definition proposed for AGRIS is the same one proposed by FAO in its WCA 2020 programme (FAO, 2015).

> "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."

The agricultural holding is under single management, exercised by the holder (see section 3.2).

Using the SNA 2008 terminology, farms can be grouped into: (1) those that are defined as household units (holdings in the household sector); and (2) all other institutional units engaged in agricultural production (holdings in the non-household sector), such as corporations and government institutions. In most countries, the majority of agricultural production occurs in the household sector. The concept of "agricultural holding" is therefore closely related to the concept of "household". Both subpopulations should be covered by AGRIS, as household and non-household sector holdings (see annex 1-4).

Coverage and use of threshold

AGRIS should cover all relevant agricultural activities of agricultural holdings in a country within the scope of the ISIC groups mentioned above. Following national characteristics, thresholds can be fixed for the entire country, with the objective of covering the largest possible share of agricultural production and to exclude very small agricultural holdings that contribute little to total agricultural production. Preferably, those thresholds should be decided before an agricultural census and used without change for all surveys conducted between two censuses. The benefits of establishing thresholds must be carefully assessed: if operational simplicity and budget savings are obvious advantages, disadvantages would include the need to monitor small-scale holdings, which are often of primary policy concern.

The different identification numbers

The Core Module questionnaire asks for three different identification numbers, including statistical identification numbers and administrative identification numbers.

Statistical identification numbers:

The main goal is to identify the statistical unit (the agricultural holding) without any doubt. This identifier can be specific to the sampling database or can be an administrative identifier, if one exists and is compatible with the objective (the same definition of the holding).

- Sampling database ID: this is linked to one unique holding and used generally for all surveys, including censuses. It can be the same as the census ID or as the business register ID
- Surveyor ID: this corresponds to the name and surname of the surveyor for the current survey, linked with surveyor work management and payments
- Enumeration area and census ID: this is linked to one unique holding and calculated during the census.

Administrative identification numbers:
Business register ID: this number is linked to a unique holding, can be used as a statistical ID but is very often difficult because:

a. the statistical definition of "holding" and business definitions of "holding" can be different; and
b. the coverage of the two registers can be also different, for example with implications for very small holdings.

- Individual number: can be useful for holders (civil persons) and managers if the names of persons of different generations are the same.
- Other administrative IDs (livestock, wine, organic, oil, etc.) may be useful, to merge statistical data and administrative data.

4.1.1.5. Reference periods and timing

4.1.1.5.1. Reference period

Two types of reference periods are used in the Core Module, depending on the type of data being collected:

a. **The reference year (YYYY/MM/DD) to (YYYY/MM/DD)** – this coincides with the last complete agricultural year and with the main reference period for the AGRIS Core Module. It is used when collecting data on agricultural productions or aspects closely associated with them. This reference period provides a natural framework for respondents when they think about their agricultural production. The main characteristics of this reference period include:
   - A duration of 12 months
   - Period including soil preparation(s), sowing(s) and harvest(s); and finishing with one harvest period, to be consistent with the agricultural campaign(s). The end of the period is generally the date of the last harvest in the year.
   - Period including one or more harvests (in addition to the possibility to have continuous harvests).
b. **A given point in time or particular day.** It is used when inventory data (such as livestock numbers) are asked for, or in cases of punctual events. It is preferable to choose a single date (the same day each year) within the reference period for the questions concerning punctual events, for example present livestock. It is possible to use the interview day; however, this may be problematic for seasonal phenomena (births, etc.)

4.1.1.5.2. Timing

The Core Module should be implemented at least once every year, to follow agricultural productions. To maximize respondent recall, the best time to implement the survey is at the end of the agricultural year – if possible, immediately after the main harvest. This is particularly important when holdings do not have systematic recordings of their activities, because the most important information is still "fresh" in the farmers' minds. It is of utmost importance to test farmers' recalls and capacity to answer in the pilot and field tests that should be conducted by national agencies before implementing their customized version of AGRIS. When tests show that the long-period recall approach is not suitable, or where there is more than one agricultural campaign per year, it is advised to carry out the Core Module in different waves of data collection. In this case, operational and budget consequences should be properly balanced vis-à-vis data quality gains. For a country with two agricultural campaigns in a single calendar year, one option would be to have twin visits and adjust the Core Module questionnaires to cover the two distinct periods (in practice, one should be the main campaign and the other should be the minor campaign).
In any case, the reference period and the number of wave(s) of data collection must be decided at an early stage of survey preparation.

4.1.1.6. Units of measure

Reporting quantities and areas

When reporting land areas, inventories of animals, quantities of inputs used or agricultural products produced and sold, international standard units of measurement are useful and AGRIS results should be converted to such units. In many cases, however, there may be local units of measurement that are more familiar to respondents. To facilitate reporting, local units of measurement should be identified and used during data collection. The Core Module should use these local units as appropriate and conversion factors to standard units should be specified. Such conversions can be built into the CAPI application prior to collection, to ensure seamless reporting in local units and dissemination in standard units.

Reporting prices, costs, sales and other monetary values

The official currency of the country should be used to report monetary values throughout the Core Module. This will facilitate reporting by data providers, and may enable reports to be compiled and disseminated for domestic use. However, for the sake of coherence when making comparisons with other jurisdictions, monetary values should be converted to a standard international currency and made available to data users.

Country customization

The Generic Questionnaire is designed to facilitate the tasks of respondents and enumerators. The Core Module does not propose “default” units. Rather, the questionnaire asks which unit is used for each relevant question or set of questions. Another option would be to ask which units will be used for areas, quantities, values, etc. at the beginning of the interview. Which of these options should be chosen could require conduction of a field test during the pilot survey.

4.1.2. Structure of the Core Module and main indicators

The Core Module questionnaire is divided into nine sections. Table 4.2 below summarizes the organization of the thematic coverage of each of these parts. Some of the sections or parts may only be relevant and applicable to holdings operated by a civil person or group of civil persons.

TABLE 4.2. STRUCTURE OF THE AGRIS CORE MODULE.

Sections (S) and parts (P) of AGRIS Core Module questionnaire	Main themes included	Main indicators that can be calculated
S1. The holding		
P1.1. Survey preparation	Respondent choice, changes in the holding structure	Refusal rate
P1.2. Identification of the holding	Location, including geographical coordinates Legal status Land tenure	Agricultural production legal framework Land tenure Activity registration
P1.3. Agricultural activity	Agricultural activity from an economic point of view	Main agricultural activity, main crop or livestock activity, specialization
S2. Characteristics of the holders and managers		
	Characteristics of the civil persons in charge of the holding; characteristics of the legal entity; manager of the holding	Holders and managers by age, sex, education, nationality Generational replacement Female entrepreneurship Working time spent on the holding Other activities outside the holding
S3. Crop production		
P3.1. Crop production, destinations	Harvests and stocks, destinations of productions	Intensive agriculture Farm concentration Area planted and harvested by crop Irrigated area by crop Irrigable area Use of fertilizers by crop Use of plant protection products by crop Number of harvests by crop Quantity harvested by crop Yield by crop
P3.2. Area utilized	Land use	Area of the holding by land use types Farm concentration Other area on the holding
P3.3. Crop production modes	Use of fertilizers and plant protection products, types of seeds, contracts	Types of seeds by crop Selling prices by crop and contracts
P3.4. Intentions for crop production	Foreseen land use, new crops	Area planned for planting for next year by crop Change reasons by crop

Sections (S) and parts (P) of AGRIS Core Module questionnaire	Main themes included	Main indicators that can be calculated
S4. Livestock production		
P4.1. Raising activities and production	Description of livestock and herd movements (births, purchases, sales, deaths, etc.) Production and destination of animal products (meat, eggs, milk, etc.)	Livestock (number of heads) by type of livestock Births, purchases, losses by type of livestock Slaughters/species/farm or slaughterhouse Sales, donations by type of livestock Production of meat, eggs and milk by type of livestock Production of other animal products
P4.2. Raising practices	Feeding practices and production contracts	Feeding practices by type of livestock
P4.3. Intentions for livestock production	Foreseen livestock, new species	Livestock forecast by type of livestock
S5. Economy		
P5.1. Other activities of the holding	Other gainful activities Income evolution Agricultural information channels used Expenditures and credits	Existence and importance of other gainful activities Aquaculture, fishery and forestry productions Income repartition and evolution Agricultural information
P5.2. Shocks	Shocks	Shocks/type/level/recovering
S6. Households of the holders and co-holders	This section is only to be completed by holdings whose holder is a civil (natural) person or group of civil (natural) persons (that is, holdings in the household sector).	
	Demographic characteristics of all household members – education, status, age, sex, etc	Sex/education/status by household member
S7. Labour used by the holding		
P7.1. Work on the holding by the holder and his/her household members	Part 7.1 is only to be completed by holdings whose holder is a civil (natural) person or group of civil (natural) persons (that is, holdings in the household sector). Agricultural activity of the household members, duration, type of works, etc.	Agricultural activity and other activity by household member
P7.2. Work on the holding by external workers	Long-term employees Temporary employees Casual workers Contractors' activities	External workers labour force/working time, by season Salaries Contractors' work by type of work
S8. Household dwelling and assets	This section is only to be completed by holdings whose holder is a civil (natural) person or group of civil (natural) persons (that is, holdings in the household sector).	
	Types of dwellings and facilities	Type of holder dwelling Presence of bank accounts Types of household facilities
S9. End of survey		
	Interview duration Response burden	Interview duration Response burden, questionnaire difficulties

Detailed descriptions of the main indicators, including the required variables and calculations, are available in annex 2 of this handbook.

4.1.3. Content, proposed definitions and classifications

This subchapter goes through the proposed questionnaire and discusses methodological considerations for particular questions. It provides recommended definitions and classifications. In addition to the questionnaire itself, the proposed list of crops grown is available as annex 1-2, the categories for livestock raised are detailed in annex 1-3, and the list of activities is included as annex 1-1c to this handbook.

4.1.3.1. Section 1: the holding

4.1.3.1.1. Section 1, part 1.1: Survey preparation

The available identifying information on the holding is shown to the respondent. In addition, this part covers the name, surname, identifier of the surveyor, and the time when the interview begins, as well as asking for the characteristics of the person answering the survey. These are the main data necessary to manage the survey implementation and progress.

To facilitate the interview, it is preferable that the statistical agency in charge send a letter to all sampled farms before data collection starts (if applicable). Other usual pre-survey operations to enhance survey response rate and promote quality, including field communication and field testing, should also be considered.

4.1.3.1.2. Section 1, part 1.2: Identification of the holding

Q10 refers to the general legal status of the holder.

The agricultural holder is defined as "the civil person, group of civil persons or juridical person who makes the major decisions regarding resource use and exercises management control over the agricultural holding operation. The agricultural holder has technical and economic responsibility for the holding and may undertake all responsibilities directly, or delegate responsibilities related to day to day work management to a hired manager" (FAO, 2015).

The following three options are proposed:

- **A civil (natural) person**. In this case, one woman or man is legally, socially and economically responsible for her or his independent activity of production, and can be clearly identified by her or his name, surname and date of birth. Most often, this person is also technically responsible, although in some cases, a manager may be in charge of the day-to-day decisions or more (what to sow, when to sell, etc.). However, agricultural holdings whose holder has this legal status may fall outside the household sector if they behave as corporations and sell the main part of their production (see annex 1-4).
- **Group of civil persons**. In this case, several civil persons (as defined above) have decided to pool means of production, totally or partially, to benefit each one of them. It generally concerns two or three persons; exceptionally, six or seven persons may be involved. These persons are collectively responsible for the holding. In some cases, these holdings are not within the household sector because the association between several holders (not living in the same household) must be registered under national legislation. As a direct consequence, in AGRIS, the household members working on the holding should be registered as external employees.
- **Legal person.** In this case, some natural and/or legal persons share the capital stock of a private company. This may also be a public company or a similar entity, such as a corporation, a cooperative, a governmental institution or a church. This form of organization falls outside of the household sector. The status involves formal registration according to the applicable national legislation.

Q11 refers to the legal status of the holding and must be adapted to a list of national existing legal statuses. The sector to which the holding belongs may be classified as "household sector" or "non-household sector". The household and non-household sectors can be defined using a combination of **Q10** and **Q11** categories, depending on the national context (see annex 1-4). A clear distinction between both sectors is crucial as many of the subsequent questions will be filtered through these two categories.

The following questions refer to identifying information on the holding, which must be provided before the interview. It is of utmost importance for updating the sampling frame.

Q17 and **Q18** refer to the location of the holding. The physical address is asked, together with the location type. The location (physical address) of the holding is required to assign it to an administrative unit, and thus enable geographical localization of the activities of the holding. Each holding should be linked to only one administrative unit. For this reason, there are rules to be applied when deciding on the location of the holding. As a general principle, the location is identified as the main building of the holding or the main parcel, if there is no building. The main building of the holding is used for:

- Keeping machinery and equipment linked to the holding's production, and
- Keeping livestock or growing crop in greenhouses.

For the holdings in the household sector, very often, the dwelling of the household is also used as the main building of the holding. If several buildings are used by the holding at different places, the location is linked to the dwelling (for the household sector) or the building that the manager uses more often (see section 3.2 for the definition of "manager"). If there is no building, and the holding consists of several parts (parcels), the location is where the main parcel is located.

It should be noted that for legal entities, this physical address may differ from the legal address (that is, where the entity is registered). When relevant, another question could be added to capture the legal address.

Q22 does not have to be asked, because it is an ID number internal to the national implementing agency.

Changes in the holding's structural characteristics must be recorded for frame and sampling purposes, as well as to address any purely analytical issues that may arise.

4.1.3.1.3. Section 1, part 1.3: Agricultural activity

In this part, generalities are asked about activity recording and logbook-keeping, land tenure and the holder's perception of the main activity of the holding from an economic perspective.

Q26 to **Q28** ask about the main activity of the holding (in the holder's perception), with the purpose of establishing a basic classification of the type of farming, based on the economic value of the activities. In this sense, it is essential that only one response option is chosen in each question.

Q27 further details the main cropping activity and the answers are based on the main crop activity groups. The activity groups can be customized; however, it is advised to keep the correspondence to the original group, for international comparisons.

Q28 refers to the main livestock-raising activity, distinguishing between raising ruminant livestock/grazing livestock (cattle, sheep, goats, etc.); raising non-ruminant livestock – mainly grain-eating (poultry, pigs, etc.), mixed livestock, production of eggs and production of milk.

4.1.3.2. Section 2: holders and managers

This section of the questionnaire provides information on the organizational structure and main characteristics of the management of the agricultural holding. It allows for the determination of the sector to which the agricultural holding belongs (household or non-household; see chapter 2).

The holder (see definition in section 3.1.2) has technical, juridical and economic responsibility for the holding. He or she may undertake all responsibilities directly, or delegate those related to day-to-day work management to a manager.

There are three types of holder: a civil (natural) person, a group of civil persons, and a legal person.

In the case of a group of civil persons, most frequently, all persons participate in the agricultural work. Grouping civil persons enables pooling, into one single holding, the means of production, land, livestock, machinery and labour force to obtain better results than would be possible with separate holdings.

In some cases, the holder delegates the technical day-to-day responsibility of the holding to a manager. **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 for running the holding.

In each case, one or more manager(s) may have the responsibility of the day-to-day decisions, such as the work to be done, the time to implement the works, and the crop species to sow. In many cases, when the holder is a civil person or a group of civil persons, the holder is also the manager of the holding.

Following the answer to **Q10** in section 1, part 1.2, the characteristics of holder(s) and manager(s) will be registered differently. It should be noted that when the holder is a legal person, there is always a hired manager, who is different from the holder.

Case 1: the holder is a civil person

The main characteristics of the holder and the manager(s) is collected. The questions on indigenous groups (**Q01**g, **Q02**h) can be deleted if they are not of interest, or contrary to country practices or legislation. If the questions are asked, relevant mutually exclusive response options should be proposed.

Case 2: the holder is a group of civil persons

The main characteristics of all holders and the manager(s) is collected. The questions on indigenous groups (**Q01**g, **Q02**h) can be deleted if they are not of interest, or contrary to country practices or legislation. If the questions are asked, relevant mutually exclusive response options should be proposed.

Case 3: the holder is a legal person

The number of civil persons and legal persons participating in the capital of the holding is collected.

It should be noted that in this case, there is necessarily at least one hired manager. All characteristics of the manager(s) will be recorded. The question on indigenous groups (**Q09**h) can be deleted if they are not of interest, or contrary to country practices or legislation. If the question is asked, relevant mutually exclusive response options should be proposed.

4.1.3.3 Section 3: Crop production during the reference period

This section provides information on the area utilized, crop productions and harvested quantities during the reference period. It also provides crop intentions for the period following the survey reference period (for example, the following 12 months). The structure of this section is based on the order of importance of the information collected, starting with that on crop production – production being the main focus of the Core Module. Another structure is also possible, starting with the breakdown of the physical area of the holding according to land use classes (part 3.2) and then moving on to crop production. This approach requires farmers to have sound knowledge of areas of the holding – which is not always the case, as discussed in other sections of this handbook. When there is very good knowledge of the area and other sources of information are available, part 3.2 (on area utilized) can be moved to the Rotating Module on Production Methods and the Environment, with a lower data collection frequency.

The Generic Questionnaire proposes filter questions to avoid unnecessary overburden of respondents (**Q00**). During data processing, a specific value must be assigned to the skipped variables to avoid any analytical error. This is valid for all such skip questions throughout the questionnaires.

Section 3, part 3.1: Crop production and destination

This part provides information on crop productions from all harvests during the reference period (the last agricultural year). The main indicators include the total available production and yield, for each crop. Available production is the sum of stock at the beginning of the reference period and the total harvested during all harvests.

In **Q02**, all agricultural parcels must be included, regardless of their land tenure status. Parcels used for livestock are exclusively those used for pastures or crops for animals feeding. Parcels or courtyards used only for keeping livestock are excluded.

A **parcel** is defined as "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" (FAO, 2015; para 6.15).

In **Q03** and **Q04**, all cultivated crops have to be registered following the classification proposed in annex 1-2.

The following questions collect information on the production at crop level, by harvest.

In **Q04f**, "no harvest" would typically be ticked for permanent pastures or unproductive permanent crops.

Q05 covers continuous harvests: a crop is considered a continuous harvested crop when the harvest is carried out throughout the year, when needed, and not in a single period of harvest (as occurs, for example, for cassava). Taking into account this particularity, and based on recent experimental research, the reference period for the product of continuous harvest crops is six months. This would avoid some problems associated with the recall. Implementing national agencies should establish a list of continuous crops cultivated in the country before the surveys starts, to avoid any errors during data collection.

The answer will be "Yes" for irrigation if the crop has been irrigated at least once during the period of cultivation.

Q06 to **Q10** covers harvests analysis, which starts from the most recent one.

If there is more than one crop on a plot, the area for each crop will be estimated proportionally to the occupied area:

- On a plot of total area 1.2 ha, there are 3 crops: A, B and C.
- Crop A occupies approximately half of the plot, B and C about half of the rest of the area.
- **The areas registered will be: A = 0.6 ha, B = 0.3 ha, C = 0.3 ha.**

Q06 to **Q10** are on successive punctual harvests (continuous ones are therefore excluded): each harvest is studied individually. Harvest 1 is the most recent harvest, Harvest 2 the previous one, Harvest 3 the one before Harvest 2, and Harvest 4 the oldest one. The number of harvests analysed for each crop is filtered by the answer to Q04f. The answer will be "Yes" for irrigation if the crop has been irrigated at least once during the period of cultivation.

The area harvested can be smaller than the area planted; for example, a part of a plot may have been destroyed by a parasite.

The question on the level of yield compared to the previous harvest (**Q06g**) becomes interesting after some survey iterations have been carried out, and also enables comparisons with other sources of yield estimations. It will be possible to carry out these estimations if farmers tend to under- or overestimate yields. Evidence also shows that questions in which respondents' opinions are valued tend to enhance overall response quality.

Q10, on the destination of crop production: with CAPI, the list of crops will be initialized from the previous question.

The sum of the four quantities on each row (own consumption, selling, pay for wages and given for services) should be equal to the maximum quantity harvested. All crops must be filled in. However, when stocks exist at the beginning of the reference year, there may be a difference between the sum of quantities by destination and the maximum quantity harvested.

If a part of production is sold, the unit price that should be registered is proposed as being that one of the most recent sell. However, when possible, the average price at country or regional level can be asked.

Section 3, part 3.2: Area utilized

The area utilized by the holding (for agricultural and non-agricultural purposes) is a key indicator in agricultural statistics. The information collected here refers to the physical area of the holding.

The main problem in this context could be farmers' lack of knowledge of the exact areas, by type of land use. This issue has been reported widely in the literature, and is well known to survey practitioners in developing countries in particular. In countries where this is a particular problem, actual area measurements of plots and parcels using GPS receivers could be obtained on a subsample basis. This is neither foreseen nor promoted in this version of the questionnaire; however, a simple customization could accommodate this feature.

The approach adopted in the AGRIS Core Module is to ask for the areas by crop or type of land use. Actually, the entire logic of the questionnaire is articulated around a crop/product roster, and not a parcel/plot roster. Another possible approach that implementing agencies could consider is to ask areas and crops by parcel/plot. This could be more relevant for agencies that wish to implement actual area measurements in addition to farmers' declarations.

In **Q11**, crops and grassland are classified using two criteria: under cover or not, and permanent or not. Annex 1-2 provides the relevant clarifications on crops grown, based on ICC rev. 1.1.

The total areas calculated will require either one single unit to be used or all conversion factors to one single standard unit to be filled.

Areas under forestry or aquaculture do not fall under the AAU and therefore should not be recorded under Q11. Q13 records the absence or presence of land dedicated to these activities. Q13d can be divided in more detailed types of other land when relevant (for example, unutilized agricultural area and area of buildings).

The basis for classifying area by land use type is the System of Environmental-Economic Accounting (SEEA) Land Use Classification.

The United Nations Statistical Commission (UNSC) has adopted the SEEA 2012 Central Framework as an international statistical standard and the classification of land use is part of this Framework standard. The AGRIS land use classes are harmonized with the SEEA Land Use Classification. However, this classification is adapted to better reflect the purpose of AGRIS, notably by creating a separate categories, better reflecting specific agricultural uses, for example kitchen gardens.

The main land use categories to be used in the Core Module are as follows:

- **Area under temporary crops** includes all areas of the holding used for crops with a growing cycle that lasts lesser than one year. Following national classification practices, this may include some crops that remain in the fields after harvest for more than one year, such as strawberries, pineapples, bananas and cassava. It excludes temporary grassland. The area refers to the physical area of land, regardless of the number of harvests on the same land during one agricultural year. This category is broken down in the questionnaire into 2 subcategories:
    - temporary crops under greenhouses or high shelters (permanent installations that can be entered); and
    - temporary crops outdoors or under low shelters (non-permanent installations covering only the crop).
- **The temporary fallow area** refers to arable land in rest before re-cultivation. The rest may be due to crop rotation or other reasons, such as the fact that crops cannot be planted because of flood damage, lack of water, unavailability of inputs, or other reasons (WCA 2020, chapter 8). Usually, the temporary fallow land is left to recover for one year, and in some cases for about two years. Fallow land is not to be confused with permanent grassland or unutilized agricultural area (where the period of non-utilization is usually longer than three years.)
- **Area under permanent crops** (crops with a growing cycle longer than one year) includes land under trees and shrubs producing flowers (rose, jasmine, etc.), and nurseries of fruit trees. It excludes nurseries for forest trees and permanent grassland. The area refers to the physical area of land, regardless of the number of harvests on the same land during one agricultural year. In the questionnaire, this category is broken down into two subcategories:
    - permanent crops under greenhouses or high shelters (permanent installations that can be entered); and
    - permanent crops outdoors or under low shelters (non-permanent installations covering only the crop).
- **Grassland, meadows and pastures** are divided into two categories:
    - Permanent grassland refers to areas where the meadow goes without sowing for five years or more. In some countries, this type of pastures usually fall outside the area of the holding (for example, common pastures), and are used only by the holding. However, when the holding has an agreement for the exclusive use of a given area of permanent pasture, this area should be included in the holding's agricultural area utilized.
    - Temporary grassland refers to pasture that is sown every one, two, three or four years.
- **Kitchen gardens** are separated as a particular form of land use to simplify answers. This category refers to the area devoted to the cultivation of agricultural products intended exclusively for own consumption by the holder or manager and his family. Crops in kitchen gardens will not be detailed on a crop-by-crop basis.

It should be noted that the area with associated crops is recorded only once, in **only one land use category**, usually on the basis of the most important crop. For example, in case of association between a permanent crop and a temporary crop, the area is recorded under the permanent crop category. However, this can be adapted to national practices.

The question on organic farming **Q11(l)** refers to the certified organic farming practices. The definition must be established at country level, following local regulations and practices. The definition recommended by FAO defines organic agriculture as "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, 2015, para 8.6.13).

In this sense, certified organic farming practices means that the farm is producing agricultural products which have been produced, stored, processed, handled and marketed in accordance with specific technical specifications (standards) and have been certified as "organic" by a certification body. Some bodies allow certification of a part of a farm as long as organic and non-organic products are not mixed, while others require whole-farm certification. Certification can be given through a third-party accredited certification body or authority, or through Participatory Guarantee Systems (PGSs). 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 certification by a certification body enables producers to export products labelled as organic to that market (being certified does not allow access to all markets). A PGS is based on the active participation of stakeholders and only recognized within a single country. It thus provides certification of organic production only for local markets, and not for export (FAO, 2015, para. 8.6.16).

De facto organic farming is not expressly asked for through questions, but can be calculated with reference to different questions (such as the use of PPPs, fertilizers, etc.).

In addition to the AAU, information is collected on the land on the holding used for other purposes, with the following categories (FAO, 2015, para.s 8.2.27–8.234):

- **Farm buildings and farmyards** – surfaces occupied by operating farm buildings (hangars, barns, cellars, silos), buildings for animal production (stables, cow sheds, sheep pens, poultry yards), etc. The area under the holder's house (including the yard around it) is also classified here, if it constitutes part of the agricultural holding.
- **Forest and other wooded land** – Forest land is land spanning more than 0.5 ha with trees higher than 5 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 for example 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. Forest tree nurseries that form an integral part of the forest should be included. The category of other wooded land is land spanning more than 0.5 ha with: (i) trees higher than 5 m and a canopy cover of 5–10 percent, or trees able to reach these thresholds *in situ*; or (ii) trees not able to reach a height of 5 m *in situ* but with a canopy cover of more than 10 percent (e.g. some alpine tree vegetation types and arid zone mangroves); or (iii) a combined cover of shrubs, bushes and trees exceeding 10 percent.
- **Area used for aquaculture** includes area (land, inland waters or coastal waters) for aquaculture facilities, including supporting facilities. It should be noted that where the same land is used for aquaculture in one season and for growing crops (rice) in another season, it should be recorded only once, in only one land use category. 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.
- **Other land** 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 unutilized agricultural 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 are: land occupied by non-farm buildings; parks and ornamental gardens; roads or lanes (except forest roads, which are categorized as forest); 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, rocks, etc.). The category of other land can be further broken down, for example to collect unutilized agricultural area as a separate subcategory.

Section 3, part 3.3: Crop production modes

This part provides information on the main characteristics of the cultivation modes, varieties, seeds, production and marketing contracts relevant to temporary crops.

Q14, seeds: the list of crops will be initialized in CAPI from **Q07**.

The sum of the two percentages (certified and uncertified seeds) should be 100 percent.

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”.

Certified seeds of modern varieties are those that can be certified as meeting certain national standards as regards their physical and genetic purity. Their quality and established identity are **verified** by an official agency after inspection. A document of certification is issued as a result of this verification. Seed certification systems vary between countries. The national situation is to be studied and explained to the surveyors.

Modern uncertified varieties are seeds of good quality but that have not been certified according to national standards. They are often provided through the informal sector. It should be noted that farmer multiplication of certified seeds without verification by the official agency is to be considered as yielding uncertified seeds.

GM seed refers to seeds that are proprietary, have been developed by the private sector, and possess a novel combination of genetic material obtained through the use of modern biotechnology (FAO, 2015, para. 8.6.4)

The question on GM seeds can be cancelled if there are no such seeds in the country.

The question on GM seeds can be cancelled if there are no such seeds in the country.

Q15, contracts: a list of the types of production and marketing contract varieties in use in the country must be established during survey preparation and is to be used during the interview.

The question on crops under contracts is cancelled if the answer to the previous question is “No”.

A production contract is considered exclusive when the producer cannot produce the same product outside of the contract, including for self-consumption.

A marketing contract is considered exclusive when the producer cannot sell the same product to a person other than the contractor.

Section 3, part 3.4: Intentions for crop production for the 12 months after the reporting period

This part provides information on the intentions for crop production, which is very useful information for market efficiency purposes.

Q16: for crops cultivated during the reference period (the list is initiated in CAPI from previous questions), intentions are asked in terms of increase, decrease or ceasing of production. In CAPI, the question about the reason for change appears only if the intended area is increasing or decreasing or if the crop is abandoned. Reasons for change in cultivated crops or for the introduction of new crops may be agronomic (crop rotations, pests and diseases, etc.), technical (problems with equipment or labour force, etc.), economic (level of prices, etc.). The same applies for **Q17** regarding the intentions for introducing new crops.

4.1.3.4. Section 4: livestock production

This section provides information on livestock inventory on the reference date, and on livestock changes and herd composition during the reference period. It provides information on livestock production on the holding.

All animals raised on the holding are concerned regardless of ownership, including those that are boarded (animals in pension), owned by another member of the household, custom-fed or fed under contract. Implementing agencies are to adjust the types of livestock to be considered to country specificities. The livestock categories are based on CPC rev. 2.1, with some adaptations having been made for AGRIS (see section 1.2 and annex 1-3)

Section 4, part 4.1: Raising activities and production

For asking the number of animals on the holding, it is preferable that a given fixed day for all farms is used as the sole reference day. If implementing agencies consider this to be unfeasible, mostly because of recall reasons, then the day of the interview can be used as the reference day.

The types of livestock to be considered should be adjusted to country/region specificities. Similarly, more details could also be required, for instance on varieties.

It should be noted that to facilitate answering, the reference period proposed in the questionnaire is not the same for all animals. In addition to the 12-month recall period proposed for cattle, a six-month recall period is proposed for sheep, pigs and goats, while a three-month recall period is proposed for rabbits and poultry. If, in a country, it is possible to obtain quality information for the entire same period of 12 months for all types of livestock, then this is of course to be preferred. This would be the case where holdings have a systematic recording of livestock changes. When the reference period is of six or three months, questions are included to assess the level of production on those periods as compared to the rest of the 12 months (for example, the full reference period of the Core Module). Countries may test this approach during their pilot surveys, and consider an alternative approach with season-based questions.

Q01, registration: relevant to evaluate the quality of the interview data.

Parts 4.1.1 to 4.1.12 collect information on the number of livestock on the reference day, the movements that have taken place during the reference period, and the production of livestock products (meat, milk, eggs, etc.), by type of livestock.

For each type of livestock, the answer to a filter question activates in CAPI the corresponding questions on this type of livestock.

Another approach to organizing the questionnaire is to start with number of livestock and movements by type of livestock during the reference period (the same for all types of livestock), and continuing with production of meat by type of livestock, production of milk by type of livestock and production of eggs and other animal products. This approach is more suitable when holdings systematically record livestock events and production of animal products.

Questions on the number of births refer only to categories of young animals (less than one year old). For example, Q10a only refers to cattle less than one year old that have been declared in **Q08a=3**.

For rabbits, Q81a only refers to other rabbits declared in **Q79a=2**.

Countries could consider a season-based approach could be considered for those animal productions that are particularly subject to seasonality (such as cashmere wool).

Moreover, it is often interesting to localize animal productions. To obtain figures that are as precise as possible it is recommended to insert the geographical level of interest among the stratification criteria, or, better, the level immediately below that.

The main derived indicators include:

- Fertility rate, number of living births divided by the number of females of childbearing age
- Losses rate: the number of deaths of animals resulting from natural or accidental causes divided by the number of animals of the same category
- Number of herbivores/ha: the number of herbivorous animals divided by the area of fodder crops (per ha) on the farm. The use of a single standard animal unit is required for this indicator (for example, equivalent dairy cow), such that it is necessary to convert all actual herbivorous animals into this unit. This conversion can be done with rates provided by research institutes or a specialized organisation.

Meat production

At the holding level, meat production can be estimated from the total carcass weight of the animals slaughtered on the farm plus the animals slaughtered in a slaughterhouse on behalf of the holding.

If the reference period used in the questionnaire is less than one year, as occurs for poultry for example, it is still necessary to be able to estimate yearly production by adding an estimation of the production for the rest of the reference year (two months).

In some countries, on-farm slaughtering practices can be of great importance. The rate of on-farm slaughtering (calculated at national or regional level) by type of livestock is calculated as the carcass weight from on-farm slaughtering (by type of livestock) divided by the total carcass weight produced in the country or region (by type of livestock); or as the number of animals slaughtered on the farm divided by the total number of slaughtered animals (by type of livestock). On-farm slaughtering reflects the holding's activity. The total slaughtering, and therefore the total meat production, in the country or region is obtained by adding the total quantities of meat produced in slaughterhouses on behalf of operators other than farmers. This latter data can be derived from administrative data or direct interrogation of slaughterhouses as to their overall activity (number of animals slaughtered and carcass weight produced), which is very often beyond the scope of agricultural surveys and belongs to industry-sector surveys.

The destination of produced meat can be asked by livestock type, species, or even by breed, when relevant. The quantity of meat (and other animal products) given to landlords as a form of payment for inputs or services should be recorded together with the other quantities given to other service or input providers.

If a part of meat is sold, the unit price of the last sale is asked. When possible, the average price can be asked, to enable a better analysis.

Milk production

The survey enables the estimation of milk production and the localization of such production. The amount of produced milk at farm level can be estimated by multiplying the declared quantity by the number of answering periods in the lactation period. For example, if the declared quantity corresponds to the weekly production, this quantity will be multiplied by the number of lactation weeks.

First, the lactation periods must be defined. Then the farmers are asked for the reporting period for which they prefer to answer milk production questions. This is done to facilitate answering, particularly when there are no systematic recordings of milk production on the holding.

In the questions about suckling directly from another animal, it is possible to split the “with the mother or with a suckle cow” modality into two distinct modalities. This question is asked to assess livestock practices. Reflecting it in the calculation of milk production would be difficult, as it would require additional parameters and modelling.

When some of the milk is sold, the unit price of the last sale is asked. When possible, the average price can be asked, to enable a better analysis.

The resulting estimates calculated must be compared with the amount of collected milk provided by administrative data or by a direct survey on the milk industry.

Egg production

The survey allows for the estimation of egg production and the localization of this production. The amount of eggs produced at farm level can be estimated by multiplying the declared quantity by the number of answering periods in the production period. For example, if the declared quantity corresponds to weekly production, this quantity will be multiplied by the number of production weeks. If the reference period used in the questionnaire for poultry is less than one year, it is necessary to obtain the yearly production.

First, the laying periods must be defined. Then, the farmers are asked for the reporting period for which they prefer to answer egg production questions. This is done to facilitate answering, in particular when there are no systematic recordings of egg production on the holding.

When some of the egg production is sold, the unit price of the last sale is asked. When possible, the average price can be asked, to enable a better analysis.

Insects

Actual numbers are replaced by weights or volumes. For honeybees, the numbers refer to the number of beehives.

This part can be developed further if insect farming is important for the country. A useful reference document is Six-legged livestock: edible insect farming, collection and marketing in Thailand (FAO, 2013, http://www.fao.org/docrep/017/i3246e/i3246e.pdf).

BOX 2. REPORTING QUANTITIES OF ANIMAL PRODUCTS.

Milk

There are several standard units used for reporting unpackaged raw fresh milk produced and sold. There may also be local measurements of milk volume in adopting countries that are useful for collecting data from respondents. Where these are used, a conversion factor to a standard unit should be identified and provided.

1 imperial gallon = 1.20 US gallons = 4.55 litres = 0.05 hectolitres

1 US gallon = 0.83 imperial gallon = 3.79 litres = 0.04 hectolitres

1 litre = 0.22 imperial gallon = 0.26 US gallon = 0.01 hectolitre

1 hectolitre = 22.00 imperial gallons = 26.42 US gallons = 100.00 litres

1 other unit = X imperial gallons = X US gallons = X litres = X hectolitres

Wool

Bales, pounds and kilograms are the standard units used in the questionnaire for reporting raw unprocessed wool. The size and weight of bales of wool can vary greatly, usually between 110 kg (243 pounds) and 204 kg (450 pounds)[5]; therefore, a conversion to pounds or kilograms for the bales being reported should be provided. There may also be local measurements for the production and sale of raw unprocessed wool. Where these are used, a conversion factor to a standard unit should be identified and provided.

1 pound = 0.45 kilograms

1 kilogram = 2.205 pounds

1 bale = X pounds = X kilograms

1 other unit = X pounds = X kilograms

Section 4, part 4.2: Raising practices

In CAPI, relevant livestock species are initialized or activated from the previous questions. The objective is to select the main feeding practice followed during the reference period (only one item of the following can be selected):

- Only grazing concerns ruminants for which more than 90 percent of the dry matter fed comes from grazed grasses or other herbaceous plants. Such grazing can be sedentary, nomadic or semi-nomadic.
- Mainly grazing, with some feeding concerns ruminants for which 50 to 90 percent of the dry matter fed comes from grazed grasses or other herbaceous plants.
- Mainly feeding, with some grazing concerns ruminants for which only 10 to 50 percent of dry matter fed comes from grazed grasses or other herbaceous plants.
- Only feeding concerns ruminants for which less than 10 percent of dry matter fed comes from grazed grasses or other herbaceous plants. Feeding is provided by crops cultivated on the holding or produced off the farm.

Contracts

The different types of production and marketing contracts in use in the country must be considered for questionnaire country customization. If at least one contract exists (Q101), this will activate each present livestock type in CAPI. A production contract is considered exclusive when the producer cannot raise the same animal outside of the contract, for example for himself.

A marketing contract is considered exclusive when the producer cannot sell the same animal to a person other than the contractor.

Section 4, part 4.3: Intentions for livestock production for the 12 months after the reporting period

In CAPI, the livestock types currently raised on the holding are initialized from the previous questions. Intentions for each one could be to:

- Stabilize the number of heads;
- Increase the number of heads;
- Decrease the number of heads; or
- Stop production.

New livestock types or species can be added if a new livestock type or specie will be introduced on the holding. Reasons for changes in the types of livestock raised can be technical (new investments in buildings, constraints on machinery, labour force, skills, etc.) or economic (level of prices, contract terms, etc.).

4 For a definition of wool bale, see Wikipedia, https://en.m.wikipedia.org/wiki/Wool_bale.

4.1.3.5. Section 5: economy

This section of the questionnaire provides information on the economic environment of the holding.

Section 5, part 5.1: Other activities of the holding

Other activities of the holding

A comprehensive list and classification of relevant activities is proposed in annex 1-1c.

The objective is to understand whether the holding, during the reference period, has carried out activities other than the production of agricultural products. These other activities could use means of production and/or agricultural products of the holding, labour force, machinery, crop or animal products, buildings, etc. These other activities may be more important (in terms of income) than its agricultural activities.

The question is limited to the holding's activities and excludes the activities of household members and/or external workers carried out outside of the holding. The activities concerned could be diversification activities using part of the holding's means, labour force, land, livestock, production or buildings, and be directly carried out by the holding. Activities carried out by another economic entity are not concerned, even if there are links between this entity and the holding.

All activities undertaken must be checked.

For each activity undertaken, it is asked whether it is a significant or a marginal one in terms of turnover or income, and what is its recent evolution, according to the farmer's appreciation.

Aquaculture

If the holding is engaged in aquaculture production (Q04) , then the list of species raised will be recorded. It is better to prepare and use a national list of relevant species. If a part of the aquaculture production is sold, it is proposed to register, as the unit price, the last price obtained. When possible, the average price can be asked to enable a better analysis.

Fishery

If the holding is engaged in fishery production (Q07) , then the list of species concerned will be recorded. It is better to prepare and use a national list of relevant species. If a part of the fishery production is sold, it is proposed to register, as the unit price, the last price that was obtained. When possible, the average price can be asked, to enable a better analysis.

Agricultural activity and income

For household-sector holdings only, the respondent must estimate the share of crop and livestock production in the total income or turnover of the household. This total consists of the income from agricultural activities, and income linked to other gainful activities of the holding and activities of household members outside the holding framework.

Agricultural income level

The objective is to record if, in the respondent's knowledge and opinion, the current total agricultural income or turnover of the holding is higher, lower or similar than that obtained in the previous period.

Bank account

The objective is to know if the holding has a bank account (and not the holder or someone else personally).

Section 5, part 5.2: Shocks

Implementing agencies are to adjust the list of shocks to country specificities. If any particular shocks have occurred during the reference period, it can be interesting to assess their consequences, as listed in **Q22**.The interviewers are to read out the full list of shocks and possible consequences.

4.1.3.6. Section 6: households of the holders and co-holders

This part of the questionnaire is relevant only to holdings where the holder is a civil (natural) person or a group of civil (natural) persons, or is considered a holding from the household sector using combined criteria (see annex 1-4). It collects the main sociodemographic information about the members of the household(s). Information is asked on all members of the household(s) (see the definition of “household” in section 1.4), even if they do not participate in the holding’s activities.

Household members are identified by two variables:

- Household number: this is equal to "1" when the holder is a civil person; when the holder is a group of civil persons (co-holders from different households), the household of each co-holder is numbered starting from 1 and ending with N (that is, the number of co-holders from different households). This rule must be adapted in each country in accordance with the applicable legislation. If two members of the same household can legally be co-holders, it is possible to have only one household for a group of civil (natural) persons.
- Number of each household member: "01" is the household head, or the person considered the household head. The household head may also be the holder or one of the co-holders. However, this is not a rule: the holder or co-holder can also be another person within the household.

Full name (name and surname): this is a record of the name and surname of each household member. It is preferable to register names and surnames because the household members IDs will be used in other questions and it is necessary to be able to find them easily. The respondents must be informed that these names will be deleted in the final data, and that only the anonymous IDs will be saved.

Q04d, asking "What is the household number of the person who answers for the current person?" is relevant only in cases where there is a group of civil (natural) persons from different households.

4.1.3.7. Section 7: labour used by the holding

All of the labour force used during the reference period is to be recorded.

Section 7, part 7.1: Holders, co-holders and members of their households

This part concerns "family work". It is filtered by the legal status of the holder, and is only activated when the holder is a civil (natural) person, a group of civil (natural) persons, or the holding has been determined to fall within the household sector (see annex 1-4). As a rule, and in compliance with SNA 2008, there cannot be family labour in holdings where the holder is a legal person. The labour input is then recorded under the respective categories of employees (external workers). The same rule is applied when the holder is a group of civil (natural) persons and this holding is considered in the non-household sector, following the national legislation and practices (see section 3.1.2).

Information on participation in the holding’s work will be recorded for each household member over 15 years of age and who works on the holding, from the previous section.

Section 7, part 7.2: Work on the holding by external workers

This part of the questionnaire concerns all holdings. First, the different types of workers used during the reference period and directly employed by the holding are recorded:

- External manager
- External paid long-term employees, such as permanent workers at least for more than a season
- External paid temporary employees, such as workers hired for one season or less but not on a daily basis
- External paid casual workers (hired on a daily or weekly basis)
- Unpaid external workers (mutual helpers, unpaid trainees, volunteers, unpaid relatives living into another household, etc.)

For each type of worker employed, the total amount and kind of work will be recorded.

Taking into consideration individual national practices, however, national AGRIS implementing agencies may consider that some of the questions for the category of External paid casual workers – for example, Q6b and Q6c subquestions on full- and part-time work – are not relevant and may be omitted.

Work carried out by contractors

This records whether the holding has hired any contractors to carry out agricultural work during the reference period, even for work of low importance or limited duration.

The activities carried out by the contractors during the reference period are recorded (using the list proposed in annex 1-1c). For greater country relevance, the list could be adjusted by implementing agencies. To avoid any omissions, it must be shown to the respondent.

4.1.3.8. Section 8: household dwelling and assets

This part of the questionnaire is relevant only to holdings where the holder is a civil (natural) person, or to each household in case of a group of civil (natural) persons. The objective is to record the main characteristics of each household dwelling and assets. This could be particularly useful to enable survey-to-survey imputation between AGRIS data sets and other household surveys, typically Household Income and Expenditure Surveys.

4.1.3.9. Section 9: end of survey

The interview end time is to be recorded, to calculate its duration (this happens automatically with CAPI metadata).

The respondent's judgment of questionnaire difficulty and duration will close the interview.

AGRIS ECONOMY MODULE

Global Strategy to improve Agricultural and Rural Statistics

AGRIS QUESTIONNAIRE
ECONOMY MODULE

Version 1.1, September 2017

SECTION 1: MAIN CHARACTERISTICS OF THE AGRICULTURAL HOLDING

TEXT TO READ:
This survey collects information about the economic life of agricultural holdings in the whole country, whatever the holdings' sizes. Different types of information, including the holding revenues, expenses and prices, will be collected. The reference period for the survey is the last complete agricultural year. If the survey is conducted near the end of the current agricultural year, this will be the reference period.

PART 1.1 : IDENTIFICATION OF THE AGRICULTURAL HOLDING

A proper identification of the holding surveyed, and of the survey respondent, is required before implementing this questionnaire. The questions proposed in Parts 1.1 & 1.2 of Section 1 of the AGRIS Core Module fit this purpose. These questions are not repeated here because it is recommended to implement this Rotating Module together with the Core Module. However, if this Rotating Module is adopted by a country to complement an existing farm-level production survey, then the inclusion of the identification questions is critical – as well as overall consistency with that production survey. Questions Q04 to Q09b in Section 1 of the AGRIS Core Module are not absolutely required, although they will help in identifying the holding and updating the sampling frames.

PART 1.2 : LAND

Answer the following questions about AGRICULTURAL AREA UTILIZED (AAU) by this agricultural holding.
* Report all information as of today.
* Round to the nearest whole number.

Q01. **UNIT OF MEASURE** used to report land areas
- ◯ Acres
- ◯ Hectares
- ◯ Other (specify [ ]) → If "other" is reported, provide the conversion factor.
  1 of this unit of measure = [ ][ ].[ ][ ] acres OR [ ][ ].[ ][ ] hectares

Q01a Do you confirm the unit of measure?

- ◯ No → **Go to Q01**
- ◯ Yes

	Area
Q02. ***AAU*** *of the agricultural holding*	[ ][ ][ ][ ][ ].[ ][ ]

Q03. Of the total AAU of the agricultural holding, how much is:

	Area
Q03a. **Owned with** written documentation (such as title deeds, wills, purchase agreements)	[ ][ ][ ][ ][ ].[ ][ ]
Q03b. **Owned without** written documentation	[ ][ ][ ][ ][ ].[ ][ ]
Q03c. **Rented**-in, leased or sharecropped **with** written agreement	[ ][ ][ ][ ][ ].[ ][ ]
Q03d. **Rented**-in, leased or sharecropped **without** written agreement	[ ][ ][ ][ ][ ].[ ][ ]
Q03e. State or communal land used **with** written agreement (certified use rights)	[ ][ ][ ][ ][ ].[ ][ ]
Q03f. State or communal land used **without** written agreement (uncertified use rights)	[ ][ ][ ][ ][ ].[ ][ ]
Q03g. Occupied/squatted without any permission	[ ][ ][ ][ ][ ].[ ][ ]
Control Total land (total of options a to g)	[ ][ ][ ][ ][ ].[ ][ ]

PART 1.3: LIVESTOCK

For each LIVESTOCK type/category/species raised by this agricultural holding, answer the following questions:
* **Report all information as of today.**
* **Include all animals on this agricultural holding, regardless of ownership,** including those that are boarded, custom-fed, **or fed under contract.**
* **Include all animals that are kept by this operation, regardless of ownership, that are pastured on a community pasture, grazing co-op or public land.**
* **Do not include** animals owned by this agricultural holding but kept on another farm, ranch or feedlot operated by someone else.

Q04. Is there any **LIVESTOCK** on this agricultural holding?
- ◯ 0 No → **Go to Section2 Q01**
- ◯ 1 Yes → * Report all information as of today.
  * Include all animals on this agricultural holding, **regardless of ownership,** including those that are boarded, custom-fed, or fed under contract.
  * Include all animals that are kept by this operation, regardless of ownership, **that are pastured on a community pasture,** grazing co-op or public land.
  * **Do not include** animals owned by this agricultural holding but kept on another farm, ranch or feedlot operated by someone else.

Q05. Are there any **HORSES** on this agricultural holding?
- ◯ 0 No → **Go to Q06**
- ◯ 1 Yes

	Number of animals
Q05a Number as of today	
Q05b Of the above number, how many are:	Number of animals
1 Owned	
2 Not owned - raised under contract	
3 Not owned - raised under other arrangements (specify)	
Total (total of options 1 to 3)	

Q06. Are there any **MULES or HINNIES** on this agricultural holding?
- ◯ 0 No → **Go to Q07**
- ◯ 1 Yes

	Number of animals
Q06a Number as of today	
Q06b Of the above number, how many are:	Number of animals
1 Owned	
2 Not owned - raised under contract	
3 Not owned - raised under other arrangements (specify)	
Total (total of options 1 to 3)	

Q07. Are there any **ASSES** on this agricultural holding?
- ◯ 0 No → **Go to Q08**
- ◯ 1 Yes

	Number of animals
Q07a Number as of today	
Q07b Of the above number, how many are:	Number of animals
1 Owned	
2 Not owned - raised under contract	
3 Not owned - raised under other arrangements (specify)	
Total (total of options 1 to 3)	

Q08. Are there other EQUINES on this agricultural holding?
- ◯ 0 No → **Go to Q09**
- ◯ 1 Yes

	Number of animals
Q08a Number as of today	
Q08b Of the above number, how many are:	Number of animals
1 Owned	
2 Not owned - raised under contract	
3 Not owned - raised under other arrangements (specify)	
Total (total of options 1 to 3)	

Q09. Are there any **CATTLE** (for dairy or meat purposes) on this agricultural holding?
- ◯ 0 No → **Go to Q10**
- ◯ 1 Yes

	Number of animals
Q09a Number as of today	
Q09b Of the above number, how many are:	Number of animals
1 Owned	
2 Not owned - raised under contract	
3 Not owned - raised under other arrangements (specify)	
Total (total of options 1 to 3)	

Q10. Are there any **BUFFALOES** on this agricultural holding?
- ◯ 0 No → **Go to Q11**
- ◯ 1 Yes

	Number of animals
Q10a Number as of today	
Q10b Of the above number, how many are:	Number of animals
1 Owned	
2 Not owned - raised under contract	
3 Not owned - raised under other arrangements (specify)	
Total (total of options 1 to 3)	

Q11. Are there any **CAMELS** on this agricultural holding?
- ◯ 0 No → Go to Q12
- ◯ 1 Yes

Q11a Number as of today . . . . . Number of animals

Q11b Of the above number, how many are: Number of animals
- 1 Owned . . . . . .
- 2 Not owned - raised under contract . . . . . .
- 3 Not owned - raised under other arrangements (specify ( ) . . . . . .
- **Total (total of options 1 to 3)** . . . . . .

Q12. Are there any **LLAMAS or VICUGNAS** on this agricultural holding?
- ◯ 0 No → Go to Q13
- ◯ 1 Yes

Q12a Number as of today . . . . . Number of animals

Q12b Of the above number, how many are: Number of animals
- 1 Owned . . . . . .
- 2 Not owned - raised under contract . . . . . .
- 3 Not owned - raised under other arrangements (specify ( ) . . . . . .
- **Total (total of options 1 to 3)** . . . . . .

Q13. Are there other **CAMELIDS** on this agricultural holding? (Please specify.....)
- ◯ 0 No → Go to Q14
- ◯ 1 Yes

Q13a Number as of today . . . . . Number of animals

Q13b Of the above number, how many are: Number of animals
- 1 Owned . . . . . .
- 2 Not owned - raised under contract . . . . . .
- 3 Not owned - raised under other arrangements (specify ( ) . . . . . .
- **Total (total of options 1 to 3)** . . . . . .

Q14. Are there any **SHEEP** on this agricultural holding?
- ◯ 0 No → Go to Q15
- ◯ 1 Yes

Q14a Number as of today . . . . . Number of animals

Q14b Of the above number, how many are: Number of animals
- 1 Owned . . . . . .
- 2 Not owned - raised under contract . . . . . .
- 3 Not owned - raised under other arrangements (specify ( ) . . . . . .
- **Total (total of options 1 to 3)** . . . . . .

Q15. Are there any **GOATS** on this agricultural holding?
- ◯ 0 No → Go to Q16
- ◯ 1 Yes

Q15a Number as of today . . . . . Number of animals

Q15b Of the above number, how many are: Number of animals
- 1 Owned . . . . . .
- 2 Not owned - raised under contract . . . . . .
- 3 Not owned - raised under other arrangements (specify ( ) . . . . . .
- **Total (total of options 1 to 3)** . . . . . .

Q16. Are there any **SWINE or PIGS** on this agricultural holding?
- ◯ 0 No → Go to Q17
- ◯ 1 Yes

Q16a Number as of today . . . . . Number of animals

Q16b Of the above number, how many are: Number of animals
- 1 Owned . . . . . .
- 2 Not owned - raised under contract . . . . . .
- 3 Not owned - raised under other arrangements (specify ( ) . . . . . .
- **Total (total of options 1 to 3)** . . . . . .

Q17. Are there any **RABBITS** on this agricultural holding?
- ◯ 0 No → Go to Q18
- ◯ 1 Yes

Q17a Number as of today . . . . . Number of animals

Q17b Of the above number, how many are: Number of animals
- 1 Owned . . . . . .
- 2 Not owned - raised under contract . . . . . .
- 3 Not owned - raised under other arrangements (specify ( ) . . . . . .
- **Total (total of options 1 to 3)** . . . . . .

Q18. Are there any **CHICKENS** (broilers, laying hens, other chicken, for meat or eggs) on this agricultural holding?
- ◯ 0 No → Go to Q19
- ◯ 1 Yes

Q18a Number as of today . . . . . Number of birds

Q18b Of the above number, how many are: — Percent / Number of birds

1 Owned . . . . . % OR
2 Not owned - raised under contract . . . . . % OR
3 Not owned - raised under other arrangements (specify [ ]) . . . % OR
Total (total of options 1 to 3) . . . . . 100 % OR

Q19. Are there any **TURKEYS** on this agricultural holding?
◯ 0 No → **Go to Q20**
◯ 1 Yes

Q19a Number as of today . . . . . (Number of birds)

Q19b Of the above number, how many are: — Percent / Number of birds

1 Owned . . . . . % OR
2 Not owned - raised under contract . . . . . % OR
3 Not owned - raised under other arrangements (specify [ ]) . . . % OR
Total (total of options 1 to 3) . . . . . 100 % OR

Q20. Are there any **DUCKS** on this agricultural holding?
◯ 0 No → **Go to Q21**
◯ 1 Yes

Q20a Number as of today . . . . . (Number of birds)

Q20b Of the above number, how many are: — Percent / Number of birds

1 Owned . . . . . % OR
2 Not owned - raised under contract . . . . . % OR
3 Not owned - raised under other arrangements (specify [ ]) . . . % OR
Total (total of options 1 to 3) . . . . . 100 % OR

Q21. Are there any **GEESE** on this agricultural holding?
◯ 0 No → **Go to Q22**
◯ 1 Yes

Q21a Number as of today . . . . . (Number of birds)

Q21b Of the above number, how many are: — Percent / Number of birds

1 Owned . . . . . % OR
2 Not owned - raised under contract . . . . . % OR
3 Not owned - raised under other arrangements (specify [ ]) . . . % OR
Total (total of options 1 to 3) . . . . . 100 % OR

Q22. Are there any **GUINEA FOWLS** on this agricultural holding?
◯ 0 No → **Go to Q23**
◯ 1 Yes

Q22a Number as of today . . . . . (Number of birds)

Q22b Of the above number, how many are: — Percent / Number of birds

1 Owned . . . . . % OR
2 Not owned - raised under contract . . . . . % OR
3 Not owned - raised under other arrangements (specify [ ]) . . . % OR
Total (total of options 1 to 3) . . . . . 100 % OR

Q23. Are there any **OTHER POULTRY (pigeons, ostriches, emus, other)** on this agricultural holding?
◯ 0 No → **Go to Q24**
◯ 1 Yes (Specify [ ])

Q23a Number as of today . . . . . (Number of animals/birds)

Q23b Of the above number, how many are: — Percent / Number of animals/birds

1 Owned . . . . . % OR
2 Not owned - raised under contract . . . . . % OR
3 Not owned - raised under other arrangements (specify [ ]) . . . % OR
Total (total of options 1 to 3) . . . . . 100 % OR

Q24. Are there any **INSECTS** (bees in hives, silkworms, etc.) on this agricultural holding?
◯ 0 No → **Go to Q25**
◯ 1 Yes (specify [ ])

Q24a Number as of today . . . . . (Unit of measure [ ]) → (Number of units)

Q24b Of the above number, how many are: — Percent / Number of units as reported in Q24a above

1 Owned . . . . . % OR
2 Not owned - raised under contract . . . . . % OR
3 Not owned - raised under other arrangements (specify [ ]) . . . % OR
Total (total of options 1 to 3) . . . . . 100 % OR

Q25. Are there any **OTHER ANIMALS** on this agricultural holding?
◯ 0 No → **Go to Section 2 Q01**
◯ 1 Yes (specify [ ])

Q25a Number as of today . . . . . (Number of animals/birds)

Q25b Of the above number, how many are: — Number of animals/birds

1 Owned . . . . . .
2 Not owned - raised under contract . . . . . .
3 Not owned - raised under other arrangements (specify [ ]) . . . .
Total (total of options 1 to 3) . . . . . .

Comments on SECTION 1:

SECTION 2: INCOME FOR THE AGRICULTURAL HOLDING DURING THE REFERENCE PERIOD DD/MM/YYYY to DD/MM/YYYY

UNIT OF MEASURE used to report values should be the official national currency - the use of the sign $ in this section is purely symbolic

PART 2.1: INCOME FROM AGRICULTURAL PRODUCTION

Q01. Did the agricultural holding produce any crops during the last agricultural year?

- ◯ 0 No → **Go to Q02**
- ◯ 1 Yes

Q01a For each CROP commodity produced by this agricultural holding, answer the following questions on production and sales.

* Include income received for **all types of sales**, including production contracts.
* Report the **average price received OR** the **total value of sales** for each type of crop sold.
* Report the **gross value** of crops sold. Include landlord's share, marketing charges, taxes, transportation, etc.

CROP	*Quantity produced in the last agricultural year*	Unit of measure	If "other " reported, give conversion to kilograms	Quantity sold	Unit of measure	If "other " reported, give conversion to kilograms	Average price received per unit of measure ($)		Total value of sales for the last agricultural year ($)
01.1 Wheat		→	.		→	.	.	OR	. 0 0
01.2 Grain maize		→	.		→	.	.	OR	. 0 0
01.3 List other grains		→	.		→	.	.	OR	. 0 0
01.4 Rice		→	.		→	.	.	OR	. 0 0
01.5 Beans		→	.		→	.	.	OR	. 0 0
01.6 Chickpeas		→	.		→	.	.	OR	. 0 0
01.7 List other legumes		→	.		→	.	.	OR	. 0 0
01.8 Soybean		→	.		→	.	.	OR	. 0 0
01.9 Linseed		→	.		→	.	.	OR	. 0 0
01.10 List other oilseeds		→	.		→	.	.	OR	. 0 0
01.11 CONTINUE FOR		→	.		→	.	.	OR	. 0 0
01.12 OTHER CROPS		→	.		→	.	.	OR	. 0 0

See the crop list

Q02. Did this agricultural holding **sell any LIVE ANIMALS** (including insects) in the **reference period**?

- ◯ No → **Go to Q03**
- ◯ Yes → * Report the animals sold in the reference period specified
  * Report the **average price received OR** the **total value of sales** for each type of animal sold.
  * Report the **gross value** of animals sold. Include landlord's share, marketing charges, taxes, transportation, etc.
  * Include income received for **all types of sales**, including production contracts.

Q02a **LIVE ANIMALS (by type/category/specie)**

	Number of animals sold during the reference period	Average price received per animal ($)		Total value of sales for the last agricultural year ($)
Horses		.	OR	. 0 0
Asses		.	OR	. 0 0
Mules, hinnies		.	OR	. 0 0
Cattle		.	OR	. 0 0
Buffaloes		.	OR	. 0 0
Camels		.	OR	. 0 0
Llamas, vicugnas		.	OR	. 0 0
Sheep		.	OR	. 0 0
Goats		.	OR	. 0 0
Other ruminants (specify)		.	OR	. 0 0
Swine, pigs		.	OR	. 0 0
Rabbits		.	OR	. 0 0

	Number sold during the reference period (birds)	Average price received per bird ($)		Total value of sales for the last agricultural year ($)
Chickens		.	OR	. 0 0
Turkeys		.	OR	. 0 0
Ducks		.	OR	. 0 0
Geese		.	OR	. 0 0
Guinea fowls		.	OR	. 0 0
Other poultry (specify)		.	OR	. 0 0

OTHER ANIMALS (by type/category/species)

	Number sold (animals)	Average price received per animal ($)		Total value of sales for last agricultural year ($)
Other animals (specify		.	OR	. 0 0

INSECTS (by type/category/species)

	Unit of measure	Number sold (units)	Average price received per unit ($)		Total value of sales for last agricultural year ($)
Type 1			.	OR	. 0 0
Type 2			.	OR	. 0 0

Q03 Did this agricultural holding **sell any ANIMAL PRODUCTS** in the **reference period**?

- ◯ No → **Go to Q04**
- ◯ Yes → * Report the animal products sold in the reference period specified
  * Report the **unit of measure** for the quantities of each type of animal product sold.
  * Report the **average price received OR** the **total value of sales** for each type of animal product sold.
  * Report the **gross value** of animal products sold. Include landlord's share, marketing charges, taxes, transportation, etc.
  * Include income received for **all types of sales,** including production contracts.

Q03a **ANIMAL PRODUCTS**	*Quantity produced during the reference period*	Unit of measure	Quantity sold	Unit of measure	Average price received per unit of measure ($)		Total value of sales for last agricultural year ($)
03.1 Unpackaged, fresh milk		→		→	.	OR	. 0 0
03.2 Eggs		→		→	.	OR	. 0 0
03.3 Honey		→		→	.	OR	. 0 0
03.4 Shorn wool		→		→	.	OR	. 0 0
03.5 Pulled wool		→		→	.	OR	. 0 0
03.6 Non-carded animal hair		→		→	.	OR	. 0 0
03.7 Silkworm cocoons		→		→	.	OR	. 0 0
03.8 Furs		→		→	.	OR	. 0 0
03.9 Animal skins		→		→	.	OR	. 0 0
03.10 Other (specify		→		→	.	OR	. 0 0

PART 2.2 : AQUACULTURE AND FISHERY PRODUCTION BY THE AGRICULTURAL HOLDING

Q04 Was there any **AQUACULTURE** or **FISHERY PRODUCTION** by this agricultural holding in the last agricultural year?

- ◯ 0 No → **Go to Q05**
- ◯ 1 Yes → * Report the **gross value** of aquaculture production sold. Include landlord's share, marketing charges, taxes, transportation, etc.
  * Include income received for **all types of sales**, including production contracts.

(fill in all applicable circles)	Used by the household or agricultural holding	Sold	Total value of sales in the last agricultural year ($)
◯ Aquaculture in inland water	◯	◯ →	. 0 0
◯ Aquaculture in marine water	◯	◯ →	. 0 0
◯ Fisheries	◯	◯ →	. 0 0
◯ Other Aquaculture (specify)	◯	◯ →	. 0 0

PART 2.3: FORESTRY PRODUCTION BY THE AGRICULTURAL HOLDING

Q05 Were any **FORESTRY PRODUCTS produced** by this agricultural holding in the last agricultural year?

- ◯ 0 No → **Go to Q06**
- ◯ 1 Yes → * Report the **gross value** of forestry products sold. Include landlord's share, marketing charges, taxes, transportation, etc.
  * Include income received for **all types of sales**, including production contracts.

(fill in all applicable circles)	Used by the household or agricultural holding	Sold	Total value of sales in the last agricultural year ($)
◯ Biomass wood for heating or cooking	◯	◯ →	. 0 0
◯ Wood prepared as lumber	◯	◯ →	. 0 0
◯ Wood processing (such as pellets)	◯	◯ →	. 0 0
◯ Other forestry products (specify)	◯	◯ →	. 0 0

PART 2.4: OTHER SOURCES OF INCOME DIRECTLY RELATED TO THE AGRICULTURAL HOLDING

Q06 Were there other sources of income for the agricultural holding in the last agricultural year?

- ◯ 0 No → **Go to Q07**
- ◯ 1 Yes →

Q06a Answer the following questions about **OTHER SOURCES OF INCOME** for the **agricultural holding** in the **last agricultural year.**

(fill in all applicable circles)	Total income in the last agricultural year ($)
◯ Contractual work for other holdings (labour input)	. 0 0
◯ Payments received from renting out farmland or buildings	. 0 0
◯ Payments received from renting out other holding's assets (machinery, equipment, etc.)	. 0 0
◯ Payments received from cash rent	. 0 0
◯ Boarding or training of animals	. 0 0
◯ Patronage dividends and refunds from cooperatives	. 0 0
◯ Other (specify)	. 0 0

PART 2.5: ON-FARM PROCESSING OF AGRICULTURAL PRODUCTS BY THE AGRICULTURAL HOLDING

Q07 Was there any **ON-FARM PROCESSING** of **AGRICULTURAL PRODUCTS** by the agricultural holding in the **last agricultural year**?

- ◯ 0 No → Go to Q08
- ◯ 1 Yes → * Report the **gross value** of processing. Include landlord's share, marketing charges, taxes, transportation, etc.
  - * Report the **products according to the list of activities - 31.11 to 31.24**
  - * Include income received for **all types of sales**, including production contracts.

(fill in all applicable circles)

	Quantity produced in the last agricultural year	Unit of measure	**TOTAL VALUE OF SALES** in the last agricultural year ($)
◯ Grain milling: production of flour, etc. of wheat, rye, oats, maize (corn) or other cereal grains		→	
◯ Rice milling: production of husked, milled, polished, glazed, parboiled or converted rice; production of rice flour		→	
◯ Processing and preserving of fruit and vegetables		→	
◯ Manufacture of crude vegetable oils: olive oil, soyabean oil, palm oil, etc.		→	
◯ Manufacture of wines		→	
◯ Distillation of spirit drinks		→	
◯ Manufacture of tobacco products (cigars, chewing tobacco, etc.)		→	
◯ Processing and preserving meat		→	
◯ Manufacture of dairy products		→	
◯ Manufacture of leather and related products		→	

Q08 Does this agricultural holding have plans to develop its on-farm capacity to process agricultural products?

- * Include plans to develop processing capacity where no processing is currently conducted.
- * Include plans to increase or alter existing processing capacity.

- ◯ 0 No → Go to Q11
- ◯ 1 Yes

Q09 Are there any constraints on the development of the on-farm processing activities?

- ◯ 0 No → Go to Q11
- ◯ 1 Yes

Q10 What are the constraints on development?

(fill in all applicable circles)

- ◯ Capital
- ◯ Knowledge
- ◯ Quantity of available labour
- ◯ Qualified labour
- ◯ Access to markets for products
- ◯ Other (specify [ ])

PART 2.6: OTHER DIVERSIFICATION ACTIVITIES OF THE AGRICULTURAL HOLDING

Q11 Answer the following questions about the **DIVERSIFICATION ACTIVITIES** undertaken by the agricultural holding in the last agricultural year.

(fill in all applicable circles)

	Total income in the last agricultural year($)
◯ Selling of holding's products at market/shop (incl. preparation, packaging and transport of processed products)	. 0 0
◯ Processing and preserving of fish, crustaceans and molluscs	. 0 0
◯ Accommodation, restaurant, catering and other leisure/educational activities	. 0 0
◯ Making handicrafts	. 0 0
◯ Training of animals	. 0 0
◯ Other (specify [ ])	. 0 0
◯ No diversification activity	

PART 2.7: ELECTRICITY PRODUCED BY THE AGRICULTURAL HOLDING

Q12 Did this agricultural holding **PRODUCE any ELECTRICITY from RENEWABLE SOURCES** in the **last agricultural year**?

- ◯ 0 No → Go to Q14
- ◯ 1 Yes → * Include energy produced for the use of the agricultural holding and for sale.
  - * For energy sold, report the **total income** received for the sale of energy.
  - * Report the **gross value** of energy sold. Include landlord's share, marketing charges, taxes, transportation, etc.
  - * Include income received for **all types of sales**, including production contracts.

Q13 In the last agricultural year, which forms of renewable energy were produced by this agricultural holding?

(fill in all applicable circles)

	Produced and **used** by the holding	**Produced** by the holding and **sold**	Report the **total value of sales** in the last agricultural year ($)
◯ Electricity from **biomass**	◯	◯ →	. 0 0
◯ Electricity from **wind turbines**	◯	◯ →	. 0 0
◯ Electricity from **solar panels**	◯	◯ →	. 0 0
◯ Electricity from **biogas or methane**	◯	◯ →	. 0 0
◯ **Other renewable sources** used to produce electricity (specify [ ])	◯	◯ →	. 0 0

PART 2.8: SUBSIDIES AND TRANSFERS RECEIVED, RELATED TO THE AGRICULTURAL HOLDING

Q14 Were any **AGRICULTURAL SUBSIDIES RECEIVED** by the agricultural holding in the **last agricultural year**?

- ◯ 0 No → **Go to Q16 for HH sector (Core module, Part 1.2, Q10 = 1,2) or to Section 3 Q01 for non-HH sector (Core module, Part 1.2, Q10 = 3)**
- ◯ 1 Yes → * Include the all types of subsidies (e.g., cash subsidies, fuel subsidies, input subsidies, subsidies for the purchase of capital items such as machinery, etc.).
  * Include subsidies from all sources (governments, national and international organizations, NGOs, etc.).

Definition: subsidies are economic benefits (such as a tax allowance) or financial aid (such as cash grants, vouchers towards purchases of inputs or interest-free loans) provided by a government, NGO, etc. to (1) maintain the income of producers, (2) support a desirable activity (such as exports), or (3) keep prices low.

Q15 Report the **direct** and **indirect subsidies received** related to the agricultural production of the agricultural holding.

(fill in all applicable circles)

Q15a Direct subsidies:

	Value received in the last agricultural year ($)
◯ Cash	. 0 0
◯ Vouchers towards the purchase of agricultural inputs	. 0 0
◯ Interest-free loans	. 0 0

Q15b Indirect subsidies:

	Quantity	Unit Value		Value received in the last agricultural year ($)
◯ Tax breaks				. 0 0
◯ Fuel		. 0 0	OR	. 0 0
◯ Seeds		. 0 0	OR	. 0 0
◯ Fertilizers		. 0 0	OR	. 0 0
◯ Other (specify [ ])		. 0 0	OR	. 0 0

The following questions (Q16 to Q20) will be asked for the HH sector only (Core module, Part 1.2, Q10 = 1,2); Go to Section 3 Q01 for non HH sector (Core module, Part 1.2, Q10 = 3)

Q16 In the last agricultural year, did this **household** receive any CASH **TRANSFERS USED FOR AGRICULTURAL ACTIVITIES?**

* Transfers are received with no expectation of repayment on the part of the giver.
* Include cash transfers used for agricultural activity.
* Include transfers to the household as a whole, and to individual household members.

- ◯ 0 No → **Go to Q21 for HH sector (Core module, Part 1.2, Q10 = 1,2)**
- ◯ 1 Yes

Q17 For these cash transfers received in the last agricultural year and used for agricultural activity, report the **provider of the transfer.**

(fill in all applicable circles)

- ◯ Friends or family - living in the country
- ◯ Friends or family - living abroad
- ◯ Other (local merchant, employer, self-help clubs, religious groups, etc.)

Q18 What was the **total value** of these cash **transfers received** in the last agricultural year, used for agricultural activity?

	Value received in the last agricultural year ($)
*** Include the value of cash transfers and an estimate of the value of non-cash transfers.**	. 0 0

Q19 Report the **ID code(s)** of the **household member(s)** who **received transfers**

ID Code

Q20 Report the ID code(s) for the **household member(s)** who **decided how transfers would be used**

ID Code

PART 2.9: HOUSEHOLD MEMBERS' SOURCES OF INCOME NOT RELATED TO THE AGRICULTURAL HOLDING

THIS PART IS FOR HOLDINGS IN THE HOUSEHOLD SECTOR ONLY (Core module, Part 1.2, Q10 = 1,2); GO TO SECTION 3 Q01 FOR HOLDINGS IN THE NON HOUSEHOLD SECTOR

Q21 Answer the following questions about **SOURCES OF INCOME NOT RELATED TO THE AGRICULTURAL HOLDING** for **HOUSEHOLD MEMBERS.**

* Include all income from sources other than this agricultural holding.
* Include the income of all household members.
* Include transfers to the household or household members that are not used for agricultural activities of the holding.
* The concept of household is based on the arrangements made by persons, individually or in groups, for providing themselves with food or other essentials for living. A household may be either (a) a one-person household, that is to say, a person who makes provision for his or her own food or other essentials for living without combining with any other person to form part of a multi-person household, or (b) a multi-person household, that is to say, a group of two or more persons living together who make common provision for food or other essentials for living. The persons in the group may pool their resources and may have a common budget; they may be related or unrelated persons, or constitute a combination of persons both related and unrelated. (UN, 2015b, paragraph 2.33)

(fill in all applicable circles)	For each other source of income, report the total income received in the last agricultural year ($)
◯ Income from activities on **another agricultural holding**	
◯ Income from **other businesses operated** that are not related to this agricultural holding	
◯ Income from **salaries or wages from employment not related** to an agricultural holding (teaching, working in a factory, etc.)	
◯ Investment income such as interest, dividends, etc. from sources other than the agricultural holding	
◯ Rental income from the rental of non-agricultural real estate	
◯ Pensions	
◯ Grants, transfers, charity	
◯ Other (specify [ ])	

Comments on SECTION 2:

SECTION 3: EXPENSES OF THE AGRICULTURAL HOLDING DURING THE REFERENCE PERIOD DD/MM/YYYY to DD/MM/YYYY

UNIT OF MEASURE used to report values should be the official national currency - the use of the sign $ in this section is purely symbolic

PART 3.1: RESOURCE INPUTS USED BY THE AGRICULTURAL HOLDING

Answer the following questions about the RESOURCE INPUTS USED by this agricultural holding in the last agricultural year for all activities reported on previous section.

* Include only the agricultural business share of amounts paid.

	Amount paid in the last agricultural year ($)
Q01 **Natural resources - land and water:**	
Q01a Rent paid for land and buildings (including grazing fees)	. 0 0
Q01b Total expenditure for water	. 0 0
Q02 **Energy:**	
Q02a Fuel and lubricants (diesel, gasoline, oil, wood, natural gas, propane, etc.)	. 0 0
Q02b Electricity	. 0 0
Q02c Other (specify)	. 0 0

PART 3.2: INPUTS AND SERVICES USED FOR CROP PRODUCTION

Q03 **Answer the following questions about INPUTS and SERVICES used for CROP PRODUCTION by the agricultural holding in the last agricultural year.**

* Include production of cereal crops, pulses, fruits and vegetables.

* Include all crop inputs, whether bought, retained from the production of this agricultural holding, received through donations, from other agricultural holdings, from landlord's share in crop-sharing agreements, etc.

	Quantity USED	Unit of measure	If "other" reported, give conversion to kilograms	Quantity PURCHASED	Amount paid in the last agricultural year ($)
Q03a Seeds and plants		→	.		. 0 0
Q03b Fertilizer and lime		→	.		. 0 0
Q03c Plant protection products (PPPs) (herbicides, fungicides, insecticides, etc.)		→	.		. 0 0

Q04 Did the agricultural holding use any contracts and services related to crop production (custom seeding, custom fertilizer, pesticide application, etc.)?

* Include all contracts and services used, whether purchased, received through donations, exchanged for in-kind payments or traded for services or other types of arrangements (machinery for labour, for storage, for PPP disposal, etc.).

◯ 0 No → **Go to Q06**
◯ 1 Yes

Q05 Specify the contracts and services used and the nature of the arrangement

(fill in all that apply)	Type of payment arrangement				For cash only
Type of contract or service used	Received without payment	In-kind payment	Other arrangement	Cash payment	Amount paid in the last agricultural year ($)
11 - Land clearing	◯	◯	◯	◯ →	. 0 0
12- Ploughing	◯	◯	◯	◯ →	. 0 0
13 - Sowing/planting	◯	◯	◯	◯ →	. 0 0
14 - Pest control	◯	◯	◯	◯ →	. 0 0
15 - Weed control	◯	◯	◯	◯ →	. 0 0
16 - Harvesting, incl. collecting fruits	◯	◯	◯	◯ →	. 0 0
17- Preparation of non-processed crops for primary markets	◯	◯	◯	◯ →	. 0 0

PART 3.3: INPUTS AND SERVICES USED FOR LIVESTOCK AND POULTRY PRODUCTION

Q06 **Answer the following questions about INPUTS and SERVICES used for LIVESTOCK PRODUCTION by this agricultural holding in the last agricultural year.**

* Include all livestock inputs used, whether purchased, received through donations, exchanged for in-kind payments or traded for services or other types of arrangements.

(fill in all that apply)	Type of payment arrangement				For cash only
	Received	In-kind	Other	Cash payment	Amount paid in the last agricultural year ($)
Q06a Feed, supplements and hay	◯	◯	◯	◯ →	. 0 0
Q06b Veterinary services and drugs	◯	◯	◯	◯ →	. 0 0
Q06c Semen and breeding fees	◯	◯	◯	◯ →	. 0 0
Q06d Livestock purchases	◯	◯	◯	◯ →	. 0 0
Q06e Contracts and services related to livestock production - activities from 21 to 28 (see activity codes list)	◯	◯	◯	◯ →	. 0 0
Q06f Other livestock inputs (specify)	◯	◯	◯	◯ →	. 0 0

PART 3.4: LABOUR INPUTS USED BY THE AGRICULTURAL HOLDING

Q07 Identify the types of workers providing labour to this agricultural holding in the last agricultural year.

(fill in all that apply)
- ◯ 1 Household members
- ◯ 2 External manager
- ◯ 3 External, paid, long-term employees
- ◯ 4 External, paid, temporary workers
- ◯ 5 External, paid, casual workers
- ◯ 6 External, unpaid workers

Answer the following questions about LABOUR INPUTS USED by this agricultural holding for each of the identified category of workers (except unpaid workers)

	Amount paid in the last agricultural year ($)
Q07a Cash salaries, wages and retributions paid (including all employee benefits)	. 0 0

Q07b Labour paid in-kind with a share of agricultural production:
(fill in all applicable circles)

Product shared	Unit of Measure	Quantity of product shared
◯ Cereals, pulses		
◯ Fruit, vegetables		
◯ Other (specify [ ])		

Q07c Other types of arrangements for labour (specify [ ])

PART 3.5: OTHER INPUTS USED BY THE AGRICULTURAL HOLDING

Q08 Did you operate animal-powered equipment for the agricultural production (crop and livestock) in the last agricultural year?
- ◯ 0 No
- ◯ 1 Yes

Q09 Did you operate machine-powered equipment for the agricultural production (crop and livestock) in the last agricultural year?
- ◯ 0 No
- ◯ 1 Yes

Q10 Answer the following questions about **OTHER INPUTS** used by the agricultural holding in the last agricultural year.

	Amount paid in the last agricultural year ($)
Q10a Repairs and maintenance to farm machinery, equipment and vehicles	. 0 0
Q10b Rental and leasing of farm machinery, equipment and vehicles	. 0 0
Q10c Repairs and maintenance to farm buildings and fences	. 0 0
Q10d Other (specify [ ])	. 0 0

PART 3.6: TAXES AND LICENSES PAID

Q11 Answer the following questions about **TAXES AND LICENSES PAID** by this agricultural holding in the **last agricultural year**.

	Amount paid in the last agricultural year ($)
Q11a **Land and property taxes** related to the agricultural holding	. 0 0
Q11b **Other taxes** (specify [ ])	. 0 0
Q11c **Licenses** (water access rights, organic certification charges, etc.)	. 0 0

Comments on SECTION 3:

SECTION 4: INVESTMENTS, FINANCIAL AND INSURANCE COSTS

UNIT OF MEASURE used to report values should be the official national currency - the use of the sign $ in this section is purely symbolic

PART 4.1: CAPITAL INVESTMENTS

Q01 In the last agricultural year, did this agricultural holding invest any money in CAPITAL ITEMS or IMPROVEMENTS?
*Do not include expenses for maintenance and repairs.

- ◯ 0 No → **Go to Q03**
- ◯ 1 Yes

Q02 Report the amount of capital invested for the following in the last agricultural year:

		Amount ($)
Q02a	Farm real estate purchased	.00
Q02b	House construction or renovation	.00
Q02c	Manure storage construction or renovation	.00
Q02d	Construction or renovation of a storage facility for pesticides, fertilizers or fuel	.00
Q02e	Other building construction or renovation (barns, storage sheds, machine sheds, greenhouses, etc.)	.00
Q02f	Environmental protection improvements (shelterbelts, windbreaks, buffer strips or fences for waterways protection)	.00
Q02g	Other land improvements (irrigation, orchard planting, draining or clearing of land, fences for purposes other than environmental protection	.00
Q02h	Breeding and replacement livestock intended to be on the agricultural holding for more than one year (exclude poultry)	.00
Q02i	Farm machinery and equipment	.00

PART 4.2: LOANS AND FINANCING

Q03 Were any **CASH LOANS REPAID** in the **last agricultural year?**
* Include the amount of principal and interest repaid.
* Include only cash loans repaid.

- ◯ 0 No → **Go to Q05**
- ◯ 1 Yes

Q04 Report the amount of **cash loans repaid** in the last agricultural year . . . . . Amount repaid in the last agricultural year ($) .00

Q05 In the last agricultural year, did this **agricultural holding** obtain any **LOANS?**
* Include cash loans and in-kind loans seeds provided by another farmer and repaid with a share of the harvest, etc.) ONLY for agriculture-related investments.

- ◯ 0 No
- ◯ 1 Yes → **Go to Q06**

Q05a Identify the reasons for not obtaining a loan
- ◯ The holding did not request → **Go to Q11**
- ◯ The holding request was refused → **Go to Q11**
- ◯ The holding could not request, no access → **Go to Q11**

Q06 For cash loans and in-kind loans obtained in the last agricultural year, report the **provider of the loan**.

(fill in all that applicable circles)

Provider of the loan	Type of loan provided: Cash loan	Type of loan provided: In-kind loan
◯ Public banks or other government institutions	◯	◯
◯ Other commercial banks and insurance companies	◯	◯
◯ Microfinance Institutions and NGOs	◯	◯
◯ Production cooperatives	◯	◯
◯ Friends or family - living in the country	◯	◯
◯ Friends or family - living abroad	◯	◯
◯ Other (local merchant, employer, self-help clubs, religious groups, etc.)	◯	◯

Q07 What was the total value of all **LOANS OBTAINED** in the **last agricultural year?**

		Amount obtained in the last agricultural year ($)
Q07a	Value of cash loans	.00
Q07b	Estimated value of in-kind loans	.00

(FOR HH sector only, Core module, Part 1.2, Q10 = 1,2; Holdings in the NON HH sector should go to Q09)

Q08 Report the **ID code(s)** of the **household member(s) responsible** for **negotiating** and **payment** of the **largest cash loan** or **in-kind loan** used for **agricultural production.**

ID Code

Q09 Report the main **USE** of the **LARGEST CASH LOAN OBTAINED** in the **last agricultural year:**

(fill in one circle only)
- ◯ Purchase land
- ◯ Purchase machinery
- ◯ Buy agricultural inputs
- ◯ Buy or build an agricultural building or structure or dwelling
- ◯ Other agricultural purpose (specify [ ])

(FOR HH sector only, Core module, Part 1.2, Q10 = 1,2; Holdings in the NON HH sector should go to Q11)

Q10 **Report the ID code(s)** of the **household member(s) responsible** for **deciding the use** of the **largest cash loan** used for **agricultural production**.

ID Code

PART 4.3: INSURANCE

Q11 Was the **AGRICULTURAL HOLDING COVERED** by **INSURANCE** in the **last agricultural year**?

- ◯ 0 No → **Go to Q17**
- ◯ 1 Yes

Q12 What **type** of **insurance** provided coverage?

(fill in all that apply)

- ◯ **Collective agricultural** insurance (the insurance was subscribed to by a group of agricultural holdings, for example through a farmer cooperative)
- ◯ **Individual agricultural** insurance (you or your agricultural holding are the only subscriber of the insurance)
- ◯ Other (specify [ ])

Q13 Were any **insurance payments** or **reimbursements received** in the **last agricultural year?**

* Include all payments received for losses covered by an insurance policy.
* Include payments from agricultural holding insurance coverage only.

- ◯ 0 No → **Go to Q15**
- ◯ 1 Yes

Q14 What was the **amount** of insurance **payments** or **reimbursements received** by the agricultural holding in the **last agricultural year?** . . . . . Amount received in the last agricultural year ($) [ ]

Q15 Were any **insurance premiums paid** in the **last agricultural year?**

* Include expenses for the purchase of insurance for the agricultural holding only.

- ◯ 0 No → **Go to Q17**
- ◯ 1 Yes

Q16 Report the **insurance premiums paid** for the following types of insurance in the **last agricultural year**: Amount paid in the last agricultural year ($)

- Q16a Insurance related to crop production . . . . . [ ]
- Q16b Insurance related to livestock production . . . . . [ ]
- Q16c Other agricultural insurance (specify [ ]) . . . . . [ ]

Q17 Identify the **main insurance protection/coverage scheme** that is **most needed but was not purchased**.

(fill in 1 circle only)

- ◯ Crop losses
- ◯ Livestock losses
- ◯ Revenue losses
- ◯ Other agricultural insurance related to crop or livestock production (specify [ ])
- ◯ Not applicable - all needed insurance was purchased → **Go to Section 5 Q01**

Q18 For the types of insurance identified above, identify the **reasons** they were **not purchased.**

(fill in all applicable circles)

- ◯ Too expensive
- ◯ Not provided by the insurance companies
- ◯ Not aware of the existence of this type of insurance
- ◯ Other reason (specify [ ])

Comments on SECTION 4:

SECTION 5: MARKETING AND STORAGE

PART 5.1: DESTINATION OF COMMODITIES PRODUCED

Q01 For each of the CROP commodities (**CEREAL CROPS and PULSES, FRUITS, VEGETABLES, etc.**) produced by this agricultural holding, report the percent for each destination:

		Percent
Q01a	Sold	%
Q01b	Used as pay or wages for labour	%
Q01c	Given to other service or input providers	%
Q01d	Retained for household	%
Q01e	Retained for farm use - for animal feed	%
Q01f	Retained for farm use - seeds for the next cropping season	%
Q01g	Stored for later sales	%
Q01h	Other (specify [ ])	%
	Total (total of questions a to h)	1 0 0 %

Q02 For each type of **ANIMAL PRODUCT excluding meat (milk, eggs, honey, furs, skins, etc.)** produced by this agricultural holding, report the percent for each destination type:

		Percent
Q02a	Sold	%
Q02b	Used as pay or wages for labour	%
Q02c	Given to other service or input providers	%
Q02d	Retained for household use	%
Q02e	Retained for farm use	%
Q02f	Stored for later sales	%
Q02g	Other (specify [ ])	%
	Total (total of questions a to g)	1 0 0 %

PART 5.2: MAIN COMMERCIAL NETWORKS

Q03 For each commodity (**CROP, LIVESTOCK, ANIMAL PRODUCTS)** produced by this agricultural holding, report the **most important commercial network** used for selling.
Commodities from Part 2.1.

(fill in one circle only)

- ◯ Wholesale market
- ◯ Retail market
- ◯ Farm-gate sales, stands, kiosks, U-pick
- ◯ Farmers' markets
- ◯ Delivered to customers' homes
- ◯ Production/marketing contracts
- ◯ Other (specify [ ])

PART 5.3: AGRICULTURAL MARKETS AND MARKETING

Q04 **How long** does it take to **reach** the **market** where you **sell most** of the **crop production** produced by this agricultural holding**?**

(fill in one circle only)
- ◯ Under 30 minutes
- ◯ 30 to 60 minutes
- ◯ 1 to 2 hours
- ◯ More than 2 hours

Q05 Over the **past 12 months, how** often did you go to the market to sell the **crop production** produced by this agricultural holding?

(fill in one circle only)
- ◯ Daily
- ◯ Weekly
- ◯ Every two weeks
- ◯ Monthly
- ◯ Less frequently than monthly

(FOR HH sector only, Core module, Part 1.2, Q10; Holdings in the NON HH sector should go to Q08)

Q06 Report the **ID code(s)** of the **household member(s) responsible** for **deciding what crops to sell.**

ID Code

(FOR HH sector only, Core module, Part 1.2, Q10 = 1,2; Holdings in the NON HH sector should go to Q08)

Q07 Report the **ID code(s)** of the **household member(s) responsible** for **selling crops on markets.**

ID Code

Q08 **How long** does it take to **reach** the **market** where you **sell most** of the **livestock and animal products** produced by this agricultural holding**?**

(fill in one circle only)
- ◯ Under 30 minutes
- ◯ 30 to 60 minutes
- ◯ 1 to 2 hours
- ◯ More than 2 hours

Q09 Over the **past 12 months, how** often did you go to the market to sell the **livestock and animal products** produced by this agricultural holding?

(fill in one circle only)
- ◯ Daily
- ◯ Weekly
- ◯ Every two weeks
- ◯ Monthly
- ◯ Less frequently than monthly

(FOR HH sector only, Core module, Part 1.2, Q10 = 1,2; Holdings in the NON HH sector should go to Q12)

Q10 Report the **ID code(s)** of the **household member(s) responsible** for **deciding what livestock and animal products to sell.**

ID Code

(FOR HH sector only, Core module, Part 1.2, Q10 = 1,2; Holdings in the NON HH sector should go to Q12)

Q11 Report the **ID code(s)** of the **household member(s) responsible** for **selling livestock and animal products on markets.**

ID Code

PART 5.4: STORAGE FOR AGRICULTURAL PRODUCTS

Q12 Does this agricultural holding have the **ability to store agricultural products** in order to wait for better market conditions (higher selling prices)
***Include storage facilities on the agricultural holding and elsewhere, regardless of ownership.**

- ◯ 0 No → **End of questionnaire, thank you**
- ◯ 1 Yes

Q13 Does this agricultural holding have the access to storage for **CEREAL** and **PULSES CROPS?**

- ◯ x Not applicable → **Go to Q14**
- ◯ 0 No → **Go to Q14**
- ◯ 1 Yes

Type of storage
(fill in all applicable circles)

- ◯ Silos
- ◯ Granaries
- ◯ Pots
- ◯ Cribs or barns
- ◯ Room storage
- ◯ Piled on the ground
- ◯ Other (specify [ ])

FOR EACH TYPE OF STORAGE FACILITY IDENTIFIED ABOVE:

Q13a. In own storage facility
- ◯ 0 No
- ◯ 1 Yes

Q14 Does this agricultural holding have access to storage for **ROOT CROPS?**

- ◯ x Not applicable → **Go to Q15**
- ◯ 0 No → **Go to Q15**
- ◯ 1 Yes

Q14a In own storage facility?
- ◯ 0 No
- ◯ 1 Yes

Q14b Modern facility?
- ◯ 0 No
- ◯ 1 Yes

Q15 Does this agricultural holding have access to storage for **FRUITS** and **OTHER VEGETABLES?**

- ◯ x Not applicable → **Go to Q16**
- ◯ 0 No → **Go to Q16**
- ◯ 1 Yes

Q15a In own storage facility?
- ◯ 0 No
- ◯ 1 Yes

Q15b Modern facility?
- ◯ 0 No
- ◯ 1 Yes

Q16 Does this agricultural holding have access to storage for **MEAT?**

- ◯ x Not applicable → **Go to Q17**
- ◯ 0 No → **Go to Q17**
- ◯ 1 Yes

Q16a In own storage facility?
- ◯ 0 No
- ◯ 1 Yes

Q16b Modern facility?
- ◯ 0 No
- ◯ 1 Yes

Q17 Does this agricultural holding have access to storage for **MILK AND MILK PRODUCTS?**

- ◯ x Not applicable → **Go to Q18**
- ◯ 0 No → **Go to Q18**
- ◯ 1 Yes

Q17a In own storage facility?
- ◯ 0 No
- ◯ 1 Yes

Q17b Modern facility?
- ◯ 0 No
- ◯ 1 Yes

Q18 Does this agricultural holding have access to storage for **OTHER AGRICULTURAL PRODUCTS?**

- ◯ x Not applicable → **End of questionnaire, thank you**
- ◯ 0 No → **End of questionnaire, thank you**
- ◯ 1 Yes

Q18a In own storage facility?
- ◯ 0 No
- ◯ 1 Yes

Q18b Modern facility?
- ◯ 0 No
- ◯ 1 Yes

Comments on SECTION 5:

General comments on the survey:

End of questionnaire, thank you

4.2. AGRIS ECONOMY MODULE METHODOLOGICAL NOTE

Introduction

This note provides an overview of the Economy Module, presents its structure and content, and proposes definitions and classifications to be used within the module. It is meant to provide survey managers and operational staff with an understanding of the Economy Module within the context of AGRIS – which in turn fits into the larger context of a national statistical system. This methodological note also discusses some issues relating to survey implementation and customization to country specificities.

- Subchapter 4.2.1 outlines the key elements underlying the module: the context, measurement objectives, coverage and collection, timing and reference periods. It identifies both primary and secondary data objectives. It describes AGRIS and the Economy Module, explaining how it fits into established international statistical frameworks and how it can respond to the data needs of priority international development initiatives in the agricultural and rural sectors. This subchapter describes the linkages between the Economy Module and the other elements of AGRIS: namely, the Core Module and the other Rotating Modules, both in operational terms and from the perspective of leveraging the data produced by the individual components of AGRIS into a powerful analytical data set.
- Subchapter 4.2.2 introduces the content and the structure of the Economy Module itself, providing the rationale for the inclusion of questions along six thematic lines. It describes the data outputs that can be calculated and presents selected economic indicators that can be generated from the Economy Module and other AGRIS modules.
- Subchapter 4.2.3 provides methodological notes and discusses options for customization for specific parts and questions of the Economy Module questionnaire. It identifies how the individual questions meet the module's primary and secondary objectives and provides specific definitions proposed for use in the context of the Economy Module.
- Subchapter 4.2.4 reinforces the benefits of conducting the Economy Module in its recommended format. It proposes that adopting countries may want to augment the content of the module and acknowledges that in rare cases, it may have to be conducted in a reduced form. The subchapter proposes a framework for determining a reduced-content Economy Module and presents a short questionnaire option that will maintain data that respond to the module's primary objective.

4.2.1. Context, measurement objectives, statistical unit, reference periods and units of measure

4.2.1.1. The Economy Module in its AGRIS context

AGRIS is designed as a ten-year integrated sample survey program. The annual Core Module is at the foundation of AGRIS, as it collects basic frame information about holdings and those operating them, as well as data on the agricultural production of crops and livestock. A set of four Rotating Modules provides thematic data on economy, labour, production methods and the environment, and machinery, equipment and assets. These Rotating Modules complement the Core Module data, and can be integrated not only with the Core Module, but also with each other to provide a rich data set covering all aspects of agricultural holdings.

Table 4.3 outlines the recommended timing and elements of the AGRIS system for agricultural statistics, including the AGRIS Core Module and the four Rotating Modules (Economy, Labour, Production Methods and the Environment, and Machinery, Equipment and Assets). The Economy Module is recommended to be conducted starting in the first year of the ten-year cycle, and to be conducted every other year thereafter. It is the most frequently conducted of the Rotating Modules, underlining both the importance and the relative volatility of the economic attributes collected. The more volatile or changeable a measured attribute is, the shorter the "shelf-life" of the related statistics in providing a true indicator of the reality they are meant to represent. More frequent measurement of such attributes means that the statistical data are refreshed and updated to serve as a better indicator for use in developing policies and programs and in assessing the state of agricultural holdings towards stated targets.

TABLE 4.3. RECOMMENDED AGRIS MODULE FLOW.

	Years	1	2	3	4	5	6	7	8	9	10
Core Module	Agricultural holding (AH) Roster	•	•	•	•	•	•	•	•	•	•
	Crop + livestock production	•	•	•	•	•	•	•	•	•	•
	Other key variables	•	•	•	•	•	•	•	•	•	•
Rot. Module 1	Economy	•		•		•		•		•	
Rot. Module 2	Labour		•				•				
Rot. Module 3	Production Methods and the Environment				•				•		
Rot. Module 4	Machinery, Equipment and Assets	•				•					

The Core Module of AGRIS is the framework upon which the Rotating Modules are built. It is conducted annually, and primarily collects roster information for the agricultural holding, as well as crop and livestock production. In addition, some economic, labour and demographic questions are included. Along with providing annual production data, the roster information is critical in maintaining an up-to-date survey frame for the selection of samples for the Rotating Modules and future Core Module surveys.

While there are economic questions in the Core Module, it is not as detailed as the Economy Module in its treatment of the subject. The Core Module complements the Economy Module by collecting data on the production of commodities that relate to the economic data on sales and expenses (collected in the Economy Module) associated with the commodities produced.

The Economy Module of the AGRIS program focuses on the business aspects of agricultural holdings. The data gathered by the module fall into six themes that together provide an economic profile of the sector. These themes are tenure, income, inputs, other finances, markets and marketing, and storage. The questions in the module relate primarily to the agricultural holding, with some questions focussing on the household and household members. This is the case since there are often economic interdependencies between households and the agricultural holdings with which they are associated. Details on the content of the Economy Module can be found in subchapter 4.2.2.

Sampling recommendations for the Economy Module are provided in the Sampling Guidelines section of this handbook. When possible, the Economy Module will use the same sample of the holdings that have completed the AGRIS Core Module. This will be important so that data from the two modules can be combined to provide a more robust data set, while minimizing the costs of collection and the reporting burden placed on data providers. Data are meant to be collected in the field directly from survey respondents using Computer-Assisted Personal Interview (CAPI) techniques. A CAPI version of the AGRIS Economy Module Generic Questionnaire is available in the Survey Solution package.

Some information from the other Rotating Modules can also be used when analysing data from the Economy Module. Where common samples are large enough, data can be combined directly for the holdings common to different Rotating Modules, to provide an even more comprehensive data profile at the micro (holding) level. If this is done, allowance must be made in the analysis to account for the fact that data for Rotating Modules will be collected in, and for, different reference periods. Even if data cannot be matched and analysed directly at the micro level, it is possible to classify holdings in multiple Rotating Module data sets at the meso level through an appropriate farm typology, using characteristics such as main production type or size (available from the Core Module) to compare variables from the two modules for "similar" agricultural holdings. In this way, inferences may be made across a broad set of variables. For example, economic variables could be analysed in relation to practices reported in the Production Methods and the Environment Module to try to identify relationships. Again, it is important to account for the fact that data from different Rotating Modules will be collected in, and for, different reference periods.

Linkages can be made between the Economy Module and other Rotating Modules when calculating economic indicators. For example, a number of indicators require a measure for "Total costs". While the Economy Module collects variable costs and cash costs, data mined from other modules can be used to impute for non-cash costs and capital costs. In the case of non-cash costs, data from the Labour Module provide an estimate of the value of in-kind payments for labour, and a quantity of the unpaid labour used. A wage rate can be applied to the unpaid work reported to estimate the value of the unpaid labour input. For capital costs such as depreciation, a depreciation rate can be applied to data from the Machinery, Equipment and Assets Module on numbers, types and ages of machinery to impute a value for the purposes of the indicator. More information about the calculation of indicators is available in annex 2 of this handbook.

4.2.1.2 The Economy Module and international statistical frameworks

There are costs associated with the production of statistics, both for the agencies that collect, process, analyse and publish them (in the form of personnel and technical costs) and for the respondents who provide the data (in the form of time and response burden). It is incumbent upon statistical agencies to maximize the value of the data resulting from the investment of these costs. Getting the most out of the data means that they are valuable (a) over time, (b) across jurisdictions and (c) among various user groups and uses. All three of these elements are enhanced when international statistical frameworks are adhered to, both in the production of the statistics, and in their publication and use. A number of such frameworks are relevant for the Economy Module. They are introduced below as they relate to the production of data, and to its use.

Relevant statistical frameworks applied in the AGRIS Economy Module

As a sound statistical practice, the application of international statistical frameworks during the development of the AGRIS Economy Module questions has ensured that the resulting data respect norms and standards that will facilitate their use. The relevant frameworks are introduced here, while more detail on the classifications presented can be found in annex 1.

Some of the frameworks are applied broadly throughout many or all of the AGRIS modules, while others relate more specifically to the Economy Module.

AGRIS will generate data that can be incorporated into the statistical systems of adopting countries to feed their economic data framework. Data from the Economy Module are appropriate for inclusion in the System of National Accounts (SNA 2008[1]; see annex 1-4) for compiling measures of economic activity, or the more recently developed System of Environmental-Economic Accounting (SEEA) for analysing economic activities in relation to the environment, within the Central Framework, or in the SEEA subsystem for Agriculture, Forestry and Fisheries[2].

Beyond the essential alignment in terms of timing between the ten-year AGRIS cycle and the frame building on the basis of an agricultural census, the AGRIS methodology is articulated with the World Programme for the Census of Agriculture 2020 (FAO, 2015) in terms of relevant items, definitions and classifications.

The International Standard Industrial Classification of All Economic Activities (ISIC), Rev.4[3] is another framework broadly applied with AGRIS. It classifies all activities and categorizes them into a hierarchy of Sections, Divisions, Groups and Classes, accompanied by explanatory notes. ISIC Rev.4 provides the structure and definitions to determine which activities are in scope for inclusion in AGRIS (see annex 1-1).

The Central Product Classification (CPC) ver. 2.1 describes the agricultural products produced on holdings, allowing for standardization and international comparisons. Like ISIC, Rev.4, its hierarchy is comprised of Sections, Divisions, Groups and Classes, supplemented with explanatory notes. The products covered by AGRIS are based on the CPC ver. 2.1, UN Central product classification, adapted for the AGRIS context (see annex 1-3).

Using AGRIS economy data: relevant international statistical demand frameworks for AGRIS Economy Module data

There are two main international programs (Sustainable Development Goals, or SDGs, and the Global Strategy's Minimum Set of Core Data, or MSCD) whose goals and data demands can be aided by data from the AGRIS Economy module.

1 United Nations Statistics Division (UNSD). 2009. *The System of National Accounts 2008*. UN Publication: New York, USA. Available at: http://unstats.un.org/unsd/nationalaccount/docs/SNA2008.pdf. Accessed on 04 October 2017.

2 UN, European Commission (EC), FAO, OECD, International Monetary Fund (IMF) & World Bank. 2014. *System of Environmental-Economic Accounting 2012— Central Framework.* New York.

3 UNSD. 2008. *International Standard Industrial Classification of All Economic Activities (ISIC), Rev.4*. http://unstats.un.org/unsd/cr/registry/regcst.asp?Cl=27. Accessed 30 October 2016.

Sustainable Development Goal indicators supported by the Economy Module

On 25 September 2015, countries adopted a set of goals to **end poverty, protect the planet, and ensure prosperity for all** as part of a new sustainable development agenda[4]. Each goal has specific targets to be achieved over the next 15 years, all coming with specific indicators[5]. AGRIS provides essential and direct information for the following four SDG indicators through its Economy Module:

- 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
- 2.4.1: Proportion of agricultural area under productive and sustainable agriculture
- 5.a.1: (a) Proportion of total agricultural population with ownership or secure rights over agricultural land, by gender, and (b) Share of women among owners or rights bearers of agricultural land, by type of tenure

The AGRIS Economy Module contributes to the following five additional SDG indicators on the subpopulation of the population associated with agricultural holdings only:

- 1.1.1: Proportion of population below the international poverty line, by sex, age, employment status and geographical location (urban/rural)
- 1.2.1: Proportion of population living below the national poverty line, by sex and age
- 1.2.2: Proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions
- 1.3.1: Proportion of population covered by social protection floors/systems, by sex, distinguishing children, unemployed persons, older persons, persons with disabilities, pregnant women, newborns, work-injury victims and the poor and the vulnerable
- 1.4.2: Proportion of total adult population with secure tenure rights to land, with legally recognized documentation and who perceive their rights to land as secure, by sex and by type of tenure

The contribution of AGRIS to SDG measures is demonstrated with the examples detailed below.

EXAMPLE 1

Indicator 2.3.1 is a measure of the volume of production per labour unit by classes of farming/pastoral/forestry enterprise size, and thus an essential element for measuring productivity[6]. To calculate the measure, the following variables are required:

a. **Volume of production**: A measure of agricultural production in a country. While collecting physical measures of the production of an array of agricultural products is relatively easy, aggregating those measures is difficult because this would require adding the different weights or volumes related to a variety of agricultural products, for example, milk and wheat. For this reason, production is often measured as the monetary value of agricultural production.

4 http://www.un.org/ga/search/view_doc.asp?symbol=A/RES/70/1&Lang=E.

5 https://unstats.un.org/sdgs/metadata/.

6 FAO. 2001. *Agricultural investment and productivity in developing countries. Chapter: Agricultural Investment, Production Capacity and Productivity.* Social and Economic Development Paper 148. Rome. http://www.fao.org/docrep/003/x9447e/x9447e03.htm. Accessed 14 January 2017.

AGRIS sources:

Core Module

Agricultural production is collected in physical quantities. A value can be obtained directly for quantities of products sold. For production used for farm or household use, or as payment for labour or inputs, a value can be derived by applying a price to the quantities reported for those purposes. Section 3 (part 3.1 – Crop production and destinations) and section 4 (part 4.1 – Livestock raising activities and production) provide information on quantities of products by destination, but do not distinguish between household use from use for the holding.

Economy Module

The detailed reporting of prices of products sold in section 2 (section 2 – Income from the agricultural holding) and of the destination of production in section 5 (in part 5.1 – Destination of commodities produced) provide an estimate of the value of production and the percentage share of commodities sold, used for the household, used to pay for farm inputs (labour or other inputs) and used for the farm as inputs (seed or feed). Therefore, it provides potential indicators to be used for the calculation of the volume of production in value terms. The shares reported can be applied to the quantities produced and the dollar values as reported in section 2 (part 2.1 – Income from agricultural production).

b. Labour unit: A measure of the paid and unpaid labour used for agricultural production. Measures could include the number of economically active persons (EAPs) or number of person-hours.

AGRIS sources:

Core Module

Number of persons and number of days are provided in section 7 (part 7.1 – Work on the holding by the holder and household members, and part 7.2 – Work on the holding by external workers).

Labour Module

Number of persons and person-hours can be calculated by summing responses in section 2 (part 2.2 – Household members) and section 3 (part 3.4 – External workers).

c. Classes of farming/pastoral/forestry enterprise size: these key variables against which to classify enterprises, and could be land area, number of animals, economic size, etc.

AGRIS sources:

Core Module

Section 1 on organization type, section 3 on the agricultural area utilized (AAU) and section 4 on number of animals provide potential indicators.

Economy Module

Section 1 (part 1.1 – Organization type, part 1.2 – Agricultural area utilized, and part 1.3 – Number of animals), and section 2 (on Income and sales) may provide potentially useful information.

EXAMPLE 2

Indicator 2.3.2 is a measure of average income of small-scale food producers, by gender and indigenous status. To calculate the measure, the following variables are required:

a. **Average income**; this requires data on sales and expenses relating to agricultural production, as well as data on other income sources.

   AGRIS sources:
   Economy Module
   Section 2 provides data on income (part 2.1 – Income from agricultural production, part 2.2 – Income from aquaculture and fishery, part 2.3 – Income from forestry, part 2.4 – Income from other sources directly related to the agricultural holding, part 2.5 – Income from on-farm processing, part 2.6 – Income from other diversification activities, part 2.7 – Income from electricity production, part 2.8 – Subsidies and transfers). Section 3 provides data on expenses (parts 3.1 to 3.6 are all operating expenses related to agricultural production).

   Machinery, Equipment and Assets Module (if depreciation is to be calculated as an expense)
   Section 1 (part 1.2 – Manually operated equipment, part 1.3 – Animal-powered equipment, part 1.4 (Machine-powered equipment) provides numbers and ages of equipment, to which a depreciation rate can be applied to derive depreciation.

b. **Variables to classify "small-scale food producers"** and support the definition adopted. Such variables could include land area, number of animals, sales class, organization type (household-based vs commercial).

   AGRIS sources:
   Core Module
   Section 1 (organization type), section 3 (agricultural area utilized) and section 4 (number of animals) provide potential indicators.

   Economy Module
   Section 1 (part 1.1 – Organization type, part 1.2 – Agricultural area utilized, part 1.3 – Number of animals), and section 2 (sales class – parts to be determined depending on whether solely agricultural income, or also other income for the holding, is to be included in the classification) provide potential indicators.

c. **Gender and indigenous status** of the holders of agricultural holdings

   AGRIS source:
   Core Module
   Section 2.

A summary of how the Economy Module contributes to the data requirements of SDG indicators can be found in table 4.6.

Minimum Set of Core Data (MCSD)

The Global Strategy to improve Agricultural and Rural Statistics (Global Strategy) is a coordinated effort to provide a conceptual and institutional framework for the production of data, to establish an MSCD required to meet the basic and emerging data demands of national development policies, to develop cost-effective methodologies for data production and use, and to establish the necessary governance structures and capacities.

The MSCD covers three dimensions:

- Economic: recording data on outputs, trade, resources, inputs, prices, agroprocessing; final expenditure; and rural infrastructure;
- Social: collecting information on employment status, education level, household composition, family workers, and sex disaggregated data; and
- Environmental: gathering data on soil degradation, water population, greenhouse gases, agricultural practices on water use, land use, etc.

The proposed set of AGRIS questionnaires generate approximately two thirds of the MSCD data requirements. AGRIS generates all of the MSCD-relevant data to be collected at farm level. The Economy questionnaire generates six MSCD items under the Economic – Inputs, Agro-processing, and Prices heading.

4.2.1.3 Measurement objectives and scope

The primary objective of the Economy Module is the measurement of the value of agricultural production. Quantifying the actual production levels, along with the income and the costs related to agricultural production, and the destination of commodities produced, are key elements in this measurement.

Secondary objectives include measuring the non-agricultural activities undertaken by agricultural holdings and the households associated with them. This enables a better understanding of the range of endeavours carried out by holdings, as well as measurement of the income related to all activities.

In addition, the means by which holdings obtain the resources (inputs and financing) required to produce agricultural products, and how they market their output, along with an understanding of the economic relationships between agricultural holdings and households, provide a comprehensive picture of the context in which food is produced.

While the data related to the primary objective meet the requirement to account for agricultural economic activities, the addition of questions related to secondary objectives provides a wealth of integrated data for SDG monitoring and for policy and development purposes. Only the comprehensive data profile of agricultural holdings provided by the full Economy Module will allow for a thorough understanding of how holdings operate from an economic perspective. It will characterize the diversification activities that accompany agricultural production, allow analysts to identify the characteristics of holdings that are performing well, and show how various support mechanisms are integrated into the operations of recipient holdings. The Economy Module will quantify the connections and interdependencies between households and holdings that contribute to the well-being of both.

Elements of the Economy Module that fulfil the primary objective

The collection of primary data from the Economy Module will allow for the measurement of the value of agricultural production and agricultural economic activity. The following elements constitute the primary content of the Economy Module:

- Quantities of agricultural products produced (crops, fruits, vegetables, livestock, poultry, animal products);
- Quantities of agricultural products sold (crops, fruits, vegetables, livestock, poultry, animal products);
- The value of agricultural products sold (crops, fruits, vegetables, livestock, poultry, animal products);
- The value of aquaculture and fishery products sold;
- The value of agricultural subsidies received;
- The value of inputs and services related to agricultural production (resources, crop expenses, livestock and poultry expenses, labour expenses, machinery and building expenses, taxes, insurance costs);
- The destination of the agricultural commodities produced (sold, used as pay or wages for labour, given to a landlord as rent, retained for household use, retained for farm use).

A summary of the Economy Module's content, as it relates to the primary and secondary measurement objectives can be found in table 4.5. illustrating the AGRIS Economy Module – How content topics respond to a variety of data needs. The scope of all AGRIS modules is defined under ISIC (Rev.4), as follows:
Section: A – Agriculture, forestry and fishing
Division: 01 – Crop and animal production, hunting and related service activities

- 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

The detailed ISIC description for these activities can be found in annex 1-1. The annex provides information at the Section, Division, Group and Class level of the classification, along with explanatory notes.

4.2.1.4 Statistical unit and coverage

The agricultural holding

The statistical unit of AGRIS, including its Economy Module, is the agricultural holding, as an independent producer of agricultural products. The definition proposed for AGRIS is that proposed by FAO in its WCA 2020 (FAO, 2015).

> "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."

The agricultural holding is under single management, exercised by the holder (see section 3.2 of the Methodological Note for the Core Module).

Using the terminology adopted in the System of National Accounts 2008 (SNA 2008; UNSD, 2009), farms can be grouped into (1) those that are defined as household units (that is, holdings in the household sector); and (2) all other institutional units engaged in agricultural production (or holdings in the non-household sector), such as corporations and government institutions. In most countries, the majority of agricultural production occurs in the household sector. The concept of "agricultural holding" is therefore closely related to that of "household". Both subpopulations should be covered by AGRIS, as household and non-household sector holdings (see annex 1-4).

Coverage and use of thresholds

AGRIS should cover all relevant agricultural activities of the agricultural holdings in a country that fall within the scope of the ISIC groups mentioned above. In accordance with each country's characteristics, thresholds based on variables indicating a holding's size can be fixed for the entire country, with the objective of covering the largest possible share of the agricultural production and to exclude very small agricultural holdings that contribute little to total agricultural production. Potential variables to establish size could be area in crops, number of livestock, value of sales, or combinations of these. The country's agricultural census and the AGRIS surveys should be considered when deciding whether to implement thresholds. If there are no thresholds in the census or the surveys, the data resulting from the two sources are directly comparable from a coverage perspective; both sources are useful in updating the entire frame of agricultural holdings.

If the census has not established a threshold, but the surveys have, the census data can be used as a benchmark to estimate for the target population that falls outside of the survey thresholds or the survey population. In this case, the coverage of the two sources is identical, thus ensuring data comparability. Even if the survey is not adjusted to account for the population beyond the threshold, census data can be tabulated to reflect the coverage of the survey population, to compare data from the two sources.

If thresholds are applied to both the census and the surveys, they should either be identical, or the census should be more inclusive (that is, less restrictive) than the survey, to maintain the census's capability to provide the frame for the survey.

The benefits of establishing thresholds is to be carefully assessed: if a reduced respondent burden and budget savings related to a smaller sample are obvious advantages, disadvantages would include the continued need to monitor small-scale holdings, which are not included in the survey population but are nonetheless often of primary policy concern.

4.2.1.5. Reference period and timing

4.2.1.5.1. Reference period

A number of reference periods are used in the AGRIS Economy Module, depending on the type of data being collected. Below is a list and description of each:

a. **The reference year (YYYY/MM/DD) to (YYYY/MM/DD)** coincides with the last complete agricultural year. This is used when collecting data related to the production, costs or sales of agricultural products. The agricultural year provides a natural framework for respondents when they think about their agricultural production. In some cases, especially when there is systematic record-keeping, respondents will record their business information based on a calendar year; therefore, the reference period of the calendar year can be used. This means that an estimation for the agricultural year should be made on the basis of the data collected. In either case, the data reported should cover a period spanning 12 months.
b. **A given point in time, or day** is used in the case of inventory data, for example numbers of livestock. To facilitate respondent recall, in these cases, the day the questionnaire is being administered is used as the reference day. The question itself, or the interviewer instructions, will specify "as of today".
c. Other reference periods such as **weekly, monthly, quarterly, last 12 months, last calendar year** may be used

to facilitate reporting. The shorter periods are appropriate in questions where recalling long periods may be difficult for respondents. When 12-month periods are appropriate for reporting, but the agricultural year is not a relevant frame of reference, the calendar year or even the past 12 months may be used as the reference period.

4.2.1.5.2. Timing

The timing of the collection of the Economy Module will depend on the timing of the AGRIS Core Module, because the two can be administered together. Given that many of the Economy Module's questions relate to the receipt of income or the outlay of expenses related to economic activities, reference periods related to business cycles (last calendar year or last agricultural year) form the reporting framework of the questionnaire. To maximize respondent recall, timing that is in close proximity to the end of calendar or agricultural years is optimal. If holders must meet mandatory administrative reporting requirements related to sales and expenses ¬– such as tax reporting or reporting for the purposes of agricultural programs – timing of the Economy Module after these requirements have been met should be considered, as these administrative records may be a good basis for respondent reporting in the Economy Module.

Acknowledging that among the AGRIS survey respondents, there will be a range of practices with respect to record-keeping, it is reasonable to tailor the type and frequency of data collection to enable respondents to provide quality data. The recall periods for production questions are generally appropriate for a reference period related to a production cycle (agricultural year). The activities surrounding agricultural production are usually at the fore of respondents' minds because they spend the majority of their time on production activities and decision-making. However, this is not necessarily the case when it comes to financial- and economic-type questions. Where accounting records are kept, they provide an excellent source of information for respondents to use when completing the Economy Module. When record-keeping is not undertaken, or is not complete, answering the Economy Module relies on the respondent's recall. To reduce data quality problems related to memory bias (the respondent's inability to recall with precision information for a longer period), some options are presented below that may shorten the recall period and provide a framework for record-keeping that will enhance the quality of the data provided to the survey.

When several waves of data collection are implemented, it will be necessary to adapt some parts of the questionnaire.

Timing for agricultural holdings in the non-household sector

The underlying assumption in this model is that agricultural holdings in the non-household (or commercial) sector are businesses that engage in production and accounting record-keeping, and that these sources of information will provide the basis for reporting on a reference period of 12 months for both production and economic variables. In this case, the Economy Module will have the following features:

- One visit = one wave of data collection, for those years when the Economy Module is fielded (for example, harvest of the main campaign).
- The Economy Module will be conducted back-to-back with the annual Core Module: a subsample (approximately 30 percent) can be drawn from the holdings sampled for the annual Core Module.
- Reference period: because collected data are mainly values, the reference period will be the last accountancy period. This is usually the last year (1 January to 31 December), although it may also be another period: for example, the agricultural year, when the accountancy and agricultural years are the same.

Timing for agricultural holdings in the household sector

Two options are presented for collecting data from respondents in the household sector. Option A assumes that respondents are able to answer questions for a reference period spanning 12 months for both production and economic questions. This would require that some form of accounting record-keeping exists for the agricultural holding. Option B should be considered when it is unlikely that comprehensive accounting record-keeping exists. It facilitates respondent reporting by (a) shortening the reference period, and (b) providing a diary approach, which is a framework for record-keeping for the purposes of the survey. Option B requires four visits from an AGRIS interviewer, thus increasing collection costs. However, identifying the subsample most likely to require this type

of data collection will make it possible to minimize these costs; improvements in data quality will be achieved through this approach.

Option A: One visit = one wave of data collection

- One visit = one wave of data collection, for those years when the Economy Module is fielded (no diaries).
- The Economy Module is conducted back-to-back with the annual Core Module. The Core Module sample or a subsample (approximately 30 percent) drawn from the holdings sampled for the annual Core Module will receive the Economy Module.
- Reference period: some questions have a reference period spanning 12 months (see 4.2.1.5). In this option, it is assumed that the farmer is able to answer all questions. Therefore accountancy or, at least, a registration of incomes and expenses.

Option B: Two + two visits = four waves of data collection

- First visit (long): in month *M*, the Economy Module is conducted back-to-back with the annual Core Module, year *T*: the Core Module sample or a subsample (approximately 30 percent) of the holdings sampled for the annual Core Module will receive the Economy Module
    - Reference period: some questions have a reference period spanning 12 months (see 4.2.1.5)
    - All types of income, with special focus on non-agricultural income
    - A diary is given to the respondent to record all expenses and income related to agricultural activities for the next four months
- Second visit (short): in month *M + 4*, all holdings subsampled for the Economy Module
    - Reference period: the last four months
    - Special focus on agricultural income and cost of production
    - A diary is given to record all expenses and income related to agricultural activities for the next four months
- Third visit (short): in month *M + 8*, all holdings subsampled for the Economy Module
    - Reference period: the last four months
    - Special focus on agricultural income and cost of production
    - A diary is given to record all expenses and income related to agricultural activities for the next four months
- Fourth visit (long): in month *M + 12*, all holdings subsampled will receive the Economy Module as a stand-alone survey, or back-to-back with the annual Core Module (for those holdings that are sampled again for the Core Module of year *T + 1*)
    - Reference period: for some questions, this spans 12 months (see 4.2.1.5)
    - all types of income

If diaries are used, the interview must be adapted to the data collection mode (paper or CAPI), mainly for the checking of diaries. Table 4.4. provides details on the data collection plan described in option B.

TABLE 4.4. OUTLINE OF THE DATA COLLECTION PLAN FOR OPTION B IN THE HOUSEHOLD SECTOR.

Visit	Data collection	Reference period
First visit (long), month *M* After the agricultural year (after harvesting)	Core Module (area per crop, livestock, production, etc.)	Last agricultural year for crops and production, day of data collection for livestock
	Part of Economy Module data (type of tenure, property of livestock, own consumption, selling networks, storage facilities, insurance)	Current situation referring to the previous agricultural year
	Diary left and explained	Next four months
Second visit (short), month *M + 4*	Diary checking	Last four months
	Diary left and explained	Next four months
Third visit (short), month *M + 8*	Diary checking	Last four months
	Diary left and explained	Next four months
Fourth visit (long), month *M + 12*	Core Module (area per crop, livestock, production, etc.)	Last agricultural year for crops and production, day of collection for livestock
	Part of Economy Module data (type of tenure, property of livestock, own consumption, selling networks, storage facilities, insurance)	Last agricultural year, to update the first data collected
	Diary checking and aggregating responses from all diaries to obtain annual totals, in order to ask the respondent for confirmation	Last agricultural year (last 12 months)

Farms surveyed following option A are surveyed only during the fourth round of visits.

4.2.1.6. Units of measure

For reporting land areas, inventories of animals, quantities of inputs or agricultural products used or sold, international standard units of measure are useful for comparing data from the Economy Module questionnaire across countries. In many cases, however, there may be local units of measure that respondents use and are more familiar with. To facilitate reporting, local units of measure should be identified and used during data collection. When this is the case, conversion factors to standard measures should be identified so that results can be calibrated to enable comparison across regions or countries. Such conversions can be built into the CAPI application prior to collection, to ensure seamless reporting in local units and dissemination in standard units.

Reporting areas of land

Acres and hectares (ha) are the standard units used in the questionnaire. There may be local measurements of land area that are useful for collecting data from respondents. When these are used, a conversion factor to acres or ha should be identified and provided.

1 acre = 0.40 ha = X local units
1 ha = 2.47 acres = X local units
1 local unit = X acre = X ha

Reporting prices, costs, sales and other monetary values

The standard currency of the adopting country should be used for reporting monetary values throughout the questionnaire. This will facilitate reporting by data providers, and may be compiled and disseminated for domestic

use. However, to ensure coherence when making comparisons with other jurisdictions, monetary values should be converted to a standard international currency and made thus available to data users. This will eliminate the effects of relative price changes among multiple currencies when making comparisons across countries. The United States dollar is the recommended currency to be used in international comparisons. The conversion from the country currency to the currency for international comparison can be incorporated into the CAPI application.

Reporting inventories of animals

The number of animals and the number of birds are the standard units used in the questionnaire.

Reporting quantities of animal products

Milk (section 2, part 2.1)

Several standard units are used in the questionnaire for reporting unpackaged raw fresh milk produced and sold. There may also be local measurements of milk volume in adopting countries that are useful for collecting data from respondents. When these are used, a conversion factor to one of the standard units should be identified and provided.

1 imperial gallon = 1.20 US gallons = 4.55 litres = 0.05 hectolitres
1 US gallon = 0.83 imperial gallon = 3.79 litres = 0.04 hectolitres
1 litre = 0.22 imperial gallon = 0.26 US gallon = 0.01 hectolitre
1 hectolitre = 22.00 imperial gallons = 26.42 US gallons = 100.00 litres
1 other unit = X imperial gallons = X US gallons = X litres = X hectolitres

Wool (section 2, part 2.1)

Bales, pounds and kilograms (kg) are the standard units used in the questionnaire for reporting raw unprocessed wool. The size and weight of bales of wool can vary greatly, usually between 110 kg (243 pounds) and 204 kg (450 pounds)[7]; therefore, a conversion to pounds or kg for the bales being reported should be provided. There may also be local measurements for the production and sale of raw unprocessed wool. When these are used, a conversion factor to one of the standard units should be identified and provided.

1 pound = 0.45 kg
1 kg = 2.205 pounds
1 bale = X pounds = X kg
1 other unit = X pounds = X kg

Country customization

The questionnaire is designed to facilitate the tasks of the provision and collection of data for respondents and enumerators. There are no “default” units proposed throughout the Economy Module. The questionnaire currently asks which unit is used, for each relevant question or set of questions. Another option would be to ask which units will be used for areas, quantities, values, etc. at the beginning of the interview. Choosing between these options could require a field test to be conducted during the pilot survey.

7 For a definition of wool bale, see Wikipedia, https://en.m.wikipedia.org/wiki/Wool_bale. Accessed 31 October 2016.

4.2.2. Structure of the Economy Module and main indicators

The Economy Module questionnaire consists of 25 parts that are organized into five sections, each section covering a specific theme. The five broad themes covered by the questionnaire are tenure, income, inputs, other finances, and marketing and storage. The combination of data from all of the sections provides a comprehensive picture of the economic activities of agricultural holdings.

TABLE 4.5. CONTENT AND STRUCTURE OF THE AGRIS ECONOMY MODULE.

Sections (S) and parts (P) of the AGRIS Economy Module questionnaire	Main themes included	Main indicators that can be calculated
S1. Main characteristics of the agricultural holding		
P1.1. Identification of the agricultural holding	Identification of the legal status of the holder and legal status of the holding	
P1.2. Land	AAU area; total land area in each of the seven categories of tenure	Proportion of owned area in the total area Proportion of rented area in the total area
P1.3. Livestock	For each livestock category: Inventory on the survey day Number in each of the three categories of tenure	Proportion of owned livestock, of the total number of livestock (by livestock type) Proportion of rented livestock, of the total number of livestock (by livestock type)
S2. Income for the holding during the reference year		
P2.1. Income from agricultural production	For each crop produced during the last agricultural year: • Quantity produced (respondent-provided units of measure) • Quantity sold (respondent-provided units of measure) • Average price received per unit of measure OR Total value of sales for the last agricultural year For each livestock type sold during the reference period: • Number of animals sold • Average price received per animal OR Total value of sales for the last agricultural year For each type of animal product produced: • Quantity produced during the reference period • Quantity sold during the reference period • Average price received per unit of measure OR Total value of sales for the last agricultural year	Elements for the calculation of: Cost of production indicator – Costs of production per unit of output: • Cost per physical unit of output (quantity of output) • Cost per monetary unit of output (value of output? Profitability indicator: • Gross return or Gross margin • Net return or Net margin Productivity indicator – Total factor productivity Other indicator – Value of output: • Agricultural sales • Value of output Other indicator – Household income

Sections (S) and parts (P) of the AGRIS Economy Module questionnaire	Main themes included	Main indicators that can be calculated
P2.2. Aquaculture and fishery production by the agricultural holding	Identification of up to four categories of aquaculture/fishery production, and for each: • Total sales in the last agricultural year	
P2.3. Forestry production by the agricultural holding	Identification of up to four types of forestry products produced, and for each, an indication of whether the product was: • Used by the household or agricultural holding • Sold For each type of forestry product sold: Total sales in the last agricultural year	
P2.4. Other sources of income directly related to the agricultural holding	Identification of up to six sources of income directly related to the agricultural holding, and for each: Total income in the last agricultural year	
P2.5. On-farm processing of agricultural products by the agricultural holding	Identification of up to eleven types of on-farm processing of agricultural products, and for each: Quantity produced in the last agricultural year Total sales in the last agricultural year Indication of whether the holding has plans to develop its on-farm capacity to process agricultural products, and if so: • Indication of whether there are any constraints on the planned development, and if so: • Identification of up to six types of constraints	
P2.6. Other diversification activities by the agricultural holding	Identification of up to six sources of diversification activities by the agricultural holding, and for each: • Total income in the last agricultural year	
P2.7. Electricity produced by the agricultural holding	For each of four types of forestry products produced, an indication of whether the product was: • Produced and used by the holding • Produced by the holding and sold For each type of renewable energy electricity sold: • Total sales in the last agricultural year	

Sections (S) and parts (P) of the AGRIS Economy Module questionnaire	Main themes included	Main indicators that can be calculated

P2.8. Subsidies and transfers received, related to the agricultural holding	Indication of whether agricultural subsidies were received, and if so:
	• Identification of up to three direct subsidies and the amount received in the last agricultural year
	• Identification of up to five indirect subsidies, and if so:
	  • Quantity
	  • Unit value
	  • Amount received in the last agricultural year
	
	The following questions are only to be completed by holdings whose holder is a civil (natural) person or group of civil (natural) persons (that is, holdings in the household sector).
	
	Indication of whether cash transfers were received and used for agricultural activity, and if so:
	• Identification of up to three providers of transfers
	• Total value received in the last agricultural year
	• Identification of the household members who received the transfers
	• Identification of the household members who decided how transfers would be used	

P2.9. Household members' sources of income not related to the agricultural holding	**This part is only to be completed by holdings whose holder is a civil (natural) person or group of civil (natural) persons (that is, holdings in the household sector).** Identification of up to eight types of income not related to the agricultural holding received by household members in the last calendar year, and if so: • Total income received in the last calendar year	Other indicator – Household income

Sections (S) and parts (P) of the AGRIS Economy Module questionnaire	Main themes included	Main indicators that can be calculated
S3. Expenses of the agricultural holding during the reference period DD/MM/YYYY to DD/MM/YYYY		
P3.1. Resource inputs used by the agricultural holding	Amount paid in the last agricultural year for: • Up to two types of natural resources • Up to three types of energy	Elements for the calculation of: Cost of production indicator — Costs of production per ha Cost of production indicator – Costs of production per unit of output Profitability indicator: • Gross return or Gross margin • Net return or Net margin Productivity indicator –Total factor productivity Other indicator – Household income

P3.2. Inputs and services used for crop production	For three types of crop inputs used by the holding in the last agricultural year:
	• Quantity used
	• Quantity purchased
	• Amount paid
	
	Indication of whether contracts and services related to crop production were used:
	• Identification of up to seven types of contracts/services, and for each, identification whether:
	  • Received without payment
	  • In-kind payment
	  • Other arrangement
	  • Cash payment and if so, amount paid in the last agricultural year
		Elements for the calculation of:
		
		Cost of production indicator – Costs of production per ha:
		• Total costs per ha
		• Cost per ha by item
		• Cost per ha by cost categories
		
		Cost of production indicator – Costs of production per unit of output:
		• Cost per physical unit of output (quantity of output)
		• Cost per monetary unit of output (value of output)
		
		Profitability indicator:
		• Gross return or Gross margin
		• Net return or Net margin
		
		Productivity indicator –Total factor productivity
		
		Other indicator – Household income

Sections (S) and parts (P) of the AGRIS Economy Module questionnaire	Main themes included	Main indicators that can be calculated
P3.3. Inputs and services used for livestock and poultry production	Identification of up to seven types of contracts/services, and for each, identification whether: • Received without payment • In-kind payment • Other arrangement • Cash payment and if so, amount paid in the last agricultural year	Elements for the calculation of: Cost of production indicator – Costs of production per ha: • Total costs per ha • Cost per ha by item • Cost per ha by cost categories Cost of production indicator – Costs of production per unit of output: • Cost per physical unit of output (quantity of output) • Cost per monetary unit of output (value of output) Profitability indicator: • Gross return or Gross • Net return or Net margin Productivity indicator –Total factor productivity Other indicator – Household income
P3.4. Labour inputs used by the agricultural holding	Amount of cash salaries, wages and retributions paid in the last agricultural year Indication of up to three types of products shared with labour for in-kind payments and the quantity shared Indication of other types of arrangements for labour **The category of household member workers is only to be completed by holdings whose holder is a civil (natural) person or group of civil (natural) persons (that is, holdings in the household sector).**	Elements for the calculation of: Cost of production indicator – Costs of production per ha: • Total costs per ha • Cost per ha by item • Cost per ha by cost categories Cost of production indicator – Costs of production per unit of output: • Cost per physical unit of output (quantity of output) • Cost per monetary unit of output (value of output) Profitability indicator: • Gross return or Gross margin • Net return or Net margin Productivity indicator –Total factor productivity Other indicator – Household income
P3.5. Other inputs used by the agricultural holding	Indication of whether animal-powered equipment was used for the holding Indication of whether machine-powered equipment was used for the holding Amounts paid in the last agricultural year for four types of other inputs	Elements for the calculation of: Cost of production indicator – Costs of production per ha: • Cost per ha by cost categories Productivity indicator –Total factor productivity

Sections (S) and parts (P) of the AGRIS Economy Module questionnaire	Main themes included	Main indicators that can be calculated
P3.6. Taxes and licenses paid	Amount paid in the last agricultural year for: Land and property taxes Other taxes Licenses	Elements for the calculation of: Cost of production indicator – Costs of production per ha: • Total costs per ha • Cost per ha by item • Cost per ha by cost categories Cost of production indicator – Costs of production per unit of output: • Cost per physical unit of output (quantity of output) • Cost per monetary unit of output (value of output) Profitability indicator – Net return or Net margin Productivity indicator –Total factor productivity Other indicator – Household income
S4. Investments, financial and insurance costs		
P4.1. Capital investments	Indication of whether the holding invested in capital items or improvements in the last year, and if so: • Amount invested in nine types of capital items/improvements	Elements for the calculation of: Cost of production Indicator – Costs of production per ha: • Cost per ha by cost categories
P4.2. Loans and financing	Indication of whether any cash loans were repaid in the last agricultural year, and if so: • Amount repaid Indication of whether any loans were obtained in the last agricultural year, and if so, for up to seven types of loan providers: • Identification of cash loans and in-kind loans Value of cash loans obtained Estimated value of in-kind loans Identification of the main use of the largest cash loan obtained in the last agricultural year in one of five categories **The following question is only to be completed by holdings whose holder is a civil (natural) person or group of civil (natural) persons (that is, holdings in the household sector):** Identification of the household members who decided how the largest loan would be used	Elements for the calculation of: • Cost of production indicator – Costs of production per ha Cost of production indicator – Costs of production per unit of output: • Profitability indicator – Net return or Net margin • Productivity (2.3.3.) indicator I. Total factor productivity

Sections (S) and parts (P) of the AGRIS Economy Module questionnaire	Main themes included	Main indicators that can be calculated
P4.3. Insurance	Indication of whether the holding was covered by insurance in the last agricultural year, and if so: • Identification of up to three types of insurance • Indication of whether any insurance payments/reimbursements were received in the last agricultural year, and if so • Amount received • Indication of whether any insurance premiums were paid in the last agricultural year, and if so • Amount paid for up to three types of insurance Identification of the main insurance protection needed but not purchased from five categories and if so: • Identification of up to four reasons why needed insurance was not purchased	Elements for the calculation of: Cost of production indicator – Costs of production per ha: • Total costs per ha • Cost per ha by cost categories Cost of production indicator – Costs of production per unit of output: • Cost per physical unit of output (quantity of output) • Cost per monetary unit of output (value of output) Profitability indicator – Net return or Net margin Productivity indicator –Total factor productivity
S5. Marketing and storage		
P5.1. Destination of commodities produced	For each cereal crop and grain type produced during the last agricultural year: • Percent in each of seven destination categories For each fruit and vegetable crop produced during the last agricultural year: • Percent in each of seven destination categories For each livestock type produced during the last agricultural year: • Percent in each of seven destination categories For each insect type produced during the last agricultural year: • Percent in each of seven destination categories For each other animal type produced during the last agricultural year: • Percent in each of seven destination categories For each animal product type produced during the last agricultural year: • Percent in each of six destination categories	Elements for the calculation of: Cost of production indicator – Costs of production per ha: • Total costs per ha • Cost per ha by cost categories Cost of production indicator – Costs of production per unit of output: • Cost per monetary unit of output (value of output) Profitability indicator – Net return or Net margin Productivity indicator –Total factor productivity Other indicator –Value of output
P5.2. Main commercial networks	For each commodity produced during the last agricultural year: • Identification of the most important commercial network used for selling	

Sections (S) and parts (P) of the AGRIS Economy Module questionnaire	Main themes included	Main indicators that can be calculated
P5.3. Agricultural markets and marketing	For each of crop production and livestock and animal products, identification of: • the length of time to reach the market where most of the holding's crop production was sold, from four categories • the frequency products were taken to market during the past 12 months, from five categories **The following questions are only to be completed by holdings whose holder is a civil (natural) person or group of civil (natural) persons (that is, holdings in the household sector):** • Identification of the household members responsible for deciding what to sell • Identification of the household members responsible for selling on markets	
P5.4. Storage for agricultural products	Indication of whether the holding has the ability to store agricultural products in order to wait for better market conditions, and if so: • Identification of types of commodities for which storage was accessible and for each: • Identification of types of storage used	

Some parts of the Economy Module questionnaire relate only to holdings in the household sector. Where this is the case, they are identified in the table.

Detailed descriptions of the main indicators, including the required variables and calculations, are available in annex 2 of this handbook.

Some sections and parts provide data to support the primary measurement objective of the module – measurement of the value of agricultural production – by quantifying the production levels, the income and the costs related to agricultural production, and the destination of the agricultural commodities produced. Other sections and parts fulfil secondary objectives with a focus on ancillary activities, to round out the economic picture of agricultural holdings and expand the analytical capacity of the data set. Still other parts of the questionnaire fulfil a survey administrative function. A summary of these roles can be found in table 4.6 on the AGRIS Economy Module – How content topics respond to a variety of data needs.

4.2.3. Content, proposed definitions and classifications in the Economy Module

This subchapter presents the content of the Economy Module and provides the rationale for the variables to be collected. It links the resulting data for each section and part of the questionnaire to primary or secondary measurement objectives.

It is important to define the foundational elements of the survey. Determining the parameters of entities to be included in AGRIS is an example of definitions being applied in a global sense. As with all definitions, these should align with established programs. In addition, those established and used in the AGRIS Core Module will be applied within the Economy Module; see for example the underlying concepts identifying the entities targeted by AGRIS as outlined below.

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.

For the purposes of AGRIS, holdings in the household sector and the non-household sector are in scope. It is important to establish which sector a holding belongs in because some questions in AGRIS questionnaires are only relevant and only to be asked to holdings in the household sector. The rules used to establish the household and non-household sectors for AGRIS should align with those used for other programs within adopting countries. Generally, these sectors are defined as follows:

Holdings in the household sector: holdings that are operated by a civil (natural) person or group of civil (natural) persons. Examples are sole proprietorships and most partnerships. It is still possible, however, that agricultural holdings with this legal status for the holder fall outside of the household sector, if they behave more like corporations, as in the case of limited liability partnerships (see annex 1-4).

Holdings in the non-household sector: holdings that are in sectors other than the household sector, such as corporations and cooperatives. Holdings that are operated by a legal person and have a hired manager are included in this definition.

Household: the concept of household is based on the arrangements made by persons, individually or in groups, for providing themselves with food or other essentials for living. A household may be either (a) a one-person household; that is, a person who makes provision for his or her own food or other essentials for living without combining with any other person to form part of a multiperson household; or (b) a multiperson household, a group of two or more persons living together who make common provision for food or other essentials for living. The persons in the group may pool resources and have a common budget; they may be related or unrelated persons or constitute a combination of persons both related and unrelated (UNSD, 2015b, paragraph 2.33; FAO, 2015).

When planning to implement the Economy Module in a given country, it is important to explore whether it might be appropriate to customize the survey by adding economic content that will include topics of specific interest or priority within the context of the country.

Other ways of customizing the survey include collecting data in the units of measure that are typically used within the jurisdiction of the survey collection. This can include local measures for currency (for reporting value of sales, expenses, etc.), area (for reporting crops), and weight or volume measures (for reporting production). Where local measures are used for collecting data, it may also be useful to disseminate data in the same way for analytical, policy and program use within the country. To facilitate broader use of the data, however, conversion factors to standard (international) units should be applied to survey results when local units are used in data collection. For all parts of the questionnaire, local units of measure can be accommodated and later converted to standard units. For each section and part of the Economy Module questionnaire, the related specific methodological notes, concepts and definitions are outlined below. In addition, each part is described and identified as fulfilling either the primary or secondary objective of the module.

4.2.3.1. Section 1: main characteristics of the agricultural holding

In section 1, parts 1.2 and 1.3 of the Economy Module questionnaire examine the quantity and tenure of two key resources; land (part 1.2) and livestock (part 1.3).

The quantity data provide an indicator of the size of agricultural holdings, while data on tenure give a profile of the capital ownership of holdings. The data generated by these parts of the questionnaire contribute to filling the primary objective of the module.

Parts 1.2. and 1.3 contain inventory-type questions, recording the situation at a given point in time; therefore, the reference period for these questions is the day of collection.

In Part 1.2 **Q01**, the unit of area measurement is established. While acres and hectares are the two major choices provided, the unit measure for area can be collected in local units and recalculated in standard units.

Sometimes, AAUs can be very small or represent fractions of area units of measure; however, respondents should be instructed to report areas to the nearest whole number.

In **Q02**, the total AAU is asked of respondents. The area should include all areas used by the holding for agricultural and non-agricultural purposes. Then, the tenure is established in Q03 by asking for the area in seven tenure categories:

- Owned with written documentation (such as title deeds, wills, purchase agreements)
- Owned without written documentation
- Rented-in, leased or sharecropped with written agreement
- Rented-in, leased or sharecropped without written agreement
- State or communal land used with written agreement (certified use rights)
- State or communal land used without written agreement (uncertified use rights) and
- Occupied or squatted without any permission.

The total of the tenure categories is calculated in the CAPI application and provides a control total that should be equal to the total AAU initially reported by the respondent. This provides a tool for ensuring data quality. Where the reported total and the calculated control total differ, the interviewer may be instructed to review responses with the respondent to resolve the difference.

In part 1.3, **Q05** to **Q25** ask questions for each livestock species raised by the holding. All livestock on the holding are to be included in the responses, regardless of their ownership. Animals kept by the operation (regardless of ownership) that are pastured on a community pasture, grazing coop or public land are also to be included. Animals that are owned by the agricultural holding but kept on another farm, ranch or feedlot operated by someone else are not to be included in the response.

The total number of animals is asked of respondents. Then, the tenure is established by asking for the number of animals in each of three tenure categories:

- Owned
- Not owned – raised under contract
- Not owned – raised under other arrangements

In the case of bird species, the number of birds or the percentage of birds in each tenure category can be reported. As in the case of part 1.2, the sum of the tenure categories is calculated by the CAPI application and may be used as a control total for comparison with the total number of animals initially reported by the respondent.

While the generic questionnaire contains 21 species of animals, the list can be customized to represent the range of animals raised in adopting countries. The livestock categories are based on CPC rev. 2.1, with some adaptations for AGRIS (see section 1.2 and annex 1-3)

For the purposes of AGRIS, the following definitions are recommended in part 1.3:

Livestock, not owned – **raised under contract** refers to livestock raised under a **production contract**. A production contract is a legally binding agreement of a fixed term, that has entered into force between the producer and buyer before production begins, in which the quantity, price, quality and timing of delivery – among other supply chain management requirements – are specified. Contracts may also specify the desired processes for agricultural crop production or livestock rearing, often to comply with domestic and international quality and safety standards for food and agricultural production and trade[8].

4.2.3.2. Section 2: income for the agricultural holding

The Generic Questionnaire proposes filter questions to avoid unnecessary overburden of respondents (Q01). During data processing, a specific value must be assigned to the skipped variables to avoid any analytical error. This is valid for all such skip questions throughout the questionnaires.

Section 2, parts 2.1 to 2.9 focus on different components of income – income for the holding, from agricultural production and six other types of economic activities, and from subsidies and transfers. Household members' income not associated with the agricultural holding (for holdings in the household sector) is also collected.

In part 2.1 (Income from agricultural production), the reference period for questions on crops is the last agricultural year. For questions on animals, the last agricultural year may also be used as the reference period. However, depending on local selling practices and the nature of record-keeping among respondents, adopting agencies may wish to use a shorter reference period to facilitate reporting. Parts 2.2 to 2.8 all use the last agricultural year as the reference period, while Part 2.9 (Household members' sources of income not related to the agricultural holding) can use the agricultural year or the last calendar year as the reference period. If the latter is used, an estimation should be done for the last agricultural year to calculate the whole income for the same period.

The following definitions are recommended for all parts of this section:

Total value of sales (the **gross value** of products sold) includes the **landlord's share**, **marketing charges**, taxes, transportation, etc. The **gross value** is the total value of sales before any deductions or charges to move the production to market have been applied. Some of the potential deductions are further defined below.

Landlord's share:

This occurs in sharecropping where a landowner (landlord) allows a sharecropper to use his or her land to produce crops in exchange for a share of the crops produced on the land. The landlord may pay a share of seed and other crop inputs. The landlord's share to be reported in this context is the value of the crops that the landlord receives as part of the sharecropping agreement. It should be included as part of the gross value (total sales).

8 International Institute for the Unification of Private Law (UNIDROIT), FAO & International Fund for Agricultural Development (IFAD). 2015. *Legal Guide on Contract Farming*. Rome. Available at http://www.fao.org/3/a-i4756e.pdf. Accessed 31 December 2016.

Marketing charges:

Marketing charges include items such as storage, commissions, handling and other charges incurred in getting agricultural products to market. The amount reported as gross value (total sales) should reflect the value received by the producer before marketing charges are applied.

The values to be reported in all parts of the section are to include the income from all types of sales, including production contracts (see definition of production contracts in Core Module methodological note).

Part 2.1 of the questionnaire provides data on the income received by the agricultural holding related to its agricultural production. It indicates the quantities produced and sold, as well as the monetary value of sales of each of the crop, livestock and animal product commodities produced by the holding. All types of sales are to be included here, including sales under production contracts.

This part of the questionnaire provides data towards the primary objective of the module.

Q01 covers crops. Questions include the unit of measure, a conversion to a standard measure (if necessary), the quantity produced, the quantity sold and the value of sales. For livestock, reported in **Q02**, the number of animals sold as well as the value of sales are provided. In **Q03**, which covers animal products considered as primary agricultural products (unpackaged fresh milk; eggs; honey; shorn wool; pulled wool; non-carded animal hair; silkworm cocoons; furs; animal skins; other), a unit of measure, quantity produced, quantity sold and value of sales are asked.

To facilitate reporting the value of commodities sold in **Q01**, **Q02** and **Q03**, the respondent is given the option to report the value of sales as either:

a. the average price received per unit of crop, animal or animal product sold, or
b. the total value of sales during the reference period.

When prices of a commodity vary significantly over the course of the reference period, it would be difficult for respondents to provide the average price. In these cases, it would be better to ask for the current price or the total value.

The difference in the quantities produced and the quantities sold can be accounted for by a number of factors, including production used for consumption by the household, used for the holding (as seed or feed for example), and production stored for sale or use at a later time.

Average price received per unit of measure/per animal refers to a representative measure of the range of prices received for a product over a specific reference period. For example, assuming reporting in Ghana, in a given reference period, ten goats are sold as follows: three at 200 GH¢[9]; two at 300 GH¢; and five at 150 GH¢. The average price per animal would be the sum of the amounts received divided by the number of goats sold:

((3 X 200) + (2 X 300) + (5 X 150))/10
= (600 + 600 + 750)/10
= 1950/10
= 195 GH¢ per animal

Parts 2.2 to 2.7 collect data on the sales and income generated by the agricultural holding from economic activities other than primary agriculture.

9 GH¢ = Ghanaian cedi

Part 2.2, **Q04** covers aquaculture and fishery production and collects sales for:

- Aquaculture in inland water
- Aquaculture in marine water
- Fisheries and
- Other aquaculture (specify)

Forestry production is covered in part 2.3, **Q05** for the categories of:

- Biomass wood for heating or cooking
- Wood prepared as lumber
- Wood processing (such as pellets) and
- Other forestry products (specify)

An indication of whether the forestry products are used by the household or agricultural holding is collected, along with an indication of whether they are sold, and if so, the total sales.

Part 2.4, **Q06** accounts for other sources of income directly related to the agricultural holding by collecting the total income for:

- Contractual work for other holdings (labour input)
- Payments received from renting out farmland or buildings
- Payments received from renting out other holdings' assets (machinery, equipment, etc.)
- Payments received from cash rent
- Boarding or training of animals
- Patronage dividends and refunds from cooperatives and
- Other (specify)

On-farm processing of agricultural products is found in part 2.5, **Q07**. The units of measure, quantity produced and the total sales are asked for:

- Grain milling: production of flour, etc. of wheat, rye, oats, maize (corn) or other cereal grains
- Rice milling: production of husked, milled, polished, glazed, parboiled or converted rice; production of rice flour
- Processing and preserving of fruit and vegetables
- Manufacture of crude vegetable oils: olive oil, soybean oil, palm oil, etc.
- Manufacture of wines
- Distillation of spirit drinks
- Manufacture of tobacco products (cigars, chewing tobacco, etc.)
- Processing and preserving meat
- Manufacture of dairy products and
- Manufacture of leather and related products

The processing included in the list corresponds to activities 31.11 to 31.23 in annex 1-1c.

The objective of **Q07** is to obtain information on the income received from processed products produced by the agricultural holding. For example, the income from "grain milling: production of flour" refers to sales of flour from a cereal produced on the holding and milled on the holding. Income from the milling of cereals as a service provided to other holdings is not reported here but in part 2.4 – Other sources of income directly related to the holding. Income from the milling of cereals as a service provided to other holdings is not reported here but in part 2.4 – Other sources of income directly related to the holding.

An indication of the agricultural holding's plans to develop its on-farm capacity to process agricultural products is collected in **Q08**. Respondents should include plans to develop processing capacity where no processing is currently conducted, as well as plans to increase or alter existing processing capacity.

Q09 determines if there are any constraints to the development of the on-farm processing activities, and **Q10** asks respondents to identify all of the constraints faced (capital, knowledge, quantity of available labour, qualified labour, access to markets for products, other (specify)).

Other diversification activities are covered in part 2.6, **Q11** by collecting total income for the following activities:

- Selling of holding's products at the market/shop (including preparation, packaging and transport of processed products)
- Processing and preserving of fish, crustaceans and molluscs
- Accommodation, restaurant, catering and other leisure/educational activities
- Making handicrafts
- Training of animals
- Other (specify)

Part 2.7, **Q12** collects information about electricity production from renewable sources on the holding in the following categories:

- Electricity from biomass
- Electricity from wind turbines
- Electricity from solar panels
- Electricity from biogas or methane and
- Other renewable sources used to produce electricity (specify)

Indication of electricity produced and used by the holding is provided, as well an indication of electricity produced by the holding and sold, along with the total value of sales.

The data from these parts of the questionnaire demonstrate the combination of activities undertaken by holdings which contribute to the overall generation of income. Questions on aquaculture (part 2.2) are classified as primary objective questions for the module, due to the nature of aquaculture as a primary producer of food products. The other parts in this grouping (parts 2.3 to 2.7) are considered secondary, in that they provide data which represent a fuller context of the economic activity of agricultural holdings, but are not primary agriculture activities in their own right.

Part 2.8 provides the final piece of the income picture for agricultural holdings, supplying data on direct and indirect subsidies received by the holding, as well as cash transfers used to support the agricultural holding. This part of the questionnaire, by completing the income picture for holdings, contributes to the primary objective of the module.

For the purposes of the AGRIS Economy Module, a clear distinction should be made between the subsidies used for the holding's production activities and the cash transfers (usually to individual household members or to the household as a whole) used to support the agricultural holding. The following definitions are recommended:

Subsidies are current payments by the general government, local government or non-government organizations (NGOs) to resident producers that are not required to be reimbursed. The overriding goal is to influence levels of production or prices, or to compensate producers for production costs.

The following are examples of the objectives of giving subsidies:

(a) influencing levels of production;
(b) influencing the prices of products; or
(c) influencing the remuneration of the factors of production[10].

10 Based on the definition provided by Eurostat in Statistics explained http://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:Subsidies.

There are two main types of subsidies included in this questionnaire – direct (cash, vouchers, etc.) and indirect subsidies (tax breaks, fuel, seeds, etc.).
Transfers are one-way payments of money for which no money, good, or service is received in exchange. There is no expectation of repayment on the part of the giver of the transfer[11].

Q14 determines if any subsidies were received, including cash subsidies, fuel subsidies, input subsidies, subsidies for the purchase of capital items such as machinery, etc. Subsidies from all sources (governments, national and international organizations, NGOs, cooperatives, etc.) are to be included. **Q15** asks for the value of direct subsidies received in three categories (cash, vouchers towards the purchase of agricultural inputs, and interest-free loans). It also asks for the quantity, unit value or the amount received for indirect subsidies (tax breaks, fuel, seeds, fertilizers, other (specify)).

The questions on subsidies need preliminary preparation and customization by adopting agencies to ensure that the types of subsidies available in the jurisdiction are included in the questionnaire. The types of subsidies, target beneficiaries and granting conditions and mechanisms are usually well known within the administration. It is possible that this information could be obtained by the administration (ministry of agriculture, ministry of development, etc.) and not asked directly to agricultural holders. This is even more valid for the indirect subsidies where the holders may not always be aware of the value of the subsidies (in the case of reduced prices for fuel, seeds, etc.).

Only holdings in the household sector are asked questions on transfers (**Q16** to **Q20**), since by definition, transfers are received by households or household members. It is important to note that only transfers used for agricultural activities are in scope for this part of the questionnaire.

Q17 asks for the provider(s) of the transfers (friends or family – living in the country; friends or family – living abroad; other (local merchant, employer, self-help clubs, religious groups, etc.), while **Q18** asks for the amounts of cash transfers received. The receiver(s) of transfers within the household (**Q19**) and the household member(s) who make decisions regarding the use of the transfers (**Q20**) are included.

Part 2.9 is asked of holdings in the household sector only. It enumerates income sources of household members, where the income is not related to the agricultural holding. This part of the questionnaire provides insights into the strategies of households as economic units and highlights interdependencies between agricultural holdings and the households associated with them. As such, these data are related to secondary data measurement objectives. **Q29** asks for the total income in the last calendar year from the following sources:

- Activities on another agricultural holding
- Other businesses operated that are not related to the agricultural holding
- Salaries or wages from employment not related to an agricultural holding (teaching, working in a factory, etc.)
- Investment income (interest, dividends, etc.) from sources other than the agricultural holding
- Rental income from the rental of non-agricultural real estate
- Pensions
- Grants, transfers, charities and
- Other (specify)

11 Based on the definition found in the Business Dictionary, http://www.businessdictionary.com/definition/transfer-payment.html. Accessed 22 February 2017.

4.2.3.3. Section 3: expenses of the agricultural holding

Section 3, parts 3.1 to 3.6 of the questionnaire provide information on the inputs used and the operating expenses incurred by the agricultural holding for the purposes of primary agricultural production. It addresses the primary objective of the Economy Module.

The reference period for the section is the last agricultural year.

Included in this section are resource inputs (part 3.1), inputs and services related to crop production (part 3.2), inputs and services for livestock and poultry production (part 3.3), labour inputs (part 3.4), other inputs and operating expenses related to repairs, maintenance and machinery leasing (part 3.5), and finally, taxes and licenses paid (part 3.6). While cash expenditures on each of the input categories is collected, information on other means of acquiring some inputs is also gathered, in particular, for inputs related to crop production (part 3.2). For labour inputs (part 3.4), in addition to cash wages paid, labour paid with a share of agricultural production is recorded by indicating the type of product shared as well as the quantity. For other inputs (part 3.5), the use of animal-powered and machine-powered equipment is identified.

In part 3.1, **Q01** deals with the natural resources of land and water (rent for land and buildings, including grazing fees, and water). **Q02** covers energy (fuel and lubricants, electricity, and other). The expenses included are those that could be common to the operation of a holding and a household (rent, water, fuel, electricity). The intention of the section is to account for expenses related to agricultural production only, so it is important that only the agricultural holding portion of these expenses is reported.

In part 3.2, **Q03** records the quantity of seeds and plants, fertilizer and lime, and plant protection products (PPPs) used, as well as the quantity purchased. This is to reflect the use of inputs produced on the agricultural holding and those that may be received without cash payment, as well as those purchased. Some examples of inputs received without cash payment are seeds and plants retained from a previous crop on the holding, seeds, fertilizers or plant protection products received via donations, exchanged for in-kind payments or other services, or received from the landlord in crop-sharing arrangements. For those inputs purchased, the amount paid is reported.

In **Q04**, contracts and services related to crop production are collected. The type of arrangement (received without payment, in-kind payment, cash payment or other arrangement) is collected, in addition to the amounts paid for the following types of contracts and services related to crop production:

- Land clearing
- Ploughing
- Sowing/planting
- Pest control
- Weed control
- Harvesting, including collecting fruits and
- Preparation of non-processed crops for primary markets (cleaning, trimming, grading, disinfecting, packaging, etc.)

Country customization can be applied to this part of the questionnaire. For instance, the information collected on fertilizers can be further detailed by type, for example the quantity of liquid fertilizers or the quantity of solid fertilizers. PPPs can be broken out to collect quantities and expenses for herbicides, fungicides and insecticides separately.

In part 3.3, **Q06**, the reporting of expenses related to the production of livestock is similar to crop production, in that it collects the three types of arrangements, as well as cash payments for six livestock inputs:

- Feed, supplements and hay
- Veterinary services and drugs
- Semen and breeding fees
- Livestock purchases
- Contracts and services related to livestock production and
- Other livestock inputs (specify)

For the category "Contracts and services related to livestock production", activities 21 to 28 from the activities list in annex 1-1c are to be considered.

Labour inputs are recorded in part 3.4, **Q07** for six categories of workers:

- Household members
- External manager
- External, paid, long-term employees
- External, paid, temporary workers
- External, paid, casual workers and
- External, unpaid workers

For each, cash salaries and wages, in-kind payments and other arrangements are collected. The category of household member workers is only asked to holdings in the household sector, while the other categories are asked to all holdings. For holdings that are not in the household sector, all workers are considered external, even if they live in the household of the holder.

Cash salaries, wages and retributions are to be reported, including employee benefits paid by the holding, such as health insurance or pension contributions. In-kind payments of agricultural products are identified for cereals/grains, fruit/vegetables, and other products and the quantities given are reported. The opportunity is provided for holdings to describe other types of arrangements that they use for labour.

Customization of this part of the questionnaire could include the addition of other types of labour arrangements that are common in the adopting country.

Part 3.5 identifies the use of animal-powered equipment (**Q08**) and machine-powered equipment (**Q09**) by the holding for agricultural production. These questions help to establish the level of mechanization on the holding and can be used as an indicator to impute a value for depreciation.

Q10 collects expenses related to the repair and maintenance of two categories of farm assets: machinery, equipment and vehicles; and farm buildings and fences. Rental and leasing expenses for farm machinery, equipment and vehicles is also provided, as well as a category where respondents can specify other expenses.

Where repair and maintenance activities are undertaken by employees of the holding, the purchase of materials for repairs and maintenance should be included in this part of the questionnaire, while the related labour expenses should be reported in part 3.4. Where repair and maintenance activities are provided by an outside service provider, the entire costs should be reported in this part of the questionnaire.

Repair and maintenance expenses are related to the upkeep of existing assets. Any expenses related to major renovations, or new construction should be reported in part 4.1 – Capital investments.

Part 3.6, **Q11** reports two categories of taxes (land and property taxes, as well as other taxes, to be specified by the respondent). Taxes reported should only include the holding portion, with household taxes excluded from responses. An aggregated category for licenses for water access rights, organic certification charges and other agricultural production licenses is also provided. Where adopting countries have specific taxes or licenses that are common within the agricultural sector, they should be added as examples, or could be added as separate categories to help facilitate response and provide relevant data.

It should be noted that the expenses related to the other activities of the holding (aquaculture and fisheries, forestry, etc.) are not asked in detail. These should be included in part 3.1 on resource inputs and in part 3.5 on other inputs. Where these activities are important for the adopting country and it is considered that agricultural producers have a good knowledge of these expenses, they could be asked separately by adding specific categories of expenses within the existing parts of the section, or by adding a separate, dedicated part within the section to record all of the expenses related to the other activities.

All parts of this section contribute to the primary data measurement objective.

4.2.3.4. Section 4: investments, financial and insurance costs

Section 4, parts 4.1 to 4.3 of the questionnaire look at other financial aspects of the agricultural holding: capital investments, loans and financing, and insurance. Some questions in this section fulfil the primary objective of the Economy Module (measurement of the value of agricultural production) while the rest of the section addresses secondary objectives. The parts that do not provide direct data for the primary objective do provide valuable information describing the financial context within which holdings operate.

The reference period for this section is the last agricultural year.

Part 4.1 (**Q01** and **Q02**) enumerates the amount of capital investments made by the agricultural holding for a number of categories of capital assets:

- Farm real estate purchased
- House construction or renovation
- Manure storage construction or renovation
- Construction or renovation of a storage facility for pesticides, fertilizers or fuel
- Other building construction or renovation (barns, storage sheds, machine sheds, greenhouses, etc.)
- Environmental protection improvements (shelterbelts, windbreaks, buffer strips or fences or waterways protection
- Other land improvements (irrigation, orchard planting, draining or clearing of land, fences for purposes other than environmental protection)
- Breeding and replacement livestock intended to be on the agricultural holding for more than one year (exclude poultry) and
- Farm machinery and equipment purchased

Capital investments in agricultural buildings and structures result in major renovations or improvements, or new construction. This is to be distinguished from repairs and maintenance, which preserves the upkeep and existing functionality of buildings and structures present on the holding. The latter should be reported in part 3.5. Likewise, improvements to the land in the form of establishing fencing is considered a capital investment (to be reported in part 4.1), while its upkeep, once installed, is considered maintenance (to be reported in part 3.5).

While the planting of most crops does not constitute a capital investment, the planting of orchards or other long-term plantations should be reported in this part. Similarly, the purchase of livestock for growing on and subsequent slaughter is not considered a capital investment. However, when the livestock is for breeding and replacement purposes and is intended to be on the holding for more than one year, it should be reported as a capital investment. Poultry are excluded.

Part 4.2 focuses on loans and financing. It collects the amount of cash loans repaid by the holding (**Q04**). It determines if any cash or in-kind loans were obtained for the holding in the last agricultural year, their value (**Q07**) and in **Q06**, the provider of the loans, in the following categories:

- Public banks or other government institutions
- Other commercial banks or insurance companies
- Microfinance Institutions or NGOs
- Production cooperatives
- Friends or family – living in the country
- Friends or family – living abroad and
- Other (local merchant, employer, self-help clubs, religious groups, etc.)

The question of the in-kind loans can be customized and further developed by asking for the kind of commodities, quantities, estimated value, etc.

For holdings in the household sector, two questions identify the household members responsible for negotiating and paying loans (**Q08**), as well as deciding the use of the largest loan obtained in the reference period (**Q09**).

Q10 is asked of all holdings and records the main use of the largest cash loan, in the following categories:

- Purchase land
- Purchase machinery
- Buy agricultural inputs
- Buy or build a dwelling or
- Other agricultural purpose (specify)

The interest paid on loans is considered an operating expense. This is used in calculating the value of agricultural production, and as such, responds to the primary objective of the Economy Module. The questionnaire asks for the amount of principal and interest repaid, to facilitate reporting by respondents. The resulting data will have to be adjusted to impute a value for the interest repaid.

Part 4.3 asks a broad range of questions on insurance for the agricultural holding. It collects information on whether the holding has insurance coverage. For those that do, Q12 establishes the source of coverage:

- Collective agricultural insurance (the insurance has been subscribed by a group of agricultural holdings, for example through a farmer cooperative)
- Individual agricultural insurance (you or your agricultural holding are the only subscriber of the insurance) and
- Other (specify)

If insurance payments or reimbursements were received, the amount is reported in **Q14**.

The amount of agricultural insurance premiums paid are reported in **Q16** for a number of types of insurance:

- Insurance related to crop production
- Insurance related to livestock production and
- Other agricultural insurance (specify)

General types of insurance for the holding, such as liability insurance, should be reported and specified under the "other" category.

Q17 asks for the type of insurance coverage that is most needed but not purchased:
- Crop losses
- Livestock losses
- Revenue losses
- Other agricultural insurance related to crop or livestock production (specify) or
- Not applicable – all needed insurance was purchased

Reasons why insurance was not purchased are identified in **Q18**:
- Too expensive
- Not provided by the insurance companies
- Not aware of the existence of this type of insurance and
- Other reason (specify)

The questions on the insurance premiums paid respond to the primary objective of the Economy Module, because premiums paid for crop, livestock or other agricultural insurance all represent operating expenses for the holding.

All of these parts of the questionnaire provide insights into economic aspects of agricultural holdings; their investments, how they source funds and how they protect against production risks.

4.2.3.5 Section 5: marketing and storage

Section 5, parts 5.1 to 5.4 give a profile of how and where the agricultural production of holdings is stored and dispersed. In these parts of the questionnaire, the commodity-specific questions are initiated in CAPI from the commodities identified by the holding in previous sections.

Part 5.1 records the percentage of each crop (Q01) and each animal product (Q02) according to its destination:
- Sold
- Used as pay or wages for labour
- Given to other service or input providers
- Retained for the household
- Retained for farm use (for crops, this is asked in two sub-questions: for animal feed, and for seeds for the next cropping season)
- Stored for later sales and
- Other (specify)

The percentage of the commodity that is sold is calculated by the CAPI application from information reported in Section 2. The CAPI application will also calculate the sum of all of the percentages reported. The sum should equal 100 percent since the intention of the question is to account for all of the commodities produced.

It should be noted that the "given to other services and input providers" category includes the amount given to the landlord as rent. The latter can be asked also as a separate category, depending on its importance in the national context.

This part of the questionnaire fulfils the primary objective of the Economy Module.

Part 5.2 records the most important commercial network for each crop, livestock type and animal product produced by the holding. The commercial network selections are:

- Wholesale market
- Retail market
- Farm gate sales, stands, kiosks, U-pick
- Farmers' markets
- Delivered to customers' homes
- Production/marketing contracts or
- Other (specify).

Part 5.3 provides a profile of the markets and marketing of the holding's production. It enumerates the time it takes to reach the market where most of the crop products (**Q04**) and livestock and animal products (**Q08**) are sold. The four categories provided to choose from are under 30 minutes, 30 to 60 minutes, 1 to 2 hours, and more than 2 hours.

The frequency of travel to markets during the past 12 months for selling most of the crop products (**Q05**) and livestock and animal products (**Q09**) is identified from the following categories: daily, weekly, every two weeks, monthly, and less frequently than monthly.

For holdings in the household sector, the household members who are responsible for deciding what crops (**Q06**) and livestock and animal products (**Q10**) to sell, as well as those responsible for selling them on markets are identified, in **Q07** for crops and in **Q11** for livestock.

Part 5.4 allows agricultural holdings to identify whether they have access to storage for a number of categories of agricultural products:

- Cereal and grain crops
- Root crops
- Fruits and other vegetables
- Meat
- Milk and milk products and
- Other agricultural products

In addition, the type of storage is specified when access is available. For cereal and grain crops, storage types are: silos, granaries, pots, cribs or barns, room storage, piled on the ground, and other. For all other categories of products, there are four storage types, to reflect the possible combinations of two ownership types (own or collective facilities), and two structure types (modern and traditional facilities). This information provides an understanding of the ability of agricultural holdings to manage the time of use or sale of their production, since access to storage capacity allows farmers to make decisions about marketing their commodities based on market prices, rather than simply selling them as they are produced.

Customization can be applied to this part of the questionnaire by including commonly used storage types within the list of respondent choices.

Together, these four parts of the questionnaire provide valuable information on how agricultural holdings are using their output, along with where and by whom agricultural holdings are getting their production to market. With the exception of part 5.1, this section furnishes secondary measurement objective data. Part 5.1 provides primary data.

For a summary of Economy Module questionnaire sections and parts, and whether they fulfil primary or secondary data measurement objectives, refer to table 4.8. below.

4.2.4. Options for a shorter version – identification of priority questions

This chapter proposes priority information that should be collected in cases where a given country is not able to conduct the full Economy Module.

As proposed, the AGRIS program provides comprehensive data on the agriculture and rural sector through a regular collection of core data complemented by themed Rotating Modules (Economic; Labour; Machinery, Equipment and Assets; and Production Methods and the Environment). It is the integration of the results from all of the survey components that provides a complete statistical picture over time of the agriculture sector in adopting countries. To preserve the integrity of the survey program and ensure a complete statistical picture, it is recommended that the Economy Module in its entirety be conducted on the rotation schedule outlined in 4.2.1.5.2 Timing above. The full Economy Module will provide the best data profile, in conjunction with the Core Modules and other Rotating Modules, for the purposes of monitoring and evaluating the progress towards the SDGs and for supporting comprehensive policy and program development and evaluation. In addition to the recommended content, it is possible for adopting countries to customize the survey content to include topics of specific interest or priority within their particular country context.

Generally, the major costs associated with conducting personal interviewer-based surveys lie in transporting interviewers to respondents and making contact with respondents. Of course, the interviewing process varies in time (and therefore cost) according to the number of questions asked; however, once contact is made, and the basic information is collected, the costs associated with collecting additional data are marginal. Therefore, collecting data for the Economy Module or any of the other modules during the collection visit for the Core Module will provide a cost-effective means of developing a broad statistical picture. However, there may still be some particular cases when a full Economy Module cannot be conducted. In these cases, at least questions deemed as high priority should be covered, either by augmenting the Core Module with key questions or by conducting a reduced or light Economy Module.

In the rare case when the recommended full module cannot be conducted, a framework should be used to assign priorities to module questions. The highest priority questions from the module should be aligned with fulfilling the primary measurement objective of the Economy Module (measurement of the value of agricultural production). Priority should also be accorded to questions that will respond to other strategic data needs in the adopting country, such as supporting the calculation of SDG indicators, achieving production of the MSCD, feeding SNA frameworks and providing data to support priority agricultural and rural policies and programs. Table 4.6. identifies how topics from the Economy Module can potentially fulfil a variety of data needs. Consideration of priority data needs is an essential step in establishing which questions should be asked in a reduced-content context.

In some countries, detailed questions can be limited to a few commodities (crops, livestock types) where a few commodities encompass the majority of agricultural output. In this way, the number of questions can be reduced.

The results of the questions selected for a reduced-content scenario should continue to provide key indicators, perhaps with less detail than the full Economy Module would offer.

The proposed short version of the AGRIS Economy Module includes only the content which aligns with the primary measurement objective of the module; that is, the measurement of the value of agricultural production. Therefore, questions to determine production levels, along with the income and the costs related to agricultural production, as well as the destination of the agricultural production are included in the short version of the questionnaire. While this version will reduce collection time and respondent burden, it also limits the scope of the data and the related analysis that will be possible using the resulting data.

TABLE 4.6. AGRIS ECONOMY MODULE – HOW CONTENT TOPICS RESPOND TO A VARIETY OF DATA NEEDS.

Legend for the "**Measurement Objective Priority**" column	Legend for the "**SDG measures supported**" column
P = primary measurement objective	**D** = direct input into indicator (and indicator number)
S = secondary measurement objective	**S** = secondary data related to target 2.3
	P = data that contribute towards indicators for the part of the population associated with agricultural holdings

Group	Economy Module section/part	Topic	Measurement objective priority	SDG measures supported	MSCD	Comments
Tenure	S1 P1.1	Identification of the agricultural holding	P			
	S1 P1.2	Land	P	P 1.4.2 D 2.3.1 D 2.3.2		
	S1 P1.3	Livestock and poultry	P	D 2.3.1	Yes	**MSCD** – *Stock of Resources*/Animal Stocks: • number of live animals (stocks) reported directly in section 1, part 1.3.

Group	Economy Module section/part	Topic	Measurement objective priority	SDG measures supported	MSCD	Comments
Income	S2 P2.1	Income from agricultural production	P	D 2.3.1 D 2.3.2	Yes	**MSCD** – *Prices*/Producer prices: • average prices by commodity reported directly in section 2, part 2.1, or to be calculated by dividing Total value of sales reported by quantities sold in section 2, part 2.1 .
	S2 P2.2	Aquaculture and fishery production by the agricultural holding	P	D 2.3.2		
	S2 P2.3	Forestry production by the agricultural holding	S	D 2.3.2		
	S2 P2.4	Other sources of income directly related to the agricultural holding	S	D 2.3.2		
	S2 P2.5	On-farm processing of agricultural products by the agricultural holding	S	D 2.3.2		
	S2 P2.6	Other diversification activities by the agricultural holding	S	D 2.3.2		
	S2 P2.7	Electricity produced by the agricultural holding	S	D 2.3.2		
	S2 P2.8	Subsidies and transfers received related to the agricultural holding	P	D 2.3.2		
	S2 P2.9	Household members' sources of income not related to the agricultural holding	S	P 1.1.1 P 1.2.1 P 1.2.2 P 1.3.1 D 2.3.2	Yes	**MSCD** – *Demographics of urban and rural population*/Total income of the household (rural and urban) – for agricultural holdings in the household sector, the income reported directly in section 2, part 2.9, plus the income reported in section 2, part 2.1.

Group	Economy Module section/part	Topic	Measurement objective priority	SDG measures supported	MSCD	Comments
Inputs	S3 P3.1	Resource inputs used by the agricultural holding	P	D 2.3.2		
	S3 P3.2	Inputs and services used for crop production	P	D 2.3.2	Yes	**MSCD** – 1. *Inputs*/fertilizers in quantity and value • Quantity of fertilizer and lime (aggregate) used and purchased directly from section 3, part 3.2. • Value of fertilizer and lime (aggregate) directly from section 3, part 3.2 for the quantities purchased, and for the quantity used but not purchased by multiplying (quantity used – quantity purchased) by a price calculated by dividing Amount paid by Quantity purchased in section 3, part 3.2. 2. *Inputs*/pesticides in quantity and value • Quantity of plant protection products (aggregate) used and purchased directly from section 3, part 3.2. • Value of plant protection products (aggregate) directly from section 3, part 3.2 for the quantities purchased, and for the quantity used but not purchased by multiplying (quantity used – quantity purchased) by a price calculated by dividing Amount paid by Quantity purchased in section 3, part 3.2.
	S3 P3.3	Inputs and services used for livestock and poultry production	P	D 2.3.2		
	S3 P3.4	Labour inputs used by the agricultural holding	P	D 2.3.2		
	S3 P3.5	Other inputs used by the agricultural holding	P	D 2.3.2		
	S3 P3.6	Taxes and licenses paid	P	D 2.3.2		

Group	Economy Module section/part	Topic	Measurement objective priority	SDG measures supported	MSCD	Comments
Other finances	S4 P4.1	Capital investments	S	S 2.3		
	S4 P4.2	Loans and financing	P, S	D* 2.3.2 S* 2.3	Yes	**SDG** – * Interest paid data are direct inputs; other data from this part are secondary **MSCD** – *Final expenditure*/Private credit for agricultural investments/ Private credit (loans and advance) for agricultural operations and investments: • Source and main purpose directly from part 4.2 for loans acquired in the current year.
	S4 P4.3	Insurance	P, S	D* 2.3.2 S* 2.3		**SDG** – * Insurance premiums paid data are direct inputs; other data from this part are secondary
Marketing and storage	S5 P5.1	Destination of commodities produced	P	S 2.3	Yes	**MSCD** – 1. *Inputs*/Feed (for animal consumption) in quantity and value: • Quantity of Core crops for Animal Feed Utilization directly from part 5.1 (amount held back from own production) • Value of Core crops for Animal Feed Utilization by multiplying quantities (above) by Prices from section 2, part 2.1. 2. Final *expenditure*/household consumption – quantity and value: • Quantity of consumption of core crops and livestock for household consumption directly from part 5.1 (amount held back from own production). • Value of core crops and livestock for household consumption by multiplying quantities (above) by Prices from section 2, part 2.1.
	S5 P5.2	Main commercial networks	S	S 2.3		
	S5 P5.3	Agricultural markets and marketing	S	S 2.3		
	S5 P5.4	Storage for agricultural products	S	S 2.3	Yes	**MSCD** – *Rural Infrastructure (Capital stock)*/Irrigation, roads, railways, communication • Storage infrastructure by four categories crossing own vs collective with modern vs traditional, as reported directly in part 5.4.

AGRIS LABOUR MODULE

Global Strategy to improve Agricultural and Rural Statistics

AGRIS QUESTIONNAIRE
LABOUR MODULE

Version 1.1, September 2017

SECTION 1: OVERVIEW OF THE HOLDING ACTIVITIES AND LABOUR

TEXT TO READ:
This survey collects information about the labour used on agricultural holdings in the whole country and whatever the holdings' sizes. The volume of labour, the organization of labour, and the amount and types of payments will be collected. The reference period for the survey is the last complete agricultural year. If the survey is being conducted near the end of the current agricultural year, this will be the reference period.

PART 1.1: IDENTIFICATION OF THE AGRICULTURAL HOLDING

A proper identification of the holding surveyed, and of the survey respondent, is required before implementing this questionnaire. The questions proposed in Parts 1.1 & 1.2 of Section 1 of the AGRIS Core Module fit this purpose. These questions are not repeated here because it is recommended that this Rotating Module be implemented together with the Core Module. However, if this Rotating Module is adopted to complement an existing farm-level production survey, then the inclusion of the identification questions is critical - as well as overall consistency with that production survey. Questions Q04 to Q09b in Section 1 of the AGRIS Core Module are not absolutely necessary, although they will help in identifying the holding and updating the sampling frames.

PART 1.2: ACTIVITIES OF THE AGRICULTURAL HOLDING DURING THE REFERENCE YEAR

Q01. Report the activities that were performed on the agricultural holding during the reference year (12 months, YY/MM/DD to YY/MM/DD).

(fill in all that apply) *RESPONSE = [ACTIVITY]*

- ◯ 11 Land clearing
- ◯ 12 Ploughing
- ◯ 13 Sowing/planting
- ◯ 14 Pest control
- ◯ 15 Weed control
- ◯ 16 Harvesting, including collecting fruits
- ◯ 17 Preparation of non-processed crops for primary markets (cleaning, trimming, grading, disinfecting, packaging, etc.)
- ◯ 21 Grazing
- ◯ 22 Feeding
- ◯ 23 Shearing
- ◯ 24 Milking
- ◯ 25 Slaughtering
- ◯ 26 Breeding
- ◯ 27 Animal and veterinary care
- ◯ 28 Preparation of non-processed animals/animal products for primary markets (cleaning, grading, disinfecting, packaging of raw milk, etc.)
- ◯ 31 On-farm processing of agricultural products

  If on-farm processing of agricultural products (Code 31) is reported, specify the type of processing:
  - ◯ 31.11 Grain milling: production of flour, groats, meal or pellets of wheat, rye, oats, maize (corn) or other cereal grains
  - ◯ 31.12 Rice milling: production of husked, milled, polished, glazed, parboiled or converted rice; production of rice flour
  - ◯ 31.13 Processing and preserving of fruit and vegetables
  - ◯ 31.14 Manufacture of crude vegetable oils: olive oil, soyabean oil, palm oil, sunflower seed oil, cottonseed oil, rape, colza or mustard oil, linseed oil, etc.
  - ◯ 31.15 Manufacture of wines
  - ◯ 31.16 Distillation of spirit drinks
  - ◯ 31.17 Manufacture of tobacco products (cigars, chewing tobacco, etc.)
  - ◯ 31.21 Processing and preserving meat
  - ◯ 31.22 Manufacture of dairy products
  - ◯ 31.23 Manufacture of leather and related products
- ◯ 32 Selling of holding's products at a market or shop (including preparation, packaging and transport of processed products)
- ◯ 33 Production of forestry products
- ◯ 34 Production, processing and preserving of fish, crustaceans and other molluscs
  - ◯ 34.11 Production of fish, crustaceans and other molluscs
  - ◯ 34.12 Processing and preserving of fish, crustaceans and other molluscs
- ◯ 35 Production of renewable energy
- ◯ 36 Contractual work for other holdings using the means of production of this holding
- ◯ 37 Accommodation, restaurant, catering and other leisure/educational activities
- ◯ 38 Making handicrafts
- ◯ 39 Training of animals
- ◯ 41 Management and/or administration
- ◯ 99 Other (specify [ ])

THE FOLLOWING QUESTIONS (Q02 to Q03) WILL BE ASKED FOR EACH OF THE [ACTIVITY] TYPES IDENTIFIED IN Q01.

Q02. In what months was the [ACTIVITY] carried out?

(fill in all that apply)

- ◯ 1 January
- ◯ 2 February
- ◯ 3 March
- ◯ 4 April
- ◯ 5 May
- ◯ 6 June
- ◯ 7 July
- ◯ 8 August
- ◯ 9 September
- ◯ 10 October
- ◯ 11 November
- ◯ 12 December

Q03. What types of worker were mainly involved in [ACTIVITY]?

(fill in all that apply)

- ◯ 1 Household members
- ◯ 2 External managers
- ◯ 3 External, paid, long-term employees
- ◯ 4 External, paid, temporary workers
- ◯ 5 External, paid, casual workers
- ◯ 6 Unpaid external workers
- ◯ 7 Contractors

THE SERIES OF QUESTIONS ABOVE WILL BE ASKED FOR EACH OF THE ACTIVITIES REPORTED IN Q01. ONCE COMPLETE FOR ALL ACTIVITIES, PROCEED TO Q04.

Q04. Considering all of the agricultural activities (Activity Codes 11-28, 41 or 99) carried out on the holding, indicate the peak months over the past 12 months.

(Fill in all that apply)

- ◯ 1 January
- ◯ 2 February
- ◯ 3 March
- ◯ 4 April
- ◯ 5 May
- ◯ 6 June
- ◯ 7 July
- ◯ 8 August
- ◯ 9 September
- ◯ 10 October
- ◯ 11 November
- ◯ 12 December

Q05. Did you need more workers than you had during the peak months?

- ◯ 0 No → **Go to SECTION 2.**
- ◯ 1 Yes

Q06. What was the main reason for the labour shortage?

(fill in one circle only)

- ◯ 1 Lack of workers
- ◯ 2 Workers are available, but lack adequate skills
- ◯ 3 Wages are too high; the holding cannot afford labour

Q07. How did the labour shortage affect the holding's activities?

(fill in all that apply)

- ◯ 1 No impact on the holding's activities
- ◯ 2 Reduced production
- ◯ 3 Reduced marketable surplus
- ◯ 4 Reduced the amount of land cultivated or the number of livestock raised
- ◯ 5 Reduced product quality
- ◯ 9 Other (specify [ ])

Comments on SECTION 1

SECTION 2: HOUSEHOLD MEMBERS: TIME WORKED, MAIN ACTIVITIES, PAYMENTS AND BENEFITS FOR THE WORK ON THE HOLDING

SECTION 2 IS ONLY TO BE ASKED FOR HOLDINGS WHERE THE HOLDER IS A CIVIL (NATURAL) PERSON OR GROUP OF CIVIL (NATURAL) PERSONS OTHERWISE PROCEED TO SECTION 3.

PART 2.1: AGRICULTURAL WORK ON THE HOLDING IN THE PAST N MONTHS

THE FOLLOWING QUESTIONS (Q01 to Q21) WILL BE ASKED FOR EACH OF THE HOUSEHOLD MEMBERS REPORTED IN TURN.

Q01. In the past N months, was [NAME] involved in agricultural activities (crop or livestock) for this holding?

- ◯ 0 No → **Go to PART 2.2, Q07.**
- ◯ 1 Yes

Q02. What is [NAME]'s position on the holding?

(fill in one circle only)

- ◯ 1 Holder/co-holder of the holding
- ◯ 2 Manager
- ◯ 3 Worker on the holding, with no decision-making role

Q03. In the past N months, how many months did [NAME] carry out agricultural activities (crops or livestock) for the holding? . . . . . Months ☐☐

Q04. On average, how many days per month did [NAME] carry out agricultural activities (crop or livestock) for the holding? . . . . . Days per month ☐☐

Q05. On average, how many hours per day did [NAME] carry out agricultural activities (crop or livestock) for the holding? . . . . . Hours per day ☐☐

Q06. What was [NAME]'s main agricultural activity?

(fill in one circle only)

- ◯ 11 Land clearing
- ◯ 12 Ploughing
- ◯ 13 Sowing/planting
- ◯ 14 Pest control
- ◯ 15 Weed control
- ◯ 16 Harvesting, including collecting fruits
- ◯ 17 Preparation of non-processed crops for primary markets (cleaning, trimming, grading, disinfecting, packaging, etc.)
- ◯ 21 Grazing
- ◯ 22 Feeding
- ◯ 23 Shearing
- ◯ 24 Milking
- ◯ 25 Slaughtering
- ◯ 26 Breeding
- ◯ 27 Animal and veterinary care
- ◯ 28 Preparation of non-processed animals/animal products for primary markets (cleaning, grading, disinfecting, packaging of raw milk, etc.)
- ◯ 41 Management and/or administration

CONTINUE FROM Q07 TO Q21 FOR [NAME]; THEN RESTART AT Q01 FOR NEXT [NAME].

PART 2.2: WORK ON OTHER ECONOMIC ACTIVITIES ON THE HOLDING IN THE PAST N MONTHS

Q07. Report the non-agricultural activities related to the holding that were carried out by [NAME] during the past N months, even if it was for one day.

*** Include all activities done using the means of production of the holding (or the holding's establishments).**
***Include all agricultural services provided to other holdings using this holding's means of production.**

(fill in all that apply)

- ◯ 31 On-farm processing of agricultural products
  - ◯ 31.11 Grain milling: production of flour, groats, meal or pellets of wheat, rye, oats, maize (corn) or other cereal grains
  - ◯ 31.12 Rice milling: production of husked, milled, polished, glazed, parboiled or converted rice; production of rice flour
  - ◯ 31.13 Processing and preserving of fruit and vegetables
  - ◯ 31.14 Manufacture of crude vegetable oils: olive oil, soyabean oil, palm oil, sunflower seed oil, cottonseed oil, rape, colza or mustard oil, linseed oil, etc.
  - ◯ 31.15 Manufacture of wines
  - ◯ 31.16 Distillation of spirit drinks
  - ◯ 31.17 Manufacture of tobacco products (cigars, chewing tobacco, etc.)
  - ◯ 31.21 Processing and preserving meat
  - ◯ 31.22 Manufacture of dairy products
  - ◯ 31.23 Manufacture of leather and related products
- ◯ 32 Selling of holding's products at a market/shop (including preparation, packaging and transport of processed products)
- ◯ 33 Production of forestry products
- ◯ 34 Production, processing and preserving of fish, crustaceans and molluscs
  - ◯ 34.11 Production of fish, crustaceans and molluscs
  - ◯ 34.12 Processing and preserving of fish, crustaceans and molluscs
- ◯ 35 Production of renewable energy
- ◯ 36 Contractual work for other holdings using the means of production of this holding
- ◯ 37 Accommodation, restaurant, catering and other leisure/educational activities
- ◯ 38 Making handicrafts
- ◯ 39 Training of animals
- ◯ 99 Other (specify [ ])
- ◯ 0 None of the above → **Go to PART 2.3, Q11.**

Q08. In the past N months, how many months did [NAME] carry out these non-agricultural activities related to this holding?

*** Include all non-agricultural activities in your answer.**

Number of months . . . [ ][ ] Months

Q09. On average, how many days per month did [NAME] carry out these non-agricultural activities related to this holding? . . . . . [ ][ ] Days per month

Q10. On average, how many hours per day did [NAME] carry out these non-agricultural activities related to this holding? . . . . . [ ][ ] Hours per day

PART 2.3: PAYMENTS FOR WORK ON THE HOLDING

Q11 IS TO BE ASKED FOR [NAME] IF Q01 = YES, OR IF Q07 > 0. OTHERWISE, RESTART AT Q01 FOR NEXT [NAME] REPORTED.

Q11. Did [NAME] receive payment for the work done on agricultural or other economic activities on the holding during the last N months?
*** Include wages, salaries, commission, tips or any other pay.**
*** Include in-kind payments. That is, payments made in goods or services rather than cash. This includes payments of agricultural products.**

- ◯ 0 No → **Go to PART 2.4, Q19.**
- ◯ 1 Yes

Q12. Was [NAME] paid in cash or in kind?

(fill in one circle only)
- ◯ 1 Paid only in cash
- ◯ 2 Paid only in-kind → **Go to Q16.**
- ◯ 3 Paid both in cash and in-kind

Q13. What was the amount of the LAST payment in cash paid to or to be paid to [NAME] for the work during the past N months? . . . Local currency [ ][ ][ ][ ][ ][ ][ ][ ].[ ][ ]

Q14. To what period of time does this payment refer?
* Report the number and type of time units separately.

Q14a What is the time unit?

(fill in one circle only)
- ◯ 1 Hour
- ◯ 2 Day
- ◯ 3 Week
- ◯ 4 Month
- ◯ 5 Year
- ◯ 6 Upon completion of a task or piece of work → **Go to Q15.**

Q14b What is the number of time units? [ ][ ][ ][ ][ ][ ] → **If Q12 = 1, Go to PART 2.4, Q19. Otherwise, go to Q16.**

Q15. How long did it take to complete the task or piece of work?
* Report the number and type of time units separately.

Q15a What is the time unit?

(fill in one circle only)
- ◯ 1 Hour
- ◯ 2 Day
- ◯ 3 Week
- ◯ 4 Month
- ◯ 5 Other (specify [ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ])

Q15b What is the number of time units? [ ][ ][ ][ ][ ][ ]

Q16 IS TO BE COMPLETED IF Q12 = 2 OR 3. OTHERWISE, GO TO PART 2.4, Q19.

Q16. What was the estimated value of the LAST in-kind payment paid or to be paid to [NAME] for the work during the past N months? . . . . . Local currency [ ][ ][ ][ ][ ][ ][ ][ ].[ ][ ]

Q17. To what period of time does this payment refer?
* Report the number and type of time units separately.

Q17a What is the time unit?

(fill in one circle only)
- ◯ 1 Hour
- ◯ 2 Day
- ◯ 3 Week
- ◯ 4 Month
- ◯ 5 Year
- ◯ 6 Upon completion of a task or piece of work → **Go to Q18.**

Q17b What is the number of time units? [ ][ ][ ][ ][ ][ ] → **Go to PART 2.4, Q19.**

Q18. How long did it take to complete the task or piece of work?
* Report the number and type of time units separately.

Q18a What is the time unit?

(Fill in one circle only)
- ◯ 1 Hour
- ◯ 2 Day
- ◯ 3 Week
- ◯ 4 Month
- ◯ 5 Other (specify [ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ])

Q18b What is the number of time units? [ ][ ][ ][ ][ ][ ]

PART 2.4: BENEFITS FOR THE WORK ON THE HOLDING

Q19. Does [NAME] receive contributions for a pension fund from the agricultural holding? **To be asked if Q01 = Yes, or if Q07 > 0.**

- ◯ 0 No
- ◯ 1 Yes

Q20. Does [NAME] receive health insurance benefits paid in whole or in part by the agricultural holding? **To be asked if Q01 = Yes, or if Q07 > 0.**

- ◯ 0 No
- ◯ 1 Yes

If Q19 = Yes and/or Q20 = Yes, go to Q21. Otherwise, repeat PARTS 2.1 to 2.4 for the next [NAME] reported. If all [NAME]s reported have been completed, go to SECTION 3.

Q21. **In the last month**, can you tell what was the total value of the contributions made by the agricultural holding on behalf of [NAME] for pension funds and/or health insurance ?
* Include only the agricultural holding's share of contributions.

Local currency

- ◯ 1 Contributions made . . [ ][ ][ ][ ][ ][ ][ ][ ].[ ][ ]
- ◯ 99 Not known

THE SERIES OF QUESTIONS ABOVE (Q01 to Q21) WILL BE ASKED FOR EACH OF THE HOUSEHOLD MEMBERS REPORTED.
ONCE COMPLETE FOR ALL HOUSEHOLD MEMBERS, PROCEED TO SECTION 3.

Comments on SECTION 2

SECTION 3: EXTERNAL WORKERS: DEMOGRAPHIC CHARACTERISTICS, TIME WORKED, MAIN ACTIVITIES, PAYMENTS & BENEFITS FOR THE WORK ON THE HOLDING

PART 3.1: DEMOGRAPHIC CHARACTERISTICS

Q01. Did the agricultural holding have any external workers during the past N months?

*** For agricultural holdings where the holder is a civil (natural) person or group of civil (natural) persons, include workers that are not members of the household.**
*** For agricultural holdings where the holder is a legal person, include all workers.**

◯ 0 No → **Go to SECTION 4.**
◯ 1 Yes

Q02. Identify the types of external workers providing labour to the holding during the past N months.

(fill in all that apply) **RESPONSE = [WORKER]**

◯ 1 External managers
◯ 2 External, paid, long-term employees (hired permanently, that is, for more than a season)
◯ 3 External, paid, temporary workers (hired for a season or less)
◯ 4 External, paid, casual workers (hired on a daily or weekly basis)
◯ 5 Unpaid external workers (mutual helpers, unpaid trainees, volunteers, unpaid relatives living in another household, etc.)

THE FOLLOWING QUESTION (Q03) WILL BE ASKED FOR EACH OF THE WORKER TYPES IDENTIFIED IN Q02.

Q03. Identify how many [WORKER] worked on the holding during the past N months.

		Number of workers
Q03a	Adult males	
Q03b	Adult females	
Q03c	Children under 15 years of age	
Q03d	**Total** (calculated)	

RESPONSE = [CATEGORY]

THE QUESTION ABOVE WILL BE ASKED FOR EACH OF THE WORKER TYPES REPORTED IN Q02, WITH THE FOLLOWING SKIP PATTERNS:
A) After answering Q03 for Q02 =1 or 2 cases, if Q03a and/or Q03b > 0, Go directly to PART 3.2 before proceeding to ask Q03 for Q02 > 2.
B) If Q02 = 4, and Q03d > 0, Go directly to PART 3.3 before proceeding to ask Q03 for Q02 = 5 cases.

ONCE PART 3.1 IS COMPLETE WITH SKIP PATTERNS, PROCEED TO PARTS 3.4, 3.5, 3.6 AND 3.7 FOR EACH OF THE WORKER TYPES IDENTIFIED IN QUESTIONS Q02 AND Q03.

PART 3.2: EXTERNAL MANAGERS AND EXTERNAL, PAID, LONG-TERM EMPLOYEES BY AGE GROUP AND SEX

TO BE ASKED WITHIN THE SKIP PATTERN IDENTIFIED IN PART 3.1 ABOVE, ONLY FOR CASES WHERE Q02 = 1 OR 2 AND Q03a AND/OR Q03b > 0.

Q04. Identify how many [CATEGORY] paid, long-term employees of each age category worked on the holding during the past N months.

		Number of workers
Q04a	15 to 24 years	
Q04b	25 to 44 years	
Q04c	45 to 64 years	
Q04d	65 years or over	
Q04e	Not known	
Q04f	**Total** (calculated)	

PART 3.3: EXTERNAL, PAID, CASUAL WORKERS BY PROVENANCE

TO BE ASKED WITHIN THE SKIP PATTERN IDENTIFIED IN PART 3.1 ABOVE, ONLY FOR CASES WHERE Q02 = 4 AND Q03d > 0.

Q05. Identify how many paid, casual workers of each provenance worked on the holding during the past N months.

		Number of workers
Q05a	From same region as the holding	
Q05b	From another region of the same country	
Q05c	From another country	
Q05d	Not known	
Q05e	**Total** (calculated)	

PART 3.4: TIME WORKED OVER THE PAST N MONTHS

THE FOLLOWING QUESTION (Q06) WILL BE ASKED FOR THE WORKER TYPES IDENTIFIED IN Q02. PARTS 3.4, 3.5, 3.6 AND 3.7 WILL BE ANSWERED FOR ONE WORKER TYPE BEFORE THE SERIES REPEATS FOR THE NEXT WORKER TYPE.

Q06. Did any [WORKER] work on the holding in [MONTH]?

◯ 0 No → **Repeat Q06 for [WORKER] for the next [MONTH] (till Month N). If Month N = No, repeat Q06 for the next [WORKER], starting at Month 1**
◯ 1 Yes

Q07. In total, how many [CATEGORY][WORKER] worked on the holding in [MONTH]? . . . Number of workers

Q08. What was the usual number of days worked by one [CATEGORY][WORKER] in [MONTH]? . . . Days

Q09. What was the usual number of hours worked per day by [CATEGORY][WORKER] in [MONTH]? . Hours

PART 3.5: MAIN ACTIVITIES

THE FOLLOWING QUESTIONS (Q10 TO Q13) WILL BE ASKED WHERE Q07 > 0 FOR AT LEAST ONE [MONTH].

Q10. Report the number of [CATEGORY][WORKER] for whom agricultural activities (crop or livestock) were the main activity in the past N months.
***Include activities related to Activity Codes 11 to 28 or 41, or 99.**

	Number of workers
Q10a Number of workers	☐☐☐

Q11. Report the number of [CATEGORY][WORKER] for whom other economic activities of this holding were the main activity in the past N months.
***Include activities related to Activity Codes 31 to 39 or 41 or 99.**

	Number of workers
Q11a Number of workers	☐☐☐

Q12. Report the main activities that were performed by [CATEGORY][WORKER] on the agricultural holding during the past N months.

(fill in a maximum of two, that occupy the most time)

- ◯ 11 Land clearing
- ◯ 12 Ploughing
- ◯ 13 Sowing/planting
- ◯ 14 Pest control
- ◯ 15 Weed control
- ◯ 16 Harvesting, including collecting fruits
- ◯ 17 Preparation of non-processed crops for primary markets (cleaning, trimming, grading, disinfecting, packaging, etc.)
- ◯ 21 Grazing
- ◯ 22 Feeding
- ◯ 23 Shearing
- ◯ 24 Milking
- ◯ 25 Slaughtering
- ◯ 26 Breeding
- ◯ 27 Animal and veterinary care
- ◯ 28 Preparation of non-processed animals/animal products for primary markets (cleaning, grading, disinfecting, packaging of raw milk, etc.)
- ◯ 31 On-farm processing of agricultural products
  If on-farm processing of agricultural products (Code 31) is reported, specify the type of processing:
  - ◯ 31.11 Grain milling: production of flour, groats, meal or pellets of wheat, rye, oats, maize (corn) or other cereal grains
  - ◯ 31.12 Rice milling: production of husked, milled, polished, glazed, parboiled or converted rice; production of rice flour
  - ◯ 31.13 Processing and preserving of fruit and vegetables
  - ◯ 31.14 Manufacture of crude vegetable oils: olive oil, soyabean oil, palm oil, sunflower seed oil, cottonseed oil, rape, colza or mustard oil, linseed oil, etc.
  - ◯ 31.15 Manufacture of wines
  - ◯ 31.16 Distillation of spirit drinks
  - ◯ 31.17 Manufacture of tobacco products (cigars, chewing tobacco, etc.)
  - ◯ 31.21 Processing and preserving meat
  - ◯ 31.22 Manufacture of dairy products
  - ◯ 31.23 Manufacture of leather and related products
- ◯ 32 Selling of holding's products at the market/shop (including preparation, packaging and transport of processed products)
- ◯ 33 Production of forestry products
- ◯ 34 Production, processing and preserving of fish, crustaceans and molluscs
  - ◯ 34.11 Production of fish, crustaceans and molluscs
  - ◯ 34.12 Processing and preserving of fish, crustaceans and molluscs
- ◯ 35 Production of renewable energy
- ◯ 36 Contractual work for other holdings using the means of production of this holding
- ◯ 37 Accommodation, restaurant, catering and other leisure/educational activities
- ◯ 38 Making handicrafts
- ◯ 39 Training of animals
- ◯ 41 Management and/or administration
- ◯ 99 Other (specify ☐)

EXTERNAL PAID CASUAL WORKERS (Q02 = 4) ARE EXCLUDED FROM Q13

Q13. Report the number of [CATEGORY] [WORKER] that are employed in each of the following occupations.

	Number of workers
Q13a Production managers	☐☐☐
Q13b Professional and technical production staff	☐☐☐
Q13c Machinery, equipment and facilities operators	☐☐☐
Q13d General labourers	☐☐☐
Q13e Other occupations (accountants, clerical staff, mechanics, watchmen, etc.)	☐☐☐
Q13f **Total** (calculated)	☐☐☐

PART 3.6: PAYMENTS FOR WORK ON THE HOLDING

UNPAID EXTERNAL WORKERS (Q02 = 5) ARE EXCLUDED FROM PART 3.6

Q14. How often did you normally pay the majority of [CATEGORY] [WORKER] during the reference period?

*** Include wages, salaries, commission, tips or any other pay.**
*** Include in-kind payments (payments made in goods or services rather than cash, which include payments of agricultural products)**

(fill in one circle only)

- ◯ 1 Daily — RESPONSE = [FREQUENCY]
- ◯ 2 Weekly
- ◯ 3 Monthly
- ◯ 4 Yearly
- ◯ 5 Upon completion of a task or piece of work
- ◯ 6 Other (specify ☐☐☐☐☐☐☐☐☐☐☐☐)

Q15. What was the typical cash [FREQUENCY] payment for [CATEGORY][WORKER] during the reference period? . . Local currency ☐☐☐☐☐☐☐☐.☐☐

Q16. What is the estimated value of the typical in-kind [FREQUENCY] payment for [CATEGORY][WORKER]? . . Local currency ☐☐☐☐☐☐☐☐.☐☐

If the answer to Q16 > 0, ask Q17, otherwise, go to PART 3.7, Q18

Q17. How many [CATEGORY][WORKER] were paid only in-kind? . . . . . Number of workers ☐☐☐

PART 3.7: BENEFITS FOR THE WORK ON THE HOLDING

UNPAID EXTERNAL WORKERS (Q02 = 5) ARE EXCLUDED FROM PART 3.7

Q18. To how many [CATEGORY][WORKER] did the holding provide contributions for a pension fund during the reference period? Number of workers ☐☐☐

Q19. To how many [CATEGORY][WORKER] did the holding provide health insurance benefits, in whole or in part, during the reference period? Number of workers ☐☐☐

Q20. **In the last month**, what was the total value of the contributions made by the agricultural holding on behalf of [CATEGORY][WORKER] for pension funds and/or health insurance?

*** Include only the agricultural holding's share of contributions.**

- ◯ 1 Contributions made . . Local currency ☐☐☐☐☐☐☐☐.☐☐
- ◯ 99 Not known

Q21. Report the other benefits provided by the holding to [CATEGORY][WORKER] during the reference period.

(fill in all that apply)

- ◯ 1 Transportation allowance or vehicle provided
- ◯ 2 Housing allowance or housing provided
- ◯ 3 Family, dependants or similar allowance
- ◯ 4 Education allowance
- ◯ 5 Payments for absence due to sickness, parental duties, occupational injury, etc.
- ◯ 6 Payments for temporary or partial lay-off or unemployment
- ◯ 7 Severance or termination payments
- ◯ 99 None of the above → **Go to PART 3.4, Q06 for the next WORKER type identified in Q02.**
  If all identified WORKER types have been completed, proceed to SECTION 4.

Q22. **In the last month,** can you tell what is the estimated value of the other benefits provided by the agricultural holding to [CATEGORY][WORKER]?

- ◯ 1 Contributions made . . Local currency ☐☐☐☐☐☐☐☐.☐☐
- ◯ 99 Not known

CONTINUE THE ABOVE SERIES OF QUESTIONS UNTIL ALL [CATEGORY][WORKERS] ARE COVERED, THEN CONTINUE TO SECTION 4.

Comments on SECTION 3

SECTION 4: CONTRACTORS

PART 4.1: WORK ON THE HOLDING AND PAYMENTS FOR WORK ON THE HOLDING

Q01. Did the agricultural holding use any contractors during the past N months?

- ◯ 0 No → **End of survey, thank you.**
- ◯ 1 Yes

Q02. Report the main activities that were performed by contractors on the agricultural holding during the past N months.

(fill in a maximum of two, that occupy the most time)

- ◯ 11 Land clearing
- ◯ 12 Ploughing
- ◯ 13 Sowing/planting
- ◯ 14 Pest control
- ◯ 15 Weed control
- ◯ 16 Harvesting, including collecting fruits
- ◯ 17 Preparation of non-processed crops for primary markets (cleaning, trimming, grading, disinfecting, packaging, etc.)
- ◯ 21 Grazing
- ◯ 22 Feeding
- ◯ 23 Shearing
- ◯ 24 Milking
- ◯ 25 Slaughtering
- ◯ 26 Breeding
- ◯ 27 Animal and veterinary care
- ◯ 28 Preparation of non-processed animals/animal products for primary markets (cleaning, grading, disinfecting, packaging of raw milk, etc.)
- ◯ 31 On-farm processing of agricultural products

  If on-farm processing of agricultural products (Code 31) is reported, specify the type of processing:
  - ◯ 31.11 Grain milling: production of flour, groats, meal or pellets of wheat, rye, oats, maize (corn) or other cereal grains
  - ◯ 31.12 Rice milling: production of husked, milled, polished, glazed, parboiled or converted rice; production of rice flour
  - ◯ 31.13 Processing and preserving of fruit and vegetables
  - ◯ 31.14 Manufacture of crude vegetable oils: olive oil, soyabean oil, palm oil, sunflower -seed oil, cottonseed oil, rape, colza or mustard oil, linseed oil, etc.
  - ◯ 31.15 Manufacture of wines
  - ◯ 31.16 Distillation of spirit drinks
  - ◯ 31.17 Manufacture of tobacco products (cigars, chewing tobacco, etc.)
  - ◯ 31.21 Processing and preserving meat
  - ◯ 31.22 Manufacture of dairy products
  - ◯ 31.23 Manufacture of leather and related products
- ◯ 32 Selling of holding's products at a market/shop (including preparation, packaging and transport of processed products)
- ◯ 33 Production of forestry products
- ◯ 34 Production, processing and preserving of fish, crustaceans and molluscs
  - ◯ 34.11 Production of fish, crustaceans and molluscs
  - ◯ 34.12 Processing and preserving of fish, crustaceans and molluscs
- ◯ 35 Production of renewable energy
- ◯ 36 Contractual work for other holdings using the means of production of this holding
- ◯ 37 Accommodation, restaurant, catering and other leisure/educational activities
- ◯ 38 Making handicrafts
- ◯ 39 Training of animals
- ◯ 41 Management and/or administration
- ◯ 99 Other (specify [ ])

Q03. What was the total amount of payments made to contractors in the past N months? . . . . . Local currency [ ]

Q04. What was the amount of the LAST payment made to a contractor? . . . . . Local currency [ ]

Q05. To what period of time did this payment refer?

*** Report the number and type of time units separately.**

Q05a What is the time unit?

(fill in one circle only)

- ◯ 1 Hour
- ◯ 2 Day
- ◯ 3 Week
- ◯ 4 Month
- ◯ 5 Year
- ◯ 6 Upon completion of a task or piece of work → **GO TO Q06.**

Q05b What is the number of time units? [ ] → **End of survey, thank you.**

Q06. To what activities does the LAST payment refer?

(fill in all that apply)

- ◯ 11 Land clearing
- ◯ 12 Ploughing
- ◯ 13 Sowing/planting
- ◯ 14 Pest control
- ◯ 15 Weed control
- ◯ 16 Harvesting, including collecting fruits
- ◯ 17 Preparation of non-processed crops for primary markets (cleaning, trimming, grading, disinfecting, packaging, etc.)
- ◯ 21 Grazing
- ◯ 22 Feeding
- ◯ 23 Shearing
- ◯ 24 Milking
- ◯ 25 Slaughtering
- ◯ 26 Breeding
- ◯ 27 Animal and veterinary care
- ◯ 28 Preparation of non-processed animals/animal products for primary markets (cleaning, grading, disinfecting, packaging of raw milk, etc.)
- ◯ 31 On-farm processing of agricultural products

  If on-farm processing of agricultural products (Code 31) is reported, specify the type of processing:

- ◯ 31.11 Grain milling: production of flour, groats, meal or pellets of wheat, rye, oats, maize (corn) or other cereal grains
- ◯ 31.12 Rice milling: production of husked, milled, polished, glazed, parboiled or converted rice; production of rice flour
- ◯ 31.13 Processing and preserving of fruit and vegetables
- ◯ 31.14 Manufacture of crude vegetable oils: olive oil, soyabean oil, palm oil, sunflower seed oil, cottonseed oil, rape, colza or mustard oil, linseed oil, etc.
- ◯ 31.15 Manufacture of wines
- ◯ 31.16 Distillation of spirit drinks
- ◯ 31.17 Manufacture of tobacco products (cigars, chewing tobacco, etc.)
- ◯ 31.21 Processing and preserving meat
- ◯ 31.22 Manufacture of dairy products
- ◯ 31.23 Manufacture of leather and related products

◯ 32 Selling of holding's products at the market/shop (including preparation, packaging and transport of processed products)
◯ 33 Production of forestry products
◯ 34 Production, processing and preserving of fish, crustaceans and molluscs

- ◯ 34.11 Production of fish, crustaceans and molluscs
- ◯ 34.12 Processing and preserving of fish, crustaceans and molluscs

◯ 35 Production of renewable energy
◯ 36 Contractual work for other holdings using the means of production of this holding
◯ 37 Accommodation, restaurant, catering and other leisure/educational activities
◯ 38 Making handicrafts
◯ 39 Training of animals
◯ 41 Management and/or administration
◯ 99 Other (specify [ ])

Comments on SECTION 4

End of survey, thank you.

4.3. AGRIS LABOUR MODULE METHODOLOGICAL NOTE

Introduction

This note provides an overview of the Labour Module, presents its structure and content, and proposes definitions and classifications to be used within the module itself. It is meant to provide survey managers and operational staff with an understanding of the Labour Module within the context of AGRIS – which also fits into the larger context of a national statistical system.

This methodological note also discusses some issues relating to survey implementation and customization to country specificities.

- Subchapter 4.3.1 outlines the key elements underlying the module: the measurement objectives, coverage and collection, timing, and reference periods for the module. It explains how the module can respond to the data needs of priority international development initiatives in the agricultural and rural sectors.
- Subchapter 4.3.2 introduces the structure and overall articulation of the Labour Module. It presents selected labour-related indicators that can be generated from the Labour Module, and from other AGRIS modules.
- Subchapter 4.3.3 provides methodological notes and discusses options for customization for specific parts and questions of the Labour Module questionnaire. It provides definitions, and introduces relevant classifications.

4.3.1. Context, measurement objectives, statistical unit, reference periods and units of measure

4.3.1.1. The Labour Module in its AGRIS context

As noted in previous sections, AGRIS is designed as a ten-year integrated sample survey program. The annual Core Module is at the foundation of AGRIS as it collects basic frame information about holdings and those operating them, as well as data on the agricultural production of crops and livestock. A set of four Rotating Modules provides thematic data on the economy, labour, production methods and the environment, and machinery, equipment and assets. These Rotating Modules complement the Core Module data, and can be integrated not only with the Core Module, but also with each other to provide a rich data set covering all aspects of agricultural holdings.

The Labour Module of AGRIS focuses on the characteristics of the labour resources of agricultural holdings. The data gathered by the module may be grouped under four themes, which together provide a profile of the labour force in the sector. The themes are: volume of labour input, the organization of tasks among labour resources on the holding, payments and payment modalities for labour, and other labour costs. In the module, questions about labour are categorized on the basis of three types of workers: household members (for relevant holdings, that is household-sector holdings), external workers and contractors. A distinction is made between paid and unpaid labour, as well as among long-term, temporary and casual labour. Details of the content of the Labour Module can be found in chapter 3.

Table 4.7. below outlines the recommended timing and elements of the AGRIS system for agricultural statistics, including the AGRIS Core Module and the four Rotating Modules. The Labour Module is recommended to be conducted starting in the second year of the ten-year cycle, and to be conducted again four years later. With this schedule, it will be completed two times within the ten-year AGRIS cycle. The more volatile or changeable a measured attribute is, the shorter the "shelf-life" of the related statistics in providing a true indicator of the reality they are meant to represent. More frequent measurement of such attributes means that the statistical data are refreshed and updated to serve as a better indicator for use in developing policies and programmes and in assessing the state of agricultural holdings towards stated targets.

Sampling recommendations for AGRIS modules are provided in chapter 5 of this handbook, on the AGRIS sampling strategy. When possible, the Labour Module will use the same sample of the holdings that have completed the AGRIS Core Module. This will enable the data from the two modules to be combined and provide a more robust set of data, while minimizing the costs of collection and the reporting burden placed on data providers. Data are meant to be collected in the field directly from survey respondents using Computer-Assisted Personal Interview (CAPI) techniques. A CAPI version of the AGRIS Labour Module Generic Questionnaire is available in the Survey Solution package (see annex 5 of this handbook).

TABLE 4.7. RECOMMENDED AGRIS MODULE FLOW.

	Years	1	2	3	4	5	6	7	8	9	10
Core Module	Agricultural holding (AH) Roster	•	•	•	•	•	•	•	•	•	•
	Crop + livestock production	•	•	•	•	•	•	•	•	•	•
	Other key variables	•	•	•	•	•	•	•	•	•	•
Rot. Module 1	Economy	•		•		•		•		•	
Rot. Module 2	Labour		•				•				
Rot. Module 3	Production Methods and the Environment				•				•		
Rot. Module 4	Machinery, Equipment and Assets	•				•					

The Core Module of AGRIS is the framework upon which the Rotating Modules are built. It is conducted annually and primarily collects roster information for the agricultural holding, as well as crop and livestock production. In addition, some economic, labour and demographic questions are included. Along with providing annual production data, the roster information is critical in maintaining an up-to-date survey frame for the selection of samples for the Rotating Modules and future Core Module surveys.

While there are labour-related questions in the Core Module, it is not as detailed as the Labour Module in its treatment of the subject. For example, activity categories in the Core Module are restricted to crop cultivation, raising livestock and non-agricultural activities related to the holding, while the Labour Module has more detailed categories to cover this topic.

Some information from the other Rotating Modules can also be used when analysing data from the Labour Module. Where common samples are large enough, data can be combined directly for the holdings common to different Rotating Modules, to provide an even more comprehensive data profile at the micro (holding) level. If this is done, allowance must be made in the analysis to account for the fact that data for Rotating Modules will be collected in, and for, different reference periods. Even if data cannot be matched and analysed directly at the micro level, holdings can be classified into multiple Rotating Module data sets at the meso level through an appropriate farm typology, which uses characteristics such as main production type or size (available from the Core Module) to compare variables from the two modules for “similar” agricultural holdings. In this way, inferences may be made across a broad set of variables. For example, labour variables could be analysed in relation to practices reported in the Production Methods and the Environment Module to try to identify relationships. Again, it is important to account for the fact that data from different Rotating Modules will be collected in, and for, different reference periods.

Linkages can be made between the Labour Module and other Rotating Modules when calculating economic indicators (see annex 2 for more information on indicators). For example, a number of indicators require a measure for “Total costs”. While the Economy Module collects variable costs and cash costs, data mined from other modules can be used to impute non-cash costs and capital costs. In the case of non-cash costs, data from the Labour Module

provide an estimate of the value of in-kind payments for labour, and of the quantity of unpaid labour used. A wage rate can be applied to the unpaid work reported to estimate the value of the unpaid labour input. For capital costs such as depreciation, a depreciation rate can be applied to data from the Machinery, Equipment and Assets Module on numbers, types and ages of machinery to impute a value for the purposes of the indicator.

4.3.1.2. The Labour Module and international statistical frameworks

There are costs associated with production of statistics, both for the agencies that collect, process, analyse and publish them (in the form of personnel and technical costs) and for the respondents who provide the data (in the form of time and response burden). It is incumbent upon statistical agencies to maximize the value of the data resulting from the investment of these costs. Making the most of the data means that they are valuable (a) over time, (b) across jurisdictions and (c) among various user groups and uses. All three of these elements are enhanced when international statistical frameworks are adhered to, both in the production of the statistics and in their publication and use. A number of such frameworks are relevant for the Labour Module. These are introduced below as they relate to the production of data and to its use.

Relevant international statistical frameworks applied in the AGRIS Labour Module

As sound statistical practice, the application of international statistical frameworks during the development of the AGRIS Labour Module questions has ensured that the resulting data respect norms and standards that will facilitate their use. The relevant frameworks are introduced here, while more detail on the classifications presented can be found in the annex 1.

Some of the frameworks are applied broadly throughout many or all of the AGRIS modules, while others relate more specifically to the Labour Module.

An essential articulation is established in terms of timing between the ten-year AGRIS cycle and the frame building from an agricultural census. In addition, the AGRIS methodology is consistent with the World Programme for the Census of Agriculture 2020 (WCA 2020) in terms of relevant items, definitions and classifications.

The International Standard Industrial Classification of All Economic Activities (ISIC), Rev.4[1] is a framework broadly applied with AGRIS. It provides the structure and definitions to determine which activities are in-scope for inclusion in AGRIS (see annex 1-1 of this handbook).

When it comes to frameworks specifically related to the Labour Module, those coordinated by the International Labour Organization (ILO) are the most significant. The ILO is the only tripartite United Nations (UN) agency bringing together governments, employers and workers' representatives of 187 Member States. It sets labour standards, develops policies and devises programmes promoting decent work for all women and men[2]. In an important related role, the ILO is the definitive organization involved in setting international standards for labour statistics, data that are required to monitor and assess performance in its other areas of responsibility.

1 UNSD. 2008. International Standard Industrial Classification of All Economic Activities (ISIC), Rev.4. Available at http://unstats.un.org/unsd/cr/registry/regcst.asp?Cl=27. Accessed 30 October 2016.

2 ILO. 2017. About the ILO. Available at http://www.ilo.org/global/about-the-ilo/lang--en/index.htm. Accessed 6 June 2017.

The ILO International Conferences of Labour Statisticians adopt resolutions and guidelines related to labour statistics. The Nineteenth Resolution, adopted in 2013 (ILO, 2013,b), is relevant to the Labour Module. The Resolution concerning statistics of work, employment and labour underutilization[3] aims to set standards for work statistics, define statistical concepts, and provide operational concepts, definitions and guidelines. The Resolution addresses a broad range of labour statistics issues. Most relevant for the purposes of the Labour Module is its treatment of topics such as the concept of work, forms of work and age of workers.

According to the Resolution, "**work** comprises 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".

Five categories of **forms of work** are identified, based on the intended destination of the production and the nature of the transaction for the production:

- own-use production work, comprising production of goods and services for own final use;
- employment work, comprising work performed for others in exchange for pay or profit;
- unpaid trainee work, comprising work performed for others without pay to acquire workplace experience or skills;
- volunteer work, comprising non-compulsory work performed for others without pay; and
- other work activities (which are not defined in the Resolution).

Within the realm of the AGRIS Labour Module, data is collected primarily for the first two categories. In own-use production work, the intended final consumers are the workers and only production surpluses are sold. The "subsistence foodstuff producers" subcategory of this group, in which production is key to the livelihood of the household or family, is also relevant to AGRIS. On holdings that are in scope for AGRIS, the work profile may be entirely own-use production work, entirely employment work, or a combination of the two.

With respect to age limits, the Nineteenth Resolution emphasizes the importance of collecting work data for all age groups, but notes that data tabulated for the working-age population and children are relevant for policy and international reporting purposes. While specific age cut-offs are not provided in the Resolution, the Labour Module's questions on workers adopt age breakdowns that conform to the limits typically used for the working-age population in models for labour statistics: 15 years of age as the lower limit and 64 years as the upper limit. The Labour Module collects data for workers under 15 years of age, for workers 65 years old or more, and for several categories in between.

The ILO is also the custodian of the International Standard Classification of Occupations (ISCO-08)[4]. It contains concepts that were employed during the development of work-related questions in the Labour Module.

The ISCO-08 organizes occupations based on the skill level and specialization required for jobs. Jobs with similar requirements are categorized together under ten major groups, while at its most detailed level within the hierarchical classification, there are 436 unit groups. The occupation-related questions in the Labour Module provide occupation descriptions that fall within the hierarchy of ISC0-88 (see annex 1-5 of this handbook).

3 ILO. 2013. *Resolution concerning statistics of work, employment and labour underutilization*. Adopted by the Nineteenth International Conference of Labour Statisticians (October 2013). Available at http://www.ilo.org/wcmsp5/groups/public/---dgreports/---stat/documents/normativeinstrument/wcms_230304.pdf. Accessed 31 May 2017.

4 ILO. 2008. *International Standard Classification of Occupations (ISCO-08) Structure, index correspondence with ISCO-88*. Available at http://www.ilo.org/public/english/bureau/stat/isco/isco08/index.htm. Accessed 11 April 2017.

Using AGRIS labour data: relevant international statistical demand frameworks for AGRIS Labour Module data

Sustainable Development Goals supported by the AGRIS Labour Module

On 25 September 2015, countries adopted a set of goals to end poverty, protect the planet, and ensure prosperity for all as part of a new sustainable development agenda[5]. Each goal has specific targets to be achieved over the next 15 years, all coming with specific indicators[6]. AGRIS provides essential and direct information for four SDG indicators, including the two mentioned, below through its Labour Module:

- 2.3.1: Volume of production per labour unit by classes of farming/pastoral/forestry enterprise size
- 2.4.1: Proportion of agricultural area under productive and sustainable agriculture

The AGRIS Labour Module contributes to the following seven additional SDG indicators, on the subpopulation of the population associated with agricultural holdings only:

- 1.1.1: Proportion of population below the international poverty line, by sex, age, employment status and geographical location (urban/rural)
- 1.2.1: Proportion of population living below the national poverty line, by sex and age
- 1.2.2: Proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions
- 1.3.1: Proportion of population covered by social protection floors/systems, by sex, distinguishing children, unemployed persons, older persons, persons with disabilities, pregnant women, newborns, work-injury victims and the poor and the vulnerable
- 5.5.2: Proportion of women in managerial positions
- 8.7.1: Proportion and number of children aged 5-17 years engaged in child labour, by sex and age

EXAMPLES

Indicator 2.3.1 is a measure of the volume of production per labour unit by classes of farming/pastoral/forestry enterprise size. This is a measure of productivity[7]. To calculate the measure, the following variables are required.

a. **Volume of production**: a measure of agricultural production in a country. While collecting physical measures of the production of an array of agricultural products is relatively easy, aggregating those measures is difficult because it would require adding the different weights or volumes related to a variety of agricultural products, such as milk and wheat. For this reason, production is often measured as the monetary value of the agricultural production.

   AGRIS sources:

   Core Module

   agricultural production is collected in physical quantities. A value can be obtained directly for quantities of products sold. For production used for farm/household use, or for payment for labour or inputs, a value can be derived by applying a price to the quantities reported for those purposes. Section 3 (part 3.2 – Crop production and destinations) and section 4 (part 4.1 – Livestock raising activities and production) provide information on quantities of products by destination; however, they do not distinguish between household use from use for the holding.

5 http://www.un.org/ga/search/view_doc.asp?symbol=A/RES/70/1&Lang=E.
6 https://unstats.un.org/sdgs/metadata/.
7 FAO. 2001. *Agricultural investment and productivity in developing countries. Chapter: Agricultural Investment, Production Capacity and Productivity.* Social and Economic Development Paper 148. FAO Publication: Rome. Available at: http://www.fao.org/docrep/003/x9447e/x9447e03.htm. Accessed 14 January 2017.

Economy Module
the detailed reporting of the destination of production in section 5 (part 5.1 – Destination of commodities produced) provides the percentage share of commodities sold, used for the household, used to pay for farm inputs (labour or other inputs) and used for the farm as inputs (seed/feed). Therefore, it provides an estimate of intermediate inputs, as well as a value for production. The shares reported can be applied to the quantities produced and the dollar values as reported in section 2 (part 2.1 – Income from agricultural production).

b. Labour unit: a measure of paid and unpaid labour used for agricultural production. Measures could include the number of economically active persons (EAPs) or the number of person-hours

AGRIS sources:
Core Module
the number of persons and number of days are provided in section 7 (part 7.1 – Work on the holding by the holder and household members, and part 7.2 – Work on the holding by external workers).

Labour Module
the number of persons and person-hours can be calculated by summing the responses provided in section 2 (part 2.2 – Household members) and section 3 (part 3.4 – External workers).

c. Classes of farming/pastoral/forestry enterprise size: key variables against which to classify enterprises, such as land area, number of animals, economic size, etc.

AGRIS sources:
Core Module
section 1 (organization type), section 3 (agricultural area utilized – AAU) and section 4 (number of animals) provide potential indicators.

Economy Module
section 1 (part 1.1 – organization type, part 1.2 – agricultural area utilized, part 1.3 – number of animals), and section 2 (on Income and sales) may potentially provide information.

d. Variables to classify "small-scale food producers" and support the definition adopted. Such variables could include land area, number of animals, economic size and organization type (household-based vs commercial).

AGRIS sources:
Core Module
section 1 (Organization type), section 3 (Agricultural area utilized) and section 4 (Number of animals) provide potential indicators.

Economy Module
section 1 (part 1.1 – Identification, incl. organization type; part 1.2 – Agricultural area utilized, part 1.3 – Number of animals), and section 2 (sales class – parts to be determined depending on whether solely agricultural income, or other income for the holding is to be included in the classification) provide potential indicators.

e. Gender and indigenous status of the holders of agricultural holdings

AGRIS source:
Core Module
section 2.

Minimum Set of Core Data (MSCD)

The Global Strategy to improve Agricultural and Rural Statistics (Global Strategy) is a coordinated effort to provide a conceptual and institutional framework for the production of data, to establish a Minimum Set of Core Data (MSCD) required to meet the basic and emerging demands of national development policies, to develop cost-effective methodologies for data production and use, and to establish the necessary governance structures and capacities.

The MSCD covers three dimensions:

- Economic: outputs, trade, resources, inputs, prices, agro-processing; final expenditure; rural infrastructure
- Social: employment status, education level, household composition, family workers, sex disaggregated data
- Environmental: soil degradation, water population, greenhouse gases, agricultural practices on water use, land use, etc.

The proposed set of AGRIS questionnaires generate approximately two thirds of the MSCD data requirements. AGRIS generates all of the MSCD-relevant data to be collected at farm level. The labour questionnaire generates approximately 12 MSCD items under "Economic - Stock of resources/economically active population" and "Social – Demographics of urban and rural population".

4.3.1.3. Measurement objectives

The Labour Module has, as its foundation, four main measurement objectives:

- measure the volume of the labour input of household members and external workers;
- measure the organization of labour in agricultural holdings;
- measure payments and payment modalities; and
- measure additional labour costs.

Data to address these measurement objectives are collected in such a manner as to provide disaggregated results based on categories of worker. Not only is a distinction made between household members and external workers; in addition, further detail will distinguish whether external workers are managers, or workers engaged on a long-term, temporary or casual basis. Additional disaggregation by sex and age categories for all workers will be possible, thus providing a wealth of data that is well suited for policy and development purposes. This comprehensive profile of labour on agricultural holdings will allow for a thorough understanding of the types of work done, by whom, and by means of what employment and compensation arrangements. It will also enumerate the use of contractors.

To **measure the volume of labour**, the number of workers and the quantity of time worked are key elements of the module, along with an indicator on the use of contractors. Worker shortages are also reported in the module, along with the reasons for such shortages and their consequences for the holding.

To **measure the organization of labour**, detailed questions provide insights into what types of work are done (activities) and by whom (worker type). In addition, any other non-agricultural economic activities undertaken are enumerated. Thus, a better understanding can be achieved as to the range of endeavours carried out by holdings.

To **measure payments and payment modalities**, detailed questions provide insights into the means through which holdings obtain the labour resources required to produce agricultural products. The amounts of cash payments, as well as an indicator of in-kind payment, are collected. Benefits paid by the holding on behalf of workers are also included. The module enumerates the use of unpaid labour, both from within the household and by external unpaid workers. It will provide a comprehensive picture of the labour context in which food is produced.

Measuring additional labour costs rounds out the picture of how work is accomplished on agricultural holdings. The use of contractors provides an alternative to hiring employees directly. Identifying the use of contractors, the activities they perform and the amounts paid for their services are important elements of the labour picture for many holdings.

4.3.1.4 Statistical unit and coverage

The agricultural holding

The statistical unit of AGRIS, including its Labour Module, is the agricultural holding, as an independent producer of agricultural products. The definition proposed for AGRIS is that proposed by FAO in its WCA 2020 (FAO, 2015).

> "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."

The agricultural holding is under single management, exercised by the holder (see the methodological note for the Core Module).

Using the terminology adopted in the System of National Accounts 2008 (SNA 2008), farms can be grouped into (1) those that are defined as household units (that is, holdings in the household sector); and (2) all other institutional units engaged in agricultural production (or holdings in the non-household sector), such as corporations and government institutions. In most countries, the majority of agricultural production occurs in the household sector. The concept of "agricultural holding" is therefore closely related to that of "household". Both subpopulations should be covered by AGRIS, as household-sector and non-household-sector holdings (see annex 1-4).

Coverage and use of thresholds

AGRIS should cover all relevant agricultural activities of the agricultural holdings in a country that fall within the scope of the ISIC groups mentioned above. In accordance with each country's characteristics, thresholds based on variables indicating a holding's size can be fixed for the entire country, with the objective of covering the largest share possible of agricultural production and to exclude very small agricultural holdings that contribute little to total agricultural production. Potential variables to establish size could be area in crops, number of livestock, value of sales, or combinations of these. The country's agricultural census and the AGRIS surveys should be considered when deciding whether to implement thresholds. If there are no thresholds in the census or the surveys, the data resulting from the two sources are directly comparable from a coverage perspective; both sources are useful in updating the entire frame of agricultural holdings.

If the census has not established a threshold, but the surveys have done so, the census data can be used as a benchmark to estimate for the target population that falls outside of the survey thresholds or the survey population. In this case, the coverage of the two sources is identical, thus ensuring data comparability. Even if the survey is not adjusted to account for the population outside of the threshold, census data can be tabulated to reflect the coverage of the survey population, to compare data from the two sources.

If thresholds are applied to both the census and the surveys, they should either be identical, or the census should be more inclusive (that is, less restrictive) than the survey, to maintain the census's capability to provide the frame for the survey.

The benefits of establishing thresholds is to be carefully assessed: if a reduced respondent burden and budget savings related to a smaller sample are obvious advantages, disadvantages would include the continued need to monitor small-scale holdings, which are not included in the survey population but are nonetheless often of primary policy concern.

4.3.1.5. Reference period and timing

4.3.1.5.1. Reference period

A number of reference periods are used in the AGRIS Labour Module, depending on the type of data being collected and the number of waves of collection adopted for the module. Below is a list and description of each.

- **The reference year (YYYY/MM/DD) to (YYYY/MM/DD)** coincides with the last complete agricultural year and with the main reference period for the AGRIS Core Module. This is used for section 1 of the questionnaire providing an overview of the holding's activities and labour. Regardless of whether the Labour Module is conducted in several waves (as recommended) or in a single wave, the reference period for section 1 will be the reference year. In a multiple-wave collection scenario, the remainder of the questionnaire (sections 2 to 4) will have a shorter reference period, to facilitate respondent recall. In a single-wave collection scenario, the entire Labour Module questionnaire will adopt a 12-month reference period. This reference period is consistent with the Core Module, and makes the data for the Core and Labour Modules directly comparable.
- **The last *N* months** is a reference period used to report in the bulk of the questionnaire in a multiple-wave collection scenario. The value of N will vary based on the number of waves of collection, with the principle being that an entire 12-month period should be covered by combining data from all waves of collection. The adoption of a shorter reference period is to facilitate respondent recall, thereby improving data quality.
- **The last month** is a reference period used to report the payment of benefits for household member workers and external workers.
- **Respondent-specified periods** are used for the "last payment" for household member workers, external workers and contractors. Respondents report an amount for the last payment and select the period to which the payment refers: hour, day, week, month, year, or upon completion of a certain task or piece of work.

4.3.1.5.2. Timing

The timing of the collection of the Labour Module will depend on the timing of the Core Module of AGRIS, as the two should be administered together. The recommended collection plan for the Labour Module is a multi-wave approach – in most cases, this will mean two waves. The first wave could cover the sowing period, while the second wave could cover the harvest period and contain section 1 of the questionnaire, which deals with the entire 12-month period. To maximize respondent recall, timing that is in close proximity to the end of the waves' respective reference periods is optimal. If agricultural operators must meet mandatory administrative reporting requirements related to their labour usage or to the wages and benefits paid – such as tax reporting or reporting for the purposes of agricultural programmes – the decision to time the Labour Module after these requirements are met should be considered, as these administrative records may be a good source for respondent reporting in the Labour Module.

Acknowledging that among respondents for the AGRIS surveys, there will be a range of practices with respect to record-keeping, it is reasonable to tailor the type and frequency of data collection, to enable respondents to provide quality data as far as possible. Where accounting and labour-related records are kept, they provide an excellent source of information for respondents to use when completing the Labour Module, and their use results indeed in the good quality of the survey data. When record-keeping is not undertaken or is not complete, answering the Labour Module relies on the respondent's recall. To reduce data quality problems related to memory bias (the respondent's inability to recall with precision information for a longer period), a multi-wave collection approach is recommended.

However, different factors may make it impossible to adopt this approach. An option for a one-visit approach is being developed to account for such situations. The adaptations proposed for a one-visit collection option should help to alleviate some of the problems inherent in a longer recall period.

BOX 3. OPTIONS FOR A ONE-VISIT APPROACH.

If implementing national agencies decide to administer the Labour Module with a one-visit approach, it is recommended that they amend the questions on time worked to avoid very long recall periods. The following options can be implemented.

Time worked by household members

- Option (a) Divide the recall period into seasons (for example, low and high season) so that shorter reference periods are used. The recall periods selected should be more homogenous with respect to the work profile than when a 12-month period is used.
- Option (b) Ask each household member to quantify what high, medium and low months are like, in terms of time worked. Then, ask each household member to rate each month of the year as high, medium or low.

Time worked by external workers

- Option (a) Divide the recall period into seasons (for example, low and high season) so that shorter reference periods are used. The recall periods used should presumably be more homogenous with respect to the work profile than when a 12-month period is used.
- Option (b) Ask the holder to quantify what high, medium and low months are like, in terms of time worked by external workers. Then, ask the respondent to rate each month of the year as high, medium or low.
- Both options (b) described above are being tested in Ghana, and the corresponding sections for an alternative questionnaire are being designed and will be made available with version 1.2 of the AGRIS Generic Questionnaires.

4.3.1.6. Units of measure

A large portion of the reporting in the Labour Module consists simply in identifying, from lists of potential answers or categories, those that are relevant for the respondent holding (that is, tick-box responses). Examples are questions in which holdings identify their types of workers, worker age categories, types of work activities, payment types, types of "other" benefits provided, etc. Many other questions ask respondents to report the number of workers in various categories. The units of measure in the Labour Module relate to questions that account for time worked and the amount of payments made to workers on agricultural holdings.

Reporting time worked

Standard time units are used throughout the Labour Module for reporting time. They include months, weeks, days and hours. To facilitate the provision and collection of data for respondents and enumerators, respondents are provided with all of these time units. They are then asked to report using the unit of measure that best aligns with the practices followed on the holding.

Reporting monetary values

The official currency of the country should be used to report monetary values throughout the Labour Module. This will facilitate reporting by data providers, and enables it to be compiled and disseminated for domestic use. However,

for the sake of coherence when making comparisons with other jurisdictions, monetary values should be converted to a standard international currency and made available to data users in this way.

4.3.2. Structure of the Labour Module and main indicators

The Labour Module questionnaire is divided into four sections, with 14 parts. Table 4.8. below summarizes the organization of the thematic coverage of each of these sections and parts and lists the main indicators to which each part contributes. There are 21 indicators presented, under the themes of:

- Labour input
- Organization of labour on the holding
- Cost of labour
- Wages and earnings of workers
- Other relevant labour/economy indicators

The proposed indicators can provide a way to organize data from the Labour Module (and other AGRIS modules) to help shed light on the labour characteristics of the agricultural sector.

Some of the sections or parts of the Labour Module may only be relevant and applicable to holdings operated by holdings in the household sector; that is, those for which the holder is a civil (natural) person or group of civil (natural) persons. This is identified in Table 4.8., where applicable. In addition, the reference period employed is presented for each section and part.

TABLE 4.8. STRUCTURE OF THE AGRIS LABOUR MODULE.

Sections (S) and parts (P) of the AGRIS Labour Module questionnaire	Main themes included	Main indicators that can be calculated
S1. Overview of the holding's activities and labour during the reference year	This section is to be completed by all holdings. The reference period is the last agricultural year (reference year).	
P1.1. Identification of the agricultural holding	Identification of the legal status of the holder and, when the holder is an individual or group of civil (natural) person(s), identification of all household members.	
P1.2. Activities of the agricultural holding during the reference year	Identification of all agricultural activities and other economic activities carried out on the holding, and for each of these: The months during which they were carried out, and The types of worker involved Identification of the peak months for agricultural activities Identification of whether there were labour shortages during peak months and if so: Main reason Effects of the shortage on the holding	Labour input (2.2.1.) Indicator II. Proportion of holdings facing lack of labour: Percentage of holdings facing lack of labour – part 1.2 Percentage of holdings facing lack of labour by main reason for labour shortage – part 1.2 Percentage of holdings facing lack of labour by consequence of labour shortage – part 1.2
S2. Household members: time worked, main activities, payments and benefits for work on the holding	This section is only to be completed by holdings whose holder is a civil (natural) person or group of civil (natural) persons (that is, holdings in the household sector). All questions relate to household members. The reference period is the past N months unless specified otherwise below.	

Sections (S) and parts (P) of the AGRIS Labour Module questionnaire	Main themes included	Main indicators that can be calculated
P2.1. Agricultural work on the holding in the past N months	Identification of household members involved in the holding, and for each of these: Their role on the holding Time spent on agricultural activities Main agricultural activity	Labour input (2.2.1.) Indicator I. Total labour input – parts 2.1 and 2.2; part 3.4; part 4.1 Organization of labour on the holding (2.2.2.) Indicator I. Labour profile for household members: Proportion of household members engaged in agricultural activities on the holding – part 2.1 (and Core Module part 6.1) Average time household members spent on agricultural work and other economic activities on the holding – part 2.1 and part 2.2 (and Core Module part 6.1) Cost of labour (2.2.3.) Indicator II. Type of pay and benefit arrangements: Proportion of household member workers by payment type – part 2.1 and part 2.3 c) Proportion of household member workers who received benefits – part 2.1 and part 2.4 Wages and earnings of workers (2.2.4.): Average wages of paid household member workers – part 2.1 and part 2.3 (and Core Module part 6.1) Other relevant labour/economy indicators (2.2.5.) Indicator II. Productivity: Labour productivity – part 2.1, part 3.4, part 3.5 and part 4.1 (and Core Module and Economy Module, various parts)
P2.2. Work on other economic activities on the holding in the past N months	Identification of household members involved in other economic activities on the holding and for each of these: All of the other economic activities carried out Time spent on other economic activities	Labour input (2.2.1.) Indicator I. Total labour input – parts 2.1 and 2.2; part 3.4; part 4.1 Organization of labour on the holding (2.2.2.) Indicator I. Labour profile for household members: Average time household members spent on agricultural work and other economic activities on the holding – parts 2.1 and 2.2 (and Core Module part 6.1)

Sections (S) and parts (P) of the AGRIS Labour Module questionnaire	Main themes included	Main indicators that can be calculated
P2.3. Payments for work on the holding	For each household member involved in agricultural activities and/or other economic activities on the holding: Whether paid for their work Where paid: How paid (cash, in kind, both) Amount of last cash payment and period to which it referred Value of last in-kind payment and period to which it referred	Cost of labour (2.2.3.) Indicator I. Total labour costs – part 2.3, part 2.4, part 3.6 and part 3.7 Cost of labour (2.2.3.) Indicator II. Type of pay and benefit arrangements: Proportion of household member workers by payment type – part 2.1 and part 2.3 Wages and earnings of workers (2.2.4.): Average wages of paid household member workers – part 2.1 and part 2.3 (and Core Module part 6.1) Other relevant labour/economy indicators (2.2.5.) Indicator I. Profitability: (a) & (b) Total costs of production per hectare and Cost of production per hectare by item – part 2.3, part 2.4, part 3.6, part 3.7 and part 4.1 (and Economy Module, various parts)
P2.4. Benefits for work on the holding	For each household member involved in agricultural activities and/or other economic activities on the holding: Whether they receive contributions to a pension fund from the holding Whether they receive health benefits from the holding Where benefits were received: The total contributions made by the holding in the last month on behalf of the household member	Cost of labour (2.2.3.) Indicator I. Total labour costs – part 2.3, part 2.4, part 3.6 and part 3.7 Cost of labour (2.2.3.) Indicator II. Type of pay and benefit arrangements: Proportion of household member workers who received benefits – part 2.1 and part 2.4 Wages and earnings of workers (2.2.4.): Average benefits of paid household member workers – part 2.4 (and Core Module part 6.1) Other relevant labour/economy indicators (2.2.5.) Indicator I. Profitability: (a) & (b) Total costs of production per hectare and Cost of production per hectare by item – part 2.3, part 2.4, part 3.6, part 3.7 and part 4.1 (and Economy Module, various parts)
S3. External workers: demographic characteristics, time worked, main activities, payments and benefits for work on the holding	This section is to be completed by all holdings. All questions in the section relate to external workers. For agricultural holdings where the holder is a legal person, all workers are considered external, even if they live in the household of the holder. The reference period is the past N months unless specified otherwise below.	

Sections (S) and parts (P) of the AGRIS Labour Module questionnaire	Main themes included	Main indicators that can be calculated
P3.1. Demographic characteristics	Determination of whether there were external workers, and if there were: Identification of the presence of five categories of external worker For each category of worker: Number of adults, by sex and number of children	Organization of labour on the holding (2.2.2.) Indicator II. Labour profile for external workers and contractors: Proportion of holdings using external workers (by category of external worker) – part 1.1 and part 3.1 Average time external workers worked on the holding (by category of external worker, sex) – part 3.1 and part 3.4 Cost of labour (2.2.3.) Indicator II. Type of pay and benefit arrangements: Proportion of external workers by payment type – part 3.1 and part 3.6 Proportion of external workers who received benefits – part 3.1 and part 3.7 Wages and earnings of workers (2.2.4.): Average wages of external workers – part 3.1 and part 3.6
P3.2. External managers and external, paid, long-term employees by age group and sex	For each of the two categories (external managers and external, paid, long-term employees, by sex: Number in each of four age categories (plus a "not known" category to be used only when respondents cannot estimate)	
P3.3. External, paid casual workers by provenance	Number of workers in three provenance categories (plus a "not known" category to be used only when respondents cannot estimate)	
P3.4. Time worked over the past N months	By type of worker, by category (adult male, adult female, child) for each month in the reference period: Number who worked Usual time worked	Labour input (2.2.1.) Indicator I. Total labour input – part 2.1 and 2.2; part 3.4; part 4.1 Other relevant labour/economy indicators (2.2.5.) Indicator II. Productivity: Labour productivity – part 2.1, part 3.4, part 3.5 and part 4.1 (and Core Module and Economy Module, various parts)
P3.5. Main activities	By type of worker, by category (adult male, adult female, child): Number that performed agricultural activities and the number that performed other economic activities Identification of the two main activities performed Number in each of five occupation categories (external, paid, casual workers excluded)	Other relevant labour/economy indicators (2.2.5.) Indicator II. Productivity: Labour productivity – part 2.1, part 3.4, part 3.5 and part 4.1 (and Core Module and Economy Module, various parts)

Sections (S) and parts (P) of the AGRIS Labour Module questionnaire	Main themes included	Main indicators that can be calculated
P3.6. Payments for work on the holding	By type of worker, by category (adult male, adult female, child), with the exception of unpaid external workers: Normal frequency of payment By frequency of payment by type of worker and by category: Normal cash payment Normal value of in-kind payment Number of workers paid only in kind	Cost of labour (2.2.3.) Indicator I. Total labour costs – part 2.3, part 2.4, part 3.6 and part 3.7 Cost of labour (2.2.3.) Indicator II. Type of pay and benefit arrangements: Proportion of external workers by payment type – part 3.1 and part 3.6 Wages and earnings of workers (2.2.4.): Average wages of external workers – part 3.1 and part 3.6 Other relevant labour/economy indicators (2.2.5.) Indicator I. Profitability: (a) & (b) Total costs of production per hectare and Cost of production per hectare by item – part 2.3, part 2.4, part 3.6, part 3.7 and part 4.1 (and Economy Module, various parts)
P3.7. Benefits for work on the holding	By type of worker, by category (adult male, adult female, child), with the exception of unpaid external workers: Number for whom the holding made contributions to a pension plan Number for whom the holding provided health insurance benefits Total contribution in the last month to pensions and health insurance on behalf of workers Identification of other benefits provided during the reference period Value of other benefits provided in the last month	Cost of labour (2.2.3.) Indicator I. Total labour costs – part 2.3, part 2.4, part 3.6 and part 3.7 Cost of labour (2.2.3.) Indicator II. Type of pay and benefit arrangements: Proportion of external workers who received benefits – part 3.1 and part 3.7 Wages and earnings of workers (2.2.4.): Average benefits of external workers – part 3.7 Other relevant labour/economy indicators (2.2.5.) Indicator I. Profitability: (a) & (b) Total costs of production per hectare and Cost of production per hectare by item – part 2.3, part 2.4, part 3.6, part 3.7 and part 4.1 (and Economy Module, various parts)
S4. Contractors	This section is to be completed by all holdings. All questions in the section relate to contractor workers. The reference period is the past N months unless specified otherwise below.	

Sections (S) and parts (P) of the AGRIS Labour Module questionnaire	Main themes included	Main indicators that can be calculated
P4.1. Work on the holding and payments for work on the holding	Determination of whether contractors were used, and if there were: Identification of the two main activities performed Total amount of payments to contractors Amount of last payment, the period to which it referred and the activities to which it referred	Labour input (2.2.1.) Indicator I. Total labour input – part 2.1 and 2.2; part 3.4; part 4.1 Organization of labour on the holding (2.2.2.) Indicator II. Labour profile for external workers and contractors: Proportion of holdings using contractors – part 1.1 and part 4.1 Other relevant labour/economy indicators (2.2.5.) Indicator I. Profitability: (a) & (b) Total costs of production per hectare and Cost of production per hectare by item – part 2.3, part 2.4, part 3.6, part 3.7 and part 4.1 (and Economy Module, various parts) Other relevant labour/economy indicators (2.2.5.) Indicator II. Productivity: Labour productivity – part 2.1, part 3.4, part 3.5 and part 4.1 (and Core Module and Economy Module, various parts)

Detailed descriptions of the main indicators, including the required variables and calculations, are available in annex 2 of this handbook.

4.3.3. Content, proposed definitions and classifications in the Labour Module

4.3.3.1. Content

4.3.3.1.1. Section 1: overview of the holding activities and labour

Part 1.1 – Identification of the agricultural holding – is completed when the Labour Module is conducted through a collection wave that is not synchronized with the AGRIS Core Module. When the module is conducted concurrently with the Core Module, the two questionnaires will be integrated and the holding will be identified directly from the Core Module. It provides information on links to the Core Module, as well as on the legal status of the agricultural holding and the holder(s).

Part 1.2 – Activities of the agricultural holding during the reference year – provides the opportunity for respondents to identify all of the activities undertaken on the holding during the reference year. The activity choices include 15 activities that are directly related to primary agricultural production (agricultural activities), as well as activities that are closely related to agriculture or could be undertaken using the means of production of the agricultural holding.

These are referred to as “other economic activities” and include:

- On-farm processing of agricultural products (with subcategories to be reported)
- Selling of holding’s products at a market or shop (including preparation, packaging and transport of processed products)
- Production of forestry products
- Production, processing and preserving of fish, crustaceans and molluscs
- Production of renewable energy
- Contractual work for other holdings using the means of production of this holding
- Accommodation, restaurant, catering and other leisure or educational activities
- Making handicrafts
- Training of animals
- Management and/or administration for the holding
- Other (specify)

Details on the months in which each reported activity was carried out and on the types of worker involved in the activity are identified.

The peak months for agricultural activities in the past 12 months are identified. Further questions determine if more workers were needed during peak months than were present on the holding, and if so, the main reason for and consequences of the shortage. National agencies implementing AGRIS may find it useful to limit the scope and purpose of the question on peak months, Q04, to specific activities and/or key agricultural activities.

4.3.3.1.2. Section 2 – household members: time worked, main activities, payments and benefits for the work on the holding

The Generic Labour Module questionnaire proposes filter questions to avoid unnecessary overburden of respondents (**Q01**). During data processing, a specific value must be assigned to the skipped variables to avoid any analytical error. This is valid for all such skip questions throughout the questionnaires.

This section is only to be collected when the holder is a civil (natural) person or group of civil (natural) persons (that is, holdings in the household sector). It should be noted that in some cases, the “group of civil persons” may be outside of the household sector because the association between two holders (who do not live in the same household) would have to be registered under the national legislation. As a consequence, the household members working on the holding would have to be registered as external employees (as a legal person). Where the holder is a legal person (or the holding is defined as being a holding in the non-household sector following application of a combination of criteria), the interviewer should go directly to section 3.ì

Part 2.1 – Agricultural work on the holding in the past N months establishes which household members were involved in agricultural activities on the holding during the past N months. Once the number of household-member workers is established, the rest of the questions in section 2 are asked for each of them individually. Information collected in the rest of part 2.1 includes their position in the holding (holder/co-holder, manager or worker), and the average time contribution to the holding’s agricultural activities (number of months, average days per month and average hours per day they carried out agricultural activities). This part of the questionnaire also identifies the main agricultural activity of each of the household member workers.

When completing **Q02**, “What is [NAME]’s position on the holding?”, potential responses are:

1. Holder/co-holder of the holding
2. Manager
3. Worker on the holding, with no decision-making role

Where a household member performs mainly administrative tasks on the holding, the appropriate response to the question would be answer code 3, “Worker on the holding, with no decision-making role”.

For household members who are not involved in agricultural activities, the interviewer proceeds directly to part 2.2.

Part 2.2 – Work on other economic activities on the holding in the past N months is asked for all household members. It establishes who (as detailed in the description of part 2.1 above) was involved in “other economic activities” on the holding in the past N months. For those involved in other economic activities, the time contribution to these activities (number of months, average days per month and average hours per day they carried out agricultural activities) is collected.

Part 2.3 – Payments for work on the holding: for household members who worked on agricultural activities and/or other economic activities in the past N months, this part of the questionnaire establishes whether they received payment and if so, the type of payment:

- Paid only in cash
- Paid only in kind
- Paid both in cash and in kind

For those receiving payment, further detail is collected separately for cash payments and in kind payments. The detail includes the amount of the last payment, and the time period to which the payment refers. Options for payment time periods are:

- Hour
- Day
- Week
- Month
- Year
- Upon completion of a task or piece of work

If the last option is selected, the respondent is asked to estimate how long it took to complete the task or piece of work.

It is proposed that the questions for the holder be identical to those for the other workers. National agencies implementing AGRIS may consider changing this when relevant.

Part 2.4 – Benefits for the work on the holding: for household members who worked on agricultural activities and/or other economic activities in the past N months, this part of the questionnaire establishes whether they received contributions to a pension fund from the agricultural holding. It also determines whether they received health insurance benefits from the holding. For those receiving benefits, the amount of the holding’s contributions in the last month are collected.

4.3.3.1.3. Section 3 – external workers: demographic characteristics, time worked, main activities, payments and benefits for the work on the holding

This section of the questionnaire is asked of all holdings, whether of the household or non-household sector. For holdings whose holder is a legal person (or for holdings defined as holdings in the non-household sector, following application of a combination of criteria), all workers are considered external workers, even if they reside in the household of the holder. When the holding is defined as falling within the non-household sector but the holder (or holders) is a (are) civil person(s), the category of holder may have to be added when collecting data in section 3.

Part 3.1 – Demographic characteristics: the type of external workers is identified as falling within one of the following categories:

- External managers
- External, paid, long-term employees (hired permanently, that is, for more than a season)
- External, paid, temporary workers (hired for a season or less)
- External, paid casual workers (hired on a daily or weekly basis)
- Unpaid external workers (that is, mutual helpers, unpaid trainees, volunteers)

For each of the worker types present on a holding, the number of adult males, adult females and children under 15 are reported. These categories are mutually exclusive. For example, a 16-year-old female would be reported as an adult female.

Part 3.2 – External managers and external, paid, long-term employees by age group and sex: this part of the questionnaire is only asked when external managers or external paid long-term employees are reported. The information is collected separately for each of these two categories. The number of employees in each of four age breakdowns is collected separately for adult males and adult females. The categories are: 15–24 years; 25–44 years; 45–64 years; and 65 years or over. This detail is deemed possible for respondents to provide, as the long-term nature of the employment of these workers on the holding would foster enough familiarity for this to be common knowledge. “Not known” is a valid response for this question; however, it is not actively offered to respondents as a response category during the survey interview. Rather, if the respondent is unable to estimate an age category for the worker, “not known” may be entered by the interviewer as the response. Throughout the questionnaire, if respondents are uncertain as to the answer to a survey question, they should be encouraged by the interviewer to provide their best estimate.

Part 3.3 – External, paid, casual workers by provenance is only asked when external, paid, casual workers are reported. The number of employees in each of three provenance categories is asked. The categories are:

- From the same region as the holding
- From another region of the same country
- From another country

As is the case with part 3.2, “Not known” is a valid but not actively offered response category for part 3.3.

Part 3.4 – Time worked over the past N months is asked for all categories of external workers. For each type and sex category of worker, the number working in each month in the period of N months is determined. In addition, the total number of person-days and the usual number of hours worked per day are collected. This provides a total number of person-hours worked by each worker type and sex category for each month of the reference period.

Part 3.5 – Main activities: **Q10** to **Q12** are asked for all categories of external workers with a reference period of N months. National agencies implementing AGRIS may consider treating managers differently from other workers. For each type and sex category of worker, the number working on agricultural activities is reported, as is the number working on other economic activities on the holding. A maximum of two main activities is reported for each category of external worker. In **Q13**, the number of workers in each external worker category that are employed in four

specific and one "Other" occupation types are reported, except for the category of "casual workers". The occupation types align with the International Standard Classification of Occupations (ISCO-08) Major groups[8] (see annex 1-5 of this handbook). The occupation types, with their corresponding ISCO-08 references, are:

- Production managers (ISCO-08 Major group 1, Managers)
- Professional and technical production staff (ISCO-08 Major group 3, Technicians and Associate Professionals)
- Machinery, equipment and facilities operators (ISCO-08 Major group 6, Skilled Agricultural, Forestry and fishery workers, ISCO-08 Major group 8, Plant and Machine Operators and Assemblers)
- General labourers (ISCO)-08 Major group 9, Elementary Occupations)
- Other occupations (accountants, clerical staff, mechanics, watchmen, etc.) (ISCO-08 other major groups and occupations)

Part 3.6 – Payments for work on the holding asks for the normal frequency of payment for each category of external worker, the typical amount of a payment during the reference period for cash payments, and separately, the value of a typical in-kind payment. The number of each category of external worker paid only in in-kind payments is also reported.

Part 3.7 – Benefits for work on the holding asks for the number of each category of external worker for whom a pension contribution was made by the holding during the reference period. The same is asked for contributions for health insurance benefits. An aggregate value of contributions in the last month for these two types of benefits is reported for each category of external worker. Other types of benefits provided to each category of external worker by the holding are identified individually, and an aggregate value for all "Other" benefits paid in the last month is reported for each worker category. The "Other" types of benefits to be reported by respondents, when applicable, are:

- Transportation allowance or vehicle provided
- Housing allowance or housing provided
- Family, dependants or similar allowance
- Education allowance
- Payments for absence due to sickness, parental duties, occupational injury, etc.
- Payments for temporary or partial layoff or unemployment
- Severance or termination payments

Typically, this part will not be asked for external, unpaid workers. National agencies implementing AGRIS may consider changing this procedure if benefits could be provided to this category of workers.

4.3.3.1.4. Section 4 – contractors

This section of the questionnaire is asked of all holdings, whether they are in the household or the non-household sector. In part 4.1 – Work on the holding and payments for work on the holding, the use of contractors is identified, along with the identification of a maximum of two activities (from a list of agricultural activities and other economic activities) performed by contractors, and the total amount paid during the reference period. The amount of the last payment to contractors, the period to which it refers and the activities to which it refers are also collected.

8 ILO. 2008. International Standard Classification of Occupations ISCO-08 *Structure, index correspondence with ISCO-88*. Available at http://www.ilo.org/public/english/bureau/stat/isco/isco08/index.htm.

4.3.3.2. Definitions and classifications

The following definitions are proposed for the Labour Module, in addition to the ones already proposed for the Core Module.

TABLE 4.9. DEFINITIONS OF SELECTED TERMS USED IN THE LABOUR MODULE AND THEIR LOCATION IN THE QUESTIONNAIRE.

	Term	Section & Part	Definition
1	Age of worker	S3 P3.1 P3.2	Age categories to be included in the Labour Module have been established to conform to the definition of "working age" generally used for labour statistics internationally. The ILO indicates that 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. For the purposes of the AGRIS Labour Module, and in keeping with general practice, the lower bound for "adult" workers is 15 years of age. While there may not always be an upper bound to the definition of working age, when there is, it is usually 64 years. These lower and upper bounds are incorporated into the age categories used in the Labour Module to improve the comparability of results across jurisdictions. The age categories can be defined as follows: • Children under 15 years of age • 15–24 years • 25–44 years • 45–64 years • 65 years or over
2	Household member	S2-all	This is a relevant category for holdings that are operated by a civil (natural) person or group of civil (natural) persons (that is, holdings in the household sector). Persons residing in the household of a holder are considered household members. Household members may be related or unrelated to each other. In the context of the Labour Module, those household members who provide labour to the holding are of interest. For holdings that are operated by a legal person (such as corporations and other entities in the non-household sector), household members are not a relevant concept.

	Term	Section & Part	Definition
3	External worker	S3-all	For holdings operated by a legal person (such as corporations and other entities in the non-household sector), all workers are considered external workers, even if they reside in the household of a holder. For holdings that are operated by a civil (natural) person or group of civil (natural) persons (that is, holdings in the household sector), workers who are not members of the household of the holder(s) are considered external workers.
	3a Manager	S3-all	"**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" (FAO, 2015, WCA 2020, para 8.1.29). The difference between a manager and a paid, long-term employee is the level of decision-making responsibility inherent in the role of manager.
	3b Paid, long-term worker	S3-all	A worker hired permanently for more than one season. May work full-time or part-time. May be paid in cash or in-kind.
	3c Paid, temporary worker	S3-all	A worker hired for one season or less. May work full-time or part-time. May be paid in cash or in-kind.
	3d Paid, casual worker	S3-all	A worker hired for a short term such as on a daily or weekly basis. May be paid in cash or in-kind.
	3e Unpaid, external worker	S3-all	A worker who is not paid for work on the holding. Examples are mutual helpers, unpaid trainees, volunteers, unpaid relatives living in another household, etc.
4	Contractor	S4-all	A unit, person, company, etc., hired to provide specific services and/or goods to the holding, under the terms of a contract rather than in an employer–employee relationship.
5	Agricultural activities	S2-P2.2 S3-P3.5 S4-P4.1	Agricultural activities on the holding are those that are directly related to the production of primary agricultural products. Examples are: *Crop-related activities:* • land clearing • ploughing • sowing/planting • pest control • weed control • harvesting (including collecting fruits) • preparation of non-processed crops for primary markets • (cleaning, trimming, grading, disinfecting, packaging, etc.) *Livestock-related activities:* • grazing • feeding • shearing • milking • slaughtering • breeding • animal and veterinary care • preparation of non-processed animals/animal products for primary markets (cleaning, grading, disinfecting, packaging of raw milk, etc.) *General activities:* management and/or administration for the holding

	Term	Section & Part	Definition
6	Other economic activities	S2-P2.2 S3-P3.5 S4-P4.1	Other economic activities on the holding are those that are closely but not directly related to agriculture. Other economic activities may use the means of production of the agricultural holding. Examples are: • On-farm processing of agricultural products ‣ Grain milling: production of flour, groats, meal or pellets of wheat, rye, oats, maize (corn) or other cereal grains ‣ Rice milling: production of husked, milled, polished, glazed, parboiled or converted rice; production of rice flour ‣ Processing and preserving of fruit and vegetables ‣ Manufacture of crude vegetable oils: olive oil, soybean oil, palm oil, sunflower-seed oil, cottonseed oil, rape, colza or mustard oil, linseed oil, etc. ‣ Manufacture of wines ‣ Distillation of spirit drinks ‣ Manufacture of tobacco products (cigars, chewing tobacco, etc.) ‣ Processing and preserving meat ‣ Manufacture of dairy products ‣ Manufacture of leather and related products • Selling of holding's products at a market or shop (including preparation, packaging and transport of processed products) • Production of forestry products • Production, processing and preserving of fish, crustaceans and molluscs • Production of renewable energy • Contractual work for other holdings using the means of production of this holding • Accommodation, restaurant, catering and other leisure or educational activities • Making handicrafts • Training of animals • Other (specify)
7	Not known	S2-P2.4 S3-P3.2 S3-P3.3 S3-P3.7	"Not known" is a potential response for a small number of questions in the Labour Module. "Not known" is never a response category explicitly offered to respondents during the interview process; however, if respondents are unable to make an estimate, it is a valid entry to be recorded by the interviewer. The situations where it is a valid response are: • Amount of benefits paid for household member workers and external workers • Age of paid, long-term employees • Provenience of paid, casual employees Throughout the questionnaire, if respondents are uncertain as to the answer to a survey question, they should be encouraged by the interviewer to provide their best estimate.

AGRIS PRODUCTION METHODS AND THE ENVIRONMENT MODULE

Global Strategy to improve Agricultural and Rural Statistics

AGRIS QUESTIONNAIRE
PRODUCTION METHODS AND THE ENVIRONMENT MODULE

Version 1.1, September 2017

TEXT TO READ:
This survey collects information about the production methods and the environment on agricultural holdings in the whole country and whatever the holdings' sizes. Questions will focus on crop and livestock production practices, including energy uses, soil conservation methods, irrigation methods, soil fertilization, seeds used, plant protection products, animal reproduction methods, animal housing, manure management, organic farming, agroforestry, services and infrastructures used by the holding, adaptation to climate change and hazards, and waste management. The reference period for the survey is DD/MM/YYYY to DD/MM/YYYY.

SECTION 1: GENERAL INFORMATION

PART 1.1: IDENTIFICATION OF THE AGRICULTURAL HOLDING

A proper identification of the holding surveyed, and the survey respondent, is required before implementing this questionnaire. The questions proposed in Parts 1.1 & 1.2 of Section 1 of the AGRIS Core Module fit this purpose. These questions are not repeated here because it is recommended that this Rotating Module be implemented together with the Core Module. However, if this Rotating Module is adopted to complement an existing farm-level production survey, then the inclusion of the identification questions is critical - as well as overall consistency with that production survey. Questions Q04 to Q09b in Section 1 of the AGRIS Core Module are not absolutely required, although they will help in in identifying the holding and updating the sampling frames.

PART 1.2: PROSPECTS FOR DEVELOPMENT OF THE HOLDING

Q01. What are the prospects for the holding in the next 2-3 years, in terms of the development of its activities?

(fill in one circle only)
- ◯ 1 The holding is stable and no major changes or developments are planned → **Go to SECTION 2.**
- ◯ 2 The holding will develop, without any major obstacles having been identified → **Go to SECTION 2.**
- ◯ 3 The holding will not develop, due to certain constraints
- ◯ 4 The holding is likely to stop its agricultural activities in the next 2-3 years

Q02. Identify the main constraints on the holding's development.

(fill in all that apply)
- ◯ 1 Access to land
- ◯ 2 Access to water
- ◯ 3 Access to financial resources
- ◯ 4 Access to machinery and equipment
- ◯ 5 Access to labour
- ◯ 6 Access to other agricultural inputs (irrigation, PPPs, veterinary products or services, etc.)
- ◯ 7 Not enough demand/buyers for the products of the holding
- ◯ 8 Selling prices are too low
- ◯ 9 Decreasing soil fertility
- ◯ 10 Natural disasters (including floods or droughts)
- ◯ 11 Lack of safety, thefts, etc.
- ◯ 12 Poor transportation and/or infrastructure
- ◯ 999 Other (specify [ ])

Comments on SECTION 1:

SECTION 2: USE OF NATURAL RESOURCES DURING THE REFERENCE PERIOD (DD/MM/YYYY TO DD/MM/YYYY)

PART 2.1: ENERGY SOURCES DURING THE REFERENCE PERIOD (DD/MM/YYYY) TO (DD/MM/YYYY).

Q01. Identify the energy sources used by the holding for agricultural activity during the reference period.

(fill in all that apply)

- ◯ 1 Network electricity
- ◯ 2 Petroleum fuels (gasoline, kerosene, diesel, oil, etc.)
- ◯ 3 Coal
- ◯ 4 Natural gas
- ◯ 5 Propane
- ◯ 6 Biomass (wood, plant material, etc.)
- ◯ 7 Biogas or methane
- ◯ 8 Solar energy
- ◯ 9 Wind energy
- ◯ 10 Hydro force
- ◯ 999 Other energy or fuel (specify [ ])
- ◯ 0 None

PART 2.2: SOIL MANAGEMENT DURING THE REFERENCE PERIOD (DD/MM/YYYY) TO (DD/MM/YYYY).

Q02. Report the agricultural area utilized during the reference period.
*** For Q02a, Q02b and Q02c, refer to the last harvest.**

	Area	Unit of measure (see codes)	Conversion factor to a standard unit	Area calculated in standard unit
Q02a Temporary crops under greenhouses or high shelters				
Q02b Temporary crops outdoors or under low shelters				
Q02c Temporary fallow				
Q02d Temporary meadows and pastures				
Q02e Kitchen gardens and backyards				
Q02f Permanent crops under greenhouses or high shelters				
Q02g Permanent crops outdoors or under low shelters				
Q02h Permanent meadows and pastures				
Q02i **Total Agricultural Area Utilized (AAU)** (calculated)				

Q03. Do you confirm that the calculated agricultural area utilized (Q02i) corresponds to the holding's total area utilized **[from Q02i]**?
- ◯ 0 No → **Return to Q02 and ask again.**
- ◯ 1 Yes

Q04. Report the areas under different tillage methods used on outdoor arable land covered by temporary crops.

	Area	Unit of measure (see codes)	Conversion factor to a standard unit	Area calculated in standard unit
Q04a Calculated area of outdoor arable land covered by temporary crops *pre-filled* = Q02b by default				
Q04b Conventional tillage				
Q04c Conservation (low) tillage				
Q04d Zero-tillage (no tillage)				
Q04e Calculated difference between outdoor arable land covered by temporary crops (Q04a) and sum of Q04b to Q05d.				

Q05. Considering the longest intercropping period, report the types of soil cover on the outdoor arable land covered by temporary crops.

	Area	Unit of measure (see codes)	Conversion factor to a standard unit	Area calculated in standard unit
Q05a Calculated area of outdoor arable land covered by temporary crops *pre-filled* = Q02b by default				
Q05b Bare soil				
Q05c Plant residues				
Q05d Cover crop or intermediate crop				
Q05e Next seasonal crop				
Q05f Calculated difference between outdoor arable land covered by temporary crops and sum of Q06b and Q06e.				

Q06. Is crop rotation being practised on the holding?
(Fill in one circle only)
- ◯ 0 No
- ◯ 1 Yes, on a small part of the area of temporary crops
- ◯ 2 Yes, on about half of the area of temporary crops
- ◯ 3 Yes, on most or all of the area of temporary crops

Q07. Identify which of the following practices and features were used on the holding during the reference period.

(fill in all that apply)
- ◯ 1 Fallowing or shifting cultivation
- ◯ 2 Vegetative strips
- ◯ 3 Liming
- ◯ 4 Terraces
- ◯ 5 Windbreaks and hedges
- ◯ 6 Rotational grazing
- ◯ 999 Other practices and features to reduce soil erosion, salinity, compaction, drainage of soil water, etc. (specify [ ])
- ◯ 0 None of the above

Q08. Were crop residues and/or other areas on the holding burned during the reference period?
- ◯ 0 No → **Go to Q18.**
- ◯ 1 Yes

Q09. Identify the crops for which residues were burned on the holding during the reference period.

(fill in all that apply) *RESPONSE = [CROP]*	Area sown	Unit of measure (see codes)	Conversion factor to a standard unit	Area calculated in standard unit
◯ 1 [CROP1]				
◯ 2 [CROP2]				
◯ 3 [CROP3]				
◯ N *ETC. UNTIL ALL CROPS ARE REPORTED*				

REPEAT Q10 FOR ALL [CROP]S IDENTIFIED IN Q09.

Q10. Of the total area of [CROP], what was the share in which the crop residue was burned?

(fill in one circle only)
- ◯ 1 Very small share (less than 10%)
- ◯ 2 Less than half (10% to 39%)
- ◯ 3 About half (40% to 59%)
- ◯ 4 Most (60% to 99%)
- ◯ 5 All (100%)
- ◯ 999 Not known

CONTINUE THE ABOVE SERIES OF QUESTIONS UNTIL ALL [CROP]s WHERE RESIDUES WERE BURNED ARE COVERED, THEN PROCEED TO Q11.

Q11. Was slash and burn used for clearing land during the reference period?

- ◯ 0 No
- ◯ 1 Yes

Q12 is to be asked when Q 02c > 0; otherwise, go to Q14.

Q12. Was land temporarily fallow burned during the reference period?

- ◯ 0 No → **Go to Q14.**
- ◯ 1 Yes

Q13. Of the total area of land temporary fallow in which the share that was burned?

(fill in one circle only)

- ◯ 1 Very small share (less than 10%)
- ◯ 2 Less than half (10% to 39%)
- ◯ 3 About half (40% to 59%)
- ◯ 4 Most (60% to 99%)
- ◯ 5 All (100%)
- ◯ 99 Not known

Q14. Was forest or other wooded land burned on the holding during the reference period?

- ◯ 0 No → **Go to Q16.**
- ◯ 1 Yes

Q15. Of the total area of forest or other wooded land on the holding, what was the share that was burned?

(fill in one circle only)

- ◯ 1 Very small share (less than 10%)
- ◯ 2 Less than half (10% to 39%)
- ◯ 3 About half (40% to 59%)
- ◯ 4 Most (60% to 99%)
- ◯ 5 All (100%)
- ◯ 99 Not known

Q16. Was unutilized agricultural area on the holding burned during the reference period?

- ◯ 0 No → **Go to Q18.**
- ◯ 1 Yes

Q17. Of the total unutilized agricultural area on the holding, what was the share that was burned?

(fill in one circle only)

- ◯ 1 Very small share (less than 10%)
- ◯ 2 Less than half (10% to 39%)
- ◯ 3 About half (40% to 59%)
- ◯ 4 Most (60% to 99%)
- ◯ 5 All (100%)
- ◯ 99 Not known

Q18. Did you use crop residues for feeding and/or bedding livestock during the reference period?

- ◯ 0 No → **Go to Q21.**
- ◯ 1 Yes

Q19. Identify the crops for which residues were used for livestock feed and/or bedding on the holding during the reference period.

(fill in all that apply) *RESPONSE = [CROP]*	Area sown	Unit of measure (see codes)	Conversion factor to a standard unit	Area calculated in standard unit
◯ 1 [CROP1]	.			.
◯ 2 [CROP2]	.			.
◯ 3 [CROP3]	.			.
◯ N *ETC. UNTIL ALL CROPS ARE REPORTED*				

REPEAT Q20 FOR ALL [CROP]S IDENTIFIED IN Q19.

Q20. Of the total area of [CROP], what was the share in which the crop residue was used for feed and/or bedding?

(Fill in one circle only)

- ◯ 1 None or close to none (0% to 9%)
- ◯ 2 Less than half (10% to 39%)
- ◯ 3 About half (40% to 59%)
- ◯ 4 Most-(60% to 99%)
- ◯ 5 All (100%)
- ◯ 99 Not known

CONTINUE THE ABOVE SERIES OF QUESTIONS UNTIL ALL [CROP]s WHERE RESIDUES WERE USED FOR FEED AND/OR BEEDING ARE COVERED, THEN PROCEED TO Q21.

Q21. IS TO BE ASKED FOR THOSE WHO REPORTED PASTURES (PART 2.2, Q02d AND/OR Q02h > 0); OTHERWISE, GO TO Q23.

Q21. Was any pasture area on the holding renewed during the reference period?

***Include areas that were renewed by reseeding, fertilizing, adding micronutrients, aerating, etc.**

- ◯ 0 No → **Go to Q23.**
- ◯ 1 Yes

Q21a Identify the ways in which pasture areas were renewed during the reference period.

(fill in all that apply)

- ◯ 1 Reseeded pasture areas
- ◯ 2 Fertilized pasture areas
- ◯ 3 Added micronutrients to pasture areas
- ◯ 4 Aerated pasture areas
- ◯ 999 Other methods used for renewing pasture areas (specify [ ])

	Area	Unit of measure (see codes)	Conversion factor to a standard unit	Area calculated in standard unit
Q22. Report the area of pastures that were renewed	. . . . .			

Q23. Did the holding conduct a soil analysis during the reference period?

- ◯ 0 No → **Go to Q24.**
- ◯ 1 Yes → **Go to Q25.**

Q24. Did the holding conduct a soil analysis in the past five years?

- ◯ 0 No
- ◯ 1 Yes

Q25. During heavy rain, do large volumes of water accumulate on the agricultural soil surface?

- ◯ 0 No → **Go to Q27.**
- ◯ 1 Yes

Q26. When water accumulates on the soil surface and runs, how does it appear?

(fill in one circle only)

- ◯ 1 The water is clear
- ◯ 2 The water is not clear and/or is brown because it contains a lot of soil

Q27. Do salts accumulate on the agricultural soil of the holding during dry periods?
***Include white spots and/or deposits on the soil surface.**

(fill in one circle only)

- ◯ 0 No, never
- ◯ 1 Yes, sometimes
- ◯ 2 Yes, often

Q28. Have there been any of the following changes in the soil on the holding over the last five years?

(fill in all that apply)

- ◯ 1 Change in soil colour
- ◯ 2 Change in the amount of fine and coarse particles
- ◯ 3 Change in how easy it is to plough or work the soil
- ◯ 4 Change in how easily crops emerge after planting
- ◯ 5 Change in the amount of stones present in the soil
- ◯ 0 None of the above

PART 2.3: IRRIGATION AND DRAINAGE DURING THE REFERENCE PERIOD (DD/MM/YYYY) TO (DD/MM/YYYY).

Q29. Was irrigation used on the holding during the reference period?

- ◯ 0 No → **Go to Q43.**
- ◯ 1 Yes

Q30. Identify which methods of fully controlled irrigation were used during the reference period.

(fill in all that apply) *RESPONSE = [IRRIGATION METHOD].*

- ◯ 1 Surface irrigation (flooding, furrows)
- ◯ 2 Sprinkler irrigation
- ◯ 3 Drip irrigation
- ◯ 4 Spray or microsprinkler irrigation
- ◯ 5 Bubbler irrigation
- ◯ 999 Other (specify [ ])
- ◯ 0 None → **Go to Q34**

REPEAT Q31 FOR ALL [IRRIGATION METHOD] IDENTIFIED IN Q30.

Q31. Report the importance of [IRRIGATION METHOD] in the holding's entire use of irrigation during the reference period.

(fill in one circle only)

- ◯ 1 Not used very often, or used for a small part of the area irrigated
- ◯ 2 Used for a significant part of the area irrigated
- ◯ 3 Main irrigation method used
- ◯ 4 Only irrigation method used

CONTINUE THE ABOVE SERIES OF QUESTIONS UNTIL ALL [IRRIGATION METHOD]s ARE COVERED, THEN PROCEED TO Q32.

Q32. Identify which sources of fully controlled irrigation water were used during the reference period.

(Fill in all that apply) *RESPONSE = [IRRIGATION SOURCE]*

- ◯ 1 On-farm ground water
- ◯ 2 On-farm surface water
- ◯ 3 Off-farm surface water (lakes, rivers, watercourses)
- ◯ 4 Municipal water supply or other water network
- ◯ 5 Treated waste water
- ◯ 6 Reservoir (used to avoid flooding)
- ◯ 999 Other source (specify [ ])

REPEAT Q33 FOR ALL [IRRIGATION SOURCE] IDENTIFIED IN Q32.

Q33. Report the importance of [IRRIGATION SOURCE] in the holding's entire use of irrigation during the reference period.

(fill in one circle only)

- ◯ 1 Not used very often, or used for a small part of the area irrigated
- ◯ 2 Used for a significant part of the area irrigated
- ◯ 3 Main irrigation source used
- ◯ 4 Only irrigation source used

CONTINUE THE ABOVE SERIES OF QUESTIONS UNTIL ALL [IRRIGATION SOURCES]s ARE COVERED, THEN PROCEED TO Q34.

Q34. Was rainwater collected during the reference period for the purpose of irrigating?

- ◯ 0 No → **Go to Q36.**
- ◯ 1 Yes

Q35. Report the contribution of collected rainwater to the total amount of irrigation water used by the holding.

(fill in one circle only)

- ◯ 1 Minor part
- ◯ 2 Major part

Q36. Were other water-saving practices (alternate wet and dry rice irrigation, etc.) used on the holding during the reference period?

- ◯ 0 No
- ◯ 1 Yes

Q37. Identify which of the following partially controlled irrigation methods were used on the holding during the reference period.

(fill in all that apply)

- ◯ 1 Equipped wetland and inland valley bottoms
- ◯ 2 Equipped flood recession cultivation
- ◯ 3 Spate irrigation
- ◯ 999 Other method (specify [ ])
- ◯ 0 None of the above

REPEAT Q38 TO Q43 FOR SEASON-1 TO SEASON-N IF IRRIGATION PRACTICES ARE IDENTIFIEDIN THE PREVIOUS QUESTIONS (Q30 <> 0 and Q37 <> 0)
[N] REPRESENTS THE NUMBER OF GROWING SEASONS IN THE 12-MONTH PERIOD OF THE REFERENCE PERIOD - IT WILL VARY BY COUNTRY

Q38. Was any area irrigated at least once during [SEASON] of the reference period?

- ◯ 0 No → **Repeat Q38 for next season (2 to N). If N is complete, go to Q43.**
- ◯ 1 Yes

Q39. Was fully controlled irrigation used during [SEASON]?
*Include surface, sprinkler, drip, spray or bubbler irrigation.

- ◯ 0 No → **Go to Q41.**
- ◯ 1 Yes

Q40. Report the area irrigated by fully controlled irrigation in [SEASON].

	Irrigated area	Unit of measure (see codes)	Conversion factor to a standard unit	Area calculated in standard unit
Q40a Temporary crops, single irrigation				
Q40b Temporary crops, multiple irrigations				
Q40c Permanent crops				
Q40d Temporary meadows and pastures				
Q40e Permanent meadows and pastures				
Q40f **Total (calculated)**				

Q41. Was partially controlled irrigation used during [SEASON]?
*** Include flood recession, spate irrigation or wetland and inland valley bottoms.**

◯ 0 No → **Go to Q38 for next season (2 to N). If N is complete, go to Q43.**
◯ 1 Yes

Q42. Report the area irrigated by partially controlled irrigation in SEASON-N.

	Irrigated area	Unit of measure (see codes)	Conversion factor to a standard unit	Area calculated in standard unit
Q42a Temporary crops, single irrigation				
Q42b Temporary crops, multiple irrigations				
Q42c Permanent crops				
Q42d Temporary meadows and pastures				
Q42e Permanent meadows and pastures				
Q42f **Total (calculated)**				

CONTINUE THE ABOVE SERIES OF QUESTIONS UNTIL SEASON1 TO SEASON-N ARE COVERED, THEN PROCEED TO Q43.

Q43. Report the payment terms for irrigation carried out during the reference period.

(fill in one circle only)
◯ 1 No payment for water
◯ 2 Lump sum
◯ 3 Fee based on irrigated land area
◯ 4 Fee based on volume of water used
◯ 999 Other (specify [ ])

Q44. Report the agricultural area that is equipped with irrigation equipment in working order (IRRIGABLE AREA) even if not irrigated during the reference period.

	Area	Unit of measure (see codes)	Conversion factor to a standard unit	Area calculated in standard unit
Q44a Area under fully controlled irrigation system (surface, sprinkler, drip, spray or bubbler irrigation).				
Q44b Area under partially controlled irrigation system (flood recession, spate irrigation, wetland and inland valley bottoms).				

Q45. Were there areas on the holding where drains were present during the reference period?
◯ 0 No → **Go to SECTION 3.**
◯ 1 Yes

	Area	Unit of measure (see codes)	Conversion factor to a standard unit	Area calculated in standard unit
Q45a Area equipped with surface drains				
Q45b Area equipped with subsurface drains				

Comments on SECTION 2:

SECTION 3: CROP PRODUCTION METHODS DURING THE REFERENCE PERIOD (DD/MM/YYYY TO DD/MM/YYYY)

This section is closely linked to section 3 from the AGRIS Core Module. When the PME Module is not administered with the AGRIS Core Module, information on the crops grown and areas needs to be collected. Three types of variables (rosters) are created - [CROP] - for all crops; [TEMPORARY CROP] and [PERMPLANTCROP] - subgroups of [CROP]

PART 3.1: USE OF FERTILIZERS DURING THE REFERENCE PERIOD (DD/MM/YYYY) TO (DD/MM/YYYY).

Q01. Were fertilizers applied on the holding during the reference period?

- ◯ 0 No → **Go to Q02.**
- ◯ 1 Yes → **Go to Q03.**

Q02. Why were fertilizers not applied during the reference period?

(fill in all that apply)

- ◯ 1 Fertilizers were too expensive
- ◯ 2 Fertilizers were not available
- ◯ 999 Other (specify [ ])

Q03. Identify which fertilizers were applied during the reference period.

(fill in all that apply) ***RESPONSE = [FERTILIZER]***

- ◯ 1 Mineral fertilizers
- ◯ 2 Organo-mineral fertilizers
- ◯ 3 Compost
- ◯ 4 Mulch
- ◯ 5 Biofertilizers
- ◯ 6 Solid dung, incorporated within **X** hours after spreading
- ◯ 7 Solid dung, incorporated more than **X** hours after spreading
- ◯ 8 Solid dung, not incorporated
- ◯ 9 Liquid manure, incorporated within **X** hours after spreading
- ◯ 10 Liquid manure, incorporated more than **X** hours after spreading
- ◯ 11 Liquid manure, not incorporated
- ◯ 12 Slurry, incorporated within **X** hours after spreading
- ◯ 13 Slurry, incorporated more than **X** hours after spreading
- ◯ 14 Slurry, not incorporated
- ◯ 999 Other (specify [ ])

REPEAT Q04 AND Q05 FOR ALL FERTILIZER TYPES IDENTIFIED IN Q03.

Q04. Report the area applied with [FERTILIZER] during the reference period.

	Area applied with fertilizer	Unit of measure (see codes)	Conversion factor to a standard unit	Area calculated in standard unit
Q04a Temporary crops				
Q04b Temporary meadows and pastures				
Q04c Temporary fallow				
Q04d Permanent crops				
Q04e **Total (calculated)**				

Ask Q05 for the categories (a, b, c, and d) reported in Q04 above.

Q05. Report the quantity of [FERTILIZER] applied during the reference period.

	Quantity of fertilizer	Unit of measure (see codes)	Conversion factor to a standard unit	Quantity calculated in standard unit
Q05a Temporary crops				
Q05b Temporary meadows and pastures				
Q05c Temporary fallow				
Q05d Permanent crops				
Q05e **Total (calculated)**				

CONTINUE Q04 AND Q05 UNTIL ALL [FERTILIZER]S ARE COVERED, THEN PROCEED TO Q06.
IF Q03 = 6, 7, 8, 9, 10, 11, 12, 13 or 14 (INDIVIDUALLY OR IN COMBINATION), GO TO Q06; OTHERWISE GO TO PART 3.2, Q09.

Q06. Was manure purchased or received from other holdings and used on this holding during the reference period?
* Include solid dung, liquid manure and slurry.

- ◯ 0 No → **Go to PART 3.2, Q09.**
- ◯ 1 Yes

	Quantity	Unit of measure (see codes)	Conversion factor to a standard unit	Quantity calculated in standard unit
Q07. Report the quantity of manure purchased or received from other holdings and applied on this holding				

Q08. Report the share of each type of payment terms for the manure that was purchased or received from other holdings during the reference period.

	Percent
Q08a Share of received manure that was exchanged for goods and/or services	%
Q08b Share of received manure that was purchased	%
Q08c Share of received manure that was received for free	%
Q08d **Total (calculated)**	%

PART 3.2: USE OF PLANT PROTECTION PRODUCTS DURING THE REFERENCE PERIOD (DD/MM/YYYY) TO (DD/MM/YYYY).

Q09. Were plant protection products applied on the holding during the reference period?

- ◯ 0 No → **Go to Q12.**
- ◯ 1 Yes

REPEAT Q10 FOR ALL CROP TYPES IDENTIFIED

Q10. Report the area of [CROP] on which the following plant protection products were applied during the reference period.

	Area	Unit of measure (see codes)	Conversion factor to a standard unit	Area calculated in standard unit
Q10a Insecticides				
Q10b Herbicides				
Q10c Fungicides				
Q10d Rodenticides				
Q10e Other (specify)				

CONTINUE Q10 UNTIL ALL [CROP]S ARE COVERED, THEN PROCEED TO Q11.

REPEAT Q11 FOR ALL PPP TYPES IDENTIFIED IN Q10; I.E., WHERE AREA REPORTED > 0.

Q11. Report the type and quantities of plant protection products (PPP) used during the reference period.
RESPONSE = [PPP]

	Name/purpose	Quantity	Unit of measure (see codes)	Conversion factor to a standard unit	Quantity calculated in standard unit
Q11a Commercial name or purpose of [PPP]					

CONTINUE Q11 UNTIL ALL [CROP]S ARE COVERED, THEN PROCEED TO Q12.

Q12. Were natural pests used against diseases or for weed control on the holding during the reference period?

- ◯ 0 No
- ◯ 1 Yes

PART 3.3: CROP AND SEED VARIETIES DURING THE REFERENCE PERIOD (DD/MM/YYYY) TO (DD/MM/YYYY).

REPEAT Q13 TO Q19 FOR ALL TEMPORARY CROP TYPES IDENTIFIED

Q13. How many varieties of [TEMPORARY CROP] were planted on the holding in the reference period? . . . . Number of varieties [ ][ ]

Q14. Report the share of the following seed types of [TEMPORARY CROP] that were planted during the reference period.

		Percent
Q14a	Modern varieties, certified seed	[ ][ ][ ] %
Q14b	Modern varieties, uncertified seed	[ ][ ][ ] %
Q14c	Traditional varieties, uncertified seed	[ ][ ][ ] %
Q14d	**Total (calculated)**	[ ][ ][ ] %

Q15 is to be asked where Q14a > 0; otherwise, go to Q16.

Q15. Were the certified seeds of [TEMPORARY CROP] genetically modified (GM) seed?

- ◯ 0 No
- ◯ 1 Yes
- ◯ 99 Not known

Q16 is to be asked where Q14b > 0; otherwise, go to Q18.

Q16. Were the modern variety, uncertified seeds of [TEMPORARY CROP] adapted to local conditions and stresses?

- ◯ 0 No
- ◯ 1 Yes
- ◯ 99 Not known

Q17. Report the share of each source of modern variety, uncertified seeds of [TEMPORARY CROP].

		Percent
Q17a	Seeds produced on the holding	[ ][ ][ ] %
Q17b	Seeds obtained at exchanges within the community	[ ][ ][ ] %
Q17c	Seeds purchased from local market	[ ][ ][ ] %
Q17d	Seeds purchased from seed company	[ ][ ][ ] %
Q17e	Seeds received as a donation	[ ][ ][ ] %
Q17f	**Total (calculated)**	[ ][ ][ ] %

Q18 is to be asked where Q14c > 0; otherwise, go to Part 3.4, Q20.

Q18. Were the traditional variety, uncertified seeds of [TEMPORARY CROP] adapted to local conditions and stresses?

- ◯ 0 No
- ◯ 1 Yes
- ◯ 99 Not known

Q19. Report the share of each source of traditional variety, uncertified seeds of [TEMPORARY CROP].

		Percent
Q19a	Seeds produced on the holding	[ ][ ][ ] %
Q19b	Seeds obtained at exchanges within the community	[ ][ ][ ] %
Q19c	Seeds purchased from local market	[ ][ ][ ] %
Q19d	Seeds purchased from seed company	[ ][ ][ ] %
Q19e	Seeds received as a donation	[ ][ ][ ] %
Q19f	**Total (calculated)**	[ ][ ][ ] %

CONTINUE Q13 TO Q19 UNTIL ALL [TEMPORARY CROP]S ARE COVERED, THEN PROCEED TO PART 3.4, Q20.

PART 3.4: PERMANENT CROPS DURING THE REFERENCE PERIOD (DD/MM/YYYY) TO (DD/MM/YYYY).

Q20. Did the holding have any permanent crop plantations during the reference year?

- ◯ 0 No → **Go to Q24.**
- ◯ 1 Yes

Q21. Report the permanent crop plantations on the holding during the reference year.

* Report all permanent plantation crops grown, regardless of the quantity harvested (even zero).
* Report associated crops grown on the same parcel.
* See crop list.

	Crop name	Crop code
[CROP 1]		
[CROP 2]		
[CROP 3]		
[CROP 4]		
[CROP 5]		
[CROP 6]		
[CROP 7]		

RESPONSE = [PERMPLANTCROP]

REPEAT Q22 AND Q23 FOR EACH PERMANENT PLANTATION CROP REPORTED IN Q21.

Q22. How many homogeneous plots of [PERMPLANTCROP] were on the holding? . . . **Number** ☐☐☐

Definition of "homogeneous plot" with permanent crop: defined by same location, age of plantation, distance between rows and between the trees on the rows (or same density, if there are no regular rows)

REPEAT Q23 FOR PLOT-1 TO PLOT-N.
[N] REPRESENTS THE NUMBER OF PLOTS AND IS EQUAL TO THE RESPONSE IN Q22.

Q23. Answer the following questions about [PERMPLANTCROP] on [PLOT] during the reference period.

Q23a Location of [PLOT] . . . . . ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Q23b Number of varieties of [PERMPLANTCROP] grown on [PLOT]. . . . . ☐☐☐

Q23c Year the plantation was established . . . . . **Year** ☐☐☐☐

	Distance	Unit of measure (see codes)	Conversion factor to a standard unit	Distance calculated in standard unit
Q23d Distance between rows	☐☐☐☐☐.☐☐	☐☐☐☐	☐☐☐☐☐☐	☐☐☐☐☐.☐☐
Q23e Distance between trees/plants in a row	☐☐☐☐☐.☐☐	☐☐☐☐	☐☐☐☐☐☐	☐☐☐☐☐.☐☐

	Area	Unit of measure (see codes)	Conversion factor to a standard unit	Area calculated in standard unit
Q23f Area of plantation trees/plants	☐☐☐☐☐.☐☐	☐☐☐☐	☐☐☐☐☐☐	☐☐☐☐☐.☐☐

Q23g Calculated density . . . . . **Density calculated in standard unit** ☐☐☐☐☐☐☐☐

Q23h Calculated number of trees/plants . . . . . **Number** ☐☐☐☐☐☐☐☐

Q23i Was there production of [PERMPLANTCROP] from this plot during the reference period?

- ◯ 0 No → **Go to Q24.**
- ◯ 1 Yes

Q23j Number of trees in production ☐☐☐☐☐

CONTINUE Q23 UNTIL ALL [PLOT]S ARE COVERED FOR [PERMPLANTCROP], THEN RETURN TO Q22 FOR THE NEXT [PERMPLANTCROP].
ONCE ALL [PERMPLANTCROP]S HAVE BEEN COMPLETED, PROCEED TO Q24.

Q24. Did the holding have any permanent crops grown as scattered trees/plants during the reference year?

- ◯ 0 No → **Go to PART 3.5, Q27.**
- ◯ 1 Yes

Q25. Report the permanent crops grown as scattered trees/plants on the holding during the reference year.

* Report all permanent crops grown, regardless of the quantity harvested (even zero).
* Report associated crops grown on the same parcel.
* See crop list below.

	Crop name	Crop code
[CROP 1]		
[CROP 2]		
[CROP 3]		
[CROP 4]		
[CROP 5]		
[CROP 6]		
[CROP 7]		

RESPONSE = [PERMCROP]

REPEAT Q26 FOR EACH PERMANENT CROP REPORTED IN Q25.

Q26. Answer the following questions about scattered [PERMCROP] trees/plants on the holding during the reference period.

Q26a Number of varieties of [PERMCROP] grown . . . . . ☐☐☐

Q26b Estimated number of [PERMCROP] trees/plants . . . . . Number [ ]

Q26c Was there production from these [PERMCROP] trees/plants during the reference period?
- ◯ 0 No
- ◯ 1 Yes

Q26d Number of trees in production [ ]

CONTINUE Q26 UNTIL ALL [PERMCROP]S ARE COVERED, THEN PROCEED TO PART 3.5, Q27.

PART 3.5: POLINATION PRACTICES DURING THE REFERENCE PERIOD (DD/MM/YYYY) TO (DD/MM/YYYY).

Q27. Were any practices or features used to enhance pollination on the holding during the reference period?
- ◯ 0 No → **Go to PART 3.6, Q29.**
- ◯ 1 Yes

Q28. Identify the methods used to enhance pollination.

(fill in all that apply)
- ◯ 1 Planting of wildflower-rich fallows or strips (such as "bee pastures")
- ◯ 2 Presence of flowering hedgerows
- ◯ 3 Use of nectar-producing cover crops
- ◯ 4 Use of dedicated nectar and pollen seed mixes
- ◯ 5 Provision of nesting sites ("bee hotels" for many bees, or nesting tubes for megachilid bees)
- ◯ 6 Protection of existing ground-bee nesting sites or tress in which wild species of bees nest
- ◯ 7 Use of managed honeybee hives
- ◯ 8 Use of managed stingless bee hives
- ◯ 9 Use of managed bumblebee boxes
- ◯ 10 Use of managed leafcutter nesting sites
- ◯ 999 Other (specify [ ])

PART 3.6: RICE CULTIVATION DURING THE REFERENCE PERIOD (DD/MM/YYYY) TO (DD/MM/YYYY).

Q29. Was rice cultivated on the holding during the reference period?
- ◯ 0 No → Go to SECTION 4.
- ◯ 1 Yes

Q30. How many rice cultivating cycles were there during the reference period? . . . . [ ][ ]

Q31 is to be asked where Q30 > 1; otherwise, go to Q32.

Q31. What was the average interval between two cultivating cycles? . . . . [ ][ ] weeks . OR . [ ][ ] months

Q32. Identify the types of rice that were cultivated during the reference period.

(fill in all that apply) *RESPONSE = [RICE]*
- ◯ 1 *Indica* rice
- ◯ 2 *Japonica* rice
- ◯ 3 Aromatic rice
- ◯ 4 Glutinous rice

REPEAT Q33 TO Q35 FOR ALL RICE TYPES IDENTIFIED IN Q32.

Q33. What was the length of the growing period for [RICE]? . . . . . [ ][ ] months

Q34. Identify the irrigation methods and water regimes that were used before the growing period of [RICE].

(fill in all that apply)
- ◯ 1 Flooded pre-season, for less than 30 consecutive days
- ◯ 2 Flooded pre-season, 30 consecutive days or more
- ◯ 3 Not flooded pre-season, for less than 180 consecutive days
- ◯ 4 Not flooded pre-season, for 180 consecutive days or more

Q35. Identify the irrigation methods and water regimes that were used during the growing period of [RICE].

(fill in all that apply)
- ◯ 1 Irrigated, continuously flooded
- ◯ 2 Irrigated, intermittently flooded with single aeration
- ◯ 3 Irrigated, intermittently flooded with multiple aerations
- ◯ 4 Regularly rain-fed
- ◯ 5 Deep water
- ◯ 6 Drought-prone

CONTINUE Q33 TO Q35 UNTIL ALL [RICE]s ARE COVERED, THEN PROCEED TO Q36.

Q36. Identify the organic amendments added to the soil before the cultivation of rice during the reference period.

(fill in all that apply)
- ◯ 1 Straw, incorporated shortly before cultivation (30 days or less)
- ◯ 2 Straw, incorporated long before cultivation (more than 30 days)
- ◯ 3 Compost
- ◯ 4 Farmyard manure
- ◯ 5 Green manure
- ◯ 999 Other (specify [ ])
- ◯ 0 None

Q37. Identify the rice planting techniques used during the reference period.

(fill in all that apply)
- ◯ 1 Transplanting → Go to Q38.
- ◯ 2 Seed broadcasting → Go to Q39.
- ◯ 999 Other (specify [ ]) → Go to Q39.

Q38 is to be asked where Q37=1; otherwise go to Q39.

	Number of plants per area unit	Unit of measure (see codes)	Area unit of measure (see codes)	Conversion factor to a standard unit	Planting rate calculated in standard unit
Q38. Report the average planting rate for rice during the reference period	[ ][ ][ ][ ][ ]	[ ][ ][ ][ ]	[ ][ ][ ][ ]	[ ][ ][ ][ ]	[ ][ ][ ][ ][ ]

Q39 is to be asked where Q37=2 or Q37=999; otherwise go to SECTION 4.

	Weight of seeds per area unit	Unit of measure (see codes)	Area unit of measure (see codes)	Conversion factor to a standard unit	Seeding rate calculated in standard unit
Q39. Report the average seeding rate for rice during the reference period	[ ][ ][ ][ ][ ]	[ ][ ][ ][ ]	[ ][ ][ ][ ]	[ ][ ][ ][ ]	[ ][ ][ ][ ][ ]

Comments on SECTION 3:

SECTION 4: LIVESTOCK PRODUCTION METHODS DURING THE REFERENCE PERIOD (DD/MM/YYYY TO DD/MM/YYYY)

PART 4.1: ANIMAL BREEDING AND REPRODUCTION DURING THE REFERENCE PERIOD (DD/MM/YYYY) TO (DD/MM/YYYY).

Q01. Was livestock raised on the holding during the reference period?

- ◯ 0 No → Go to SECTION 5.
- ◯ 1 Yes

Q02. Identify the types of livestock raised on the holding during the reference period.

(fill in all that apply) *RESPONSE = [LIVESTOCK]* *RESPONSE = [DRAFT LIVESTOCK] for answers 1 to 4*

- ◯ 1 Equidae
- ◯ 2 Cattle
- ◯ 3 Buffaloes
- ◯ 4 Camelidae
- ◯ 5 Sheep
- ◯ 6 Goats
- ◯ 7 Pigs
- ◯ 8 Rabbits
- ◯ 9 Poultry
- ◯ 10 Insects
- ◯ 999 Other (specify [ ])

REPEAT Q03 FOR ALL LIVESTOCK TYPES IDENTIFIED IN Q02.

Q03. Identify the main animal reproduction technique for [LIVESTOCK] used on the holding during the reference period.

(fill in one circle only)

- ◯ 1 Natural mating with a sire selected within the herd
- ◯ 2 Natural mating with a purchased or rented sire
- ◯ 3 Natural mating with an exchanged sire
- ◯ 4 Artificial insemination
- ◯ 5 Dam was purchased pregnant
- ◯ 6 Dam was exchanged pregnant
- ◯ 999 Other (specify [ ])

CONTINUE Q03 UNTIL ALL [LIVESTOCK] ARE COVERED, THEN PROCEED TO Q04.

Q04. Identify the main provider of breeding services for the holding during the reference period.

(fill in one circle only)

- ◯ 1 Private veterinarian
- ◯ 2 Public veterinarian
- ◯ 3 Self-provision
- ◯ 999 Other (specify [ ])

PART 4.2: USE OF VETERINARY PRODUCTS AND TRADITIONAL METHODS DURING THE REFERENCE PERIOD (DD/MM/YYYY) TO (DD/MM/YYYY).

Q05. Were veterinary services used on the holding during the reference period?

- ◯ 0 No → **Go to Q07.**
- ◯ 1 Yes

REPEAT Q06 FOR ALL LIVESTOCK TYPES IDENTIFIED IN Q02.

Q06. Identify the types of veterinary services used by the holding for [LIVESTOCK] during the reference period.

(fill in all that apply)

- ◯ 1 Reproduction
- ◯ 2 Curative treatment, surgical procedures
- ◯ 3 Curative treatment, other (specify [ ])
- ◯ 4 Preventative medicine, vaccinations
- ◯ 5 Preventative medicine, deworming (anthelmintic)
- ◯ 6 Preventative medicine against parasites
- ◯ 7 Preventative medicine, other (specify [ ])

CONTINUE Q06 UNTIL ALL [LIVESTOCK] ARE COVERED, THEN PROCEED TO Q07.

Q07. Were hormones used on livestock on the holding during the reference period?

- ◯ 0 No → **Go to Q09.**
- ◯ 1 Yes

REPEAT Q08 FOR ALL LIVESTOCK TYPES IDENTIFIED IN Q02.

Q08. Identify the types of hormones used on [LIVESTOCK] during the reference period.

(fill in all that apply)

- ◯ 1 Hormone Type 1
- ◯ 2 Hormone Type 2
- ◯ 999 Other hormones (specify [ ])
- ◯ 0 None of the above

CONTINUE Q08 UNTIL ALL [LIVESTOCK] ARE COVERED, THEN PROCEED TO Q09.

Q09. Were antibiotics used on livestock on the holding during the reference period?

- ◯ 0 No → **Go to Q11.**
- ◯ 1 Yes

REPEAT Q10 FOR ALL LIVESTOCK TYPES IDENTIFIED IN Q02.

Q10. Identify the types of antibiotics used on [LIVESTOCK] during the reference period.

(fill in all that apply)

- ◯ 4 Antibiotic Type 1
- ◯ 5 Antibiotic Type 2
- ◯ 999 Other antibiotics (specify [ ])
- ◯ 0 None of the above

CONTINUE Q10 UNTIL ALL [LIVESTOCK] ARE COVERED, THEN PROCEED TO Q11.

Q11. Was traditional medicine applied on the livestock on the holding during the reference period?

- ◯ 0 No → **Go to PART 4.3, Q13.**
- ◯ 1 Yes

REPEAT Q12 FOR ALL LIVESTOCK TYPES IDENTIFIED IN Q02.

Q12. Identify the objectives of the traditional medicine applied on [LIVESTOCK] during the reference period.

(fill in all that apply)

- ◯ 1 Reproduction
- ◯ 2 Curative
- ◯ 3 Preventative
- ◯ 999 Other (specify [ ])
- ◯ 0 None of the above

CONTINUE Q12 UNTIL ALL [LIVESTOCK] ARE COVERED, THEN PROCEED TO PART 4.3, Q13.

PART 4.3: ANIMAL HOUSING DURING THE REFERENCE PERIOD (DD/MM/YYYY) TO (DD/MM/YYYY).

Q13 is to be asked in the following cases:
Where Q02 = 2 (cattle)
Where Q02 = 3 (buffaloes)
Q13 is to be asked separately for each of the cases outlined above.
If Q02 does not equal 2 and/or 3, Go to Q14.

Q13. Identify the main type of animal housing system that was used for [LIVESTOCK] on the holding during the reference period.

(fill in one circle only)
- ◯ 1 Open/no housing
- ◯ 2 Stanchion-tied stable, with solid dung or liquid manure/slurry
- ◯ 3 Loose housing, with solid dung or liquid manure/slurry
- ◯ 999 Other, including boxes sometimes used for young animals (specify [ ])

CONTINUE Q13 UNTIL ALL [LIVESTOCK] (CATTLE AND BUFFALOES) ARE COVERED, THEN PROCEED TO Q14.

Q14 is to be asked where Q02 = 7 (pigs); otherwise, Go to Q15.

Q14. Identify the main type of animal housing system that was used for pigs on the holding during the reference period.

(fill in one circle only)
- ◯ 1 Open/no housing
- ◯ 2 On partially or completely slatted floors
- ◯ 3 On straw-beds (deep litter loose housing)
- ◯ 999 Other (specify [ ])

Q15 is to be asked where Q02 = 5 (sheep) and/or 6 (goats). Where Q02 = 5 and/or 6; this becomes "small ruminants".
Q15 is to be asked only once for the combined category of Q02 = 5 and/or 6.
If Q02 does not equal 5 and/or 6, Go to Q16.

Q15. Identify the main type of animal housing system that was used for small ruminants on the holding during the reference period.

(fill in one circle only)
- ◯ 1 Open/no housing
- ◯ 2 Traditional barns or buildings
- ◯ 3 Shelter
- ◯ 999 Other (specify [ ])

Q16 is to be asked where Q02 = 9 (poultry)
If Q02 does not equal 9, Go to Q18.

Q16. Were chickens raised on this holding during the reference period?
*Include chickens raised for eggs and chickens raised for meat.

- ◯ 0 No → Go to Q18.
- ◯ 1 Yes

Q17. Identify the main type of animal housing system that was used for chickens on the holding during the reference period.

(fill in one circle only)
- ◯ 1 Open/no housing
- ◯ 2 On straw-beds (deep litter loose housing)
- ◯ 3 Battery cage with manure belt
- ◯ 4 Battery cage with deep pit
- ◯ 5 Battery cage with stilt house
- ◯ 999 Other (specify [ ])

Q18. Was any of the housing reported above used to house both humans and livestock?

- ◯ 0 No
- ◯ 1 Yes

Do not ask Q19 if Q13=1 and/or Q14=1 and/or Q15=1 and/or Q17=1 (that is, if livestock are held "open/no housing")

Q19. Identify the types of ventilation systems in the livestock building(s) on the holding during the reference period.

(fill in all that apply)
- ◯ 1 Fans switched on automatically
- ◯ 2 Fans switched on manually
- ◯ 3 Passive ventilation (side curtains, free air or vent panels)
- ◯ 999 Other (specify [ ])
- ◯ 0 None of the above

Q20 is to be asked where Q02 = 7 (pigs) and/or 9 (poultry).
If Q02 does not equal 7 and/or 9, Go to Q21.
Do not ask Q20 in the following cases: a) Q02=7 AND (Q14=1 and/or Q19=0); b) Q02=9 AND (Q17=1 and/or Q19=0)

Q20. Were there filters on vents and/or vent fans to control dust emissions in buildings used to house pigs or poultry during the reference period?

(fill in one circle only)
- ◯ 0 No
- ◯ 1 Yes
- ◯ 2 Not applicable
- ◯ 99 Not known

Do not ask Q21 if Q13=1 and/or Q14=1 and/or Q15=1 and/or Q17=1 (that is, if livestock are held "open/no housing")

Q21. Were there temperature controls in the buildings used to house livestock during the reference period?

(fill in one circle only)

- ◯ 0 No
- ◯ 1 Yes
- ◯ 2 Not applicable
- ◯ 99 Not known

PART 4.4: EQUIPMENT AND TRANSPORTATION OF ANIMALS DURING THE REFERENCE PERIOD (DD/MM/YYYY) TO (DD/MM/YYYY).

Q22. Was transhumance practised by the holding during the reference period?

- ◯ 0 No → Go to Q25.
- ◯ 1 Yes

Q23. Identify the types of animals for which transhumance was practised during the reference period.

(fill in all that apply)
- ◯ 1 Equidae
- ◯ 2 Cattle
- ◯ 3 Buffaloes
- ◯ 4 Camelidae
- ◯ 5 Sheep
- ◯ 6 Goats
- ◯ 999 Other (specify [ ])

Q24. Was cross-border transhumance practised during the reference period?
- ◯ 0 No
- ◯ 1 Yes

Q25. Were live animals transported from the holding to a slaughterhouse during the reference period?

- ◯ 0 No → Go to Q28.
- ◯ 1 Yes

REPEAT Q26 AND Q27 FOR ALL LIVESTOCK TYPES IDENTIFIED IN Q02.

Q26. Identify the main transportation method used to transport [LIVESTOCK] to a slaughterhouse during the reference period.

(fill in one circle only)
- ◯ 1 By foot
- ◯ 2 By road with motor véhicules
- ◯ 3 By rail véhicules
- ◯ 999 Other (specify [ ])

Q27. Report the frequency of transportation of live [LIVESTOCK] to a slaughterhouse during the reference period.

(fill in one circle only)
- ◯ 1 Weekly
- ◯ 2 Monthly
- ◯ 3 Once a year
- ◯ 999 Other (specify [ ])

CONTINUE Q26 AND Q27 UNTIL ALL [LIVESTOCK] ARE COVERED, THEN PROCEED TO Q28.

Q28. Were live animals transported from the holding to a market to sell them during the reference period?

- ◯ 0 No → Go to Q31.
- ◯ 1 Yes

REPEAT Q29 AND Q30 FOR ALL LIVESTOCK TYPES IDENTIFIED IN Q02.

Q29. Identify the main transportation method used to transport [LIVESTOCK] to a market during the reference period.

(fill in one circle only)
- ◯ 1 By foot
- ◯ 2 By road with motor véhicules
- ◯ 3 By rail véhicules
- ◯ 999 Other (specify [ ])

Q30. Report the frequency of transportation of live [LIVESTOCK] to a market during the reference period.

(fill in one circle only)
- ◯ 1 Weekly
- ◯ 2 Monthly
- ◯ 3 Once a year
- ◯ 999 Other (specify [ ])

CONTINUE Q29 AND Q30 UNTIL ALL [LIVESTOCK] ARE COVERED, THEN PROCEED TO Q31.

Q31. Were live animals transported to pastures outside the holding during the reference period?

- ◯ 0 No → Go to Q34.
- ◯ 1 Yes

REPEAT Q32 AND Q33 FOR ALL LIVESTOCK TYPES IDENTIFIED IN Q02.

Q32. Identify the main transportation method used to transport [LIVESTOCK] to pastures outside the holding during the reference period.

(fill in one circle only)
- ◯ 1 By foot
- ◯ 2 By road with motor véhicules
- ◯ 3 By rail véhicules
- ◯ 999 Other (specify [ ])

Q33. Report the frequency of transportation of [LIVESTOCK] to pastures outside the holding during the reference period.

(fill in one circle only)
- ◯ 1 Weekly
- ◯ 2 Monthly
- ◯ 3 Once a year
- ◯ 999 Other (specify [ ])

CONTINUE Q32 AND Q33 UNTIL ALL [LIVESTOCK] ARE COVERED, THEN PROCEED TO Q34.

Q34. Were live animals transported to another holding which fed them during the reference period?

- ◯ 0 No → **Go to Q37.**
- ◯ 1 Yes

REPEAT Q35 AND Q36 FOR ALL LIVESTOCK TYPES IDENTIFIED IN Q02.

Q35. Identify the main transportation method used to transport [LIVESTOCK] to another holding which fed them during the reference period.

(fill in one circle only)
- ◯ 1 By foot
- ◯ 2 By road with motor véhicules
- ◯ 3 By rail véhicules
- ◯ 999 Other (specify [ ])

Q36. Report the frequency of transportation of [LIVESTOCK] to another holding which fed them during the reference period.

(fill in one circle only)
- ◯ 1 Weekly
- ◯ 2 Monthly
- ◯ 3 Once a year
- ◯ 999 Other (specify [ ])

CONTINUE Q35 AND Q36 UNTIL ALL [LIVESTOCK] ARE COVERED, THEN PROCEED TO Q37.

Q37 is to be asked where Q02 = 1 (equidae) and/or 2 (cattle) and/or 3 (buffaloes) and/or 4 (camelidae). Each of these is considered [DRAFT LIVESTOCK].
Q37 is to be asked separately for each of the cases outlined above.
If Q02 does not equal 1 and/or 2 and/or 3 and /or 4, Go to PART 4.5, Q38.

Q37. Were [DRAFT LIVESTOCK] used for transport or draft animal power on the holding during the reference period?

- ◯ 0 No → **Go to PART 4.5, Q38.**
- ◯ 1 Yes

		Number
Q37a	How many [DRAFT LIVESTOCK] were used for transporting people, goods, etc. during the reference period?	[ ][ ]
Q37b	How many [DRAFT LIVESTOCK] were used for draft animal power (ploughing, farming, etc.) on the holding during the reference period?	[ ][ ]

CONTINUE Q37 UNTIL ALL [DRAFT LIVESTOCK] ARE COVERED, THEN PROCEED TO PART 4.5, Q38.

PART 4.5: FEED AND USE OF PASTURES DURING THE REFERENCE PERIOD (DD/MM/YYYY) TO (DD/MM/YYYY).

REPEAT Q38 TO Q40 FOR ALL LIVESTOCK TYPES IDENTIFIED IN Q02.

Q38. Report the practices used for feeding [LIVESTOCK] during reference period.
* Report shares, by percent of the [LIVESTOCK] herd.

		Percent of [LIVESTOCK] herd
Q38a	Only grazing, including scavenging	%
Q38b	Mainly grazing, including scavenging, with some feeding	%
Q38c	Mainly feeding, with some grazing, including scavenging	%
Q38d	Only feeding (zero grazing or scavenging)	%
Q38e	**Total (calculated)**	%

If "Only grazing, including scavenging" is the only practice (that is, Q38a = 100%), go to Q45. Otherwise, go to Q39.

Q39. Report the types of feed fed to [LIVESTOCK] during the reference period.
* Report shares, by percent of the feed used over the reference period.

If [LIVESTOCK] = pigs or poultry {i.e., Q02 = 7 (pigs) or 9 (poultry)}, do not include Q39a in the response options.

		Percent	
Q39a	Forages, including roughages	%	*RESPONSE BECOMES VARIABLE [FEED].*
Q39b	Crops and agro-industrial by-products, including concentrate	%	
Q39c	Swill and household wastes	%	
Q39d	**Total (calculated)**	%	

Q40. Were supplements and/or additives fed to [LIVESTOCK] during the reference period?
- ◯ 0 No
- ◯ 1 Yes

CONTINUE Q38 TO Q40 UNTIL ALL [LIVESTOCK] ARE COVERED, THEN PROCEED TO Q41.

ASK Q41 FOR [FEED] WHEN IT WAS REPORTED IN Q39d AS > 0% FOR AT LEAST ONE TYPE OF [LIVESTOCK].
REPEAT Q41 FOR ALL FEED TYPES IDENTIFIED IN Q39.

Q41. Report the sources of [FEED] used during the reference period.

If Q39b > 0% for at least one type of [LIVESTOCK]}, do not include Q41b in the response options.
If Q39c > 0% for at least one type of [LIVESTOCK]}, do not include Q41b or Q41c in the response options.

		Percent	
Q41a	Produced on the holding	%	*RESPONSE = [FEED SOURCE].*
Q41b	Common pasture	%	
Q41c	Purchased	%	
Q41d	Exchanged	%	
Q41e	Received for free	%	
Q41f	**Total (calculated)**	%	

CONTINUE Q41 UNTIL ALL [FEED]S ARE COVERED, THEN PROCEED TO Q42.
ASK Q42 FOR CASES WHERE Q39a > 0% AND Q41c > 0% (that is, WHERE FORAGES, INCLUDING ROUGHAGES WERE PURCHASED).

Q42. Report the quantity of fodder (forages, including roughages) that were purchased during the reference period.

		Quantity	Unit of measure (see codes)	Conversion factor to a standard unit	Quantity calculated in standard unit
Q42a	Hay				
Q42b	Wrapped grass				
Q42c	Grass or hay silage				
Q42d	Maize (grain)				
Q42e	Maize silage				
Q42f	Other (specify [ ])				
Q42g	**Total (calculated)**				

ASK Q43 FOR CASES WHERE ANY [FEED] > 0% (FROM Q39) AND Q41c > 0% (i.e., WHERE FEED WAS PURCHASED).

Q43. Identify the months during which purchased feed was used to feed livestock.

(fill in all that apply)
- ◯ 1 January
- ◯ 2 February
- ◯ 3 March
- ◯ 4 April
- ◯ 5 May
- ◯ 6 June
- ◯ 7 July
- ◯ 8 August
- ◯ 9 September
- ◯ 10 October
- ◯ 11 November
- ◯ 12 December

DO NOT ASK Q44 AND Q45 IF "Only feeding (zero grazing or scavenging)" IS THE ONLY PRACTICE (that is, Q38d = 100%).

REPEAT Q44 FOR ALL LIVESTOCK TYPES IDENTIFIED IN Q02.
WHERE [LIVESTOCK] = 1, 2, 3, 4, 5 OR 6 (that is, EQUIDAE, CATTLE, BUFFALOES, CAMELIDAE, SHEEP OR GOATS) ASK Q44 SEPARATELY.
WHERE [LIVESTOCK] = 7, 8, 9, 10 OR 11 (PIGS, RABBITS, POULTRY, INSECTS, OTHER), ASK Q44 AS ONE QUESTION FOR "OTHER LIVESTOCK".

Q44. Report the grazing practices for [LIVESTOCK] used during the reference period.

	Area	Unit of measure (see codes)	Conversion factor to a standard unit	Area calculated in standard unit	Number of animals	Number of months
Q44a Grazing on the holding						
Q44b Grazing on a common pasture						

CONTINUE Q44 UNTIL ALL [LIVESTOCK] ARE COVERED, THEN PROCEED TO Q45.

Q45. Report the amount of manure (free fall) that was collected from pasture to be used as fuel during the reference period.

(fill in one circle only)

- ◯ 1 No manure was removed from pasture to be used as fuel
- ◯ 2 A small part of the manure on pasture was removed to be used as fuel
- ◯ 3 About half of the manure on pasture was removed to be used as fuel
- ◯ 4 Most or all of the manure on pasture was removed to be used as fuel

PART 4.6: WATERING OF ANIMALS DURING THE REFERENCE PERIOD (DD/MM/YYYY) TO (DD/MM/YYYY).

Q46. Was the main source of water for watering livestock the same for all seasons during the reference period?

- ◯ 0 No → **Go to Q48.**
- ◯ 1 Yes

REPEAT Q47 FOR ALL LIVESTOCK TYPES IDENTIFIED IN Q02.

Q47. Identify the main source of water used for watering [LIVESTOCK] during the entire reference period.

(fill in one circle only)

- ◯ 1 Borehole
- ◯ 2 Well
- ◯ 3 Dam or lake
- ◯ 4 River, spring or stream
- ◯ 5 Rainwater harvesting
- ◯ 999 Other (specify [ ])

CONTINUE Q47 UNTIL ALL [LIVESTOCK] ARE COVERED, THEN PROCEED TO Q48.

REPEAT Q48 AND Q49 FOR ALL LIVESTOCK TYPES IDENTIFIED IN Q02.

Q48. Identify the main source of water used for watering [LIVESTOCK] during the dry season.

(fill in one circle only)

- ◯ 1 Borehole
- ◯ 2 Well
- ◯ 3 Dam or lake
- ◯ 4 River, spring or stream
- ◯ 5 Rainwater harvesting
- ◯ 999 Other (specify [ ])

Q49. Identify the main source of water used for watering [LIVESTOCK] during the rainy season.

(fill in one circle only)

- ◯ 1 Borehole
- ◯ 2 Well
- ◯ 3 Dam or lake
- ◯ 4 River, spring or stream
- ◯ 5 Rainwater harvesting
- ◯ 999 Other (specify [ ])

CONTINUE Q48 AND Q49 UNTIL ALL [LIVESTOCK] ARE COVERED, THEN PROCEED TO Q50.

Q50. Were problems encountered in watering livestock during the reference period?

- ◯ 0 No → **Go to PART 4.7, Q57.**
- ◯ 1 Yes

Q51. Identify the months in which problems were encountered in watering livestock during the reference period.

(fill in all that apply)

- ◯ 1 January
- ◯ 2 February
- ◯ 3 March
- ◯ 4 April
- ◯ 5 May
- ◯ 6 June
- ◯ 7 July
- ◯ 8 August
- ◯ 9 September
- ◯ 10 October
- ◯ 11 November
- ◯ 12 December

Q52. Identify the main problem encountered in watering livestock during problematic periods.

(fill in one circle only)

- ◯ 1 Restricted access to water sources
- ◯ 2 Lack of water in usual water sources
- ◯ 3 Poor quality of usual water sources
- ◯ 999 Other (specify [ ])

Q53. Identify the solution that was implemented to provide water to livestock during problematic periods.

(fill in one circle only)

- ◯ 1 Use of another water source near the holding, for free (neighbours, etc.)
- ◯ 2 Use of another water source near the holding, with payment (cash or exchange of products or services)
- ◯ 3 Use of another water source far from the holding, for free (public help, etc.)
- ◯ 4 Use of another water source far from the holding, with payment (cash or exchange of products or services)
- ◯ 999 Other (specify [ ])

ASK Q54 WHEN Q53 = 3 OR 4. OTHERWISE, GO TO PART 4.7, Q57.

Q54. Was water for livestock transported by trucks?

- ◯ 0 No → **Go to PART 4.7, Q57.**
- ◯ 1 Yes

Q55. During which months was water for livestock transported by trucks?

(fill in all that apply) *RESPONSE = [MONTH]*

- ◯ 1 January
- ◯ 2 February
- ◯ 3 March
- ◯ 4 April
- ◯ 5 May
- ◯ 6 June
- ◯ 7 July
- ◯ 8 August
- ◯ 9 September
- ◯ 10 October
- ◯ 11 November
- ◯ 12 December

REPEAT Q56 FOR ALL MONTHS IDENTIFIED IN Q55.

Q56. Report the frequency of transporting water by trucks during [MONTH].

(fill in one circle only)

- ◯ 1 Daily
- ◯ 2 Weekly
- ◯ 3 Monthly

CONTINUE Q56 UNTIL ALL [MONTH] ARE COVERED, THEN PROCEED TO PART 4.7, Q57.

PART 4.7: MANURE MANAGEMENT DURING THE REFERENCE PERIOD (DD/MM/YYYY) TO (DD/MM/YYYY).

Q57. Identify the types of manure produced on the holding during the reference period.

(fill in all that apply) *RESPONSE = [MANURE].*

- ◯ 1 Solid dung
- ◯ 2 Liquid manure
- ◯ 3 Slurry

Q58. Was manure produced on this holding and sold or given to others during the reference period?
CAN BE ASKED BY TYPE OF MANURE - [MANURE]

- ◯ 0 No → **Go to Q61.**
- ◯ 1 Yes

	Quantity	Unit of measure (see codes)	Conversion factor to a standard unit	Quantity calculated in standard unit
Q59. Report the quantity of manure that was produced on this holding and sold or given to others during the reference period.				

Q60. Report the payment terms for the manure that was sold or given to others during the reference period.

	Percent
Q60a Share of moved manure that was exchanged for goods and/or services	%
Q60b Share of moved manure that was sold	%
Q60c Share of moved manure that was given away for free	%
Q60d **Total (calculated)**	%

REPEAT Q61 AND Q62 FOR ALL MANURE TYPES IDENTIFIED IN Q57.

Q61. Report the number of months that [MANURE] was managed using each of the following manure management systems during the reference period.

If [MANURE] = "Solid manure" (that is, Q57 = 1), do not include Q61b in the response options.
If [MANURE] = "Liquid manure" (that is, Q57 = 2), do not include Q61b in the response options.
If [MANURE] = "Slurry" (that is, Q57 = 3), do not include Q61c, Q61d or Q61e in the response options.

	Months
Q61a Digester (biogas reactor)	
Q61b Slurry tank	
Q61c Anaerobic lagoon	
Q61d Aerobic lagoon	
Q61e Aerobic treatment	
Q61f Other (specify)	

Q62. What share of the manure storage facility for [MANURE] was covered (to keep off rain or reduce emissions of manure gases) during the reference period? **Percent** %

CONTINUE Q61 AND Q62 UNTIL ALL [MANURE] ARE COVERED, THEN PROCEED TO Q62.

Q63. Report the quantity of manure produced on the holding that was used for the following purposes during the reference period.

	Quantity	Unit of measure (see codes)	Conversion factor to a standard unit	Quantity calculated in standard unit
Q63a For fuel (including heating)				
Q63b For construction				
Q63c For feed				

Comments on SECTION 4:

SECTION 5: CERTIFIED ORGANIC FARMING AND CONVERSION TO ORGANIC CERTIFICATION DURING THE REFERENCE PERIOD (DD/MM/YYYY TO DD/MM/YYYY)

Q01. Did the holding produce certified organic crops during the reference period ?
* Include only crops that were certified by an organic certifying body and were produced using national and/or international standards for organic farming.
* Do not include production under conversion to organic certification. Crops under conversion to organic certification will be reported in Q05.

◯ 0 No → **Go to Q05.**
◯ 1 Yes

Q02. Answer the following questions about the holding's organic certification.

Q02a Report the holding's Organic Registration Number. [ ]

Q02b Report the name of the certifying body. [ ]

Q03. Identify the certified organic crops that were produced during the reference period.

(fill in all that apply) *RESPONSE = [CERTIFIED ORGANIC CROP]*
◯ 1 [CERTIFIED ORGANIC CROP1]
◯ 2 [CERTIFIED ORGANIC CROP2]
◯ 3 [CERTIFIED ORGANIC CROP3]
◯ N **ETC. UNTIL ALL CERTIFIED ORGANIC CROPS ARE REPORTED**

REPEAT Q04 FOR ALL CERTIFIED ORGANIC CROP TYPES IDENTIFIED IN Q03.

	Area	Unit of measure (see codes)	Conversion factor to a standard unit	Area calculated in standard unit
Q04. Report the area on which certified organic [CERTIFIED ORGANIC CROP] was produced during the reference period	[ ]	[ ]	[ ]	[ ]

CONTINUE Q04 UNTIL ALL [CERTIFIED ORGANIC CROP]S ARE COVERED, THEN PROCEED TO Q05.

Q05. Was the holding in conversion to organic certification of crops during the reference period?
* Report crops not yet certified, but in the process of becoming certified by an organic certification body.

◯ 0 No → **Go to Q09.**
◯ 1 Yes

Q06. Answer the following questions about the holding's conversion to organic certification.

Q06a Report the holding's Organic Number. [ ]

Q06b Report the name of the certifying body. [ ]

Q07. Identify the crops that were produced under conversion to organic certification during the reference period.

(fill in all that apply) *RESPONSE = [CONVERSION CROP]*
◯ 1 [CONVERSION CROP1]
◯ 2 [CONVERSION CROP2]
◯ 3 [CONVERSION CROP3]
◯ N **ETC. UNTIL ALL CONVERSION CROPS ARE REPORTED**

REPEAT Q08 FOR ALL CONVERSION CROP TYPES IDENTIFIED IN Q07.

	Area	Unit of measure (see codes)	Conversion factor to a standard unit	Area calculated in standard unit
Q08. Report the area on which [CONVERSION CROP] was produced under conversion to organic certification during the reference period.	[ ]	[ ]	[ ]	[ ]

CONTINUE Q08 UNTIL ALL [CONVERSION CROP]S ARE COVERED, THEN PROCEED TO Q10.
ASK Q09 IF Q01=0 (NO) AND Q05=0 (NO); OTHERWISE, GO TO Q10.

Q09. Does the holding plan to obtain organic certification for at least one crop production cycle in the next 2-3 years?
◯ 0 No
◯ 1 Yes

Q10. Did the holding produce certified organic livestock during the reference period ?
* Include only livestock that were certified by an organic certifying body and were produced using national and/or international standards for organic farming.
* Do not include production under conversion to organic certification. Livestock under conversion to organic certification will be reported in Q13.

◯ 0 No → **Go to Q13.**
◯ 1 Yes

Q11. Answer the following questions about the holding's organic certification.

Q11a Report the holding's Organic Number. [ ]

Q11b Report the name of the certifying body. [ ]

Q12. Identify the certified organic livestock that were produced during the reference period.

PRESENT THE LIVESTOCK TYPES IDENTIFIED IN SECTION 4, Q02 TO SELECT FROM.

(fill in all that apply) *RESPONSE = [CERTIFIED ORGANIC LIVESTOCK]*
◯ 1 [CERTIFIED ORGANIC LIVESTOCK1]
◯ 2 [CERTIFIED ORGANIC LIVESTOCK2]
◯ 3 [CERTIFIED ORGANIC LIVESTOCK3]
◯ N ***ETC. UNTIL ALL CERTIFIED ORGANIC LIVESTOCK ARE REPORTED***

Q13. Was the holding in conversion to organic certification of livestock during the reference period?
*** Report livestock not yet certified, but in the process of becoming certified by an organic certification body.**

◯ 0 No → Go to Q16.
◯ 1 Yes

Q14. Answer the following questions about the holding's conversion to organic certification.

Q14a Report the holding's Organic Number. ☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Q14b Report the name of the certifying body. ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Q15. Identify the livestock that were produced under conversion to organic certification during the reference period.
* Report livestock not yet certified, but in the process of becoming certified by an organic certification body.

PRESENT THE LIVESTOCK TYPES IDENTIFIED IN SECTION 4, Q02 TO SELECT FROM.

(fill in all that apply) *RESPONSE BECOMES VARIABLE [CONVERSION LIVESTOCK]*
◯ 1 [CONVERSION LIVESTOCK1]
◯ 2 [CONVERSION LIVESTOCK2]
◯ 3 [CONVERSION LIVESTOCK3]
◯ N *ETC. UNTIL ALL CONVERSION LIVESTOCK ARE REPORTED*

ASK Q16 IF Q10=0 (NO) AND Q13=0 (NO); OTHERWISE, GO TO SECTION 6.

Q16. Does the holding plan to obtain organic certification for at least one livestock production cycle in the next 2-3 years?
◯ 0 No
◯ 1 Yes

Comments on SECTION 5:

SECTION 6: AGROFORESTRY DURING THE REFERENCE PERIOD (DD/MM/YYYY TO DD/MM/YYYY)

Q01. Were there agroforestry practices on the holding during the reference period?

- ◯ 0 No → **Go to Q05.**
- ◯ 1 Yes

Q02. Identify the types of agroforestry on the holding during the reference period.

(fill in all that apply) ***RESPONSE = [AGROFORESTRY]***

- ◯ 1 Agro-sylvicultural area (crops and trees)
- ◯ 2 Sylvo-pastoral area (trees and livestock)
- ◯ 3 Agro-sylvo-pastoral area (crops, trees and livestock)

REPEAT Q03 AND Q04 FOR ALL AGROFORESTRY TYPES IDENTIFIED IN Q02.

	Area	Unit of measure (see codes)	Conversion factor to a standard unit	Area calculated in standard unit
Q03. Report the [AGROFORESTRY] during the reference period?				

Q04. Identify the main type of trees in the [AGROFORESTRY] during the reference period.

(fill in one circle only)

- ◯ 1 Coniferous trees
- ◯ 2 Broad-leafed trees
- ◯ 3 Mix of coniferous and broad-leafed trees

CONTINUE Q03 AND Q04 UNTIL ALL [AGROFORESTRY]S ARE COVERED, THEN PROCEED TO Q05.

Q05. Was forest or other wooded land created on the holding by planting trees during the reference period?

- ◯ 0 No → **Go to SECTION 7.**
- ◯ 1 Yes

	Area	Unit of measure (see codes)	Conversion factor to a standard unit	Area calculated in standard unit
Q06. Report the area planted with trees to create forest or other wooded land during the reference period.				

Comments on SECTION 6:

SECTION 7: ACCESS TO AND USE OF INFORMATION SERVICES, INFRASTRUCTURE AND COMMUNAL RESOURCES DURING THE REFERENCE PERIOD (DD/MM/YYYY TO DD/MM/YYYY)

PART 7.1: AGRICULTURAL INFORMATION DURING THE REFERENCE PERIOD (DD/MM/YYYY) TO (DD/MM/YYYY).

Q01. Identify the types of information used on the holding during the reference period.

(fill in all that apply) *RESPONSE = [INFORMATION]*

- ◯ 1 Crop rotation and other sustainable agricultural practices
- ◯ 2 Crop types to be produced
- ◯ 3 Use of fertilizers and/or plant protection products
- ◯ 4 Crop health issues
- ◯ 5 Livestock health issues
- ◯ 6 Livestock feed issues
- ◯ 7 Livestock breeding
- ◯ 8 Availability of inputs (including machinery and equipment)
- ◯ 9 Prices of inputs
- ◯ 10 Prices of outputs
- ◯ 11 Weather forecasts affecting production
- ◯ 12 Other environmental information

REPEAT Q02 AND Q03 FOR ALL INFORMATION TYPES IDENTIFIED IN Q01.

Q02. Identify the main source of information about [INFORMATION] for the holding during the reference period.

(fill in one circle only) *RESPONSE = [INFORMATION SOURCE]*

- ◯ 1 Government or extension service
- ◯ 2 Other individual farmer
- ◯ 3 Farmers' group or association
- ◯ 4 NGO or non-governmental project
- ◯ 5 Trader or market stakeholder
- ◯ 999 Other (specify [ ])

Q03 Identify the main method used for consulting the [INFORMATION SOURCE] for information about [INFORMATION]?

(fill in one circle only)

- ◯ 1 Face-to-face discussions
- ◯ 2 Phone calls
- ◯ 3 Radio
- ◯ 4 Television
- ◯ 5 Internet or SMS
- ◯ 6 Press or newspapers
- ◯ 999 Other (specify [ ])

CONTINUE Q02 AND Q03 UNTIL ALL [INFORMATION] ARE COVERED, THEN PROCEED TO Q04.

Q04. Are you informed on the instructions for the application of plant protection products (PPPs)?

- ◯ 0 No
- ◯ 1 Yes

Q05. Are you aware of any dangers to your health associated with the application of plant protection products (PPPs)?

- ◯ 0 No
- ◯ 1 Yes

Q06. Were market conditions monitored before selling products from the holding during the reference period?

- ◯ 0 No
- ◯ 1 Yes

Number of visits

Q07. Report the number of visits made to the holding by an extension officer, veterinarian or animal health assistant during the reference period. . . . . [ ][ ][ ]

Q08. Identify the main reason for not having more visits to the holding by extension officers, veterinarians or animal health assistants during the reference period.

(fill in one circle only)

- ◯ 1 No need
- ◯ 2 Too expensive
- ◯ 3 Too far away
- ◯ 4 Service provider was too busy/not available
- ◯ 999 Other (specify [ ])

PART 7.2: INFRASTRUCTURE (TRANSPORATION, COMMUNICATIONS AND ACCESS TO FACILITIES) DURING THE REFERENCE PERIOD (DD/MM/YYYY) TO (DD/MM/YYYY).

Q09. Identify the types of véhicules that were available on the holding during the reference period.
* Include all véhicules on the holding, regardless of ownership.

(Fill in all that apply)
- ◯ 1 Passenger véhicules
- ◯ 2 véhicules for transporting livestock
- ◯ 3 véhicules for transporting feed and crop products
- ◯ 5 véhicules for transporting water or other liquids
- ◯ 6 Refrigerated véhicules
- ◯ 999 Other (specify [ ])
- ◯ 0 None

Q10. Identify the types of public transportation infrastructure that were available near the holding during the reference period.

(fill in all that apply)
- ◯ 1 Bus station
- ◯ 2 Train station
- ◯ 3 Boat/ferry terminal
- ◯ 0 None of the above → **Go to Q12.**

Q11. Report the travelling time to the nearest public transportation station.

	Number of hours	Number of minutes
Q11a During Season 1	. . . . .	. . .
Q11b During Season 2	. . . . .	. . .
Q11c During Season 3	. . . . .	. . .
Q11d During Season 4	. . . . .	. . .

Q12. Was the holding covered by an agricultural products collection network during the reference period?
- ◯ 0 No
- ◯ 1 Yes

Q13. Was access to a shared food storage facility possible for the holding during the reference period?
- ◯ 0 No
- ◯ 1 Yes

Q14. Was access to an agricultural processing facility possible for the holding during the reference period?
- ◯ 0 No → **Go to Q16.**
- ◯ 1 Yes

Q15. Report the travelling time to the nearest agricultural processing facility.

	Number of hours	Number of minutes
Q15a During Season 1	. . . . .	. . .
Q15b During Season 2	. . . . .	. . .
Q15c During Season 3	. . . . .	. . .
Q15d During Season 4	. . . . .	. . .

Q16. Identify the communications services and systems that were available to the holding during the reference period.

(fill in all that apply) *RESPONSE = [COMMS]*
- ◯ 1 Internet
- ◯ 2 Telephone
- ◯ 3 Radio
- ◯ 4 Television
- ◯ 0 None of the above

REPEAT Q17 AND Q18 FOR ALL COMMS TYPES IDENTIFIED IN Q16.

Q17. Were [COMMS] services accessed by the holding during the reference period?
- ◯ 0 No → **Repeat Q17 for the next [COMMS]; if last [COMMS], go to Q19.**
- ◯ 1 Yes

Q18. Were [COMMS] services used for the business and agricultural activities of the holding during the reference period?
- ◯ 0 No
- ◯ 1 Yes

CONTINUE Q17 AND Q18 UNTIL ALL [COMMS] ARE COVERED, THEN PROCEED TO Q19.

Q19. Are you aware of any specific agricultural development projects being carried out in the holding's community or neighbourhood during the reference period?
- ◯ 0 No → **Go to Q22.**
- ◯ 1 Yes

Q20. Did the holding participate in the development project(s)?
- ◯ 0 No
- ◯ 1 Yes → **Go to Q22.**

Q21. Identify the main reason why the holding did not participate in the development project(s).

(fill in one circle only)
- ◯ 1 Not interested in participating
- ◯ 2 Interested in participating, but there was no possibility to participate
- ◯ 999 Other (specify [ ])

Q22. Were there facilities for repairing agricultural machinery in the holding's neighbourhood during the reference period?
- ◯ 0 No → **Go to PART 7.3, Q25.**
- ◯ 1 Yes

Q23. Did the holding use the repair facilities?

- ◯ 0 No
- ◯ 1 Yes → **Go to PART 7.3, Q25.**

Q24. Identify the main reason why the holding did not use the repair facilities.

(fill in one circle only)

- ◯ 1 Not necessary, because the relevant knowledge existed on the holding
- ◯ 2 Not necessary, because there was no machinery used or there was no machinery in need of repair
- ◯ 2 Too expensive
- ◯ 999 Other (specify [ ])

PART 7.3: ACCESS TO COMMUNAL RESOURCES DURING THE REFERENCE PERIOD (DD/MM/YYYY) TO (DD/MM/YYYY).

Q25. Was there communal grazing land in the holding's neighbourhood during the reference period?
- ◯ 0 No → **Go to Q28.**
- ◯ 1 Yes

Q26. Did the holding use this communal grazing land during the reference period?
- ◯ 0 No
- ◯ 1 Yes → **Go to Q28.**

Q27. Identify the main reason for not using the communal grazing land during the reference period.

(fill in one circle only)
- ◯ 1 Not applicable/no livestock on the holding
- ◯ 2 Not necessary because enough feed was available on the holding
- ◯ 3 Too expensive
- ◯ 4 No access granted
- ◯ 5 Problems with other users
- ◯ 6 Problems with the quality and quantity of pasture
- ◯ 999 Other (specify [ ])

Q28. Was there communal forest or other wooded land in the holding's neighbourhood during the reference period?
- ◯ 0 No → **Go to Q31.**
- ◯ 1 Yes

Q29. Did the holding use this communal forest or other wooded land during the reference period?
- ◯ 0 No
- ◯ 1 Yes → **Go to Q31.**

Q30. Identify the main reason for not using the communal forest or other wooded land during the reference period.

(fill in one circle only)
- ◯ 1 Not necessary because the forest land on the holding was sufficient for the holding's activities
- ◯ 2 Too expensive
- ◯ 3 No access granted
- ◯ 4 Problems with other users
- ◯ 5 Problems with the quality and quantity of forest or other wooded land
- ◯ 999 Other (specify [ ])

Q31. Was there communal area under water for aquaculture in the holding's neighbourhood during the reference period?
- ◯ 0 No → **Go to Q34.**
- ◯ 1 Yes

Q32. Did the holding use this communal area under water for aquaculture during the reference period?
- ◯ 0 No
- ◯ 1 Yes → **Go to Q34.**

Q33. Identify the main reason for not using the communal area under water for aquaculture during the reference period.

(fill in one circle only)
- ◯ 1 Not applicable/no aquaculture activities on the holding
- ◯ 2 Not necessary because the area under water on the holding was sufficient for the holding's aquaculture activities
- ◯ 3 Too expensive
- ◯ 4 No access granted
- ◯ 5 Problems with other users
- ◯ 6 Problems with the quality and quantity of water
- ◯ 999 Other (specify [ ])

Q34. Were there communal irrigation facilities in working order in the holding's neighbourhood during the reference period?
- ◯ 0 No → **Go to SECTION 8 Q01.**
- ◯ 1 Yes

Q35. Did the holding use these communal irrigation facilities during the reference period?
- ◯ 0 No
- ◯ 1 Yes → **Go to SECTION 8 Q01.**

Q36. Identify the main reason for not using the communal irrigation facilities during the reference period.

(fill in one circle only)
- ◯ 1 Not applicable/no irrigation required on the holding
- ◯ 2 Not necessary because the water and irrigation facilities on the holding were sufficient for the holding's irrigation activities
- ◯ 3 Too expensive
- ◯ 4 No access granted
- ◯ 5 Problems with other users
- ◯ 6 Problems with the quality and quantity of water
- ◯ 999 Other (specify [ ])

Comments on SECTION 7:

SECTION 8: GREENHOUSE GAS AND ENVIRONMENTAL ISSUES DURING THE REFERENCE PERIOD (DD/MM/YYYY TO DD/MM/YYYY)

Q01. Was the holding's agricultural area utilized (AAU) located partially or totally in an officially protected area during the reference period?

- ◯ 0 No → **Go to Q03.**
- ◯ 1 Yes

Q02. Report the type/name of the area. . . . . [ ]

Q03. Was the holding's forest or other wooded land partially or totally under sustainable forest management during the reference period?

- ◯ 0 No → **Go to Q05.**
- ◯ 1 Yes

Q04. Report the type/name of the area. . . . . [ ]

Q05. Were there any contaminated sites on the holding during the reference period?

- ◯ 0 No
- ◯ 1 Yes

Q06. Was the holding involved in an organization (cooperative, association, etc.) for environmental protection programs during the reference period?

- ◯ 0 No
- ◯ 1 Yes

Q07. Identify the main area of environmental concern for the holding during the reference period.

(fill in one circle only)

- ◯ 1 Lack of water (drought)
- ◯ 2 Floods
- ◯ 3 Air pollution
- ◯ 4 Soil pollution
- ◯ 5 Extreme temperature (cold or heat)
- ◯ 999 Other (specify [ ])
- ◯ 0 None

ASK Q08 WHEN SECTION 4, Q01 = YES; OTHERWISE, GO TO Q09.

Q08. What was the usual disposal method for dead animals during the reference period?

(fill in one circle only)

- ◯ Buried on the holding
- ◯ Incinerated
- ◯ Composted
- ◯ Collected by off-farm collection service
- ◯ Other (specify [ ])

Q09. Did the holding pay any fines for environmental pollution during the reference period?

- ◯ 0 No
- ◯ 1 Yes

Comments on SECTION 8:

SECTION 9: ADAPTATION TO CLIMATE CHANGE AND MITIGATION STRATEGIES DURING THE REFERENCE PERIOD (DD/MM/YYYY TO DD/MM/YYYY)

PART 9.1: ADAPTATION TO CLIMATE CHANGE AND MITIGATION STRATEGIES DURING THE REFERENCE PERIOD (DD/MM/YYYY) TO (DD/MM/YYYY).

Q01. Did natural extreme events or disasters hit the holding during the reference period?

- ◯ 0 No → **Go to Q07.**
- ◯ 1 Yes

Q01a Report the number of times that natural extreme events or disasters hit the holding during the reference period.

	Number of events
◯ Drought	
◯ Heavy rainfall or heavy winds	
◯ Extreme temperatures (cold or heat)	
◯ Tsunamis	
◯ Earthquakes	
◯ Other (specify [ ])	

ASK Q02 WHEN AT LEAST ONE OF THE RESPONSE CATEGORIES IN Q01 > 0; OTHERWISE GO TO Q07.

Q02. Report the number of human impacts on the holding for the natural extreme events or disasters that hit the holding during the reference period.

	Number
Q02a People killed	
Q02b People injured	
Q02c People rendered homeless	
Q02d People evacuated	
Q02e Other (specify [ ])	

Q03. Indicate the type of economic impacts incurred by the holding for the natural extreme events or disasters that hit the holding during the reference period.

(fill in all that apply) *RESPONSE = [ECONOMIC IMPACT]*

- ◯ 1 Loss of revenue
- ◯ 2 Loss due to disruption of production
- ◯ 999 Other economic impacts (specify [ ])
- ◯ 0 None of the above → **Go to Q05.**

ASK Q04 WHEN Q03 > 0; OTHERWISE GO TO Q05.

REPEAT Q04 FOR ALL ECONOMIC IMPACT TYPES IDENTIFIED IN Q03.

Q04. Report the severity of the [ECONOMIC IMPACT] related to the natural extreme events or disasters encountered during the reference period.

(fill in one circle only)

- ◯ 1 Small losses
- ◯ 2 Significant losses
- ◯ 3 Almost total or total losses

CONTINUE Q04 UNTIL ALL [ECONOMIC IMPACT]S ARE COVERED, THEN PROCEED TO Q05.

Q05. Indicate physical impacts incurred on the holding for the natural extreme events or disasters that hit the holding during the reference period.

(fill in all that apply) *RESPONSE = [PHYSICAL IMPACT]*

- ◯ 1 Area lost
- ◯ 2 Crop losses
- ◯ 3 Livestock losses
- ◯ 4 Aquaculture losses
- ◯ 5 Biomass losses
- ◯ 6 Building damages or losses
- ◯ 999 Other physical losses (specify [ ])
- ◯ 0 None of the above → **Go to Q07.**

REPEAT Q06 FOR ALL PHYSICAL IMPACT TYPES IDENTIFIED IN Q05.

Q06. Report the severity of the [PHYSICAL IMPACT] related to the natural extreme events encountered during the reference period.

(fill in one circle only)

- ◯ 1 Small losses
- ◯ 2 Significant losses
- ◯ 3 Almost total or total losses

CONTINUE Q06 UNTIL ALL [PHYSICAL IMPACT]S ARE COVERED, THEN PROCEED TO Q07.

Q07. Identify the practices of the holding during the reference period to adapt to climate change.

(fill in all that apply)

- ◯ 1 Multicropping
- ◯ 2 Shifting cultivation
- ◯ 3 Use of traditional agricultural heritage practices and knowledge
- ◯ 4 Use of traditional crop and animal varieties
- ◯ 5 Use of seeds adapted to local conditions and stresses
- ◯ 6 Use of new practices or technologies
- ◯ 999 Other (specify [ ])
- ◯ 0 None of the above

Comments on SECTION 9:

SECTION 10: WASTE MANAGEMENT DURING THE REFERENCE PERIOD (DD/MM/YYYY TO DD/MM/YYYY)

PART 10.1: WASTE MANAGEMENT DURING THE REFERENCE PERIOD (DD/MM/YYYY) TO (DD/MM/YYYY).

Q01. Identify the methods used during the reference period to manage the wastewater generated by the holding.

(fill in all that apply)
- ◯ 1 Discharged to a constructed retention or holding pond
- ◯ 2 Discharged to a septic or sewer system
- ◯ 3 Discharged into a vegetative filter strip or constructed wetland
- ◯ 4 Applied to agricultural land
- ◯ 5 Included in the liquid manure system
- ◯ 6 Not managed, removed through natural drainage
- ◯ 999 Other (specify [ ])

Q02. Report the share of wastewater generated by the holding during the reference period, that was discharged into the environment.

Q02a After treatment
(fill in one circle only)
- ◯ 1 A small part of the holding's wastewater
- ◯ 2 A significant part of the holding's wastewater
- ◯ 0 None/not applicable

Q02b Without treatment
(fill in one circle only)
- ◯ 1 A small part of the holding's wastewater
- ◯ 2 A significant part of the holding's wastewater
- ◯ 0 None/not applicable

Q03. Identify the types of waste generated by the holding during the reference period.

(fill in all that apply) *RESPONSE = [WASTE]*
- ◯ 1 Non-functioning véhicules (tractors, agricultural machinery, etc.)
- ◯ 2 Used tires
- ◯ 3 Waste oils (black oils and hydraulic oils)
- ◯ 4 Empty packaging of plant protection products (PPPs)
- ◯ 5 Empty packaging of fertilizer products
- ◯ 6 Empty packaging of diesel, gasoline or other petroleum products
- ◯ 7 Empty packaging of cleaning and disinfection products
- ◯ 8 Empty packaging of seeds (bags and containers of all sizes and materials)
- ◯ 9 Used plastic film
- ◯ 10 Ropes and nets (used for forage conditioning or viticulture)
- ◯ 11 Plant protection products (PPPs) that are no longer usable
- ◯ 12 Veterinary waste
- ◯ 13 Fruit-soaking fungicidal liquids
- ◯ 14 Other non-hazardous organic waste
- ◯ 15 Other non-hazardous inorganic waste
- ◯ 16 Other hazardous waste
- ◯ 0 None of the above → **End of the survey**

REPEAT Q04 FOR ALL WASTE TYPES IDENTIFIED IN Q03.

Q04. Identify the treatment used by the holding for the waste generated on the holding during the reference period.

(fill in all that apply)
- ◯ 1 Waste taken away from the holding by a professional
- ◯ 2 Waste kept on the holding, treated by burning
- ◯ 3 Waste kept on the holding, treated by burying
- ◯ 4 Waste kept on the holding, other treatment (specify [ ])
- ◯ 5 Waste kept on the holding, no treatment

CONTINUE Q04 UNTIL ALL [WASTE] ARE COVERED, THEN END OF SURVEY.

Comments on SECTION 10:

General comments on the questionnaire:

End of survey, thank you.

4.4. AGRIS PRODUCTION METHODS AND THE ENVIRONMENT MODULE METHODOLOGICAL NOTE

Introduction

This note provides an overview of the Production Methods and Environment (PME) Module of the Agriculture Integrated Survey (AGRIS) and presents its structure and content. It is meant to provide managers and decision-makers with an understanding of the PME Module within the context of AGRIS and within the larger context of a national statistical system.

- Subchapter 4.4.1 outlines the key elements underlying the module: measurement objectives, coverage and collection, timing and reference periods for the module. It explains how the module fits into established international statistical frameworks and how it can respond to the data needs of priority international development initiatives in the agricultural and rural sector, such as the Global Strategy to improve Agricultural and Rural Statistics (Global Strategy or GSARS) and the Sustainable Development Goals (SDGs).
- Subchapter 4.4.2 introduces the structure and overall articulation of the PME Module. It presents selected indicators that can be generated from this and other AGRIS modules.
- Subchapter 4.4.3 provides methodological notes and discusses options for customization for specific parts and questions of the PME Module questionnaire. It provides definitions and introduces relevant classifications.

4.4.1. Context, measurement objectives, statistical unit, reference periods and units of measure

4.4.1.1. The PME Module in its AGRIS context

AGRIS is designed as a ten-year integrated sample survey program. The modular set of surveys has at its foundation an annual Core Module to collect basic frame information about holdings and those operating them, as well as data on agricultural production of crops and livestock. A set of four Rotating Modules provides economic data as well as data on the labour force, on production methods and the environment, and on machinery and equipment. These data supplement the core data, and through focused sample selection, can be integrated not only with the core, but also with each other, to provide a rich data set covering all aspects of agricultural holdings.

Table 4.10. below outlines the recommended timing and elements of the AGRIS system for agricultural statistics, including the agricultural census, the AGRIS Core Module and the four Rotating Modules (Economy, Labour, the PME Module, and Machinery, Equipment and Assets). It is recommended to conduct the PME Module starting in the fourth year of the ten-year cycle, and again four years later. With this schedule, it will be completed two times within the ten-year AGRIS cycle, considering that production practices do not change rapidly. Given this low frequency, contextual information (meteorological conditions during the reference period including extreme events, etc.) is to be taken into account to ensure a sound analysis of the data generated.

TABLE 4.10. RECOMMENDED AGRIS MODULE FLOW.

	Years	1	2	3	4	5	6	7	8	9	10
Core Module	Agricultural holding (AH) Roster	•	•	•	•	•	•	•	•	•	•
	Crop + livestock production	•	•	•	•	•	•	•	•	•	•
	Other key variables	•	•	•	•	•	•	•	•	•	•
Rot. Module 1	Economy	•		•		•		•		•	
Rot. Module 2	Labour		•				•				
Rot. Module 3	Production Methods and the Environment				•				•		
Rot. Module 4	Machinery, Equipment and Assets	•				•					

The AGRIS Core Module is the framework upon which the Rotating Modules are built. It is conducted annually, on a sample basis, and primarily collects roster information for the agricultural holding, as well as crop and livestock production. In addition, some economic, labour and demographic questions are included. Along with providing annual production data, the roster information is critical in maintaining an up-to-date survey frame for the selection of samples for the Rotating Modules and future Core Module surveys.

The PME Module of the AGRIS program focuses mainly on the agricultural production practices of agricultural holdings and is closely linked to the Core Module, meaning that the necessary information from the Core Module is initialized in the PME Module. The PME module focuses on energies uses, land use, soil conservation methods, irrigation methods, soil fertilization, seeds used, plant protection products (PPPs), animal reproduction methods, veterinary products used, animal housing, manure management, organic farming, agroforestry, services and infrastructures used by the holding, adaptation to climate change and hazards. If the PME Module is not conducted together with the Core Module, some questions from the Core Module questionnaire (mainly, those related to the identification of the agricultural holding, crop and livestock production) should be included in the PME questionnaire.

Sampling recommendations for the all AGRIS modules are provided in chapter 5 of this handbook, on the AGRIS sampling strategy. When possible, the PME Module will use the same sample of the holdings that have completed the AGRIS Core Module. This will be important so that data from the two modules can be combined to provide a more robust set of data, while minimizing the costs of collection and the reporting burden placed on data providers. Data are meant to be collected in the field directly from survey respondents using Computer-Assisted Personal Interview (CAPI) techniques. A CAPI version of the AGRIS PME Module Generic Questionnaire is available in the Survey Solution package.

Some information from the other Rotating Modules can also be used when analysing data from the PME Module. Where common samples are large enough, data can be combined directly for the holdings common to different Rotating Modules, to provide an even more comprehensive data profile at the micro (holding) level. If this is done, allowance must be made in the analysis to account for the fact that data for Rotating Modules will be collected in, and for, different reference periods. Even if data cannot be matched and analysed directly at the micro level, it is possible to classify holdings in multiple Rotating Module data sets at the meso level, through an appropriate farm typology using characteristics such as main production type or size (available from the Core Module), to compare variables from the two modules for “similar” agricultural holdings. In this way, inferences may be made across a broad set of variables. For example, labour and economic variables could be analysed in relation to practices reported in the PME Module to attempt to identify relationships. Again, it is important to account for the fact that data from different Rotating Modules will be collected in, and for, different reference periods.

4.4.1.2. The PME Module and international frameworks

Relevant international statistical frameworks applied in the AGRIS PME Module

The AGRIS generic methodology is proposed as a public good to statistical agencies for further customization and implementation. The resulting data are meant to be used in a coherent way to make meaningful subnational, regional and international aggregations and comparisons. In this context, the AGRIS methodology relies extensively on several internationally endorsed statistical frameworks, such as statistical classifications, and is articulated with other relevant data collection programs (such as the FAO-promoted World Programme for the Census of Agriculture 2020, or WCA 2020). The AGRIS methodology, including the questionnaires' content, design and implementation (using CAPI), has benefited from several data collection innovations brought about by the implementation of the Global Strategy and the Research Program of the LSMS-ISA program promoted by the World Bank.

The AGRIS PME Module follows the structure defined in the UN Framework for the the Development of Environment Statistics (FDES 2013; UNSD, 2016), adapted to the agricultural context. The FDES 2013 is a flexible, multipurpose conceptual and statistical framework that is comprehensive and integrative in nature. It establishes the scope of environment statistics and provides an organizing structure to guide their collection and compilation, and to synthesize data from various subject areas and sources, covering the issues and aspects of the environment that are relevant for analysis, policy and decision-making (UNSD, 2016, para 1.9).

Another very important reference document for this module is the UN Framework Convention on Climate Change (UNFCCC) and, particularly, the International Guidelines of the Intergovernmental panel on Climate Change (IPCC), approved by the UNFCCC[1].

The scope of activities in AGRIS is defined under ISIC rev. 4 (see annex 1-1); the products covered by AGRIS are based on the CPC rev. 2.1 (UN Central product classification), adapted for the AGRIS context (see annex 1-3).

Beyond the essential articulation in terms of timing between the ten-year AGRIS cycle and the frame building on the basis of an agricultural census, the AGRIS methodology is linked to the WCA 2020 in terms of relevant items, definitions and classifications. For example, the Indicative Crop Classification (ICC ver 1.1), based on the CPC ver. 2.1, is used for crops grown (see annex 1-2) in both WCA 2020 and AGRIS.

The land use classes proposed in AGRIS are harmonized with the Land Use Classification of the SEEA 2012 Central Framework. The classes with agricultural land use were adapted to better capture all types of land used for crop production.

1 http://unfccc.int/national_reports/annex_i_ghg_inventories/reporting_requirements/items/5333.php.

Using AGRIS PME data: relevant international statistical demand frameworks for AGRIS PME Module data

SDG indicators

On 25 September 2015, countries adopted a set of goals to **end poverty**, **protect the planet**, and **ensure prosperity for all** as part of a new sustainable development agenda[2]. Each goal has specific targets to be achieved over the next 15 years, all coming with specific indicators[3]. Through its PME Module, AGRIS provides essential and direct information for the following SDG "sustainability indicator":

- 2.4.1: Proportion of agricultural area under productive and sustainable agriculture

The AGRIS PME Module provides elements for the compilation of the following SDG indicators:

- 2.5.2: Proportion of local breeds, classified as being at risk, not-at-risk or unknown level of risk of extinction.

Minimum Set of Core Data (MCSD)

The Global Strategy is a coordinated effort to provide a conceptual and institutional framework for the production of data, to establish a Minimum Set of Core Data (MSCD) required to meet the basic and emerging demands of national development policies, to develop cost-effective methodologies for data production and use, and to establish the necessary governance structures and capacities.

The MSCD covers three dimensions:

- Economic – outputs, trade, resources, inputs, prices, agro-processing; final expenditure; rural infrastructure
- Social – employment status, education level, household composition, family workers, sex disaggregated data
- Environmental – soil degradation, water population, greenhouse gases (GHGs), agricultural practices on water use, land use, etc.

The proposed set of AGRIS questionnaires generate approximately two thirds of the MSCD data requirements. AGRIS generates all of the MSCD-relevant data to be collected at farm level. The PME questionnaire generates approximately 16 MSCD items under ''Economic – Stock of resources, Inputs, Agro-processing and Rural Infrastructure" as well as "Environmental – Land, water, air".

4.4.1.3. Measurement objectives and scope

The objective is to produce the main indicators linked to agricultural production practices:

- General practices (organic farming, agroforestry, adaptation to climate change and GHG management, extreme events, waste management, services and information access)
- Use of natural resources (energies, water)
- Crops management and soil conservation (tillage, seeds, winter cover, crop rotation, crop burning, pastures management, permanent crops management)
- Use of fertilizers and plant protection products (concerned crops, manure management)
- Livestock management (reproduction methods, veterinary interventions, animal housing and transportation, animal feeding, manure management)
- Prospects for the two or three next years (constraints, development)

2 http://www.un.org/ga/search/view_doc.asp?symbol=A/RES/70/1&Lang=E.
3 https://unstats.un.org/sdgs/metadata/.

The scope of AGRIS (Core and Rotating Modules) is defined under ISIC (Rev.4), as follows:
Section: A – Agriculture, forestry and fishing
Division: 01 – Crop and animal production, hunting and related service activities

- 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

The detailed ISIC description for these activities can be found in annex 1-1, which information at the Section, Division, Group and Class levels of the classification, along with explanatory notes.

4.4.1.4. Statistical unit and coverage

The statistical unit of all AGRIS modules is the agricultural holding, as an independent producer of agricultural products. The definition proposed for AGRIS is that proposed by FAO in its WCA 2020 programme (FAO, 2015).

> "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."

The agricultural holding is under single management, exercised by the holder (see the methodological notes of the AGRIS Core Module).

This module shall be addressed to both household and non-household sectors, as defined by the country (for more information, see the Core Module methodological note and annex 1-4). An interesting analysis of agricultural practices can be conducted for each of these sectors, and comparisons between them can be made.

Coverage and use of thresholds

AGRIS should cover all relevant agricultural activities of agricultural holdings in the given country that fall within the scope of the ISIC groups mentioned above. Following the national characteristics, thresholds can be fixed for the whole country, with the objective of covering the greater part of the information on PME. The benefits of establishing thresholds needs to be carefully assessed; if operational simplicity and budget savings are obvious advantages, disadvantages would include the need to monitor small-scale holdings, which are often of primary policy concern.

Identification numbers

If the PME Module is carried out within the framework of AGRIS with the Core Module, the identification rules in use for the Core Module are used for the PME Module. If the PME Module is managed as an independent survey, statistical identification numbers must be defined.

The main goal is to identify with certainty the statistical unit, that is, the agricultural holding. This identifier (ID) can be specific to the sampling database or can be an administrative ID, if one exists and is compatible with the objective: the same definition of the holding. Such IDs can be:

- Sampling database ID: this is linked to a single, unique, holding and used generally for all surveys after the census. It can be the same as the census ID or the business register ID.
- Surveyor ID: this corresponds to the name and surname of the surveyor for the current survey, and is linked with surveyor work management and payments.
- Enumeration area and census ID: this is linked to a single holding and is calculated during the census.

Administrative IDs may also be used:

- Business register ID: linked to a unique holding, it can be used as statistical ID; however, this is very often difficult because
  a. The statistical definition of "holding" can be different from the business definition of "holding";
  b. The coverage of the two registers can also be different, thus bearing implications for very small holdings
- Individual number: this can be useful for holders (civil persons) and managers when persons of different generations have the same name
- Other administrative IDs (livestock, wine, organic, oil, etc.) may be useful in merging statistical and administrative data.

4.4.1.5. Reference period and timing

The reference period must be fixed by the central statistical unit during survey preparation. Many questions will refer to this period. Two types of reference periods are used in the AGRIS Core Module, depending on the type of data collected:

c. **The reference year (YYYY/MM/DD) to (YYYY/MM/DD)** – this coincides with the last complete agricultural year and the main reference period for the AGRIS Core Module. It is used when collecting data on agricultural production. It provides a natural framework for respondents when they think about their agricultural production. The main characteristics of this reference period are the following:
   - a duration of 12 months
   - the inclusion of soil preparation(s), sowing(s) and harvest(s); and conclusion with one harvest period, to ensure consistency with the agricultural campaign(s). The end of the period is generally the date of the last harvest in the year.
   - the inclusion of one or more harvests (in addition to the possibility of having continuous harvests).

d. **A given point in time or particular day** – these are used when inventory data (such as livestock numbers) are being asked. It is preferable to choose one date (the same day each year) included in the reference period for the questions concerning punctual events, such as present livestock. The interview day can be used, although this may pose problems for seasonal phenomena (such as births).

The AGRIS Core Module should be implemented annually, while the PME Module can be carried out every four or five years, and be addressed to the same sample or a subsample of the Core Module sample. To maximize respondent recall, timing that is in close proximity to the end of agricultural year is optimal. Data collection should be carried out close to, or just after, the end of the reference period (the last agricultural year) such that the information is still "fresh" in the farmer mind.

As this module focuses on highly technical matters, the first question is to estimate data quality. If the holdings do not register their activities systematically, it is necessary to help the respondents by giving them a possibility to register the events or organize the data collection in two or three waves, during the reference period.

4.4.1.6. Units of measure

In the PME Module, the data collected are mainly qualitative. For the quantitative data – such as land areas, inventories of animals and quantities of inputs used – international standard units of measure are useful and AGRIS results should be converted to them. In many cases, however, respondents may use and be more familiar with local units of measure. To facilitate reporting, local units of measure should be identified and used during data collection. During survey preparation, it is necessary to establish a list of possible units to be used during the interviews. The conversion factors to standard units should be specified. Such conversions can be built into the CAPI application prior to collection, to ensure seamless reporting in local units and dissemination in standard units.

For example, if unit *U* for areas is adopted, 1 *U* x COEF (*U*) = 1 ha.

Reporting areas of land

Acres and hectares are the standard units used. In adopting countries, local measurements of land area may be useful for collecting data from respondents. In these cases, a conversion factor to either acres or hectares should be identified and provided.

1 acre = 0.40 hectare = X local units

1 hectare = 2.47 acres = X local units

1 local unit = X acre = X hectare

Reporting inventories of animals

Number of animals and number of birds are the standard units used in the questionnaire.

Reporting weights:

Pounds and kilograms are the standard units used in the questionnaire.

1 pound = 0.45 kilograms

1 kilogram = 2.205 pounds

1 other unit = X pounds = X kilograms

Country customization

The questionnaire is designed to facilitate the tasks of the respondents and enumerators. The PME Module does not propose “default” units of measure, but rather currently asks for the unit used for each relevant question or set of questions. Another option is to ask which units will be used for areas, quantifies, values, etc. at the beginning of the interview. Choosing between these options could require a field test to be conducted during the pilot survey.

4.4.2. Structure of the PME Module and main indicators

The structure and content of the AGRIS PME Module questionnaire is presented here, following the order of the questions.

The AGRIS PME Module is divided into 11 parts. Table 4.11. below summarizes the organization of the thematic coverage of each of these parts.

TABLE 4.11. STRUCTURE OF THE AGRIS PME MODULE.

Sections (S) and parts (P) of AGRIS PME Module questionnaire	Main themes included	Main indicators that can be calculated
S1. Presentation of the survey		
P1.1. Holding identification	Location, including geographical coordinates Legal status Holders and managers characteristics	Agricultural production legal framework Human factors influence on agricultural production practices (age, education, status...)
P1.2 Prospects for development of the holding	Main constraints	Holdings prospects by activity, size, status
S2. Use of natural resources		
P2.1 Energy sources used	Energy sources used	Types of energy used
P2.2 Soil management	Tillage methods, soil cover, crops rotation, conservation practices, crop residue management, soil degradation	Agricultural area utilized by land use type Share of area of temporary crops by tillage method Share of area of temporary crops by intercropping soil cover Share of holdings practising crop rotation or other soil management practices Burnt area by land use type Use of crop residues
P2.3 Irrigation and drainage		Irrigation methods Sources of irrigation water
S3.Crop production methods		
P3.1 Use of fertilizers	Fertilization	Intensive agriculture Share of holdings applying fertilizers Area by land use types and by type of fertilizers applied Non-fertilized areas
P3.2 Use of plant protection products	PPPs	Share of holdings applying PPPs Areas with PPP applied, by type of PPP
P3.3 Crop and seeds varieties	Types of seeds	Share of holdings using modern/genetically modified (GM)/traditional varieties Main source of the seeds
P3.4 Permanent crops	Plantation structure of perennial crops	Perennial crop structures by crop Density/number of trees by crop

Sections (S) and parts (P) of AGRIS PME Module questionnaire	Main themes included	Main indicators that can be calculated
P3.5 Pollination practices	Pollination	Share of holdings using pollination practices, by type of practice
P3.6 Rice cultivation	Rice cultivation methods	Rice production practices by type of rice
S4. Livestock production methods		
P4.1 Animal breeding and reproduction	Reproduction methods	Livestock production systems Main type of breeding method by livestock type
P4.2 Use of veterinary products	Veterinary products, hormones, antibiotics, natural medicine	Share of holdings using veterinary services and products Share of holdings using traditional medicine
P4.3 Animal housing	Animal housing	Animal housing by type of livestock
P4.4 Equipment and transportation of animals	Animal transportation Transhumance practice	Main transportation by destination
P4.5 Feed and use of pastures	Animal feeding practices	Main feeding practice by type of livestock Average duration (in months) of using pastures
P4.6 Watering of animals	Animal watering practices	Main watering practice by type of livestock Main sources of water
P4.7 Manure management	Manure management	Share of holdings using a manure management system Average capacity (in months) of the manure management system (by type of system) Share of manure storage facilities that are covered
S5. Organic farming		
	Areas and animals under organic farming certification or in conversion to organic farming	Share of crop and animal productions in organic farming (areas/crop, number of heads/species)
S6. Agroforestry		
	Crops and livestock under agroforestry methods, woodland creation	Share of crop and animal productions in agroforestry farming (areas/crop, number of heads/species)
S7. Access to and use of information services, infrastructure and communal resources		
P7.1 Agricultural information	Information sources	Share of isolated holdings Impact of advice and media
P7.2 Infrastructure (transportation, communications and access to facilities)	Transport and storage facilities, agricultural products collection, Internet connection	Share of isolated holdings
P7.3 Access to communal resources	Availability and access to communal facilities	Share of holdings with access to communal resources
S8. GHG and environmental issues		
	Protected areas, forest management, environmental problems, dead animals management, contaminated areas	Share of holdings situated (partially) in officially protected area. Share of holdings with contaminated sites

Sections (S) and parts (P) of AGRIS PME Module questionnaire	Main themes included	Main indicators that can be calculated
S9 Adaptation to climate change and mitigation strategies		
	Extreme events and disasters, actions for climate change adaptation	Share of holdings that have faced extreme events, by type of event, losses Share of holdings practising adaptations to climate change practices
S10. Waste management	.	
	Wastewater management, other waste treatment, hazardous material storage	Share of holdings using wastewater, by type of use Main types of waste generated by the holding Main treatment used for the waste generated by the holding

Detailed descriptions of the main indicators, including the required variables and calculations, may be found in annex 2 of this handbook.

Survey management

The PME module is conceived to be linked to the AGRIS Core Module. It can be addressed to the whole sample or to a subsample of the AGRIS Core Module sample. In the former case, data from the Core Module and from the PME Module are available at the same time and can be used together to analyse the collected data. This is the recommended setup.

In cases when the PME is not carried out at the same time as the Core Module, it may be necessary to add questions from the AGRIS Core Module (or a similar production survey) to be able to analyse PME data. The main sections or questions from the Core Module to be added to the PME Module are:

- Section 1, part 1.1 – Survey preparation, part 1.2 – Identification and legal status of the holding
- Section 2 – Holders and managers
- Section 3 – Area utilized, area and production per crop
- Section 4 – Livestock raised and animal productions (meat, eggs, milk...)
- Section 11 – End of questionnaire

4.4.3. Content, proposed definitions and classifications

This subchapter presents the detailed content of the PME Module questionnaire and assumes that the necessary information from the Core Module is available.

It should be noted that the questions in this module are interlinked and as a whole, give important information for assessing the agricultural practices used for crop cultivation and livestock breeding, the correlation between these practices, and some problems and opportunities. In addition, the questionnaire provides countries with important elements to address internationally agreed commitments on regular reporting to the UNFCCC on the GHG emissions inventory at country level, in line with the International Guidelines of the IPCC.

4.4.3.1. Section 1: general information on the holding

Section 1, Part 1.1 – Identification of the agricultural holding

Part 1.1 – *Identification of the agricultural holding* is completed when the PME Module is conducted through a collection wave that is not synchronized with the AGRIS Core Module. When the PME Module is conducted concurrently with the Core Module, the two questionnaires will be integrated and the identification will follow that of the Core Module. It provides information on links to the Core Module as well as on the legal status of the agricultural holding and the holder(s), crop and livestock production.

Section 1, Part 1.2 – Prospects for development of the holding

The objective is to collect the holder's intentions for the future activity of the holding over the next two or three years. Four possible answers are proposed:

- The holder can consider that the activity is stable, with no major changes planned
- The holding will develop its activity, without major obstacles identified
- The holding will develop due to some constraints
- The holding is likely to stop its agricultural activities in the next two or three years

In the last two cases, the main constraint upon the holding's development should be selected: whether on inputs, selling production, ecological issues, or other.

Information on the holders' intentions can be of fundamental importance for policy-makers in orienting their actions (programmes).

The list of possible constraints can be adapted to the national context during the survey preparation phase.

4.4.3.2. Section 2 – Use of natural resources

Section 2, Part 2.1 – energy sources used by the holding

All energy sources used for the agricultural holding's activity are to be selected. The difficulty, arising mainly in the household sector, is to distinguish the energy used specifically by the holding for its activities from that used by the household. It is necessary to help the respondent by giving national examples.

After testing the questionnaire, it is useful to supplement this part with the quantity of some energies – those that are known by a majority of respondents or by the approximate part of each energy type in the holding's overall energy consumption.

Section 2, Part 2.2 – soil management

The Generic Questionnaire proposes filter questions to avoid unnecessary overburden of respondents. During data processing, a specific value must be assigned to the skipped variables to avoid any analytical error. This is valid for all such skip questions throughout the questionnaires.

Soil management gives important information on soil health, conservation and degradation. The following soil management practices are addressed in the questionnaire:

Tillage methods – the total area of outdoor arable land is divided into the different tillage methods used:

- **Conventional tillage** involves inversion (turning over) of the soil over the whole area considered, with tillage operations using tillage tools or equipment such as a mouldboard or disc plough or powered tillage equipment such as a rotavator. It can also be carried out with traditional ploughs of wood or iron drawn by animal power.
- **Conservation (low) tillage** involves tillage practices or practices that leave plant residues (at least 30–35 percent) on the soil surface for erosion control and moisture conservation. Normally, soil should not be inverted but only ripped. This type of tillage can include the following systems, and the item definition should refer to those that are present in the country:
    - Reduced or minimum tillage is a practice that is used in soil conservation to limit erosion. The equipment, such as a ripper, does not invert the soil and causes little compaction, but does leave some ripping lines. For this reason, the soil retains a good cover of residues on the surface.
    - Strip tillage, in which 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 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 scrapping off the top of a ridge, with the crops planted into the tops of the ridges formed during the cultivation of the previous crop. The soil is covered with residues between the rows until planting.
- **Zero tillage** does not involve any tillage operations – the soil is always covered. The seeding operation is carried out with direct seeders that are able to open a narrow slot of the soil through soil cover.

The questionnaire includes the three main categories. According to the importance of the conservation tillage method, these categories can be further split into the subcategories mentioned above.

With **soil cover during the longer intercropping period**, the objective is to know whether the soil is covered during the longer intercropping period of outdoor arable land.

- **Bare soil** – areas that are ploughed or otherwise tilled after the harvest and are not sown or covered with any plant residues, remaining bare during the longer intercropping period.
- **Plant residues** – land covered with residues and stubble from the last crop season.
- **Cover or intermediate crop** – area on which plants are sown specifically to reduce the loss of soil, nutrients and plant protection products during the intercropping period. Normally, they are ploughed in before the next sowing and are usually not harvested.
- **Next seasonal crop** – this crop is sowed immediately after the last harvest.

In **crop rotation on outdoor arable land**, the objective is to estimate the part of the outdoor arable area where the crop changes after each harvest to avoid impoverishment of the soils.

Questions are also asked on the **other soil conservation practices** implemented during the observation period to avoid soil erosion.

- **Fallowing or shifting cultivation**: fallowing left uncultivated and not seeded, for a season or more from time to time. Shifting cultivation is an agricultural system in which plots of land are cultivated temporarily, and then abandoned and allowed to revert to their natural vegetation while the cultivator moves on to another plot. The period of cultivation is usually terminated when the soil shows signs of exhaustion or, more commonly, when the field is overrun by weeds.
- **Vegetative strips**: narrow strips of naturally growing grasses and herbs intentionally left unploughed along the contours of slope land farms. These strips serve as buffers that prevent the soil from eroding during heavy rains and intensive cultivation. Over time, these strips form stable terraces along the contours. The strips filter pesticides, nitrates and soluble phosphorus, thus preventing runoff. They control soil erosion by more than 90 percent. They improve water infiltration during heavy rains.

- **Liming**: the application of calcium- and magnesium-rich materials to soil in various forms, including marl, chalk, limestone, or hydrated lime. This neutralizes soil acidity and increases the activity of soil bacteria. However, oversupply may result in harm to plant life. Lime is a basic chemical; it has the effect of making the soil more basic, and thus makes acidic soils neutral.
- **Terraces**: used for growing crops on sloping lands, avoiding soil erosion. It should be noted that existing terraces should be also reported here, not only those created during the reference period.
- **Wind breaks and hedges**: these create a permeable barrier that still allows air to pass through but significantly reduces its speed. A windbreak hedge reduces wind speed on the leeward side to a distance of ten times its height – in other words, a 1-metre strip of windbreak hedging will protect an area of 10 metres. It should be noted that existing wind breaks should be also reported here, not only those created during the reference period.
- **Rotational grazing**: also known as cell grazing, mob grazing and holistic managed planned grazing, this term describes a variety of closely related systems of forage use in which ruminant and non-ruminant herds and/or flocks are regularly and systematically moved to fresh rested areas, with the intent to maximize the quality and quantity of forage growth. One primary goal of rotational grazing is to ensure a vegetative cover over all grazed areas at all times, and to prevent the complete removal of all vegetation from the grazed areas.
- **Other ways to reduce soil erosion, salinity, compaction, drainage of soil water**: any other action intended during the reference period to protect soil. It is necessary for the surveyor to verify whether the proposed action can be classified into one of the previous categories, as this category will not be interesting in terms of results.

Crop residues and/or areas burnt during the reference period – the objective is to estimate the area cleared by fire before ploughing and sowing. Thus, for each type of crop, land temporarily fallow and forest or wooded land, the share of the burnt area is asked, with the aim of determining whether this practice is exceptional and to obtain an estimator of the total area burn.

Another better option would be to ask for the exact area burnt – by types of crops, forest or wooded area and land temporary fallow. This approach depends on the holders' knowledge of their area.

Use of crop residues for feeding and/or bedding construction during the reference period – the objective is to estimate the area per crop used for livestock production activities.

Other environmental characteristics at holding level – the objective is to characterize phenomena in terms of importance and link them with structural data on the holding (location, activity, holder):
- Area of pastures renewed during the observation period, by type of renewal.
- Soil analysis practices during the reference period or at least during the past five years
- Accumulation of water during heavy rains on agricultural areas
- Accumulation of salt on agricultural areas
- Soil changes – in colour, stones, and difficulties in works and/or crops emerging.

If the survey is administered at parcel level (see the methodological note on the AGRIS Core Module), the questions linked to soil quality (**Q23** to **Q28**) can be asked at this level. This will, however, have serious operational and budgetary consequences.

Section 2, Part 2.3 – Irrigation and drainage

The objective is to estimate irrigation use, its consequences on environment and relevant practices. The main indicators for irrigation can be calculated: irrigated crops and areas, water used, irrigation methods and source of water used for irrigation.

Irrigation is "any process through which water is moved from a water source to apply to an agricultural crop" (FAO, 2015, para 8.3.2). Water for irrigation may come from various sources, including rivers, dams or wells, water reservoirs, etc.

"Irrigation used on the holding" means that water (other than rain) is applied to crops at least once during the entire reference period (section 2, **Q29**).

Two **irrigation methods** are determined.

- Fully controlled irrigation refers to the following methods:
    - Surface irrigation (furrow, border strip and basin): one of the oldest methods of irrigating, and refers to a system for partially or completely covering land with water for the purpose of irrigation. Farmers flow water down small trenches that run through their crops.
    - Sprinkler irrigation: a method of applying irrigation water that simulates rainfall. Water is distributed under pressure through a system of pipes, usually by pumping. It is then sprayed into the air over the entire soil surface through spray heads, so that it breaks up into small water drops that fall to the ground.
    - Drip irrigation: form of irrigation that saves water and fertilizer by allowing water to drip slowly to the roots of many different plants, either onto the soil surface or directly onto the root zone, through a network of valves, pipes, tubing, and emitters.
    - Spray or microsprinkler: microsprinklers and sprayers operate at low pressure and are designed for areas where drip irrigation is not advisable, for keeping plant foliage constantly moist, or when overhead watering is required. Microsprinklers and microsprayers are rated by flow rate, wetting diameter and spray method (moving parts for microsprinklers vs non-moving parts for sprayers).
    - Bubbler irrigation: a localized, low-pressure, solid permanent installation system used mainly in tree groves. Each tree has a round or square basin that is flooded with water during irrigation. The water infiltrates into the soil and wets the root zone. The water is applied through bubblers, which are small emitters placed in the basins.

The last three bullets refer to localized, fully controlled irrigation. If the three types they refer to are not used very often in the country in question, they can be grouped into a single category (to be named "localized fully controlled irrigation") to improve the representativeness of the collected data.

The **source of irrigation water** for the fully controlled methods that the holding has used at least once during the entire reference period should be reported. The objective is to know the approximate share of each water source used for irrigation in the total amount. The main sources are:

- on-farm water
- off-farm surface water (lake, river, dam)
- municipal supply
- waste water
- reservoir (used to collect water and avoid flooding)

Partially controlled irrigation methods that have been used at least once by the holding during the whole reference period may include:

- Equipped wetland and inland valley bottoms: lowland areas subject to seasonal flooding that are used for cropping when covered with water. Water control structures – such as canals – may be constructed to help in crop cultivation; in these cases, this falls within the partially controlled irrigation category (FAO, 2015, para 8.3.22). Developed mangroves are included in this category.
- Equipped flood recession cultivation: areas along the edges of rivers or other water bodies where cultivation occurs, making use of water from receding floods. Floating rice is included as a flood recession crop. Structures may be built to retain the receding water, in which case this falls within the partially controlled irrigation category (FAO, 2015, para 8.3.23).
- Spate irrigation: a method of random irrigation using floodwater. The floods or spates from seasonal rivers are diverted into adjacent embanked fields for direct application. A stone or concrete structure raises the water level within the channel to be diverted to the nearby cropping area.

If some of the irrigation methods (fully or partially controlled) seen above do not exist in the country, they may be deleted from the questionnaire.

Irrigable agricultural area refers to all potentially irrigable agricultural area (irrigation equipment is in function), even if it was not irrigated during the reference period.

The objective is to collect two separate figures: one for irrigable area with fully controlled methods, and the other for irrigable area with partially controlled methods.

Irrigated agricultural area refers to all of the agricultural area irrigated at least once during the reference period.

The objective is to collect two separate figures for the irrigable area with fully controlled methods and for the irrigable area with partially controlled methods, by type of crop and by cultivation season (if there is more than one harvest).

The number of seasons should be determined at national level during survey preparation, on the basis of the agricultural calendar.

Information is asked on the payments linked to water used for irrigation.

Areas equipped with drains: only efficient (non-clogged) drains should be taken into account.

- Area equipped with surface drains: only surface water can be eliminated with this type of drain
- Area equipped with subsurface drains: these can evacuate water stored in excess in the soil.

4.4.3.3. Section 3 – Crop production methods during the reference period

If the PME Module is carried out together with the Core Module, utilized areas will be initialized from the Core Module. Otherwise, it must be collected as it is presented in the Core Module.

This section collects, at farm level, data on the use of fertilizers, PPPs, seed varieties, structure of permanent crops, pollination methods and rice cultivation methods.

Section 3, Part 3.1 – Use of fertilizers

If the holding did not use any fertilizer during the reference period, the reason must be selected: too expensive, not available, or any other reason.

If fertilizers were used, the quantity and area per type of crop (temporary crops, permanent crops, temporary meadows and pastures and fallow) are registered for the following fertilizer types:

- **Mineral fertilizers**: inorganic substances, primarily salts, containing nutrients required by plants – nitrogen (N), phosphorus (P), potassium (K) or any combination of those three elements.
- **Organo-mineral fertilizers**: fertilizers obtained by chemical reaction or by dry-mixing one or several organic fertilizers and/or one or several organic matrixes with one or several inorganic fertilizers.
- **Compost**: fertilizer obtained through an aerobic biological process that transform organic products (livestock subproducts, biomass, organic waste, etc.) into a fertilizer that plants can use.
- **Mulch**: agricultural technique consisting of covering the soil to keep it loose, limit evaporation and erosion.
- **Biofertilizer**: substance that contains living microorganisms which, when applied to seeds, plant surfaces, or soil, colonize the rhizosphere or the interior of the plant and promotes growth by increasing the supply or availability of primary nutrients to the host plant.
- **Solid dung incorporated in the X hours after spread:** solid livestock effluents. The area concerned here is important in calculating GHG and ammonia emissions. From the scientific point of view, the best value of X would be four hours. However, X can be established at national level within a reasonable timeframe (considering a maximum of one day). If this operation is not feasible, then the question could be simplified as “Solid dung incorporated after spread”.
- **Solid dung incorporated more than X hours after spread**: solid livestock effluents. The area concerned by the four hours for incorporation into the soil is important in calculating GHG and ammonia emissions. For the same reasons as above, if this question is not feasible, it can be deleted.
- **Solid dung, not incorporated**: solid livestock effluents spread but not incorporated.
- **Liquid manure incorporated in the X hours after spread**: urine from domestic animals, possibly including a small amount of excrement and/or water. Here, the area concerned is important in calculating GHG and ammonia emissions. From the scientific point of view, the best value of X would be four hours. However, X can be established at national level within a reasonable timeframe (considering a maximum of one day). If this operation is not feasible, then the question could be simplified as “Liquid manure incorporated after spread”.
- **Liquid manure incorporated more than X hours after spread**: urine from domestic animals, possibly including a small amount of excrement and/or water. The area concerned by the four hours for incorporation into the soil is important in calculating GHG and ammonia emissions. For the same reasons as apply above, if this question is not feasible, it can be deleted.
- **Liquid manure, not incorporated**: urine from domestic animals, possibly including a small amount of excrement and/or water, spread but not incorporated.
- **Slurry incorporated in the *X* hours after spread**: liquid livestock effluents. The area concerned here is important in calculating GHG and ammonia emissions. From the scientific point of view, the best value of X would be four hours. However, X can be established at the national level within a reasonable timeframe (considering a maximum of one day). If this is not feasible, then the question could be simplified as “Slurry incorporated after spread”.

- **Slurry not incorporated in the *X* hours after spread**: liquid livestock effluents. The area concerned by the four hours for incorporation into the soil is important in calculating GHG and ammonia emissions. For the same reasons as above, if this question is not feasible, it can be deleted.
- **Slurry not incorporated after spread**: slurry effluents that are spread but not incorporated.
- **Other organic fertilizers**: to be specified by the surveyor for classification.

It can be difficult for the respondent to estimate some quantities, particularly for solid dung, slurry and compost. The surveyors' training must include some notions on how to draw equivalences (the number of supplying animals, the volume of a trailer, etc.) so that they can help respondents. It is important to estimate quantities, to be able to calculate indicators linked to fertilization: area fertilized, quantities of nitrogen, phosphorus and potassium per area unit.

Quantity of manure purchased or received from other holdings: farmers are normally familiar with this amount, together with the relevant payment terms. The units used should be adapted to existing country practices and subsequently recalculated in standard units.

Section 3, part 3.2 – Use of plant protection products (PPPs)
The following definitions are proposed:

PPPs are "pesticides" – substances that prevent, destroy or control a harmful organism (a "pest") or disease, or protect plants or plant products during production, storage and transport – that protect crops or desirable or useful plants. They are primarily used in the agricultural sector, but also in forestry, horticulture, amenity areas and in home gardens. They contain at least one **active substance** and have one of the following functions:
- protect plants or plant products against pests/diseases, before or after harvest
- influence the life processes of plants (such as substances influencing their growth, excluding nutrients)
- preserve plant products
- destroy or prevent growth of undesired plants or parts of plants

They may also contain other components including safeners and synergists.

(Source: adapted from European Commission, https://ec.europa.eu/food/plant/pesticides_en)

Insecticides are substances used to kill or repel insects.
Herbicides are substances used to destroy or inhibit the growth of plants, such as weeds.
Fungicides are substances that destroy or inhibit the growth of fungi.
Rodenticides are substances that kill, repel or control rodents (FAO, 2015, para 8.6.3)

There are other types of PPPs, such as acaricides, nematicides, molluscicides, growth regulators, repellents, and biocides. If these are important in the country, they can be added to the questionnaire.

If PPPs are used by the holding, two kinds of data are collected:
- Area per crop and per type of PPP (insecticide, herbicides, fungicides, rodenticides and others)
- Quantities of PPP used during the reference period. Adaptation to national contexts is necessary: the list of nationally allowed or used PPP trademarks by type (insecticides, herbicides, fungicides, rodenticides, other) must be established and, for each PPP, the correspondent quantity of active substances. Then, the surveyor will choose from a limited list; after data collection, transformation into the active substance will allow for the summing of the quantities.

Use of natural means against pests and diseases: the aim of natural control is to restore a balance between pests and predators and to keep pests and diseases down to an acceptable level. The aim is not to eradicate them altogether, as they too have a role to play in the natural system.

Section 3, part 3.3 – Crop and seed varieties

This section examines the types of seeds used for each temporary crops cultivated by the holding during the reference period. It allows to calculate indicators about importance of each type of seeds for each temporary crop.

Types of seeds used for temporary crops during the reference period.

For each temporary crop initialized from the Core Module or from the previous questions, the number of varieties sowed is to be reported. The percentage (share) of each seed type used is also asked for the following types:

- Modern varieties are the products of plant breeding within the formal system by professional plant breeders. These varieties are also called high-yielding varieties or high-response varieties.
- Certified seeds of modern varieties (GM or not): certified seeds are those that can be certified as meeting certain national standards as regards physical and genetic purity; their quality and established identity are **verified** by an official agency after inspection. A document of certification is issued as a result of this verification. Seed certification systems vary between countries and the national situation must be explained to the surveyors.
- Modern uncertified varieties: seeds of good quality but that are not certified according to the applicable (national) standards. These are often provided through the informal sector. It should be noted that farmer multiplication of a certified seed without a verification by the official agency is considered uncertified seed.
- GM seed refers to seeds that are proprietary, having been developed by the private sector, and that possess a novel combination of genetic material obtained through the use of modern biotechnology (FAO, 2015, para 8.6.4).
- Varieties adapted to local conditions and stresses: seeds adapted to resist to the stresses occurring more frequently in the country; usually, farmers possess this type of information.
- Traditional uncertified varieties: also called farmers' varieties, landraces or traditional varieties, these are the product of breeding or selection carried out by farmers (either deliberately or not) continuously over many generations. Traditional varieties are usually adaptive seed that is adapted to local conditions and stresses.

Q17 and **Q19** ask for the share of each source of seed, as follows:

- Produced on the holding
- Obtained at exchanges within the community (exchanges in a local network of farms)
- Purchased from local market
- Purchased from seed company
- Received as a donation (given by another holding, non-governmental organization, government, etc. for free)

The certified seed of a modern variety is usually obtained from an official provider. For this reason, the source of this type of seed is not asked. For uncertified seeds (modern and traditional varieties), the question on the share of each source provide useful information. By combining the respective shares from **Q14** with those from **Q17** to **Q19**, a detailed profile of the source of each seed used can be created.

It should be noted that the questions on the percentages (share) by seed type (**Q14**) could be replaced by yes/no questions, if ascertaining the shares is considered difficult. However, in this case, it will be impossible to obtain the share of each type of seed source in the holding's overall seed requirements.

Section 3, part 3.4 – Permanent crops during the reference period

This section collects data on the structure of permanent crops. It enables the proportion of crops in production, by crop. The list of perennial crops and varieties must be customized at national level during survey preparation, integrated in the CAPI and then given to the surveyors. This list allows respondents to choose the exact crops to be mentioned.

Permanent crops are crops with a growing cycle of more than one year. An indicative list of permanent crops is given in the ICC classification (see annex 1-2), marked with "P". If necessary, countries should customize this list before the survey.

The information is collected by **permanent crop**. The first part – **Q20** to **Q23** – collects information on the permanent crops in compact plantations. This refers to permanent crops planted in a regular and systematic manner, such as in an orchard. Plants, trees or shrubs forming an irregular pattern, but densely enough to be considered an orchard, are also considered a compact plantation (FAO, 2015, para 8.4.24).

Structure of permanent crop plantations: for each permanent crop identified, the information is collected by plot. For the purposes of this data collection, the most important aspect is to determine **homogeneous plots**, defined by the same location, age of plantation, distance between rows and between the trees on the rows (or same density, in case the there are no regular rows).

The data collected on area of the plantation, distance between rows and distance between the trees in a row allows for the calculation of the density of the plantation (automatically done by CAPI):

Density = standard area unit / (distance between rows * distance between the trees in a row)

> For example, if the spacing applied is 2 feet between rows and 4 feet between plants (the standard unit being square feet), 1 square foot/(2 feet X 4 feet) = 1/8 plant per square foot density[4]. The number of trees or plants in the plantation (automatically calculated in CAPI) is:

Number of trees/plants = Are in standard units * density of the plantation

To continue the above example: if the area in standard units is 500 square feet,

Nb of trees/plants = 500*1/8 = 62.5 trees/plants, rounded up to 63

An alternative approach to collecting information on the structure of permanent crop plantations is to directly ask for the estimated density (and recalculate it to a standard area unit) and for the number of trees per area unit (this too should then be recalculated to a standard area unit). In this case, the questions on distance will be deleted.

The question on whether the trees are in production refers to whether there are fruits on the trees or plants during the reference year, even if these fruits were not collected.

Information is also collected on the permanent crops grown as scattered trees. Scattered trees refer to those planted in such a manner that it is not possible to estimate the area. Often, they are scattered around the holding (FAO, 2015, para 8.4.32). The number of scattered trees is registered for each crop. The figure could be split into two for each crop: scattered trees in production and without production.

4 For more information, see http://www.fao.org/docrep/t0122e/t0122e08.htm.

Section 3, part 3.5 – Pollination practices

If pollination practices were used during the reference period, the farmer is for the method(s) used. These may be:

- **Enhancement of pollinator habitat**: active participation in creating or favouring pollinators implantation, such as:
    - Planting wildflower-rich fallows or strips (such as "bee pastures")
    - Flowering hedgerows
    - Use of nectar-producing cover crops
    - Use of dedicated nectar and pollen seed mixes
    - Provision of nesting sites ("bee hotels" for many bees, or nesting tubes for megachilid bees)
    - Protection of existing ground-bee nesting sites or trees in which wild species of bees nest
- **Use of managed pollinators**: use of pollinators implanted and managed by the farmer, such as:
    - Use of managed honeybee hives
    - Use of managed stingless bee hives
    - Use of managed bumblebee boxes
    - Use of managed leafcutter nesting sites

This list can be adapted to national practices during survey preparation phase.

Section 3, part 3.5 – Rice cultivation

Rice cultivation is an important element in the economy of many developing countries; at the same time, it accounts for 10 percent of global GHG emissions in agriculture. This section aims to collect essential information on rice production methods, such as the number of rice cultivating cycles during the reference period, the average interval between two cultivating cycles and the length of the growing period for rice cultivation, by type of rice. The types of rice must be adapted at national level, as well as the questions on cultivating cycles following the national reality.

Questions on irrigation methods, water regimes, organic amendments, planting techniques and seed density are also to be adapted to the national context.

Information is collected for the following types of rice:

Japonica – grains are short and roundish, and spikelets are awnless to long-awned; grains do not shatter easily and have an amylose content ranging from 0 to 20 percent[5].

Indica – grains are long to short, slender, somewhat flat, and the spikelets are awnless. Indica rice shatters more easily and have an amylose content ranging between 23 and 31 percent[6].

Aromatic rice – a medium- to long-grained rice known for its nut-like aroma and taste. Varieties of aromatic rice include basmati, jasmine, Texmati, Tulaipanji, Wehani and wild pecan rice[7].

Glutinous rice – also called sticky rice, sweet rice or waxy rice, this type of rice is grown mainly in Southeast and East Asia and in the eastern parts of South Asia. It presents opaque grains, a very low amylose content, and is especially sticky when cooked[8].

For each type of rice, the length of the growing period and the irrigation methods are asked. The following definitions are recommended for this part:

Flooded pre-season means that the land has been flooded for a number of consecutive days just prior to planting. Two options are given:

- For less than 30 days
- For 30 days and more

5 http://www.majordifferences.com/2013/11/difference-between-japonica-and-indica.html#.WUAbo03U59B.
6 http://www.majordifferences.com/2013/11/difference-between-japonica-and-indica.html#.WUAbo03U59B.
7 See https://en.wikipedia.org/wiki/Rice.
8 *Ibid.*

Non-flooded pre-season means that the land has not been flooded prior to planting. Two options are available:

- For less than 180 consecutive days
- For 180 consecutive days or more

In terms of rice irrigation, the following categories are included:

Irrigated – continuously flooded indicates a field that has standing water throughout the rice-growing period and may only dry out for harvest (end-season drainage)

Irrigated – intermittently flooded indicates a field that has at least one aeration period of more than three days during the growing period.

Rice cultivation in rain-fed and deep-water areas means rice that is grown on levelled bunded fields to allow for an accumulation of floodwater on the surface during heavy rains, in areas that depend entirely on rain for water supply. Deep-water areas for rice cultivation are usually flooded deeper than 50 cm for one month or longer during the growing season.

The following organic amendments to soils used for rice cultivation are asked:

- **Straw incorporated shortly before cultivation (30 days or less)** means that straw is incorporated into the soil no more than 30 days before the cultivation of rice.
- **Straw incorporated long before cultivation (more than 30 days)** means that straw is incorporated into the soil for more than 30 days before the cultivation of rice.
- **Compost** is a mixture of decaying organic substrates – for example from leaves and manure – that is used to improve soil structure and provide nutrients. Alternatively, it refers to organic substrates subjected to biological decomposition and stabilization and converted into a final product that is stable, free of pathogens and plant seeds, and can be beneficially applied to land (Haug, 1993).
- **Green manure/cover crops (GMCCs)** are plants that are grown to provide soil cover and to improve the physical, chemical and biological characteristics of soil. GMCCs may be sown independently or in association with crops (FAO, 2011).

There are two main rice-planting techniques:[9]

- Rice transplanting: prior to transplanting, seedlings must be raised in a nursery; then, young plants are transplanted. Transplanted crops take longer to mature due to transplanting shock (stress from being pulled from the soil and re-establishing fine rootlets). Transplanting is commonly practiced as a method of weed control for wet or puddled fields. It requires less seed, but much more labour compared to direct seeding.
- Seed broadcasting (direct seeding): seeds are sown onto a dry soil surface and then incorporated into the soil, either by plowing or harrowing.

9 These definitions have been adapted from the Rice Knowledge Bank (http://www.knowledgebank.irri.org/).

4.4.3.4. Section 4: livestock production methods during the reference period

This section of the questionnaire collects important data on livestock raising practices, such as breeding methods, feeding, watering, transportation, housing, and use of manure. An important element in the livestock analysis is the type of the livestock production system. There are many different classifications; the classification suggested for AGRIS includes the following types:

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

The following definitions are suggested for the types of livestock system (FAO, 2015, para 8.5.3):

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

- **Grazing system** is characterized by ruminants (such as cattle, sheep, goats and camels) grazing mainly on grasses and other herbaceous plants, often on communal or open-access areas and in a mobile fashion. In this system, over 90 percent of the dry matter fed to animals comes from grazed grasses and other herbaceous plants. The following categories can be considered:
    - **Nomadic or totally pastoral** refers to livestock raised in a situation where the agricultural holder has no permanent place of residence and does not practice regular cultivation. Livestock moves from place to place with the agricultural holder and his/her household, depending on the season and the availability of feed or water.
    - **Semi-nomadic, semi-pastoral or transhumant** refers to livestock raised by holders who live a semi-nomadic life. Typically, the holder has a permanent residence to which he or she returns for several months of the year according to seasonal factors. For semi-nomadic and semi-pastoral systems, the holder establishes a semi-permanent home for several months or years and may cultivate crops as a supplementary food source. Herds are moved on transhumance to assure forage and water.
    - **Sedentary pastoral** refers to livestock raised by holders who have a permanent residence. Ranching refers to large-scale livestock activities carried out on large areas of land set aside for extensive grazing, where livestock graze mainly on grasses and other herbaceous plants. In recent years, the numbers of nomadic and semi-nomadic holdings are declining and the majority of holdings within the grazing system are sedentary and pastoral.
- **Mixed system** describes the largest and the most heterogeneous livestock system, in which cropping and livestock-rearing are linked activities. It is defined as a system in which grazing may be largely practised but more than 10 percent of the dry matter fed to animals comes from crop or crop by-products or stubble; and less than 90 percent of the dry matter of the animal feed is off-farm produced.
- **Industrial system** refers to intensive livestock-raising methods in which (at least 90 percent of the dry matter) of the animal feed is off-farm produced. It often consists of a single species (beef cattle, pigs or poultry) fed in feedlots or other in-house systems of feeding.

The nomadic system cannot be covered usually by surveys such as AGRIS: a specific methodology is necessary[10].

The type of livestock production system is not asked directly; however, it can be determined by reference a combination of questions, mainly linked to type of feeds and use of pastures, and transportation of animals.

Section 4, Part 4.1 – Animal breeding and reproduction

The **main animal reproduction technique** is asked for each type of livestock identified; only this technique is recorded:

- Natural mating with sire:
    - Selected within the herd: natural mating with a sire from the holding
    - Purchased or rented: sire acquired as a service whatever is the service provider
    - Exchanged: sire coming from another holding as an exchange whatever the exchange terms
- Artificial insemination: insemination methods practiced by a professional (veterinary, breeding centre, etc.)
- Dam was purchased pregnant
- Dam was exchanged pregnant
- Other technique: to be described in comments in order to enable classification after data collection.

The **main breeding services provider** is asked for all livestock in the holding during the reference period:

- Private veterinary: veterinary of the holding or of a holdings group
- Public veterinary: veterinary of a governmental body (national or regional)
- Self-provision: the holding itself
- Other: to be specified

Section 4, part 4.2 – Use of veterinary products and traditional medical methods

The **use of veterinary products** refers to whether veterinary products were used at least once during the reference period. The following objective(s) and circumstance(s) are asked for each type of livestock: reproduction, curative treatment of diseases by surgical procedures or not, or preventive medicine (vaccination, deworming, parasites or other).

The **use of hormones or antibiotics** refers to whether hormones or antibiotics were used at least once during the reference period. The types of products are asked for each livestock. It is necessary to establish a list of hormones and a list of antibiotics at national level; this list must be included in the CAPI and given to surveyors, to facilitate the interviews.

Questions on the **use of traditional medicine** must be adapted to individual country contexts. The following objective(s) and circumstance(s) are asked for each livestock: reproduction, curative treatment, preventive treatment or other objective. This question can be developed further by adding a list of practices relating to traditional methods, if it is of interest to the country.

10 Global Strategy. 2016. Guidelines for the Enumeration of Nomadic and Semi-Nomadic (Transhumant) Livestock. GSARS Guidelines: Rome. Available at: http://gsars.org/wp-content/uploads/2016/08/Guidelines-for-the-Enumeration-of-Nomadic-and-Semi-Nomadic-Livestock-06.pdf. Accessed on 8 June 2017.

Section 4, part 4.3 – Animal housing

The **main animal housing system** refers to the place where the livestock was kept during the reference period. As this can be livestock-specific, the question is asked for each type of livestock identified. The animal housing systems included in the questionnaire are the following:

Open/no housing (for all types of livestock): the animals are always outside.

- Stanchion-tied stable – with solid dung and liquid manure/with slurry (for bovines and buffaloes): animal houses where the animals are tied to their places and are not allowed moving freely. They may contain manure in the form of solid dung and liquid manure, when the floors of the stalls are on sloping concrete with bedding (such as straw, chopped straw and sawdust) and a shallow gutter at the rear of the animals to collect part of the faeces and urine, while the remaining part is regularly removed as solid manure. In some cases, the gutter is equipped with a drainage pipe to collect seepage, or there can be a deeper channel instead of a gutter to collect and store the liquid fraction. The manure is normally removed mechanically outside the building as solid dung or farmyard manure.
- Loose housing – with solid dung and liquid manure/with slurry (for bovines and buffaloes): animals are allowed to move freely and have free access over the entire area of the building or pen (a small enclosure for livestock). Cubicle houses (buildings divided into rows of individual stalls or cubicles in which animals lay when at rest but are not restrained) are also included in this category. Loose housing may contain manure in the form of solid dung and liquid manure when there is a concrete floor that is cleaned more frequently by scraping, and may be provided in the area where the animals stand to feed and/or drink. It is common for a deep layer of bedding (usually straw) to be spread over the floor and removed from the building, typically once or twice per winter, as farmyard manure.
- On partially/completely slatted floors (for pigs): the floors can be partially slatted (part of the floor features slats through which manure and urine drop down below the floor into a pit, where they form slurry) or completely slatted (the entire floor has slats where the manure and urine drop down below the floor into a pit, where they form slurry).
- On straw-beds, deep litter-loose housing (for pigs and chickens, incl. laying hens): the floor is covered with a thick layer of litter (straw, peat, sawdust, or other similar material binding the manure) that is removed only at intervals that may be several months apart. The animals live in a simple closed building that is thermally insulated and features forced ventilation or natural ventilation. At least one third of the floor area must be covered with bedding (such as chopped straw or wood shavings) and two thirds must be arranged as a pit covered with slats. Feeders and water supply are placed over the slatted area to keep the litter dry.
- Battery cage, all types (for chicken, incl. laying hens): laying hens are kept in cages, with one or more hen in each. The animals live in a closed building with forced ventilation and with or without a lighting system. The birds are kept in tiered cages, usually made of steel wire, arranged in long rows. Droppings fall through the bottom of the cages and are collected and stored underneath in a deep pit or channel, or are removed by a belt or scarper system. The droppings from laying hens in battery systems are not mixed with other material – such as litter – and may be dried or have water added to make the manure easier to manage. The battery cages can be further grouped into several types. A country may decide to use the general category of "battery cage" or the detailed categories as follows:
    - Battery cages with manure belt (for laying hens): battery cages in which the manure is removed mechanically by a belt below the cages to a location outside the building, to form solid dung or farmyard manure. Movable belts, made for example out of "non-stick" polypropylene, are placed below the cages to collect the droppings, which are then transported outside the house to a closed storage site. In improved systems, provisions are made to dry the manure on the belts by forced air through perforated pipes or drying tunnels placed over the cages. Battery cages with manure removal by scrapers are also included in this category.
    - Battery cages with deep pit (for laying hens): battery cages where the manure falls into a deep pit located beneath cages, where it forms slurry. The birds are housed in cages having one or more tiers. The droppings fall into a manure pit (deep pit) or a channel beneath the cages, by themselves or with the aid of a scraper together with spilled water from the drinkers. The layer of manure is removed

once a year or less frequently, by scraper or a front loader attached to a tractor. In some systems, the ventilation system for the house is designed such that warm air is used to dry the wet manure in the deep pit or channel.

  - Battery cages with stilt house (for laying hens): battery cages where the manure falls on the floor below the cages, where it forms solid dung or farmyard manure, and is mechanically removed regularly. This is similar to a deep pit house, except that there is a variable valve between the cage and dropping storage areas, as well as large openings in the dropping store walls that allow wind to pass through and assist drying. The building's cage and dropping areas are separated, so that droppings can be removed at any convenient time without disturbing the birds.

- Traditional barns, buildings (for small ruminants): agricultural buildings usually located on farms and used for various purposes.
- Shelter: generally a very simple house made out of wood.

Other questions on the buildings used for animal housing refer to:
- Buildings shared with humans (at least one building)
- The type of ventilation system and use of filters to manage dust emission in the livestock buildings
- The temperature control system in livestock buildings.

Section 4, part 4.4 – Animal transportation
This part refers to the movement of animals and transportation practices.

The question on **transhumance** is important for the determination of the livestock production system. For the purposes of AGRIS, the following definition is adopted:

> "Transhumant pastoralists and transhumant livestock: transhumant pastoralists are not permanently settled, although they are usually settled for a part of the year. The movements of transhumant livestock are regular, cyclical and short-distance. The livelihood of transhumant pastoralists depend largely on livestock."[11]

Transhumance (or the semi-nomadic livestock raising practice) refers to the partially nomadic system that presents regional differences depending on the climate, landscape and level of economic development. Two types of transhumance are distinguished: in-country transhumance and cross-border transhumance. This question is asked by type of livestock.

Questions on transportation of livestock are asked by livestock type. The following destinations are considered:
- Transport of live animals to the slaughterhouse
- Transport of live animals to a market for selling.
- Transport of live animals to pastures outside the holding.
- Transport of live animals to another holding which fed them.

Information is also collected on the method (on foot, by road motor vehicles, or by rail) and on the frequency (weekly, monthly, once a year or any other frequency) of transportation.

The **number of animals used for transport or draft animal power** during the reference period is also asked for each livestock type concerned.

11 Source: GSARS, 2016a

Section 4, part 4.5 – Feed and use of pastures

The aim of this part is to collect information on the types of feeding practices used and the major difficulties encountered in feeding livestock during the reference period.

The questions on the **major feeding practices** used during the reference period are asked, by livestock type and in terms of percentage of herd number for each practice:

- Only grazing, including scavenging: animals are fed only by pasture grazing and scavenging around crop parcels
- Mainly grazing, including scavenging, with some feeding: animals are fed mainly by pasture grazing and scavenging around crop parcels; some complementary feed is delivered
- Mainly feeding with some grazing, including scavenging: animals are fed mainly with feed bought or made on the holding from crops, and there is also some pasture grazing and scavenging around crop parcels
- Only feeding without any grazing or scavenging: animals are fed with feed bought or made on the holding from crops, and there is no pasture grazing or scavenging around crop parcels

The **major types of feed** used during the reference period are asked, by type of livestock and in terms of percentages of the total feed delivered. The following categories of feed are asked:

- Forages and roughages: this refers to fresh grass or grass-legume mixtures, grazed or cut and distributed; silage of grass or grass-legume mixtures; hay (dry grass or grass-legume mixtures); whole plant silage (maize, wheat, barley, oats, rye, etc.); crop residues (maize stover, crop straws, sugarcane tops, banana leaves, etc.); tree leaves.
- Crops and agro-industrial by-products including concentrate: this refers to 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; and banana fruit.
- Swill and household wastes: this category refers to organic household residues used as feed
- Use of supplements and additives: this includes vitamins, amino acids and minerals.

This question can be developed further by asking for the information by season (dry, rainy), if this is of interest for the country.

The question on the **sources of feed** used during the reference period collects information on each type of feed selected in the previous question, and in terms of percentages of the total quantity.

- Holding production
- Common pasture
- Purchased
- Exchanged (specific type of purchase, the payment is made in kind)
- Received for free

This question can be further developed by asking for the information by season (dry, rainy), if this is of interest for the country.

Fodder purchased during the reference period

- Quantity purchased of hay, wrapped grass, grass silage, maize, maize silage or other fodder in the unit of weight chosen for the survey
- Months when the purchased fodder was used

If it is important for the country, a similar question could be added for the month when fodder was purchased.

Grazing practices used during the reference period: this question is asked by type of livestock concerned

- Grazing on the holding
    - Area grazed
    - Number of animals
    - Number of months
- Grazing on common pastures
    - Number of animals
    - Number of months

The area grazed on the holding indicates 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 (FAO, 2015, para 8.15.12).

The 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 (FAO, 2015, para 8.15.13).

The number of months with animals on pasture refers to the 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 reference period. The number of months is determined regardless of whether the animals were also on pasture during the night or spent the night indoors. If the exact number of months is difficult to collect, an approximate length (fraction of the year) can be asked in time classes:

- Up to three months
- From three to less than six months
- From six to nine months
- More than nine months (FAO, 2015, 8.15.14)

Another possibility would be to ask for the names of the exact months, if it would facilitate the respondents' answers.

The common pasture refers to land that does not belong directly to the agricultural holding, but with regard to which common rights apply. Generally, common pasture is agricultural area owned by a public authority (state, parish, etc.) over which another person is entitled to exercise common rights, rights that are generally exercisable in common with others. Pastures that are rented or over which the holder enjoys rights allotted by the parish or another organization – for example, common grazing land apportioned on an acreage basis – are not included here (FAO, 2015, para 8.15.11).

The questions on the use of pastures provides important information required to understand feeding practices; however, they are also used for the calculation of agri-environmental indicators, particularly for GHG and ammonia emissions and the compilation of national GHG inventories. The next question on the collection of manure from the pastures and use as fuel may also serve the same purpose.

Section 4, part 4.6 – Watering animals

The part on watering animals is a natural continuation of the part immediately preceding it, on animal feed, and has the same objective: to collect the main elements needed for analysis of practices and problems encountered.

Sources of water for watering animals – as watering practices may differ in rainy and dry season, the questions of this part are asked by season. If there are more than two seasons, the questions can be easily adapted. The sources of water should also be adapted to the national context.

- If the main source of water was the same for all seasons during the reference period, the respondent will select the two main sources used for each livestock from the following: borehole, dam or lake, well, river or spring stream, rainwater harvested or other.
- If the main source of water was not the same for all seasons during the reference period, the respondent will select the main source of water for each livestock type and for each season, dry and rainy (to be adapted to the national context): borehole, dam or lake, well, river or spring stream, rainwater harvested or other.
- If the holding encountered problems in watering animals during the reference period, the respondent will select:
    - In which months the problems occurred, and for each livestock type
    - The main problem encountered (lack of water, restricted access or poor quality)
    - The solution found (other water source near the holding for free or for payment, other water source far from the holding for free or for payment). If a source far from the holding was used, the respondent will select the months and the frequency with which the holding used water transportation by truck.

Section 4, Part 4.7 – Manure management

This part, together with some questions related to the manure purchased or received from other holdings (section 3, part 3.1.) is relevant for the calculation of agro-environmental indicators, in particular for estimations of GHG and ammonia emissions.

Manure produced on this holding and sold or given to other holdings during the reference period should be reported, with an estimation of the share of manure exchanged for goods and/or services, sold, and given away for free.

The **manure management system** adopted on the holding during the reference period covers solid manure, liquid manure and slurry. The following types of storage facilities available in the holding are included:

- **Digesters (biogas reactors)**, 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. A biogas reactor or anaerobic digester is an anaerobic treatment technology that produces a digested slurry (digestate),that can be used as a fertilizer, and biogas, that can be used for energy. Biogas is a mix of methane, carbon dioxide and other trace gases which can be converted to heat, electricity or light.
- **Slurry tanks** are tanks, usually made of impermeable material, used for the storage of slurry. Watertight pits or cellars beneath or integrated into the livestock houses are also included.
- **Anaerobic lagoons or manure lagoons** are man-made outdoor earthen basins filled with animal waste that undergoes anaerobic respiration as part of a system. Anaerobic lagoons are created from manure slurry, which is washed out from underneath the animal pens and then piped into the lagoon. 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 lagoons**, also known as aerated lagoons or aerated basins, are treatment ponds provided with artificial aeration to promote the biological oxidation of wastewaters.
- **Aerobic treatments** are biological manure treatment processes that occur in the presence of oxygen. In these processes, aerobic microorganisms oxidize bio-available organic and nitrogenous compounds.

The capacity is asked in terms of the number of months with manure to be stored without spillover. Another approach would be to ask for the volume in m^3; however, this is considered more difficult for respondents to provide.

The share of the covered storage facilities in terms of the percentage of total storage is also asked. Storage facilities for manure are considered to be covered (by concrete lids, tents, tarpaulins, etc.) when they are protected from rain or other precipitation and the cover can reduce ammonia emissions.

The answer modalities currently proposed for Q61 are based on the categories required for the GHG emission calculation model (in line with the International Guidelines of the IPCC). At this time, they do not include basic manure management systems or practices such as piles or simple holes. National AGRIS implementing agencies may consider including such systems, to improve the relevance of this question for national practices and concerns.

The quantity of manure produced on the holding and used for other purposes during the reference period is asked for the following categories of use:

- For fuel (including heating) – this refers to manure used for production of energy
- For constructions – manure is used as a component for preparing construction materials
- For feed – manure is used as a component for preparing feed.

4.4.3.5. Section 5 – Certified organic farming during the reference period

This section of the questionnaire refers to certified organic farming practices and to in-conversion to organic.

According to the FAO-recommended definition, 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, 2015, para 8.6.13).

In this sense, certified organic farming practices indicate those farm practices leading to agricultural products that have been produced, stored, processed, handled and marketed in accordance with specific technical specifications (standards) and have been certified as organic by a certification body. Some bodies allow certification of a part of a farm as long as organic and non-organic products are not mixed, while others require whole-farm certification. Certification can be given through a third-party accredited certification body or authority, or through Participatory Guarantee Systems (PGSs). Third-party certification bodies are accredited to a particular market (the certification ensures that the production systems meet the regulations applying to a particular market); certification by a certification body enables producers to export products labelled as organic to that market (therefore, certification does not automatically allow access to all markets). PGSs are based on the active participation of stakeholders and are only recognized within a single country. It thus provides certification of organic production only for local markets, not for export (FAO, 2015, para 8.6.16).

In fact, organic farming is not asked through any specific questions; however, it can be calculated on the basis of different questions (for example, those on the use of PPPs or fertilizers).

"In-conversion to certified organic" 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 (FAO, 2015, para 8.6.16).

The definitions need to be adapted at country level following local regulations and practices.

Questions on organic crop and organic livestock production are asked separately. The area of organic crops and of in-conversion to organic are asked by crop. The number of livestock is asked by livestock type.

It should be noted that questions referring to the holding's organic number and the name of the certifying body are asked only for data quality control purposes, to allow for cross-checks (data quality), and should not be included in the tabulation of the results.

If the holding does not benefit from organic farming certification, the respondent is asked whether there is such a project in the next two or three years.

If there is no established organic farming practice in a country, this part of the questionnaire can be removed.

4.4.3.6. Section 6 – Agroforestry during the reference period

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. It 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.

Agroforestry includes:

- agrosilvicultural systems (trees and crops)
- silvopastoral systems (trees and livestock) and
- agrosilvipastoral (trees, crops and livestock) systems (FAO, 2015, para 8.13.12 and 8.13.13).

For each agroforestry practice identified, the area will be collected, together with the main type of trees (coniferous, broad leaves, mixed).

The area of forests or other woodland created during the reference period with the objective to install agroforestry practices will be also collected.

4.4.3.7. Section 7 – Access to and use of information, services, infrastructure and communal resources during the reference period

The objective of this section is to study whether holders are isolated or not and if they require help for their agricultural activity.

Section 7, part 7.1 – Agricultural information

The types of agricultural information included in Q01 are grouped into two categories:

- Information on production methods – bullets 1 to 8 included
- Information on natural and economic environments – bullets 9 to 12

Respondents are asked to select all types of information used during the reference period and the **main source (only one)** for each type identified. The sources identified are:

- Government or extension services – all official bodies depending on national or local authorities and participating in providing the holder with information
- Other individual farmers – generally, these are farmers from the neighbourhood and do not belong to any organization
- Farmers' group or association – groups of farmers created for trade, extension or any other objective that also give advice to their members
- NGO or non-governmental project
- Trader or market stakeholder – traders who may or may not be under contract with the farmer and who provide some advice
- Other (to be specified)

The **main method (medium)** used to access the information is asked for each information type:

- face-to-face discussion
- telephone calls
- radio
- television
- Internet or SMS
- press and newspapers
- other (to be specified)

In this part, other questions on the awareness of the dangers arising due to the application of PPPs, the number of visits of an extension officer, and the monitoring of market conditions are also asked.

Section 7, part 7.2 – Infrastructure (transportation, communications and access to facilities)

This part collects data related to the equipment, facilities and infrastructure necessary mainly for marketing, processing or storing the holding's production, or for maintenance service for equipment. The objective is to identify the availability of facilities and the major difficulties faced by agricultural holdings. Most of the questions are asked by season. The number of seasons should be determined during the survey preparation phase. The availability and participation of the holding in specific development projects is also asked.

Section 7, part 7.3 – Access to communal resources

This section describes access and use by the holding of communal facilities, pastures, forests, the area under water for aquaculture and irrigation facilities.

4.4.3.8. Section 8 – GHGs and environmental issues during the reference period

There is growing demand for basic agro-environmental data on GHGs and ammonia emissions, as well as for the compilation of nitrogen balances, with the objective to enable planning for effective climate change responses and facilitating access to international funding.

According to recent data (FAOSTAT, http://www.fao.org/resources/infographics/infographics-details/en/c/218650/), livestock production accounts globally for about 40 percent of GHG emissions directly through enteric fermentation, and for over two thirds of GHG and ammonia emissions from agriculture, considering enteric fermentation, manure storage and applications. Rice production accounts globally for another 10 percent of GHG emissions.

The information required to assess GHG emissions is included in the previous sections of this questionnaire (see the questions related to the use of PPPs, fertilizers, rice production methods, livestock numbers, manure management, animal feed and use of pastures, etc.). Thus, this section focuses on those areas of the holding that are officially protected or under sustainable forest management. Questions on the contaminated sites on the holding (salt, industrial waste, etc.) and on the main area of environmental concern for the holding, such as lack of water (drought), floods, air pollution, soil pollution, extreme temperatures (cold or heat), etc., are also included.

Information on the methods of **removal of dead animals** from the holding by livestock type is also collected. The methods identified are:

- Buried on farm: in an area used by the holding
- Incinerated: incinerated on the holding
- Composted: included in the holding's compost
- Off-farm collection service: given to an official service in charge of collective elimination of dead animals
- Other: to be specified

4.4.3.9. Section 9 – Adaptation to climate change and mitigation strategies during the reference period

In this section, the survey first focuses on extreme natural events that had negative consequences on the holding, and on the practices that the holding has adopted to adapt to climate change.

The **natural extreme events and disasters** that have affected the holding are identified as follows:

- drought
- heavy rainfall or heavy wind
- extreme temperatures (cold or heat)
- tsunamis
- earthquakes
- other events, to be specified.

The human impact will be evaluated by:

- the number of people working on the holding killed,
- the number of people working on the holding injured,
- the number of people working on the holding who have been rendered homeless, and
- the number of people working on the holding who have been evacuated.

The economic impact on the holding is asked, in terms of loss of revenue and disruption of production.

The physical impact on the holding is asked in terms of the area lost, livestock/aquaculture/fisheries/biomass losses, and building losses.

The practices that holdings can employ to adapt to climate change during the reference period are identified as follows:

- **Multicropping**: the practice of growing two or more crops in the same piece of land during a single growing season. It is a type of polyculture that can take the form of double-cropping, in which a second crop is planted after the first has been harvested, or relay cropping, in which the second crop is started among the first crop before it has been harvested.
- **Shifting cultivation**: also known as slash-and-burn agriculture, this is the practice in which farmers clear land by slashing vegetation and burning forests and woodlands to create clear land for agricultural purposes.

- **Use of traditional agricultural heritage practices and knowledge**: these practices, having been used for many years, could have been abandoned for a certain period of time and restored at a later stage.
- **Use of traditional crop and animal varieties**: crop and livestock varieties that, having been used for many years, could have been abandoned for a certain period of time and restored at a later stage.
- **Use of seeds adapted to local conditions and stresses**.
- **Use of new practices or technologies**: changing practices to follow advice to attain a more sustainable agriculture.

Other practices can be added as relevant, during the preparation stage.

4.4.3.10. Section 10 – Waste management during the reference period

This part collects information on the use of wastewater generated by the holding, on the treatment of wastewater, and on the types of waste generated by the holding.

Q01 – the following definition of wastewater is recommended: water that is of no further immediate value to the purpose for which it was used or in the pursuit of which it was produced because of its quality, quantity or time of occurrence. However, wastewater from one user can be a potential supply to another user elsewhere. Cooling water is not considered to be wastewater. Source: adapted from Aquastat.

Q02 – the following uses of **wastewater** are identified (all methods used must be selected):

- Discharged to a constructed retention or holding pond
- Discharged to a septic or sewer system: septic tanks are private solutions and sewers are shared solutions, whether communal or not.
- Discharged into a vegetative filter strip or constructed wetland: buffers and filter strips are areas of permanent vegetation located within and between agricultural fields and the water courses to which they drain. These buffers are intended to intercept and slow runoff, thereby providing benefits in terms of water quality. In addition, in many settings, they are intended to intercept shallow groundwater moving through the root zone below the buffer. A constructed wetland is an artificial wetland created for the purpose of treating municipal or industrial wastewater, grey water or storm water runoff.
- Applied to agricultural land as fertilizer
- Included in the liquid manure system
- Not managed, removed through natural drainage
- Other: to be specified

For holdings in the household sector, it is difficult to distinguish the wastewater generated by the holding from the wastewater generated from the household. In this case, it may be easier to adjust the question to ask for all wastewater types.

Q03 – the waste generated by the holding is classified into 16 categories. The main type of waste treatment is asked for each type of waste generated by the holding. The two main groups of treatment are waste taken away from the holding by a professional, and waste kept on the holding. For the latter, several options are identified:

- Treated by burning
- Treated by burying
- Other treatment
- No treatment applied.

AGRIS MACHINERY, EQUIPMENT AND ASSETS MODULE

Global Strategy to improve Agricultural and Rural Statistics

AGRIS QUESTIONNAIRE
MACHINERY, EQUIPMENT AND ASSETS MODULE

Version 1.1, September 2017

SECTION 1: MACHINERY AND EQUIPMENT USED BY THE HOLDING DURING THE REFERENCE PERIOD DD/MM/YYYY TO DD/MM/YYYY

TEXT TO READ:
This survey collects information about the machinery, equipment and assets of agricultural holdings in the whole country and whatever the holdings' sizes. Questions will focus mainly on the types and numbers of machinery, equipment and assets used, as well as their age and ownership. The reference period for the survey is DD/MM/YYYY to DD/MM/YYYY.

PART 1.1: IDENTIFICATION OF THE AGRICULTURAL HOLDING

A proper identification of the holding surveyed, and the survey respondent, is required before implementing this questionnaire. The questions proposed in Parts 1.1 & 1.2 of Section 1 of the AGRIS Core Module fit this purpose. These questions are not repeated here because it is recommended that this Rotating Module should be implemented together with the Core Module. However, if this Rotating Module is adopted by a country to complement an existing farm-level production survey, then the inclusion of the identification questions is critical - as well as the overall consistency with that production survey. Questions Q04 to Q09b in Section 1 of the AGRIS Core Module are not absolutely required, although they will help in holding identification and updating of the sampling frames.

PART 1.2: MANUALLY OPERATED EQUIPMENT

Q01. Was manually operated equipment used on the holding during the reference period DD/MM/YYYY to DD/MM/YYYY?

- ◯ 0 No → **Go to PART 1.3, Q03.**
- ◯ 1 Yes

Q02. Answer the following questions about manually operated equipment used on the holding during the reference period.
*Report all manually operated equipment used, regardless of ownership.

"A" & "B": TO BE ASKED TO ALL
"C": TO BE ASKED IF THE HOLDER IS A CIVIL (NATURAL) PERSON OR GROUP OF CIVIL (NATURAL) PERSONS
REPORT A MAX OF 2 ID CODES FROM THE HH, IF OWNED BY THE WHOLE HH = 777, IF OWNER UNKNOWN = 999

			A Number used	***B*** Of which, number owned	***C*** ID code of the person from the household who owns the machinery/equipment	ID code of the person from the household who owns the machinery/equipment
◯	1	Seed/fertilizer drills				
◯	2	Transplanters				
◯	3	Threshers				
◯	4	Winnowers				
◯	5	Sprayers				
◯	6	Dusters				
◯	7	Hand pumps or other hand irrigation devices				
◯	8	Country-specific response option				
◯	9	Country-specific response option				
◯	10	Country-specific response option				
◯	999	Other (specify [ ])				

PART 1.3: ANIMAL-POWERED EQUIPMENT

Q03. Was animal-powered equipment used on the holding during the reference period DD/MM/YYYY to DD/MM/YYYY?

- ◯ 0 No → **Go to PART 1.4, Q05.**
- ◯ 1 Yes

Q04. Answer the following questions about animal-powered equipment used on the holding during the reference period.
*Report all animal-powered equipment used, regardless of ownership.

"A" & "B": TO BE ASKED TO ALL
IF NUMBER OWNED > 0, ASK "D"; ELSE, GO TO NEXT EQUIPMENT
"C": TO BE ASKED IF THE HOLDER IS A CIVIL (NATURAL) PERSON OR GROUP OF CIVIL (NATURAL) PERSONS
REPORT A MAX OF 2 ID CODES FROM THE HH, IF OWNED BY THE WHOLE HH = 777, IF OWNER UNKNOWN = 999

Number owned should be less than or equal to Number used

		A Number used	*B* From which, number owned	*D* Average age of the owned [MACHINE]s Years	*C* ID code of the person from the household who owns the machinery/equipment	ID code of the person from the household who owns the machinery/equipment
◯ 1	Wooden ploughs					
◯ 2	Steel ploughs					
◯ 3	Cultivators					
◯ 4	Disk harrows					
◯ 5	Seed/fertilizer drills					
◯ 6	Levellers					
◯ 7	Animal carts					
◯ 8	Animal-powered irrigation devices					
◯ 999	Other (specify [ ])					

PART 1.4: MACHINE-POWERED EQUIPMENT

Q05. Was machine-powered equipment used on the holding during the reference period DD/MM/YYYY to DD/MM/YYYY?

- ◯ 0 No → **Go to SECTION 2.**
- ◯ 1 Yes

PART 1.4.1: MACHINE-POWERED EQUIPMENT FOR GENERAL FARM USE

Q06. Identify the types of machinery and equipment for general farm use that were used on the holding during the reference period.
*Report all general farm use equipment used, regardless of ownership.

(fill in all that apply) *RESPONSE = [MACHINE]*

- ◯ 1 Stand-alone combustion engines
- ◯ 2 Stand-alone electric motors
- ◯ 3 Generators for the production of electricity
- ◯ 4 Computers, laptops, tablets or smart phones used for farm management
- ◯ 999 Other electronic equipment used for farm management (specify [ ])
- ◯ 0 None → **Go to Q09.**

REPEAT Q07 AND Q08 FOR ALL MACHINES IDENTIFIED IN Q06.

Q07. What was the number of [MACHINE] used on the holding during the reference period? Number used [ ]

Q08. Answer the following questions about the [MACHINE] used.

"A" & "B": TO BE ASKED TO ALL
"C": TO BE ASKED IF THE HOLDER IS A CIVIL (NATURAL) PERSON OR GROUP OF CIVIL (NATURAL) PERSONS
REPORT A MAX OF 2 ID CODES FROM THE HH, IF OWNED BY THE WHOLE HH = 777, IF OWNER UNKNOWN = 999

		A Number	*B* Average age of the owned [MACHINE] Years	*C* ID code of the person from the household who owns the machinery/equipment	ID code of the person from the household who owns the machinery/equipment
Q08a	Number owned				
Q08b	Number co-owned with another holding				
Q08c	Number rented without an operator				
Q08d	Number used under another arrangement (specify [ ])				
Q08e	**Total** (calculated)				

CONTINUE THE ABOVE SERIES OF QUESTIONS UNTIL ALL GENERAL FARM USE [MACHINE] ARE COVERED, THEN CONTINUE TO Q09.

PART 1.4.2: TRACTORS, BULLDOZERS, OTHER VEHICLES

Q09. Identify the types of tractors, bulldozers and other vehicles that were used on the holding during the reference period.
*Report all tractors, bulldozers and other vehicles used, regardless of ownership.

(fill in all that apply) *RESPONSE = [MACHINE]*

- ◯ 7 Track-laying tractors
- ◯ 8 Four-wheel drive tractors
- ◯ 9 Two-wheel drive tractors
- ◯ 10 Bulldozers
- ◯ 11 Trucks
- ◯ 12 Boats
- ◯ 13 Trailers
- ◯ 999 Other vehicles (specify [ ])
- ◯ 0 None → **Go to Q12.**

REPEAT Q10 AND Q11 FOR ALL MACHINES IDENTIFIED IN Q09.

Q10. What was the number of [MACHINE] used on the holding during the reference period? . . . Number used [ ]

Q11. Answer the following questions about the [MACHINE] used.

"A" & "B": TO BE ASKED TO ALL
"C": TO BE ASKED IF THE HOLDER IS A CIVIL (NATURAL) PERSON OR GROUP OF CIVIL (NATURAL) PERSONS
REPORT A MAX OF 2 ID CODES FROM THE HH, IF OWNED BY THE WHOLE HH = 777, IF OWNER UNKNOWN = 999

	A Number	*B* Average age of the owned [MACHINE] Years	*C* ID code of the person from the household who owns the machinery/equipment	ID code of the person from the household who owns the machinery/equipment
Q11a Number owned	[ ]	[ ]	[ ]	[ ]
Q11b Number co-owned with another holding	[ ]	[ ]	[ ]	[ ]
Q11c Number rented without an operator	[ ]			
Q11d Number used under another arrangement (specify [ ])	[ ]			
Q11e **Total** (calculated)	[ ]			

CONTINUE THE ABOVE SERIES OF QUESTIONS UNTIL ALL TRACTORS, BULLDOZERS AND OTHER VEHICLE [MACHINE] ARE COVERED, THEN CONTINUE TO Q12.

PART 1.4.3: LAND PREPARATION AND PLANTING EQUIPMENT

Q12. Identify the types of land preparation and planting equipment that were used on the holding during the reference period.
*Report all land preparation and seeding equipment used, regardless of ownership.

(fill in all that apply) *RESPONSE = [MACHINE]*

- ◯ 15 Ploughs
- ◯ 16 Power tillers
- ◯ 17 Rotary tillers
- ◯ 18 Rotary harrows
- ◯ 19 Disk harrows
- ◯ 20 Cultivators
- ◯ 21 Levellers
- ◯ 22 Land planes
- ◯ 23 Diggers used for land preparation
- ◯ 24 Grain drills
- ◯ 25 Seed/fertilizer drills
- ◯ 26 Broadcast seeders
- ◯ 27 Planters
- ◯ 28 Transplanters
- ◯ 999 Other land preparation and planting equipment (specify [ ])
- ◯ 0 None → **Go to Q15.**

REPEAT Q13 AND Q14 FOR ALL MACHINES IDENTIFIED IN Q12.

Q13. What was the number of [MACHINE] used on the holding during the reference period? . . . Number used [ ]

Q14. Answer the following questions about the [MACHINE] used.

"A" & "B": TO BE ASKED TO ALL
"C": TO BE ASKED IF THE HOLDER IS A CIVIL (NATURAL) PERSON OR GROUP OF CIVIL (NATURAL) PERSONS
REPORT A MAX OF 2 ID CODES FROM THE HH, IF OWNED BY THE WHOLE HH = 777, IF OWNER UNKNOWN = 999

	A Number	*B* Average age of the owned [MACHINE] Years	*C* ID code of the person from the household who owns the machinery/equipment	ID code of the person from the household who owns the machinery/equipment
Q14a Number owned	[ ]	[ ]	[ ]	[ ]
Q14b Number co-owned with another holding	[ ]	[ ]	[ ]	[ ]
Q14c Number rented without an operator	[ ]			
Q14d Number used under another arrangement (specify [ ])	[ ]			
Q14e **Total** (calculated)	[ ]			

CONTINUE THE ABOVE SERIES OF QUESTIONS UNTIL ALL LAND PREPARATION AND PLANTING [MACHINE] ARE COVERED, THEN CONTINUE TO Q15.

PART 1.4.4: CROP MAINTENANCE EQUIPMENT

Q15. Identify the types of crop maintenance equipment that were used on the holding during the reference period.
*Report all crop maintenance equipment used, regardless of ownership.

(fill in all that apply) *RESPONSE = [MACHINE]*

- ◯ 30 Manure spreaders
- ◯ 31 Fertilizer broadcasters
- ◯ 32 Sprayers
- ◯ 33 Dusters
- ◯ 999 Other crop maintenance equipment (specify [ ])
- ◯ 0 None → **Go to Q18.**

REPEAT Q16 AND Q17 FOR ALL MACHINES IDENTIFIED IN Q15.

Q16. What was the number of [MACHINE] used on the holding during the reference period? . . . Number used [ ][ ]

Q17. Answer the following questions about the [MACHINE] used.

"A" & "B": TO BE ASKED TO ALL
"C": TO BE ASKED IF THE HOLDER IS A CIVIL (NATURAL) PERSON OR GROUP OF CIVIL (NATURAL) PERSONS
REPORT A MAX OF 2 ID CODES FROM THE HH, IF OWNED BY THE WHOLE HH = 777, IF OWNER UNKNOWN = 999

	A Number	*B* Average age of the owned [MACHINE] Years	*C* ID code of the person from the household who owns the machinery/equipment	ID code of the person from the household who owns the machinery/equipment
Q17a Number owned	[ ][ ]	[ ][ ]	[ ][ ][ ][ ][ ]	[ ][ ][ ][ ][ ]
Q17b Number co-owned with another holding	[ ][ ]	[ ][ ]	[ ][ ][ ][ ][ ]	[ ][ ][ ][ ][ ]
Q17c Number rented without an operator	[ ][ ]			
Q17d Number used under another arrangement (specify [ ])	[ ][ ]			
Q17e **Total** (calculated)	[ ][ ]			

CONTINUE THE ABOVE SERIES OF QUESTIONS UNTIL ALL CROP MAINTENANCE [MACHINE] ARE COVERED, THEN CONTINUE TO Q18.

PART 1.4.5: CROP HARVESTING EQUIPMENT

Q18. Identify the types of crop harvesting equipment that were used on the holding during the reference period.
*Report all crop harvesting equipment used, regardless of ownership.

(fill in all that apply) *RESPONSE = [MACHINE]*

- ◯ 35 Mowers for grass crops
- ◯ 36 Hay rakes
- ◯ 37 Hay balers
- ◯ 38 Forage harvesters
- ◯ 39 Forage blowers
- ◯ 40 Combine harvesters
- ◯ 41 Corn pickers
- ◯ 42 Potato harvesters
- ◯ 43 Sugar beet harvesters or harvesters for other root crops
- ◯ 44 Sugarcane harvesters
- ◯ 45 Reaper-binders
- ◯ 999 Other crop harvesting equipment (specify [ ])
- ◯ 0 None → **Go to Q21.**

REPEAT Q19 AND Q20 FOR ALL MACHINES IDENTIFIED IN Q18.

Q19. What was the number of [MACHINE] used on the holding during the reference period? . . . Number used [ ][ ]

Q20. Answer the following questions about the [MACHINE] used.

"A" & "B": TO BE ASKED TO ALL
"C": TO BE ASKED IF THE HOLDER IS A CIVIL (NATURAL) PERSON OR GROUP OF CIVIL (NATURAL) PERSONS
REPORT A MAX OF 2 ID CODES FROM THE HH, IF OWNED BY THE WHOLE HH = 777, IF OWNER UNKNOWN = 999

	A Number	*B* Average age of the owned [MACHINE] Years	*C* ID code of the person from the household who owns the machinery/equipment	ID code of the person from the household who owns the machinery/equipment
Q20a Number owned	[ ][ ]	[ ][ ]	[ ][ ][ ][ ][ ]	[ ][ ][ ][ ][ ]
Q20b Number co-owned with another holding	[ ][ ]	[ ][ ]	[ ][ ][ ][ ][ ]	[ ][ ][ ][ ][ ]
Q20c Number rented without an operator	[ ][ ]			
Q20d Number used under another arrangement (specify [ ])	[ ][ ]			
Q20e **Total** (calculated)	[ ][ ]			

CONTINUE THE ABOVE SERIES OF QUESTIONS UNTIL ALL CROP HARVESTING [MACHINE] ARE COVERED, THEN CONTINUE TO Q21.

PART 1.4.6: POST-HARVEST EQUIPMENT

Q21. Identify the types of post-harvest equipment that were used on the holding during the reference period.
* Report all post-harvest equipment used, regardless of ownership.

(fill in all that apply) *RESPONSE = [MACHINE]*

- ◯ 47 Threshers
- ◯ 48 Grain cleaners
- ◯ 49 Sorters and graders
- ◯ 999 Other post-harvest equipment (specify [ ])
- ◯ 0 None → **Go to Q24.**

REPEAT Q22 AND Q23 FOR ALL MACHINES IDENTIFIED IN Q21.

Q22. What was the number of [MACHINE] used on the holding during the reference period? . . . Number used [ ][ ]

Q23. Answer the following questions about the [MACHINE] used.

"A" & "B": TO BE ASKED TO ALL
"C": TO BE ASKED IF THE HOLDER IS A CIVIL (NATURAL) PERSON OR GROUP OF CIVIL (NATURAL) PERSONS
REPORT A MAX OF 2 ID CODES FROM THE HH, IF OWNED BY THE WHOLE HH = 777, IF OWNER UNKNOWN = 999

	A Number	*B* Average age of the owned [MACHINE] Years	*C* ID code of the person from the household who owns the machinery/equipment	ID code of the person from the household who owns the machinery/equipment
Q23a Number owned	[ ][ ]	[ ][ ]	[ ][ ][ ][ ][ ]	[ ][ ][ ][ ][ ]
Q23b Number co-owned with another holding	[ ][ ]	[ ][ ]	[ ][ ][ ][ ][ ]	[ ][ ][ ][ ][ ]
Q23c Number rented without an operator	[ ][ ]			
Q23d Number used under another arrangement (specify [ ])	[ ][ ]			
Q23e **Total** (calculated)	[ ][ ]			

CONTINUE THE ABOVE SERIES OF QUESTIONS UNTIL ALL POST-HARVEST [MACHINE] ARE COVERED, THEN CONTINUE TO Q24.

PART 1.4.7: MACHINE-POWERED EQUIPMENT FOR LIVESTOCK PRODUCTION

Q24. Was machine-powered equipment used for livestock production on the holding during the reference period DD/MM/YYYY to DD/MM/YYYY?

- ◯ 0 No → **Go to Q28.**
- ◯ 1 Yes

Q25. Identify the types of livestock equipment that were used on the holding during the reference period.
*Report all livestock equipment used, regardless of ownership.

(fill in all that apply) *RESPONSE = [MACHINE]*

- ◯ 51 Milking machines
- ◯ 52 Milk coolers
- ◯ 53 Cream separators
- ◯ 54 Other dairy equipment (packing, etc.)
- ◯ 55 Incubators
- ◯ 56 Beekeeping equipment (honey extractors, etc.)
- ◯ 999 Other livestock equipment (specify [ ])

REPEAT Q26 AND Q27 FOR ALL MACHINES IDENTIFIED IN Q25.

Q26. What was the number of [MACHINE] used on the holding during the reference period? . . . Number used [ ][ ]

Q27. Answer the following questions about the [MACHINE] used.

"A" & "B": TO BE ASKED TO ALL
"C": TO BE ASKED IF THE HOLDER IS A CIVIL (NATURAL) PERSON OR GROUP OF CIVIL (NATURAL) PERSONS
REPORT A MAX OF 2 ID CODES FROM THE HH, IF OWNED BY THE WHOLE HH = 777, IF OWNER UNKNOWN = 999

	A Number	*B* Average age of the owned [MACHINE] Years	*C* ID code of the person from the household who owns the machinery/equipment	ID code of the person from the household who owns the machinery/equipment
Q27a Number owned	[ ][ ]	[ ][ ]	[ ][ ][ ][ ][ ]	[ ][ ][ ][ ][ ]
Q27b Number co-owned with another holding	[ ][ ]	[ ][ ]	[ ][ ][ ][ ][ ]	[ ][ ][ ][ ][ ]
Q27c Number rented without an operator	[ ][ ]			
Q27d Number used under another arrangement (specify [ ])	[ ][ ]			
Q27e **Total** (calculated)	[ ][ ]			

CONTINUE THE ABOVE SERIES OF QUESTIONS UNTIL ALL LIVESTOCK [MACHINE] ARE COVERED, THEN CONTINUE TO Q28.

PART 1.4.8: IRRIGATION EQUIPMENT

Q28. Was any irrigation equipment present on the holding during the reference period?
*Report all irrigation equipment present on the holding during the reference period, regardless of whether it was used during the reference period.
*Report all irrigation equipment, regardless of ownership.

◯ 0 No → **Go to SECTION 2.**
◯ 1 Yes

Q29a. What type of irrigation equipment was present on the holding during the reference period?

(fill in all that apply) *RESPONSE = [IRRIG]*
◯ 1 Water pumps
◯ 2 Drip irrigation equipment
◯ 3 Sprinkler irrigation equipment
◯ 4 Sprayers and other localized irrigation devices
◯ 999 Other irrigation equipment (specify [ ])

ANSWER THE FOLLOWING QUESTIONS Q29b and Q29c for each type of irrigation equipment reported in Q29a

Q29b. Were/was the [IRRIG] owned by the holding?

◯ 0 No → **Go to NEXT [IRRIG] or to SECTION2 after the last [IRRIG] identified**
◯ 1 Yes

Q29c. What is the average age of the owned [IRRIG]?

[ ][ ] Years

CONTINUE THE ABOVE SERIES OF QUESTIONS UNTIL ALL [IRRIG] ARE COVERED, THEN CONTINUE TO SECTION 2.

Comments on SECTION 1:

SECTION 2: NON-RESIDENTIAL BUILDINGS OR STRUCTURES USED BY THE HOLDING DURING THE REFERENCE PERIOD DD/MM/YYYY TO DD/MM/YYYY

PART 2.1: NON-RESIDENTIAL BUILDINGS OR STRUCTURES USED FOR CROPS - PURPOSE, VOLUME/AREA AND TENURE

Q01. Were any buildings or structures used by this holding for storing crops, incl. seeds, during the reference period?
*Do not include storage in commercial storage buildings or structures.

- ◯ 0 No → **Go to Q5.**
- ◯ 1 Yes

Q02. Identify the types of crops stored in the buildings or structures used by the holding during the reference period.

(fill in all that apply) *RESPONSE = [CROP]*

- ◯ 1 Grain crops
- ◯ 2 Root crops
- ◯ 3 Fruit and other vegetables
- ◯ 999 Other crops (specify [ ])

REPEAT Q03 AND Q04 FOR ALL [CROP] IDENTIFIED IN Q02.

Q03. What is the storage capacity of the buildings or structures used to store [CROP]?

	Capacity	Unit of measure (country-specific list of units of measure)
◯	[ ][ ][ ][ ][ ][ ][ ][ ]	[ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ]

◯ I don't know

Q04. What is the tenure of the buildings or structures used to store [CROP]?

(fill in all that apply)

- ◯ 1 Owned
- ◯ 2 Rented
- ◯ 999 Used under another arrangement (specify [ ])

CONTINUE THE ABOVE SERIES OF QUESTIONS UNTIL ALL [CROP]S ARE COVERED, THEN CONTINUE TO Q05.

Q05. Identify the buildings or structures used for crop-related activities by the holding during the reference period.

(Fill in all that apply) *RESPONSE = [CROP USE]*

- ◯ 1 Processing of crops (preparation for market, etc.)
- ◯ 2 Storing plant protection products
- ◯ 3 Storing fertilizers
- ◯ 4 Storing crop-related machinery and equipment
- ◯ 999 Other purposes (Specify [ ])
- ◯ 0 None

REPEAT Q06 AND Q07 FOR ALL [CROP USE] IDENTIFIED IN Q05.

Q06. What is the area of the buildings or structures used for [CROP USE]?

	Area	Unit of measure (country-specific list of units of measure)
◯	[ ][ ][ ][ ][ ][ ][ ][ ]	[ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ]

◯ I don't know

Q07. What is the tenure of the buildings or structures used for [CROP USE]?

(fill in all that apply)

- ◯ 1 Owned
- ◯ 2 Rented
- ◯ 999 Used under another arrangement (specify [ ])

CONTINUE THE ABOVE SERIES OF QUESTIONS UNTIL ALL [CROP USE]S ARE COVERED, THEN CONTINUE TO Q08.

PART 2.2: NON-RESIDENTIAL BUILDINGS OR STRUCTURES USED FOR LIVESTOCK - PURPOSE, VOLUME/AREA AND TENURE

Q08. Were any buildings or structures used by this holding for livestock during the reference period?

- ◯ 0 No → **Go to SECTION 3 if the holder is a civil/natural person or group of civil/natural persons ; otherwise, End of survey, thank you.**
- ◯ 1 Yes

Q09. Identify the livestock-related uses of buildings or structures used by the holding during the reference period.

(fill in all that apply) ***RESPONSE = [LIVESTOCK USE]***

- ◯ 1 Housing of livestock other than poultry
- ◯ 2 Housing of poultry
- ◯ 3 Milking
- ◯ 4 Production of dairy products
- ◯ 5 Meat production (slaughtering and first cuts)
- ◯ 6 Meat processing
- ◯ 7 Preparation of hides and skins and/or production of leather goods
- ◯ 8 Storage for livestock-related machinery and equipment
- ◯ 999 Other purposes (specify [ ])

REPEAT Q10 AND Q11 FOR ALL [LIVESTOCK USE] IDENTIFIED IN Q09.

Q10. What is the area of the buildings or structures used for [LIVESTOCK USE]?

	Area	Unit of measure (country-specific list of units of measure)
◯	[ ][ ][ ][ ][ ][ ][ ][ ]	[ ][ ][ ][ ][ ][ ][ ][ ][ ][ ]

◯ I don't know

Q11. What is the tenure of the buildings or structures used for [LIVESTOCK USE]?

(fill in all that apply)

- ◯ 1 Owned
- ◯ 2 Rented
- ◯ 3 Used under another arrangement (specify [ ])

CONTINUE THE ABOVE SERIES OF QUESTIONS UNTIL ALL [LIVESTOCK USE]S ARE COVERED, THEN CONTINUE TO Q12.

Q12. Were any buildings or structures used to house both humans and farm animals?

- ◯ 0 No → **Go to SECTION 3 if the holder is a civil (natural) person or group of civil (natural) persons; otherwise, End of survey, thank you.**
- ◯ 1 Yes

Q13. Identify the farm animals that shared housing with humans.
*Do not include pets or companion animals.

(fill in all that apply)

- ◯ 1 Horses or other equines
- ◯ 2 Cattle, buffaloes or other bovines
- ◯ 3 Sheep
- ◯ 4 Goats
- ◯ 5 Pigs
- ◯ 6 Poultry
- ◯ 999 Other farm animals (specify [ ])

Comments on SECTION 2:

IF THE HOLDER IS A CIVIL (NATURAL) PERSON OR GROUP OF CIVIL (NATURAL) PERSONS, GO TO SECTION 3; OTHERWISE, END OF SURVEY, THANK YOU.

SECTION 3: SELECTED ASSETS OWNED BY THE HOUSEHOLD DURING THE REFERENCE PERIOD DD/MM/YYYY TO DD/MM/YYYY

THIS SECTION IS ONLY FOR CASES WHERE THE HOLDER IS A CIVIL (NATURAL) PERSON OR GROUP OF CIVIL (NATURAL) PERSONS

PART 3.1: LAND AND LIVESTOCK

Q01. Did this holding operate owned agricultural land during the reference period?

- ◯ 0 No → **Go to Q03.**
- ◯ 1 Yes

Q02. Identify the household members who own the agricultural land.

*Report starting with the member who owns the largest area of agricultural land and continue reporting in decreasing order.
*If the land is owned by the entire household, write 777.

		ID code
Q02a	Landowning household member 1	
Q02b	Landowning household member 2	
Q02c	Landowning household member 3	
Q02d	Landowning household member 4	

ETC..... Valid response can include all household members...

Q03. Did this holding raise owned livestock during the reference period?

- ◯ 0 No → **Go to PART 3.2, Q05.**
- ◯ 1 Yes

Q04. Identify the types of owned livestock that were raised during the reference period.

(fill in all that apply) *RESPONSE = [LIVESTOCK]*

- ◯ 1 Horses or other equines
- ◯ 2 Cattle, buffaloes or other bovines
- ◯ 3 Sheep
- ◯ 4 Goats
- ◯ 5 Pigs
- ◯ 6 Poultry
- ◯ 999 Other farm animals (specify [ ])

REPEAT Q05 FOR ALL [LIVESTOCK] IDENTIFIED IN Q04.

Q05. Identify the household members who own the [LIVESTOCK].

*Report starting with the member who owns the largest number of animals and continue reporting in decreasing order.
*If the [LIVESTOCK] is owned by the entire household, write 777.

		ID code
Q05a	[LIVESTOCK]-owner household member 1	
Q05b	[LIVESTOCK]-owner household member 2	
Q05c	[LIVESTOCK]-owner household member 3	
Q05d	[LIVESTOCK]-owner household member 4	

ETC..... Valid response can include all household members...

CONTINUE THE ABOVE QUESTION UNTIL ALL [LIVESTOCK] ARE COVERED, THEN CONTINUE TO PART 3.2, Q06.

PART 3.2: HOUSEHOLD DWELLING

Q06. Report the tenure of the household dwelling.

(fill in one circle only)
- ◯ 1 Owned → Go to Q07.
- ◯ 2 Rented → Go to Q08.
- ◯ 3 Used for free → Go to Q08.
- ◯ 4 Used under another arrangement (specify [ ]) → Go to Q08.

Q07. List the adult household members who own the dwelling.

ID code

Q08. What is the main material used for the WALLS of the dwelling?

(fill in one circle only)
- ◯ 1 Grass
- ◯ 2 Mud
- ◯ 3 Compacted earth
- ◯ 4 Mud brick
- ◯ 5 Burnt brick
- ◯ 6 Concrete
- ◯ 7 Wood
- ◯ 8 Metal sheets
- ◯ 999 Other (specify [ ])

Q09. What is the main material used for the ROOF of the dwelling?

(fill in one circle only)
- ◯ 1 Grass or other plant material
- ◯ 2 Clay tiles
- ◯ 3 Plastic sheets
- ◯ 4 Concrete
- ◯ 5 Metal sheets
- ◯ 999 Other (specify [ ])

Q10. What is the main material used for the FLOOR of the dwelling?

(fill in one circle only)
- ◯ 1 Sand
- ◯ 2 Smoothed mud
- ◯ 3 Concrete
- ◯ 4 Tile
- ◯ 5 Wood
- ◯ 999 Other (specify [ ])

Q11. What type of toilet facility does the household normally use?

(fill in one circle only)
- ◯ 1 Flush or pour-flush toilet
- ◯ 2 Pit latrine
- ◯ 3 Composting toilet
- ◯ 4 Bucket
- ◯ 5 Hanging toilet or hanging latrine
- ◯ 6 No facilities, or bush or field
- ◯ 999 Other (specify [ ])

PART 3.3: DRINKING WATER

Q12. What was the main source of drinking water for the household during the reference period?

(fill in one circle only)

- ◯ 1 Piped water - piped into dwelling → Go to Q16.
- ◯ 2 Piped water - piped to yard/plot → Go to Q16.
- ◯ 3 Piped water - piped to neighbour → Go to Q14.
- ◯ 4 Piped water - public tap or standpipe
- ◯ 5 Piped water - tube well or borehole
- ◯ 6 Dug well - protected
- ◯ 7 Dug well - unprotected
- ◯ 8 Spring water - protected spring
- ◯ 9 Spring water - unprotected spring
- ◯ 10 Rainwater
- ◯ 11 Tanker-truck
- ◯ 12 Cart with small tank/drum
- ◯ 13 Surface water
- ◯ 14 Bottled water
- ◯ 999 Other (specify [ ])

Q13. Where is the water source located?

(fill in one circle only)

- ◯ 1 In own dwelling → Go to Q16.
- ◯ 2 In own yard/plot → Go to Q16.
- ◯ 3 Elsewhere

Q14. How long does it take to go to the water source, get water and come back?

Minutes [ ][ ][ ]

Hours [ ][ ][ ]

Q15. Who usually collects the water?

(fill in all that apply)

- ◯ 1 Girls
- ◯ 2 Boys
- ◯ 3 Women
- ◯ 4 Men

Q16. In the past two weeks, was the water from this source not available for at least one full day?

- ◯ 0 No
- ◯ 1 Yes

Q17. Does the household do anything to the water to make it safer to drink?

- ◯ 0 No
- ◯ 1 Yes

PART 3.4: HOUSEHOLD ASSETS

Q18. Identify the items owned by the household.
*For owned items, report which household member owns the item.
*If an item is owned by the entire household, write 777.

(fill in all that apply)

		ID code Owner 1	ID code Owner 2
◯ 1	*Country-specific asset*	[ ][ ][ ][ ][ ]	[ ][ ][ ][ ][ ]
◯ 2	*Country-specific asset*	[ ][ ][ ][ ][ ]	[ ][ ][ ][ ][ ]
◯ 3	*Country-specific asset*	[ ][ ][ ][ ][ ]	[ ][ ][ ][ ][ ]

ETC. Valid response can include all household members.

Comments on SECTION 3:

End of survey, thank you.

4.5. AGRIS MACHINERY, EQUIPMENT AND ASSETS MODULE METHODOLOGICAL NOTE

Introduction

This note provides an overview of the AGRIS Machinery, Equipment and Assets (MEA) Module, presents its structure and content, and proposes definitions and classifications. It is meant to provide survey managers and operational staff with an understanding of the MEA Module within the larger context of AGRIS – which also fits within the broader context of a national statistical system.

These methodological notes also discuss some issues relating to survey implementation and customization to country specificities.

- Subchapter 4.5.1 outlines the key elements underlying the MEA Module: the measurement objectives, coverage and collection, timing and reference periods for the module. It explains how the module can respond to the data needs of priority international development initiatives in the agricultural and rural sectors.
- Subchapter 4.5.2 introduces the structure and overall articulation of the MEA Module. It presents selected indicators that can be generated from the module.
- Subchapter 4.5.3 provides methodological notes and discusses options for customization of specific parts and questions of the MEA Module questionnaire. It provides definitions and introduces relevant classifications. These classifications are further detailed in annex 1.

4.5.1. Context, measurement objectives, statistical unit, reference periods and units

4.5.1.1. The MEA Module in its AGRIS context

AGRIS is designed as a ten-year integrated sample survey program. The modular set of surveys has, at its foundation, an annual Core Module to collect basic frame information about holdings and those operating them, as well as data on the agricultural production of crops and livestock. A set of four Rotating Modules provides economic data as well as data on labour force, production methods and the environment, and machinery, equipment and assets. These data supplement the core data, and through focused sample selection, can be integrated not only with the Core Module but also with each other, to provide a rich data set covering all aspects of agricultural holdings.

The MEA Module focuses on the machinery, equipment and assets of agricultural holdings in the whole country, regardless of holding size. The questions focus mainly on the types and numbers of machinery, equipment and assets used, as well as their age and ownership.

Table 4.12. below outlines the recommended timing and elements of the AGRIS modules, which includes two iterations in years 1 and 5 for the MEA Module.

This frequency is based on the fact that during normal periods, the equipment of farms is slowly changing. However, if necessary, the MEA Module can be carried out more frequently, for example every two years. This may be the case, for example, when a policy aiming to encourage equipment is conducted and requires evaluation at intervals more frequent than every five years.

TABLE 4.12. RECOMMENDED AGRIS MODULE FLOW.

	Years	1	2	3	4	5	6	7	8	9	10
Core Module	Agricultural holding (AH) Roster	•	•	•	•	•	•	•	•	•	•
	Crop + livestock production	•	•	•	•	•	•	•	•	•	•
	Other key variables	•	•	•	•	•	•	•	•	•	•
Rot. Module 1	Economy	•		•		•		•		•	
Rot. Module 2	Labour		•				•				
Rot. Module 3	Production Methods and the Environment				•				•		
Rot. Module 4	Machinery, Equipment and Assets	•				•					

The AGRIS Core Module is the framework upon which the Rotating Modules are built. It is conducted annually and primarily collects roster information for the agricultural holding, as well as on crop and livestock production. In addition, some economic, labour and demographic questions are included. Along with providing annual production data, the roster information is critical in maintaining an up-to-date survey frame for the selection of samples for the Rotating Modules and future Core Module surveys.

Sampling recommendations for the MEA Module are provided in Chapter 5 of the handbook, on the AGRIS Sampling strategy. When possible, the MEA Module will be the same sample or a subsample of the holdings that have completed the AGRIS Core Module. This will be important so that data from the two modules can be combined to provide a more robust set of data, while minimizing the costs of collection and the reporting burden placed on data providers. Data are meant to be collected in the field directly from survey respondents using Computer Assisted Personal Interview (CAPI) techniques. A CAPI version of the AGRIS MEA Module generic questionnaire is available in the Survey Solution package (see annex 5).

4.5.1.2. The MEA Module and international statistical frameworks

Relevant international statistical frameworks applied and used by the AGRIS MEA Module

The AGRIS generic methodology is proposed as a public good to statistical agencies, for their further customization and implementation. The resulting data are meant to be used in a coherent way, to make meaningful subnational, regional and international aggregations and comparisons. In this context, the AGRIS methodology relies extensively on several internationally endorsed statistical frameworks, such as statistical classifications, and is articulated with other relevant data collection programs (such as the FAO-promoted World Programme for the Census of Agriculture 2020, or WCA 2020). The AGRIS methodology, including the questionnaires' content, design and implementation (through CAPI), has benefited from various innovations in data collection brought about by the implementation of the Global Strategy to improve Agricultural and Rural Statistics (hereafter, Global Strategy or GSARS), and the Research Program of the LSMS-ISA program, promoted by the World Bank.

The scope of activities in AGRIS is defined under ISIC rev. 4 (see annex 1-1); the products covered by AGRIS are based on the CPC ver. 2.1 (UN Central Product Classification), adapted for the AGRIS context (see annex 1-3).

Beyond the essential articulation in terms of timing between the ten-year AGRIS cycle and the frame building based on agricultural census, the AGRIS methodology is linked to the WCA 2020 in terms of relevant items, definitions and classifications. For example, the lists of machinery and equipment proposed in different parts of the Generic Questionnaire (see annex 1-6 of this handbook) are taken from the WCA 2020 guidelines (FAO, 2015, annex 7). Other more detailed classifications can also be used, such as the Harmonized Commodity description and Coding System.

The Harmonized System is an international nomenclature for the classification of products. It allows participating countries to classify traded goods on a common basis for customs purposes. At the international level, the Harmonized System 2017 for classifying goods is a six-digit code system[1].

National classifications can be also used if they meet the important condition of being compatible with the proposed classification, in order to allow for international comparisons. In other words, if some items of the national classification are more detailed, it is possible to reconstitute aggregates fitting with the proposed items. On the contrary, if some national items aggregate two or more proposed items, the proposed items will be used.

The System of National Accounts 2008 (SNA 2008) is a statistical framework that provides a comprehensive, consistent and flexible set of macroeconomic accounts for policy-making, analysis and research purposes. The SNA 2008 defines enterprise and establishment as two main types of economic production units. With the purpose of achieving coherence with the SNA 2008, AGRIS adopts the principle that the agricultural holding is treated as equivalent to an establishment unit under the SNA. The definitions of household and non-household sectors in agriculture are also developed within the SNA framework.

Using AGRIS data: relevant international statistical demand frameworks

Sustainable Development Goal indicators

On 25 September 2015, countries adopted a set of goals to end poverty, protect the planet, and ensure prosperity for all as part of a new sustainable development agenda[2]. Each goal has specific targets to be achieved over the next 15 years, all having specific indicators[3]. Through its MEA Module, AGRIS provides essential and direct information for four SDG indicators, including:

- 2.3.1: Volume of production per labour unit by classes of farming/pastoral/forestry enterprise size
    - *MEA helps to define relevant classes of farms, for example using a farm typology*
- 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

In addition, the AGRIS MEA Module contributes to the following nine SDG indicators, on the subpopulation of the population associated with agricultural holdings only:

- 1.1.1: Proportion of population below the international poverty line, by sex, age, employment status and geographical location (urban/rural)
- 1.2.1: Proportion of population living below the national poverty line, by sex and age
- 1.2.2: Proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions
- 1.4.1: Proportion of population living in households with access to basic services
- 1.4.2: Proportion of total adult population with secure tenure rights to land, with legally recognized documentation and who perceive their rights to land as secure, by sex and by type of tenure
- 5.b.1: Proportion of individuals who own a mobile telephone, by sex
- 7.1.1: Proportion of population with access to electricity
- 9.c.1: Proportion of population covered by a mobile network, by technology
- 17.8.1: Proportion of individuals using the Internet

1 See https://unstats.un.org/unsd/tradekb/Knowledgebase/50018/Harmonized-Commodity-Description-and-Coding-Systems-HS and http://www.wcoomd.org/en/topics/nomenclature/instrument-and-tools/hs-nomenclature-2017-edition.aspx.
2 http://www.un.org/ga/search/view_doc.asp?symbol=A/RES/70/1&Lang=E.
3 https://unstats.un.org/sdgs/metadata/.

Minimum Set of Core Data (MSCD)

The proposed set of AGRIS questionnaires generates approximately two thirds of the MSCD data requirements. AGRIS generates all of the MSCD-relevant data to be collected at farm level. The MEA questionnaire generates four MSCD items under ‘’Economic - Stock of resources/machinery”, “Economic - Rural infrastructure/Irrigation, roads, railways and communications”, and “Social – Demographics of urban and rural population/Housing conditions”.

4.5.1.3. Measurement objectives and scope

The primary objective of the MEA Module is to measure the types and quantities of machinery and equipment used on the holding. It also measures the types of non-residential buildings used by the holding.

In addition, the MEA Module includes questions related to:

- Ownership
- Age of machinery, equipment
- Assets of the holding (land, livestock, etc.)
- When relevant, assets of the holding

The scope of AGRIS is defined under ISIC (rev.4) as follows:
Section: A – Agriculture, forestry and fishing
Division: 01 – Crop and animal production, hunting and related service activities

- 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

The detailed ISIC description for these activities can be found in annex 1-1. The annex provides information at the Section, Division, Group and Class levels of the classification, along with explanatory notes.

4.5.1.4. Statistical unit and coverage

The agricultural holding

The AGRIS statistical unit, including for its MEA Module, is the agricultural holding, as an independent producer of agricultural products. The definition proposed for AGRIS is that established by FAO in its WCA 2020 programme (FAO, 2015).

> “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.”

The agricultural holding is under single management, exercised by the holder (see section 3.2).

Using the SNA 2008 terminology, farms can be grouped into (1) those that are defined as household units (holdings in the household sector) and (2) all other institutional units engaged in agricultural production (holdings in the non-household sector), such as corporations and government institutions. In most countries, the majority of agricultural production occurs in the household sector. The concept of "agricultural holding" is therefore closely related to the concept of "household". Both subpopulations should be covered by AGRIS, as household and non-household sector holdings (see annex 1-4).

Coverage and use of threshold

AGRIS should cover all relevant agricultural activities of agricultural holdings in a country within the scope of the ISIC groups mentioned above. Following national characteristics, thresholds can be fixed for the whole country, with the objective of covering the largest possible share of agricultural production and to exclude the very small agricultural holdings that contribute little to total agricultural production. Preferably, those thresholds should be established before an agricultural census and used without change for all surveys between two censuses. The benefits of establishing thresholds is to be carefully assessed: if operational simplicity and budget savings are obvious advantages, disadvantages would include the need to monitor small-scale holdings – which is often a primary policy concern.

4.5.1.5. Reference periods and timing

The reference period used in the MEA Module is the agricultural year. The main characteristics of this reference period include:

- A duration of 12 months
- The inclusion of soil preparation(s), sowing(s) and harvest(s); and conclusion with a harvest period, to be consistent with the agricultural campaign(s). The end of the period is generally the date of the last harvest in the year
- Inclusion of one or more harvests (in addition to the possibility of having continuous harvests)

The MEA Module should be implemented in a single wave of data collection within the recommended years of implementation (years 1 and 5). The timing is to be synchronized with that of the Core Module.

4.5.1.6. Units of measure

The MEA questionnaire does not present any difficulties regarding units, as most questions relate to quantities or age.

4.5.2. Structure of the MEA Module and main indicators

The MEA Module questionnaire is divided into three sections and 18 parts. Table 4.13. below summarizes the organization of the thematic coverage of each of these parts. Some of the sections or parts may only be relevant and applicable to holdings operated by a civil person or a group of civil persons, as identified in the questionnaire.

TABLE 4.13. STRUCTURE OF THE AGRIS MEA MODULE.

Sections (S) and parts (P) of AGRIS MEA Module questionnaire	Main themes included	Main indicators that can be calculated
S1. Machinery and equipment used by the holding		
P1.1. Identification of the agricultural holding	Legal status of the holder, list of household members	Information generally provided by the Core Module
P1.2. Manually operated equipment	For each kind of equipment: • number of used equipment • average age of used equipment, • owners of equipment for household sector • number of rented equipment for machine powered ones	Rate equipment/area or livestock Equipment: • By age • By owners • By mechanization organisation Equipment needs
P1.3. Animal-powered equipment	For each kind of power and following the proposed nomenclature: • number of used equipment • average age of used equipment, • owners of equipment for household sector • number of rented equipment for machine powered ones	Level of mechanization following utilized area and livestock Rate equipment/area or livestock Equipment • By age • By owners • By mechanization organisation Equipment needs
P1.4. Machine-powered equipment P1.4.1 Machine-powered equipment for general farm use P1.4.2 Tractors, bulldozers, other vehicles P1.4.3 Land preparation and planting equipment P1.4.4 Crop maintenance equipment P1.4.5 Crop harvesting equipment P1.4.6 Post-harvest equipment P1.4.7 Equipment for livestock production P1.4.8 Irrigation equipment	For each kind of power and following the proposed nomenclature: • number of used equipment • average age of used equipment, • owners of equipment for household sector • number of rented equipment for machine powered ones	Level of mechanization following utilized area and livestock Rate equipment/area or livestock Equipment: • By age • By owners • By mechanization organisation Equipment needs

Sections (S) and parts (P) of AGRIS MEA Module questionnaire	Main themes included	Main indicators that can be calculated
S2. Non-residential buildings or structures used by the holding		
P2.1. Non-residential buildings or structures used for crops	Types of crops stored, storage capacity and status of storage buildings used Area and status of other buildings used (crops processing, fertilizers and PPP storage...)	Storage capability by estimate crop harvested quantity Crop storage needs
P2.2. Non-residential buildings or structures used for livestock	Area and status of buildings used for livestock (housing, production...) Shared housing humans/livestock	Livestock housing capability/livestock Livestock buildings needs
S3. Selected assets owned by the holding		
P3.1. Land and livestock	Owned area and livestock, owners for household sector	Who owns area and livestock
P3.2. Household dwelling	Status of household dwelling, materials used for construction, toilet facilities	Dwelling and assets characteristics
P3.3. Drinking water	Source of drinking water used, availability, quality, location, collection	Share of holdings by type of access/quality of drinking water
P3.4. Household assets	Available household assets following the national nomenclature Owners of each asset	Assets characteristics

Detailed descriptions of the main indicators, including the required variables and calculations, are available in annex 2 of this handbook.

4.5.3. Content, proposed definitions and classifications

The proposed generic questionnaire of the AGRIS MEA Module aims to collect data about the machinery, equipments and assets **effectively utilized during the reference period** (that is, the agricultural year). If a country needs to collect data about all machinery, equipments and assets in agricultural holdings, it is necessary to adapt the proposed questionnaire to obtain the necessary data and to maintain available data on the utilized equipments, to enable calculation of main indicators and the drawing of international comparisons. At least two adaptations are necessary:

- Proposed questions should be modified to collect for numbers of utilized equipments and non-utilized equipments
- Adding questions about the reasons why some machinery, equipments or assets were not utilized during the agricultural year of reference.

Sensitivity of certain data items. Given the possible sensitivity of questions on household-owned assets for some respondents, national implementing agencies may consider omitting or modifying some sections of this Generic Questionnaire to preserve a good response quality and an overall satisfactory response rate on the essential elements of the module, such as on holding machinery.

4.5.3.1. Section 1 – Machinery and equipment used by the holding during the reference period

Section 1, part 1.1 – Identification of the agricultural holding

Part 1.1 - Identification of the agricultural holding is completed when the MEA Module is conducted through a collection wave that is not synchronized with the AGRIS Core Module. When the module is conducted concurrently with the Core Module, the two questionnaires will be integrated and the identification will follow that from the Core Module. It provides information on the links to the Core Module, as well as on the legal status of the agricultural holding and the holder(s).

Section 1, part 1.2 – Manually operated equipment

The Generic MEA Module questionnaire proposes filter questions to avoid unnecessary overburden of respondents (**Q01**). During data processing, a specific value must be assigned to the skipped variables to avoid any analytical error. This is valid for all such skip questions, throughout the questionnaires.

Q02: Manually operated equipment are often country-specific; therefore, the proposed list directly offers "country-specific response options". Implementing national agencies will need to prepare detailed and exact lists of such equipment, if possible with accompanying photos, because the same equipment may take different names in different places within the same country. To the extent possible, the answer modality "999 other, specify: _____" should be deleted and replaced with the development of an inclusive list of relevant equipment, to avoid any data processing issues.

For the household sector, the ID codes of the person(s) who own the equipment are asked. A maximum of two ID codes (those of the two main owners) should be collected. This ID code usually comes from the household roster (from the Core Module). When the MEA Module is conducted through a collection wave that is not synchronized with the AGRIS Core Module, this information should be collected in Part 1.1. Response options are provided when the equipment is owned by the whole household and when the owner is unknown. The use of the latter option, however, should be minimized.

Section 1, part 1.3 – Animal-powered equipment

Q04: The note above for **Q02** is valid for **Q04** as well. For the question on the Age of equipment, **Q04d**, another option that could be considered by implementing national agencies is to propose categories for the average age (for example, less than 2 years, 2–5 years, 5–10 years, and more than 10 years). The list of equipment proposed is based on annex 7 of WCA 2020. Other sources that provide more details – including HS 2017 – could also be used. The list must be customized for increased country relevance, although it is necessary to ensure consistency with international lists and classifications to enable meaningful international analysis.

Section 1, part 1.4 – Machine-powered equipment

With regard to **Q06**, it may be useful to replace the answer modality "999 Other, specify: _____" with specific relevant equipment, such as GPS or tablets.

Likewise, it may be useful to replace the category in **Q08d** with subcategories, when relevant (rented with an operator, received for free, etc.).

In **Q09**, it may be useful to replace the answer modality "999 Other, specify: _____" with specific relevant equipment.

In **Q12**, the proposed list of equipment is based on annex 7 of WCA 2020. Other sources that provide more details – including HS 2017 – could also be used. The list must be customized for increased country relevance, although consistency with international lists and classifications should be ensured to enable meaningful international analysis. It may be useful to replace the answer modality "999 Other, specify: _____" with specific relevant equipment.

In **Q15**, **Q18**, **Q21**, **Q25**, **Q29e**, it may be useful to replace the answer modality "999 Other, specify: _____" with specific relevant equipment.

The comment made for the holdings in the household sector in **Q02** is also valid for **Q08**, **Q11**, **Q14**, **Q17**, **Q20**, **Q23** and **Q27**.

4.5.3.2. Section 2 – Non-residential buildings or structures used by the holding

Section 2, part 2.1 – Non-residential buildings or structures used for crops purpose

In **Q01** and **Q02**, all buildings and structures used for storing crops should be considered, including those building or structures that were not initially conceived for storing crops. Information is asked on their capacity and ownership.

Information is also asked on the buildings and structures used for activities related to crop production (crop processing, PPP or fertilizer storage, etc.).

Section 2, part 2.2 – Non-residential buildings or structures used for livestock

In this part, information on all of the buildings and structures used for livestock should be considered, including those buildings or structures that were not initially conceived for livestock-related uses. Information is collected on whether some of the buildings are shared with humans. The objective of this question is to collect information on some aspects of living conditions and health-related issues.

Fisheries activities are not included in this part. If they are important for the country, the national authority may decide to add a similar question covering fisheries and aquaculture-related activities.

4.5.3.3. Section 3 – Selected assets owned by the holding

This section of the questionnaire only applies to holdings where the holder is a civil (natural) person or a group of civil (natural) persons.

Section 3, part 3.1 – Land and livestock

In **Q02** and **Q05**, all household members who own the agricultural land or livestock should be listed. It is important that the gender for these household members is known – which, in the generic AGRIS package, is achieved through the Core Module.

Section 3, part 3.2 – Household dwelling

In **Q08** to **Q11**, national implementing agencies may wish to customize the answer modalities and categories proposed.

Section 3, part 3.3 – Drinking water

With regard to **Q12** to **Q17**, national implementing agencies may want to customize the answer modalities and categories proposed. However, they should consider retaining a clear linkage with those proposed, which are consistent with the UNICEF/WHO Joint Monitoring Program WASH Initiative.

It is proposed to keep the same reference period for this part (for example, the agricultural year or 12 months). National implementing agencies may wish to reconsider this and follow the JMP/WASH recommendation to choose a specific day as the reference period.

Section 3, part 3.4 – Household assets

In **Q18**, all household members who own the assets should be listed. It is important that the gender of these household members is known – which, in the generic AGRIS package, is achieved through the Core Module.

National implementing agencies may wish to customize the list of assets proposed. The basic idea is to capture the information that is typically required for the computation of multidimensional poverty lines and poverty profiles. The case being, this could enable some meaningful analysis through survey-to-survey imputation – in particular, with other household income and expenditure surveys.

5

Chapter 5
AGRIS sampling strategy

INTRODUCTION

The Agricultural Integrated Survey (AGRIS) is a farm-based modular ten-year survey program on the technical, economic, environmental and social dimensions of agricultural holdings. AGRIS is conceived to cover a broad range of items with a cost-efficient set-up, which envisages one annual Core Module and four Rotating Modules: i) economy; ii) labour; iii) machinery, equipment, assets and decisions; and iv) production methods and environment. The data generated is meant to inform policy design and implementation, as well as to improve market efficiency and support research.

The aim of this short document is to provide guidance to AGRIS survey managers on sampling frames and on the sampling design issues that may arise in the implementation of AGRIS and in the generation of quality data. The document indicates a selection of useful references and tools.

The proposals and recommendations provided in this document have been developed under three basic principles:

- **Efficiency** – the recommendations are based on the major recent publications in the field and aim to ensure a reliable coverage of AGRIS data needs;
- **Practicability** – feasibility and taking into account countries' current practices; and
- **Cost-effectiveness** – cost-effective methods for economic sustainability

A sampling "gold standard" is recommended as the most suitable approach in light of the three above principles. Derived protocols are also proposed (and termed "silver standards") to accommodate different realities. Indeed, countries vary greatly in terms of their agricultural systems and structures (*what* is to be measured), as well as in terms of their statistical infrastructure and, ultimately, their budget availability for undertaking AGRIS (*how* to measure it).

Part I: sampling frames for AGRIS implementation – development, updating and maintenance

The target population of AGRIS consists of agricultural holdings, which are then adopted as the statistical units. Building a frame at country level is generally a costly operation, especially for developing countries, in which a complete in-field enumeration is usually required. In many cases, conducting a full-enumeration agricultural census is still the most suitable operation for developing agricultural list frames. The FAO WCA 2020 (FAO, 2015) recommends that countries implement an agricultural census every ten years to achieve this objective, among others.

One of the challenges arising in the AGRIS context is to ensure that the frame is of an adequate quality and capable of avoiding problems from arising in the results of the surveys designed with it. Basic frame properties are presented and discussed by Särndal, Swensson and Wretman (1992). In the context of agricultural frames, the following issues tend to be faced and must be avoided:

- **Undercoverage or incomplete frame**: failure to include some holdings in the sampling frame.
- **Overcoverage**: some units that are not agricultural holdings are included in the frame. A particular case is constituted by holdings that are listed in the frame but no longer exist.
- **Multiplicity**: some holdings are duplicated, resulting in greater probabilities of being included in the sample.
- **Clusters of elements**: some holdings in the frame are in fact clusters of holdings rather than individual holdings. This is usually due to a misunderstanding of the holding's definition on part of some enumerators, who may inventory two or more holdings as a single one.

Another challenge is to maintain the frame during the intercensal period such as to ensure its overall quality for sampling purposes. Indeed, the frames and their associated samples may become obsolete before the end of the ten-year AGRIS cycle. This obsolescence is particularly rapid for list frames because of population movements and changes in agricultural activities. Therefore, the samples may not adequately reflect the structure of the population. It thus appears necessary to develop a strategy for updating and maintaining frames that countries can follow when implementing the AGRIS system.

The Global Strategy recommends that countries use an MSF for integration and cost-effectiveness in agricultural surveys (Global Strategy, 2015b). The Global Strategy has designed and published guidelines for constructing an MSF for the agricultural sector. Based on these works and other information on countries' current practices, this section will provide practical guidance on issues pertaining to the development, updating and maintenance of sampling frames in the context of the implementation of the AGRIS system.

5.1. RECOMMENDED FRAMES FOR AGRIS

Considering AGRIS's broad coverage, an MSF appears to be the most suitable solution for countries wishing to implement AGRIS. Indeed, by definition, an MSF is a frame that enables the selection of different samples (including from different sampling designs) for specific purposes: agricultural surveys, household surveys, and farm management surveys (GSARS, 2015a). For integrated systems such as AGRIS, an MSF will enable the selection of all samples necessary to meet the system's data needs.

There are two types of frame: list frames and area frames. A combination of several frames is called a multiple frame. Based on the state of the art of frames and on the lessons learned from country experiences, the Global Strategy (2014) discusses the most appropriate MSF for designing integrated surveys such as AGRIS, with a multiple frame consisting of area frames and list frames appearing to be the best solution. Basically, area frames are constructed using cartography, including aerial photography and satellite imagery, while list frames are constructed using censuses or administrative data sources. The Global Strategy (2015b) discusses how to link area frames and list frames in agricultural surveys.

The statistical unit adopted for AGRIS is the agricultural holding as suggested and defined in the WCA 2020, which subdivides holdings into two categories: holdings of the household sector and holdings of the non-household sector. Thus, in the AGRIS context, it is important that frames allow for the collection of detailed socio-economic and environmental data (see AGRIS questionnaires) on these holdings. List frames (complete lists of holdings) can be used to collect the target data on both categories of holdings. Area frames may be used for the indirect collection of such data relating to the holdings of the household sector; however, they do not cover landless holdings that raise livestock. As AGRIS is also interested in livestock data, an area frame should be used in combination with a complete list of these landless holdings and large commercial holdings. In conclusion, the recommended type of frame for AGRIS is a multiple frame composed by either only list frames or a combination of area frame and list frames. The requirements for both types of frames are provided below, based on studies conducted by the Global Strategy (2014) and by the Global Strategy in conjunction with FAO.

5.1.1. Multiple frame 1: list frames

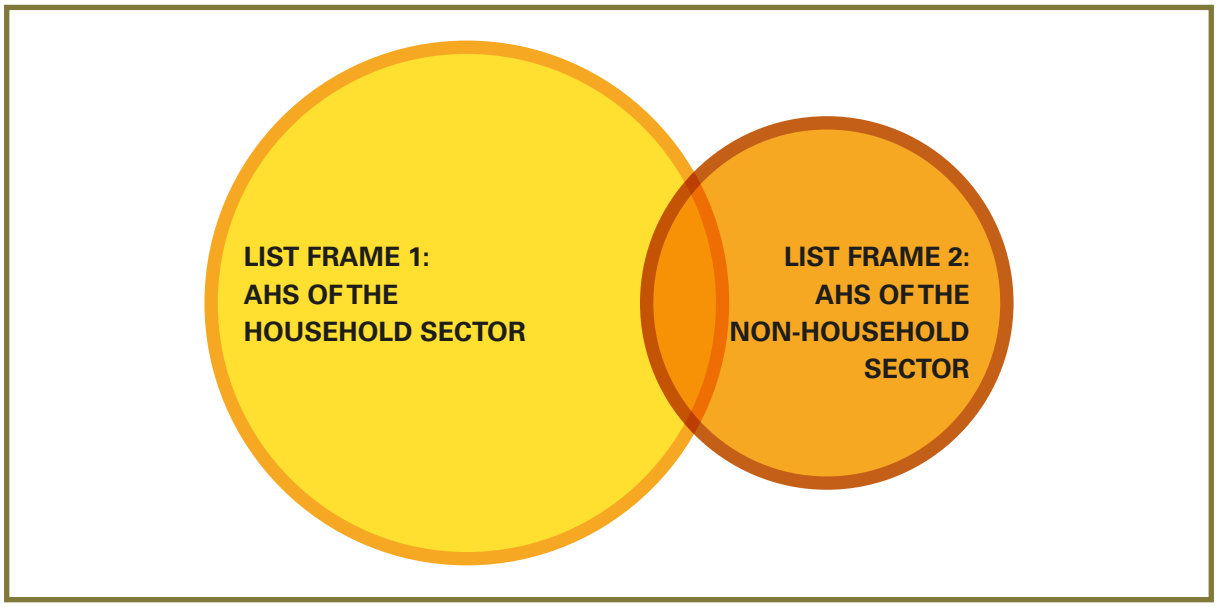
According to the Global Strategy (2015a), over two thirds of the countries in Africa and in the Asia and the Pacific region use a list frame. The most suitable list frame for AGRIS is a complete list of holdings, together with information relevant to stratification and sampling purposes. The basic requirements recommended for a list frame for AGRIS are the following:

- As mentioned in Part II of this document, the PSU is the enumeration area commonly used in population and agricultural censuses. If neither population censuses nor agricultural censuses are available, then an area of land having the features of an enumeration area is defined (village, ward, county, segments-physical or squares).
- The enumeration areas should be georeferenced and their boundaries must appear on the cartographic material. In this sense, they represent the link between area frames (which are based on cartographic material) and list frames (which are based on censuses, administrative data or listing operations).
- The enumeration areas should be stratified because the greater part of the sampling variance will come from this sampling stage.
- The frame's SSU should be the agricultural holding as defined in the WCA 2020 (FAO, 2015). The balance between the numbers of PSUs and SSUs should result from a cost/precision analysis.

For most countries, a suitable and cost-effective list frame may be built for AGRIS by linking the population and agricultural censuses as suggested by the WCA 2020 (FAO, 2015). The basic process could be the following:

1. During the preparation of the population census, the EA's geographical limits should be digitally mapped;
2. An agricultural module to be collected during the population census should be developed, taking into account basic information to stratify the holdings;
3. After the population census, a complete list of agricultural holdings may be established, together with a complementary list of holdings of the non-household sector, as an MSF for AGRIS. However, in this regard, it is important to note that the processing of the population census data processing may require over two years before the data can be used for sampling purposes. The use of CAPI software for data collection will reduce the data processing time.

FIGURE 5.1. RECOMMENDED MULTIPLE FRAME 1: LIST FRAMES.

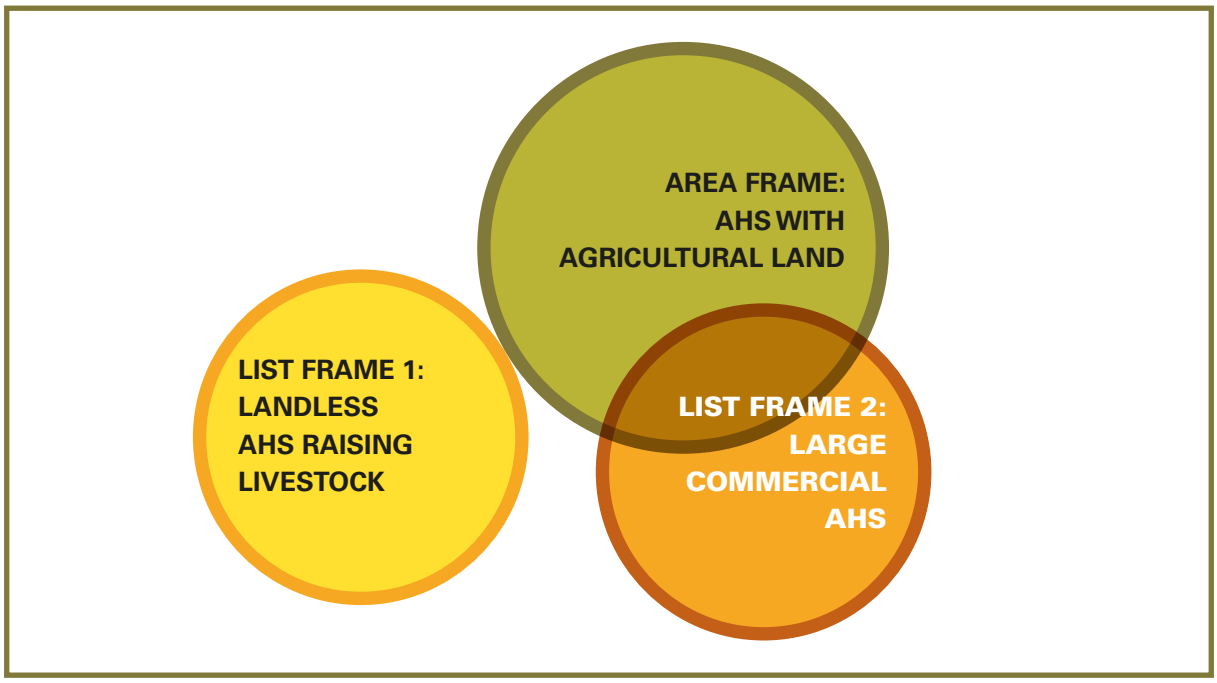


5.1.2. Multiple frame 2: area frame and list frames

Another form of multiple frame is recommended for countries that prefer to implement AGRIS with an area frame. The area statistical units used are usually points or segments. Segments may be pieces of land having a regular shape (for example, a square) or having an irregular shape and well-defined physical boundaries (such as rivers, roads or administrative boundaries). Irregularly shaped segments usually correspond to a set of adjacent parcels (generally 10 to 20 parcels, and up to 30 to 40 parcels if the parcels are small). The idea is to have a maximum of ten agricultural holdings per segment. The size of the segments should be sufficient to allow for the field activities to be performed in a working day (FAO, 2015).

Considering that an area frame does not cover landless holdings that raise livestock, a complementary listing of these holdings (List frame 1) is recommended. In addition, if large commercial agricultural holdings happen to be sampled from an area frame, they may behave like outliers. A second list of large commercial agricultural holdings (List frame 2) is therefore also recommended. Figure 5.2. below provides a representation of the multiple frame option. Obviously, no overlap is possible between the area frame and List frame 1. However, it will be very difficult to exclude the land of the large commercial agricultural holdings from the area frame before selecting a sample of points or segments. Therefore, overlaps between the area frame and List frame 2 are inevitable, and suitable dual-frame estimators should be considered after data collection.

FIGURE 5.2. RECOMMENDED MULTIPLE FRAME 2: AREA FRAME AND LIST FRAMES.



5.2. BUILDING FRAMES

Some countries may not be able to build the recommended frames before launching AGRIS. The following sections discuss a number of options for building frames so as to approximate, as closely as possible, those recommended for AGRIS implementation.

5.2.1. Using existing frames for AGRIS

The frame development process for AGRIS will depend to a large extent on the existence of recent frames from population or agricultural censuses conducted in the country in question. With regard to the availability of a frame less than 20 years old, the Global Strategy's Country Assessment, conducted in 2012, revealed three categories of countries: (i) existence of both population and agricultural frames; (ii) existence of only a population frame; and (iii) absence of any frame. Before launching AGRIS, existing frames may have to be updated, if they are relatively old; this process will depend on the type of frame. If there is no suitable frame, then a significant data collection effort will be required to build a frame for the purposes of AGRIS sampling.

5.2.1.1. Frame from population census

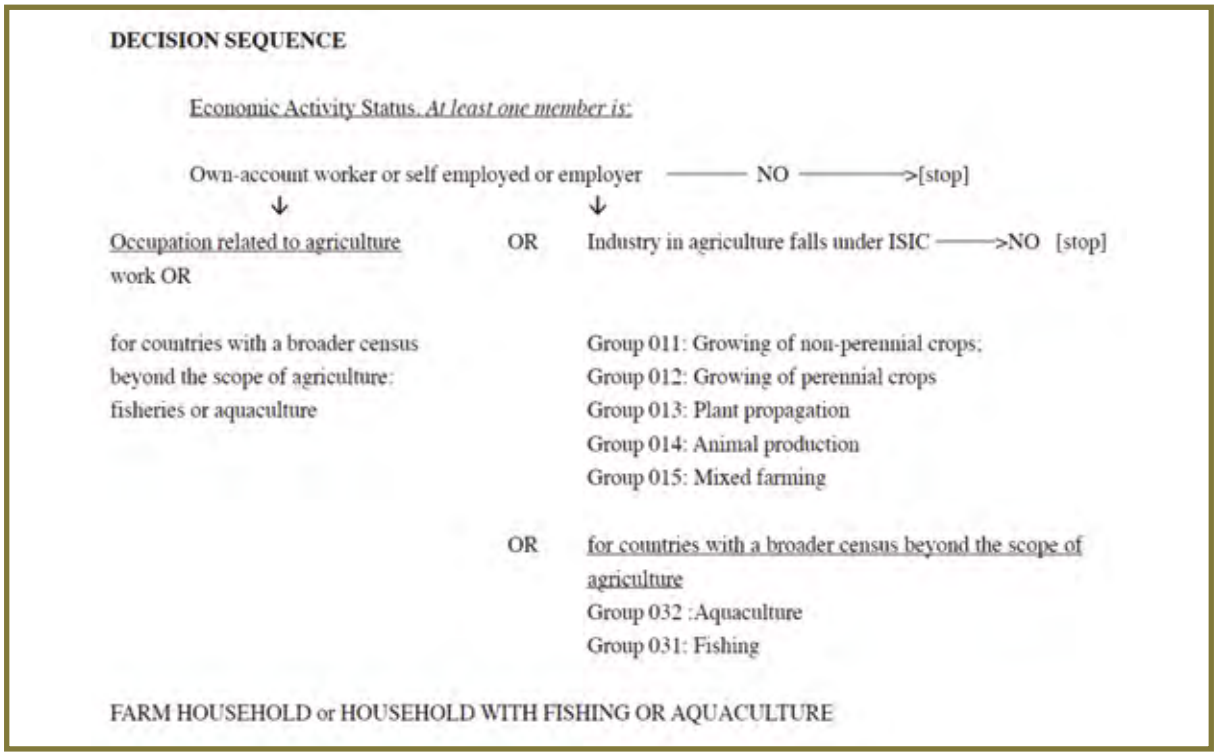
In this case, it is supposed that the country has never implemented an agricultural census or that the last census was performed several years ago (for example, over five years ago). In this case, using the latest population census data may be a viable option if the following two conditions are fulfilled:

1. ***The population census is relatively recent***
   If the population census was performed several years ago, or if it can be assumed that there have been structural changes to the population since the latest census year, it is probably obsolete and should not be used to develop a frame for AGRIS. The UNSD (UNSD, 1986) recommends using the census list of households to build a master frame only if it is recent (usually no more than one year old).
2. ***The population census data contains the minimum information required to identify AHs***
   If the census has taken an agricultural module into account, as recommended by FAO, the holdings in the household sector can be identified. Otherwise, it is important to ensure that the agricultural sector is adequately covered in the census questionnaire and that the household members involved in agriculture as an own-account activity or as employees can be identified. The population database should also contain relevant identification variables (including household georeferences) to facilitate data collection.

Building the frame

If the population data available was collected through a traditional population and housing census, a list of households with own-account agricultural production can be established using the information on (i) the economic activity status; (ii) the main occupation; and (iii) the industry of main occupation. For this purpose, the Global Strategy (2015a) suggests the following decision sequence:

FIGURE 5.3. FRAME CONSTRUCTION DECISION SEQUENCE.



Source: Global Strategy, 2015.

Using this sequence, a complete list of households in which at least one member is involved in agricultural production as an own-account activity may be established. However, this list does not include commercial farms. To build an MSF for AGRIS, a complementary listing of those farms should be performed.

Limitations

FAO and the United Nations Population Fund (UNFPA; see FAO and UNFPA, 2012) note a number of limitations in the agricultural data collected in traditional population and housing censuses:

- These censuses focus on basic demographic, social and labour force data. The list of agricultural households derived from them are usually incomplete and thus produce an inaccurate frame for agricultural surveys.
- Depending on the criteria used to define the main job, this concept may also exclude farm households in which members are engaged in several activities (when agriculture is not the main activity).

In addition, it should be noted that population census data become obsolete rapidly, and using these data to build an agricultural frame may lead to a significant undercoverage of holdings. If the frame is more than five years old, it is recommended to explore the options provided in section 5.2.2. below.

5.2.1.2. Frame from agricultural census data

AGRIS has been conceived to be synchronized with countries' agricultural censuses. Thus, ideally, countries willing to implement AGRIS should launch it together with an agricultural census. Therefore, the conduct of such a census may be an opportunity to build an MSF for AGRIS.

However, if a country wishes to start implementing AGRIS some years after an agricultural census, it may be possible to use the data of this census to build an AGRIS frame, depending on the approach adopted to implement the census. Countries collect census data either through complete enumeration or on a sample basis.

Census through complete enumeration

The basic feature of an MSF is that all populations of interest are covered. Thus, if an agricultural census was implemented on a complete enumeration basis a few years (and a maximum of five years) before AGRIS is launched, the existing frame could be efficiently used to develop an MSF for AGRIS.

One cost-effective approach recommended by FAO and the UNFPA (2012) to ensure a complete coverage of holdings is to coordinate agricultural censuses with population censuses. Practical recommendations are provided by FAO in Volume 1 of the WCA 2020 (FAO, 2015). Through this process, a complete list of all AHs of the country may be obtained.

However, it is important to ensure that the existing frame also covers non-household holdings. Otherwise, it will be necessary to build a list of these holdings to obtain a complete coverage of the agricultural holdings. Administrative data – especially business registers – may be used to establish a preliminary list, which could be complemented by an establishment and business census covering agriculture.

Sample-based census

Although FAO accepts the collection of census data through a large sample, it is important to note that these data are not suitable to build an MSF for AGRIS purposes. The main reason is the undercoverage of the agricultural population, and potentially the non-coverage of key items needed for sampling in AGRIS modular surveys. For instance, some important crops may be insufficiently covered if areas in which most of their production is located are not included in the sample. Indeed, the large sample often consists in a large sample of geographical units in which a complete enumeration of agricultural holdings is performed.

However, if the quality of the large sample is adequate (mainly with regard to size, randomness of selection and design), and depending on the coverage of the agricultural items, the large sample could be used as a proxy of a master sample from which subsamples for AGRIS modules are selected.

5.2.1.3. Use of an area frame

If a country features an area frame before AGRIS is commenced, this frame could be used for AGRIS's sampling needs. The main difference between an area frame and a list frame is that the sampling unit of the area frame is based on land (on segments, points, etc.).

Although area frames are considered to be more stable than list frames because land cover and use usually do not change significantly from one year to the next, it may be useful to make some updates, such as to the satellite images used. For instance, in the United States of America, the area frames constructed by the National Agricultural Statistics Service (NASS) for most states are used for 15 to 20 years before they are replaced (Davies, 2009).

Considering the thematic scope of AGRIS and the expected outputs at holding level, it should be noted that AGRIS surveys must cover a random sample of holdings. Area frames enable – through segments or points – to obtain an indirect sample of holdings, which are thus unknown during the sample selection. Accordingly, before using area samples for AGRIS, it could be helpful to ensure that the area frame contains additional structural information, such as on the Agro-Ecological Zones (AEZs), that may be taken into account in the sampling process. A complementary listing of landless holdings that raise livestock will be also required. Secondary data could be used for stratification: in this regard, agricultural administrative data may be of use.

5.2.2. Absence of suitable frames: practical options

In some countries, data from population or agricultural censuses are either inexistent, incomplete or too old to be used for the purposes of AGRIS sampling. If no suitable frame is available, the question is then how to develop such a frame with limited time and budgets.

5.2.2.1. Conducting a large-sample agricultural census

The ideal solution would be to implement a new agricultural census and thus build a list of all of the country's agricultural holdings. This census should take into account the basic items required for the AGRIS modules' sampling process. If a new complete enumeration is not feasible because of financial and time constraints, a census using a large sample basis could be an option. One approach could be to select a large number of enumeration areas (as large as the budget allows) and then run a complete enumeration of all holdings in the enumeration areas selected. This option will require significant resources and may impose considerable delays on the launching of AGRIS.

5.2.2.2. Use of administrative data

In countries with a reliable and updated population register, this may be used to establish the list of agricultural households for sampling purposes; however, the existence of such registers is rare, particularly in developing countries. In any case, registers may be considered when building a master list of all holdings in the non-household sector (Global Strategy, 2015). These registers may be:

- administrative registers of corporations operating agricultural holdings (business registration or licensing registers)
- land registration or cadastral records
- lists of members of agricultural cooperatives
- lists of members of farmers' associations or special commodity boards (such as coffee, cocoa or tea)
- local knowledge and information from extension agents and local authorities on large specialty-type farms

Common frame imperfections – discussed in Global Strategy (2015b) – could be exacerbated when building frames from administrative data. Such imperfections include both undercoverage and overcoverage, through missing, misclassified and duplicated units.

5.2.2.3. Building a dual frame from satellite imagery and administrative data

To build an area frame for AGRIS, another option is to build an area frame with free or open-source GIS products and satellite imagery. This area frame should be complemented with the list of large farms established from administrative data as a dual frame. The use of registers to develop a list of holdings is discussed in section 1.2.2.2 above. A cost-effective way to construct an MSF using satellite imagery and georeferencing technology is provided below through two possible approaches.

Segment area frame

Initiated by the NASS-USDA, the segment area frame is now widely used from Africa (in particular, in Rwanda) to Asia (namely Afghanistan). As explained by FAO (2017), the steps involved in the development of an area frame sample composed of physical limits and irregular segments are as follows:

> "[t]he first step is the delineation of broad areas of homogeneous land use/land forms using all types of available data and maps of the most recent date such as satellite imagery, aerial photography, topographic and/or land use maps. Areas of the uniform pattern constitute one stratum. Once these strata have been formed, one must find boundaries for them that are identifiable on the ground, such as roads, footpaths, railways and rivers. These boundaries are then marked on the map in a unique way for each stratum and the areas within each stratum are labelled.
>
> The next step is to divide these homogeneous strata into sample units. Normally, this is done in two steps: primary sampling units (PSUs) are delineated and a small sample of PSUs is selected to be further subdivided into Secondary Sample Units (SSUs), called a segment, which are enumerated in field survey. The segments vary in size depending on stratum, land use, and population density. The general rule is that they should be small enough to be enumerated in one day.
>
> The construction of the area sampling frame ends with the selection of segments (samples) that represent the total area. It is ensured that these segments have clearly recognizable and well-marked boundaries. The desired data are collected from these segments, usually by interviewing the farmers, measuring crop acreages and making crop cuttings in case of crop yield estimation."

The cost of such an approach is described well by Boryan *et al*. (2016). The delineation and stratification of segments require approximately 30 man-months for areas extending over 200 000 km^2. If automated tools are used, in case of the availability of ground land cover, this time can be reduced to 12 man-months.

An alternative solution is the use of square segments. By superimposing a square grid onto the target area and stratifying the segments by classification of free Landsat or Sentinel imagery, a frame can be obtained in little time and at a very low cost. A good example of such approach is the NCFC conducted in India (Ray, 2014).

Point area frame

This approach, presented by Gallego *et al*. (1994), was recently used in Nepal to test the various MSF options (Delincé, 2017). After downloading the open-access Global Administrative Areas Database (GADM), a uniform grid of square segments (the PSUs, each of 25 ha) is created over the region of interest. This can be done easily with free software such as the Google code editor. A grid of points (SSUs, each 3 km x 3 km) is then overlaid within the segments and the object of photointerpretation (using the free FAO Collect Earth software) to define the stratification. Point stratification using open-access Bing or Google imagery (which usually has a resolution of 50 cm) enables the coverage of several thousand km2 in a week. Using open GIS software such as Quantum GIS (QGIS) provides a solution for printing very-high-resolution image maps that can foster high-quality and efficient fieldwork. The final statistical units are the farmers managing the plots that contain the point sample locations defined above.

FIGURE 5.4. ALTERNATIVE DUAL FRAME FOR AGRIS.

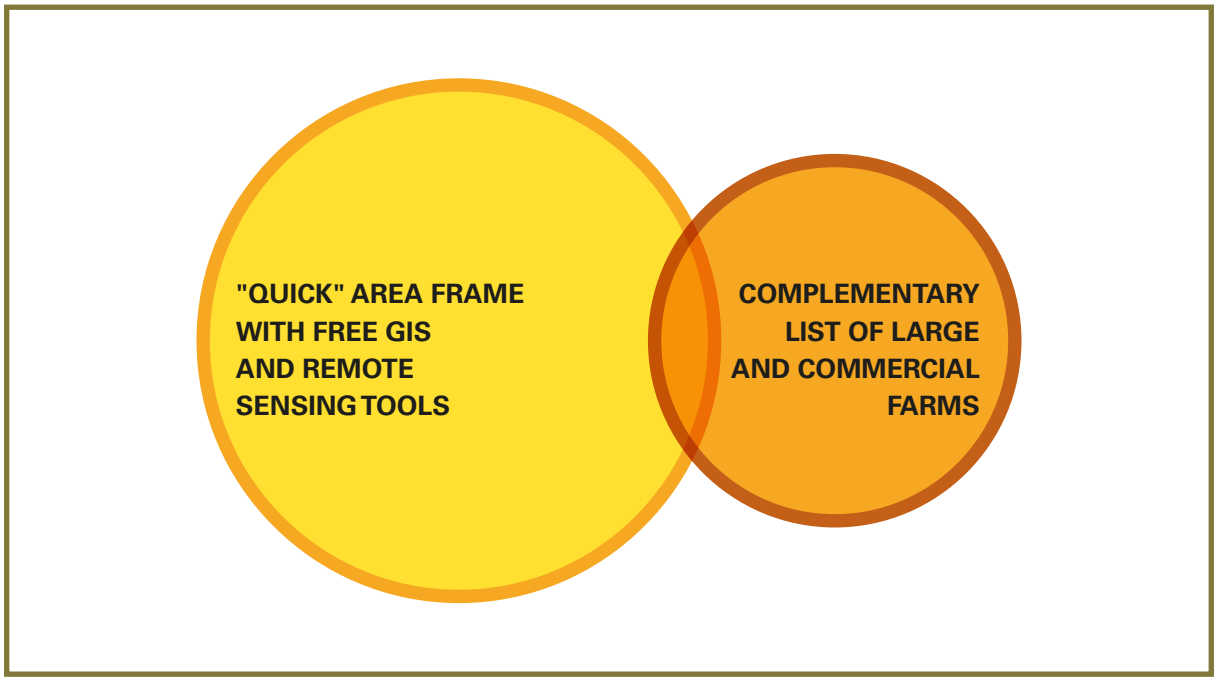
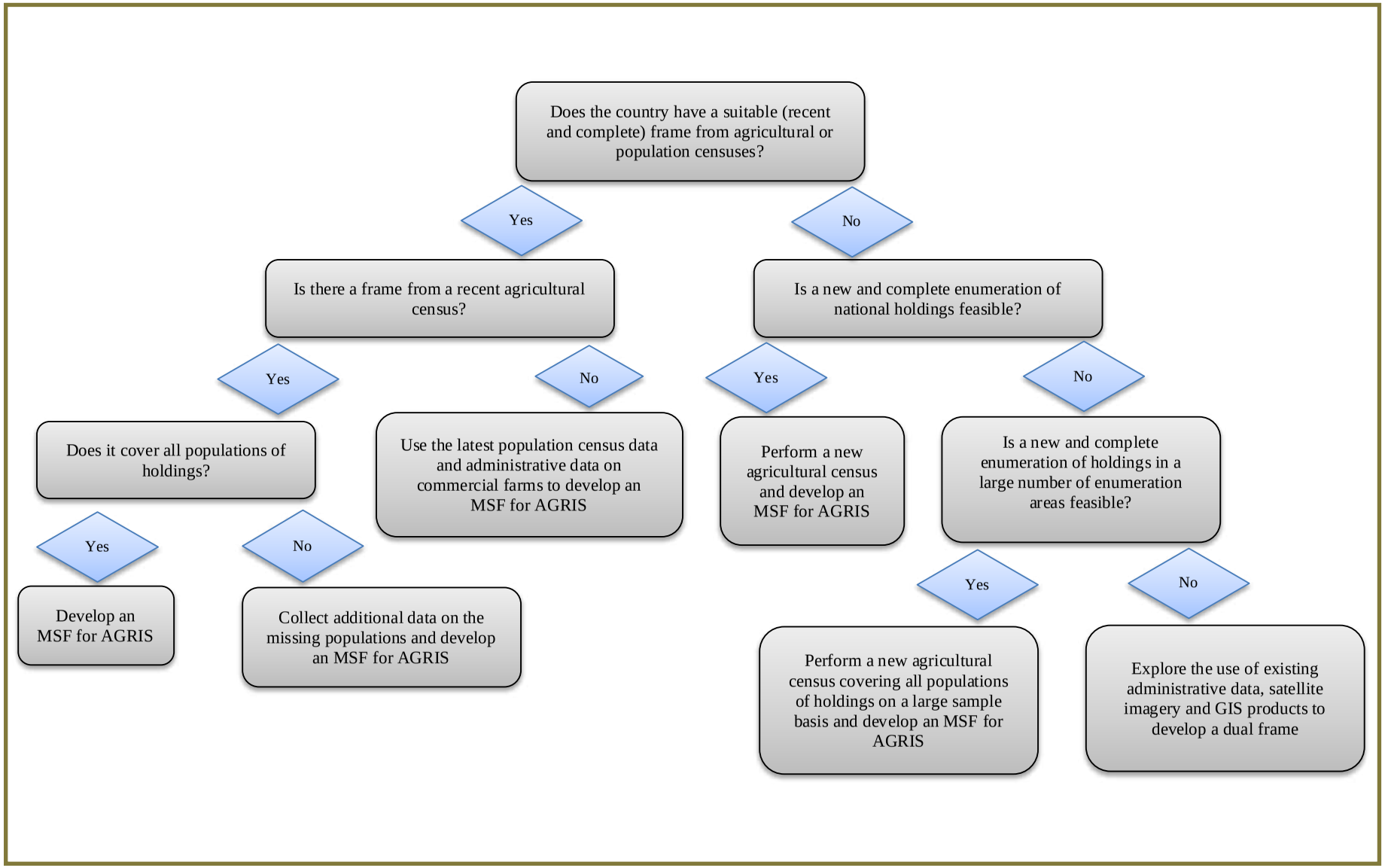


FIGURE 5.5. DECISION TREE FOR BUILDING A FRAME FOR AGRIS



5.3. OPTIONS FOR UPDATING FRAMES OVER THE TEN-YEAR AGRIS CYCLE

After the MSF has been constructed, the country should establish a plan for the maintenance and updating of the frame. This plan is particularly important when the sampling scheme adopted by the country includes the renewal of a fraction of the samples each year.

Frame maintenance and updating should be performed regularly. Depending on the type of frame and the availability of auxiliary information in the country, the maintenance may take place on a one-year or two-year basis. The use of administrative data (especially registers, for list frames) and other secondary data (such as satellite imagery for area frames) may be helpful in updating frames.

It is good practice to periodically evaluate the degree of frame obsolescence. This evaluation may be performed in various ways:

- After each survey, an analysis of the sampled holdings that have not been found may provide an idea of the extent to which units in the population disappear.
- Exchanges with agricultural extension workers or other officers in the fields may also enable assessment of the movements of statistical units.
- Various types of secondary data and administrative data may be useful to assess frame obsolescence.

Appropriate action should be taken if the degree of frame obsolescence is significant.

5.3.1. List frames

In this context, two cases must be distinguished: (1) the use of sampling schemes with the renewal of a fraction of the samples (also known as a rotation scheme); and (2) the use of said scheme without renewal (a panel scheme).

5.3.1.1. Rotation schemes

When a rotation scheme is adopted, it may be necessary to update a part of or the entire frame every year depending on the specific rotation technique. If the rotation requires new units to be selected, a new listing of units may be necessary every year. Data collected when conducting the Core or Rotating Modules may be used to update the frame for the units included in the AGRIS sample. This updating is an important part of the survey process. Otherwise, if all units are selected in the beginning, the approach to updating proposed below for the panel scheme may be adopted.

5.3.1.2. Panel schemes

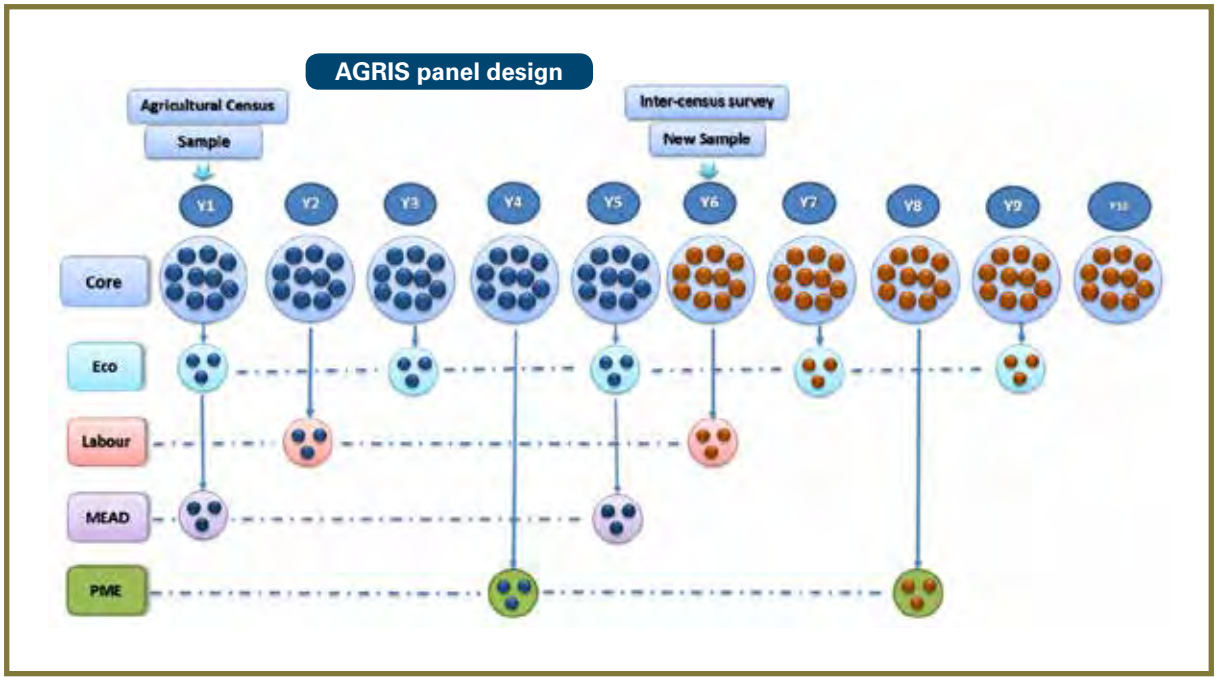
Many developing countries implement panel agricultural surveys. The same samples (selected from the agricultural census) are maintained and surveyed every year during a given period of time (usually three or five years) before being completely renewed, either before or during the next census. The renewal time and frequency depends mainly on budget and operational constraints.

5.3.1.2.1. Updating the frame

The fifth year from the construction of the frame appears to be a suitable moment to perform a global update and to select new samples, for both technical and operational reasons.

- **Technical** – During the first five years, all modules are covered by surveys. Thus, after five years, information is available on all rotation modules for the same units, for the purposes of conducting cross-sectional analyses for those years in which all modules have been covered.
- **Operational** – These consist of constraints upon the available financial, time, and human resources (it is important to ensure that the burdens are shared proportionately throughout the intercensal period).

FIGURE 5.6. AGRIS PANEL DESIGN.

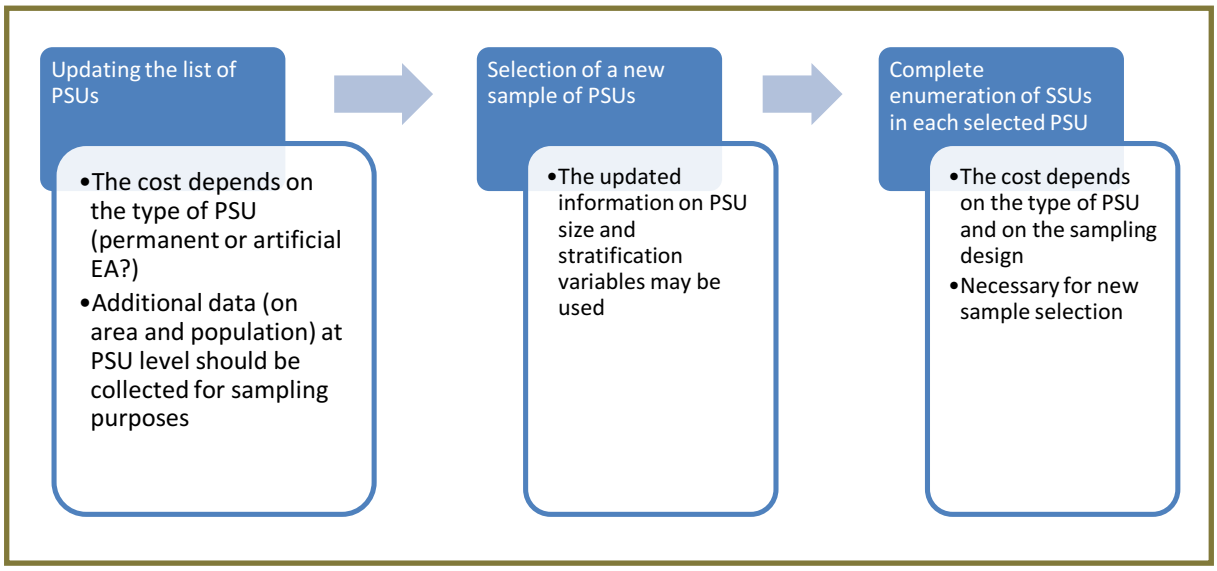


5.3.1.2.2. Options for updating

The updating process (to be initiated after the suggested five-year implementation date) depends on the relevant financial constraints and on the sampling design chosen.

- **Financial constraints** – Depending on these constraints, a complete or partial update could be performed.
- **Sampling design** – Cost-effective approaches are possible, depending on the sampling design adopted. For instance, in two-stage sampling, the following two-step scheme may be cost-effective:
    - **Updating the list of PSUs**: depending on the type of PSU, this operation will not require a large proportion of the budget. For instance, if the PSUs are official administrative areas such as villages or counties, the list may be updated using administrative data. However, if the PSUs are artificial enumeration areas (for example, if they were designed specifically for the purposes of the population census), updating the list may be much more expensive.
    - **New sample selection**: after the PSU list has been updated, a new sample of PSUs can be selected and a complete enumeration of the holdings in each selected PSU performed, to select a new sample of holdings.

FIGURE 5.7. EXAMPLE OF SAMPLE UPDATE PROCESS.



5.3.2. Area frames and multiple frames

Area frames are considered to be more stable than list frames and much easier to update (Global Strategy, 2015a). However, area frames too may require periodical maintenance and updating. Land cover and use may change over time because of urbanization, advancement of the agricultural frontier or natural disasters, which may result in the destruction of large areas of agriculture. In the United States of America, the area frames used by NASS are utilized for 15 to 20 years, and once they become outdated, new frames are constructed to replace them. Every year, three to four states are selected to receive a new frame. The states are selected on the basis of the following criteria: age of the frame; existence of any significant changes to land use; whether the target coefficients of variation (CVs) in previous sample surveys have been met; and their significance for the national program (Davies, 2009).

Remote sensing and satellite images are increasingly available at lower costs, and can be used to update the area frame: the Global Strategy (2016 c) has provided practical advice to this effect.

In the case of a multiple frame, the list frame associated with the area frame requires a specific updating plan. Special attention should be focused on landless holdings raising nomadic or transhumant livestock. Administrative data would be helpful in updating the list of large commercial agricultural holdings.

Part II: sampling design

This section illustrates the sampling designs recommended for AGRIS, considering the frames used by individual countries. These frames may be either the recommended ones or other specific frames. Sampling designs are proposed for each main domain of the country. Such domains are administrative areas such as regions, provinces or districts for which reliable estimates are expected.

5.4. STATISTICAL UNITS

The statistical unit used by AGRIS is the agricultural holding. The population of agricultural holdings in a country is usually divided into two subpopulations:

- pop1: Holdings in the household sector
- pop2: Holdings in the non-household sector

For both subpopulations, the definitions provided in the FAO WCA 2020 are adopted:

- **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. 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.
- **Holdings in the household sector**: agricultural holdings operated by household members
- **Holdings in the non-household sector**: agricultural holdings such as corporations and government institutions.

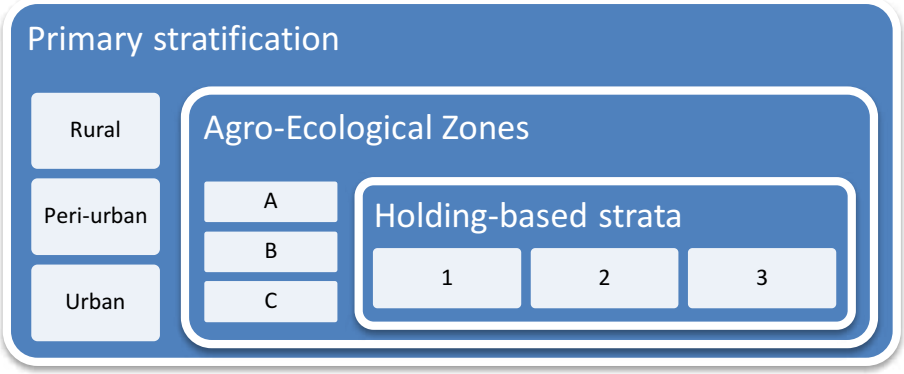
The different characteristics of these subpopulations usually require different sampling designs to be adopted. When a country has elected to use the AGRIS recommended list frame described in Part I, these two subpopulations should be distinctly available in the frame, and the sampling design most suited to each can be implemented. For countries using an area frame, the data on both populations will be collected indirectly through the area units (segments or points).

5.5. STRATIFICATION

Stratification is recommended in each main domain to improve the precision of survey estimates. A primary stratification consists in dividing the main domain's territory into three strata: urban areas, peri-urban areas and rural areas. The limits between these strata must appear on the cartographic material. If available, additional strata based on AEZs[1] may be relevant, especially to integrate soil fertility and environmental issues. The secondary strata are based on the essential characteristics of the holdings that may be found in the list frame. Examples of essential characteristics include crop intensity or presence of livestock on the holding. If specific categories of holdings are of particular interest to the country, the use of specific holding-based strata may be considered for later analyses. Administrative data may be helpful for stratification purposes (see Global Strategy, 2017). The stratification of PSUs in the two-stage sampling design is highly recommended, because in this type of design, a great part of the overall variability derives from the PSUs' intervariance (Särndal *et al*., 1992).

1 See IIASA/FAO (2012) for a proposed methodology to develop AEZs.

FIGURE 5.8. RECOMMENDED STRATIFICATION FOR AGRIS.



5.6. RECOMMENDED FRAME DESIGNS

As seen in detail above, two types of frames are recommended for AGRIS:

1. a list frame (list of agricultural holdings) in which the enumeration area is usually the smallest geographical level and basic area information is included: georeferences of enumeration area boundaries, AEZs, etc.;
2. a multiple frame composed by an area frame and by lists of landless holdings raising livestock and large commercial agricultural holdings.

TABLE 5.1. RECOMMENDED SAMPLING DESIGNS FOR AGRIS.

Type of frame	Subpopulation	Sampling units	Sampling Design	Notation
List frame	Pop1	AH of the household sector	Stratified two-stage	DLF1
	Pop2	AH of the non-household sector	Stratified one-stage	DLF2
Multiple frame	Area frame	Segments or points	Stratified two-stage	DMF1
	Lists	Landless AH raising livestock Large commercial AHs	Stratified one-stage	DMF2

Essentially, two sampling designs are proposed, the choice of which depends on the relevant populations: one- or two-stage stratified design. These designs are developed and discussed below and the related main estimators provided.

5.6.1. Design for a list of holdings of the household sector and area frame: stratified two-stage design

According to Grosh and Munoz (1996), the most common method for collecting household data in sub-Saharan Africa is the stratified two-stage sample. This was confirmed in a recent AGRIS review of the sampling designs used for agricultural surveys in developing countries, according to which 90 percent of countries in Africa and 64 percent in Asia implement multi-stage sampling (Global Strategy, 2016). Thus, the stratified two-stage sample design is recommended for AGRIS, also in light of its cost-effectiveness, practicability and other advantages mentioned below.

As seen in table 5.1. above, this design is recommended for sampling the agricultural holdings of pop1 (DLF1) and for building area frames (DMF1). The usual design entails the following steps:

1. The PSU corresponds to the enumeration area in list frames and large segments in area frames. These are stratified according to the information available. As mentioned, the PSUs in rural areas should be separated from those in peri-urban and urban areas (in case they contain a significant number of AHs involved in the agricultural sector).
2. In each stratum, a sample of PSUs is drawn with a probability-proportional-to-size (PPS) (without replacement) sampling design. In list frames, the size of the PSUs (EAs) is usually equal to the number of agricultural holdings in the agricultural sector within that enumeration area (as results from the sampling frame). In area frames, the size of the PSU may be its area.
3. For the specific case of list frames, the list of holdings within each sampled PSU (EA) is to be updated. This is an optional step, required only when the starting frame is not up-to-date or suffers from coverage problems.
4. The SSU is the agricultural holding in list frames and segments or points in area frames. A sample of SSUs must be selected (independently) within each sampled PSU by means of simple random sampling without replacement (SRSWOR). The number of SSUs to select in each sampled PSU is usually constant and established in advance.

Main advantages

The two-stage sampling design has a number of important operational and technical advantages. In particular, it:

- Enables the reduction of the enumerators' travelling costs (compared to the one-stage direct selection of SSUs) because the work is localized in the sample of PSUs, which however may be increased because of budget constraints by minimizing the number of SSUs per PSU;
- Facilitates field operations;
- Enables updating the list of SSUs within a sampled PSU before the second-stage selection;
- Can be used in absence of an appropriate census, if a list of PSUs is derived from administrative sources, maps, etc.;
- Ensures, in some cases, especially when sampling from list frames, that the probabilities of including SSUs in the sample are relatively constant for each stratum, ensuring simplifications for a number of estimations;
- Features a relatively simple formula for estimating the sampling variance, usually limited to the variability between PSUs if their sampling fraction is low.

Most countries are sufficiently familiar with this design. The following issues that frequently arise are expected to be minimized when the AGRIS recommended frames are used:

- difficulties in identifying the boundaries of the PSU, especially for list frames (EAs, villages, etc.), when they have not been established in advance. For the AGRIS-recommended list frame, it is suggested to collect the EAs' georeferences;
- if the PSUs are highly heterogeneous with respect to the phenomena being investigated (in other words, the PSUs consist of holdings sharing only few common characteristics), then the total variance may be very high. In this respect, a previous stratification of PSUs is often necessary to build groups of PSUs that are as similar as possible.

5.6.2. Design for lists of holdings of the non-household sector and landless holdings raising livestock: stratified one-stage

A one-stage stratified random sampling design is considered suitable to ensure accurate estimates for the following subpopulations:

- The recommended list frame for AGRIS should cover the holdings of the non-household sector. These holdings include large corporations, government-operated holdings, cooperatives, large plantations, large livestock units, specialized activities (vegetables and flowers), etc. This list is usually built from administrative data and updated with complementary field information.
- It is recommended to complement an area frame with lists of large holdings and landless holdings raising livestock.

The following procedure should be followed for one-stage sampling:

1. The holdings should first be stratified by geographic information, size and characteristics of the units (such as the Agricultural Area Utilized – AAU – or number of livestock), or type of holding. Very big holdings, which make a major contribution to the total amount of a given variable in the target population, should be included in the sample, separating them into a distinct take-all stratum (in other words, all units in the stratum should be included in the sample). Different algorithms to stratify a population based on continuous variables are available (see, for example, Lavallée and Hidiroglou, 1988).

2. An independent sample of holdings should be selected in each stratum via SRSWOR. In univariate cases, the literature provides analytical formulae that can be applied when deciding the overall sample size and the corresponding allocation between strata (see, for example, Cochran, 1977, pp. 105–6 and section 2.5.5.2). In multivariate cases (that is, if there are various target variables), the sample size and its optimal allocation are provided by the procedure proposed by Bethel (1989).

This recommended design provides accurate estimates if the units within each stratum are homogeneous with respect to the phenomena being investigated. However, up-to-date and relevant auxiliary variables are necessary because:

- a good stratification requires accurate auxiliary variables for all units in the sampling frame;
- the sample allocation requires auxiliary information related to the phenomena under investigation;

An additional advantage of the design is that the estimation formulae are relatively simple.

5.7. SPECIFIC RECOMMENDATIONS WHEN USING ALTERNATIVES FRAMES FOR AGRIS

5.7.1. Use of alternative list frames

In many countries, the agricultural frame is developed from the population or agricultural census and consists in a complete list of all households involved in agricultural activities. The following differences may be noted between these frames and the AGRIS-recommended list frame:

- Some of the stratification variables listed above (in particular, the information on AEZs when the GPS coordinates of the holdings have not been collected) may be unavailable in these frames;
- Generally, the boundaries of enumeration areas are neither well-established nor georeferenced, as is recommended instead under AGRIS;
- The smallest geographical area used as PSU is sometimes another administrative area (such as village or county), and not the enumeration area. The main issues with these areas are (i) the boundaries are not always clear; and (ii) the difference in size may be very high and for large areas, the internal heterogeneity may be high.

Although theses frames do not fulfil all of the requirements of the AGRIS-recommended list frame, the sampling design suggested for the latter may be applied to them. In these cases, the following indications may help to improve the design:

- A size-based stratification of PSUs could be adopted if administrative areas such as villages and counties are used as PSUs;
- Administrative data could be used to incorporate agro-ecological information into the frame.

5.7.2. Use of an area frame

This section provides specific recommendations for countries that are currently using an area frame and intending to adopt AGRIS.

5.7.2.1. Coverage

AGRIS is interested in livestock data; however, area frames exclude holdings that raise livestock without holding agricultural land. A complementary listing of these holdings is recommended.

5.7.2.2. Stratification

For the purposes of stratification, it is recommended to incorporate additional information on the holdings into the frame, such as information on the main agricultural systems and the main agricultural production zones ideally at PSU level. Crop intensity strata and a livestock stratum will be particularly useful. By classifying satellite images, the intensity of arable land and the intensity of meadow/pasture are easily obtained.

5.7.2.3. Field observation

Several types of reporting units are available (Global Strategy, 2015):

- **Open segmen**t – the reporting unit depends on the location of the headquarters or household of the holder. If it falls within a sample segment, data are collected for the holding's entire operation, regardless of whether it is included in the segment. No data are collected for holdings with land within the segment but the headquarters of which are outside the segment.
- **Closed segment** – only the portions of area (tracts) of the parcels included in the segment are observed, unless the parcel is completely included in the segment.
- **Weighted segment** – the reporting unit is all of the land operated by every holding that also has land within the sample segment. The estimator is based on the ratio of the holder's land in the segment to the land area in the entire operation.
- **Subsampling farms within a segment** – by superposing a grid of points on the sampled segments, a subsampling of farms may be performed for data collection. The estimation follows the principles of the weighted segment.

Depending on the type of field observation chosen and the list of (socio-economic) variables, it may be necessary to interview the holders.

All of these options for observation present their own strengths and weaknesses, which are discussed in detail by FAO (1996). The weighted segment approach is usually assumed to be the most precise, and the open segment the least precise.

However, for AGRIS's purposes, all of the observation options are suitable except for the closed segment when the reporting unit is the tract, because the core variables require interviewing the holders to collect information on the entire holding. For the other options, the reporting unit is the holding; therefore, more information can be obtained on the holdings linked to the segment. This is crucial for the production of statistics on holdings at national level.

5.8. SAMPLING ESTIMATION AND VARIANCE

Basic estimators and variances for the recommended sampling designs are developed in this section. Specific estimation issues are also discussed.

5.8.1. Stratified two-stage design

Notation

h = stratum
H = total number of strata
i = PSU
N = total number of PSUs
I_h = total number of PSUs in the r-th stratum
j = SSU
M_{hi} = total number of SSUs found in the i-th PSU in stratum r ($j=1,2,\ldots,M_{hi}$)
$M = \sum_h \sum_i M_{hi}$ = total number of SSUs in the country
F_{hi} = total number of SSUs listed in the sampling frame as belonging to the i-th PSU in stratum h
$F_h = \sum_i F_{hi}$, is the total number of SSUs listed in the sampling frame in stratum h
n_h = number of sample PSUs selected in stratum h
m_{hi} = number of sample SSUs selected in i-th PSU in stratum h
y_{hij} = value of the target variable Y observed on the j-th SSU, in i-th PSU in stratum h

Estimators

The probability of selecting the SSU j in the sample is the product of the probability of selection of the PSU i in which it is located $(n_h \frac{F_{hi}}{F_h})$ and its probability of selection in the PSU i $(\frac{m_{hi}}{M_{hi}})$.

Thus, the weight assigned to the SSU f selected in the i-th PSU in stratum h is:

$$w_{hij} = \left(n_h \frac{F_{hi}}{F_h}\right) * (\frac{m_{hi}}{M_{hi}})$$

The weights are roughly constant within each stratum when m_{hi} is constant ($m_{hi} = m_{h0}$) and when the number of SSUs found in a sampled PSU is approximately equal to the number of SSUs resulting from the sampling frame ($M_{hi} = F_{hi}$). An estimate of the total amount of Y for the entire population may be computed with the following formula:

$$\hat{Y} = \sum_h \sum_i \sum_j w_{hij} y_{hij}$$

The mean of Y is can be estimated with two different estimators:

- *Simple mean*

$$\hat{\bar{Y}} = \hat{Y}/M$$

- *Weighted sample mean*

$$\tilde{\bar{Y}} = \frac{\hat{Y}}{\sum_h \sum_i \sum_j w_{hij}}$$

This latter estimator tends to be preferable to the simple mean when the total size of the population is unknown or uncertain (as occurs, for example, if the frame is obsolete) and when estimating the mean of *Y* for an unplanned domain of interest.

Variance

The variance of the estimator of the total amount *Y* in the population is a rather complex formula and can be found, for instance, in Cochran (1977, equation 11.42). A simple approximate estimation of such a variance involving the PSUs alone can be obtained with the following estimator, provided by Särndal, Swensson, and Wretman (1992, p. 154), which overestimates this variance.

$$\tilde{V}(\hat{Y}) = \sum_{h=1}^{H} {M_h}^2 \frac{1}{m_h(m_h - 1)} \sum_{i=1}^{I_h} (\hat{Y}_{hi} - \frac{1}{m_h} \sum_{i=1}^{I_h} \hat{Y}_{hi})$$

where $\hat{Y}_{hi}$ and $\hat{Y}_h$ are the estimates of the total amount of *Y* at PSU and stratum levels, respectively.

An approximate estimator of the variance of the mean is:

$$\tilde{V}\left(\hat{\bar{Y}}\right) = \frac{1}{M^2} \tilde{V}(\hat{Y})$$

5.8.2. Stratified one-stage design

Let us consider the following notation:
h = stratum
H = total number of strata
i = SSU
N_h= total number of SSU in stratum h
N = total number of SSU
n_h= number of sample SSU selected in stratum h
y_{hi} = value of the target variable Y observed on the i-th SSU, in stratum h

The weight of the i-th SSU in stratum h is simply the inverse of its probability of selection:

$$w_{hi} = \frac{N_h}{n_h}$$

An estimate of the total amount of Y for the population of SSUs is:

$$\hat{Y} = \sum_h \sum_i w_{hi} y_{hi}$$

An estimate of the sampling variance is provided by:

$$\tilde{V}(\hat{Y}) = \sum_{h=1}^{H} N_h (N_h - n_h) \frac{1}{n_h(n_h - 1)} \sum_{i=1}^{n_h} (y_{hi} - \overline{y_h})^2$$

where

$$\overline{y_h} = \frac{1}{n_h} \sum_{i=1}^{n_h} y_{hi}$$

An estimate of the population mean of Y is provided by

$$\hat{\bar{Y}} = \hat{Y}/N$$

And the corresponding sampling variance is estimated through

$$\tilde{V}\left(\hat{\bar{Y}}\right) = \frac{1}{N^2} \tilde{V}(\hat{Y})$$

5.8.3. Holdings-based estimations with area samples

The AGRIS statistical unit of interest is the holding, which is different from the statistical units used in area frames (segments, points, etc.). The weights and estimators presented above can still be used for inferences related to phenomena Y observed at segment or point level. As for holdings, multiplicities (multiple appearances) may occur in the indirect sample of holdings obtained through the area sample of points or segments. This issue may be minimized by introducing a greater distance between the sampled points or a larger segment size (for example, 25 ha), as experimented in Nepal by Delincé (2017),depending on the average distance between plots at the holding level in the country. Otherwise, the probability of that phenomenon occurring is likely to be high in countries where the average number of distinct plots (usually located in different places) per holding is important. In these cases, to derive estimates at holding level, the Global Strategy (2014b) has recommended the use of indirect sampling and of the Generalized Weight Share Method (GWSM) developed by Lavallée (2007). Using the latter method, the weights of the holdings linked to the selected segments or points may be derived, and the Horvitz-Thompson estimator may be used for estimations on holdings at the country level.

5.8.3.1. Links between area units and holdings

The following definition of the link between area units and holdings may be adopted:

- A holding is linked to a segment if one of its parcels of land intersects the segment; and
- A holding is linked to a point if a portion (in terms of area or proprietary rights) or the total of the parcel in which the point is located belongs to it.

Let us consider L_{hlf} as the indicator of the link between the holding *f* and the segment or point *l* in stratum *h*; the variable is equal to *1* if there is a link, and 0 if there is no link. $L_{hf} = \sum_l L_{hlf}$ is the total number of links of the holding h with the population of segments or points.

5.8.3.2. Weight calculation

Let us assume that a given holding f is linked to s segments or points in the area sample and to *t* other segments or points that are in the population but that have not been selected in the sample. However, the collection of data on the variable t may not be straightforward. One practical approach to retrieve this information could be the georeferencing of all parcels of the holding *f* to link them to the population of segments or points and thus derive *s* and *t*.

Using the GWSM (Lavallée, 2007), the weight w_{hf} of the holding *f* in stratum *h* is:

$$w_{hf} = \frac{\sum_l L_{hlf} w_{hl}}{\sum_l L_{hlf}} = \frac{\sum_l L_{hlf} w_{hl}}{L_{hf}} = \frac{\sum_{l=1}^{s} w_{hl}}{s+t}$$

where w_{hl} is the weight of the segment or point *l* in stratum *h*.

Let y_{hf} be the value of the variable of interest for the holding *f* of stratum *h* (this could be the number of cattle). The Horvitz-Thompson estimator can be used with the weights w_{hf} for unbiased estimates at the holding level (Lavallée, 2007). The total number of cattle $\hat{Y}_h$ in the stratum *h* is then:

$$\widehat{Y_h} = \sum_f w_{hf} y_{hf}$$

Variance

Let us consider

$$z_{hf} = \frac{y_{hf}}{L_{hf}}$$

$$Z_l = \sum_h \sum_f L_{hlf} z_{hf}.$$

An estimator of the variance of $\hat{Y}h$ is (Lavallée, 2007):

$$\widehat{Var(\hat{Y}_h)} = \sum_h \sum_l \sum_{l'} \frac{(\pi_{hll'} - \pi_{hl}\pi_{hl'})}{\pi_{hl}\pi_{hl'}} Z_l Z_{l'}$$

where π_{hl} is the probability of the selection of the segment l and $\pi_{hll'}$ the joint probability of the selection of segment l and l'.

However, alternative variance estimators, such as jackknife and bootstrap estimators, will be useful.

More detailed illustrations of weight calculation using the GWSM are provided by the Global Strategy (2014, chapter 3, part 2).

5.8.4. Multiple frame estimators

One of the recommended frames for AGRIS is a multiple frame composed by an area frame and two complementary list frames (see section 1.1.2). In practice, the recommended list frame for AGRIS may be a combination of two lists (dual frame): the holdings of the household sector (pop1) on one hand, and those of the non-household sector (pop2) on the other. The main issue with this type of frames is the existence of overlap. If there is no overlap, a separate independent sampling may be easily performed in each frame, and final estimates derived by summing up estimates relating to the two samples. In case of overlap, the Global Strategy (2015) provides detailed guidance on the use of dual frames as an MSF and discusses the main estimators to be applied.

5.8.4.1. Area and list frame

The Global Strategy (2015b) explores in detail how to link area and list frames in agricultural surveys. Suitable estimators are provided by the Global Strategy (2015a and 2015b). As for the recommended multiple frame for AGRIS, the estimators are necessary for the dual frame composed by the area frame and the list of large commercial agricultural holdings.

5.8.4.2. Case of two list frames

Let us consider the case of subpopulations pop1 and pop2. The recommended sampling designs for pop1 and pop2 are proposed in sections 2.5.1 and 2.5.2., respectively. The common case of overlap arises due to a misclassification of some holdings of pop2 into pop1, as some holdings of the non-household sector are classified as falling into the household sector. Let us consider S_1 and S_2 as the samples selected respectively from pop1 and pop2. To every holding *f* selected from each subpopulation, a sampling weight w_f is assigned.

Thus, S_1 may be viewed as the union of two subsamples:

$$S_1 = S_{1,pop1} \cup S_{1,pop2}$$

with $S_{1,pop1} = \{ f \in pop1 \cap f \in S_1 \}$ being the set of holdings selected with the design DLF1 belonging to the household sector and $S_{1,pop2} = \{ f \in pop2 \cap f \in S_1 \}$ the set of holdings selected with the design P1 pertaining to the non-household sector.

The list of holdings in the non-household sector is usually updated easily and includes only holdings belonging to pop2. Hence, the sample of holdings S_2 selected with design DLF2 is:

$$S_2 = S_{2,pop2} = \{f \in pop2 \cap f \in S_2\}$$

Briefly, the overall set of holdings S_F is defined by the union of three distinct samples:

$$S_F = S_{1,pop1} \cup S_{1,pop2} \cup S_{2,pop2}$$

The first two subsamples on the right-hand side of the expression above are selected with design DLF1, and the latter with design DLF2 (see sections 2.3.1 and 2.3.2).

Estimation

Then, the target total Y_F can be estimated by means of Hartley's dual-frame estimator:

$$\hat{Y}_F = \hat{Y}_{p11} + \alpha \hat{Y}_{p12} + (1-\alpha)\hat{Y}_{p22}$$

with

$$\hat{Y}_{p11} = \sum_{f \in S_{1,pop1}} y_f \, w_f$$

$$\hat{Y}_{p12} = \sum_{f \in S_{1,pop2}} y_f \, w_f$$

$$\hat{Y}_{p22} = \sum_{f \in S_{2,pop2}} y_f \, w_f$$

The best choice for α is (Global Strategy, 2015a):

$$\hat{\alpha}_0 = \frac{\widehat{var}(\hat{Y}_{p11}) - \widehat{covar}(\hat{Y}_{p11}, \hat{Y}_{p12})}{\widehat{var}(\hat{Y}_{p12}) - \widehat{var}(\hat{Y}_{p22})}$$

The Global Strategy (2015a) proposes and discusses a number of other dual-frame estimators that may be also considered. The Frames2 (Estimation in Dual Frame Surveys) package of the statistical software R may also be used (Arcos *et al*., 2015).

5.9. SAMPLE SIZE AND ALLOCATION

The strategies for determining sample size depend mainly on the sampling design and the available budget.

5.9.1. Stratified two-stage sampling

With two-stage sampling, the sample size can be calculated by starting with the number of PSUs or with the number of SSUs to be surveyed.

5.9.1.1. Option 1: starting with the size of the sample of SSUs

Overall number of SSUs

There are two approaches to determining the sample size of the SSUs (holdings, points or segments): the first is based on the precision required of the final estimates for the main variables of interest, and the other uniquely on the budget constraints. If feasible, the first method is preferable because it ensures a better quality of the estimates after the survey.

These methods may be used to calculate the sizes of the samples for the Core and Rotating Modules. However, it should be noted that the method based on precision may provide a greater sample size for a Rotating Module than for a Core Module, depending on the variability of the variables of interest used for the calculation, as well as on the geographical disaggregation targeted for the estimates. However, many countries will choose a greater disaggregation level for the Core Module (typically: province or district), than for the Rotating Modules (typically: national).

It is recommended to calculate a suitable sample size for the Core Module. Overall issues of variability and geographical disaggregation allowing, there are analytical and operational benefits to using either the same sample or a subsample for the Rotating Modules. Different approaches to subsampling for the Rotating Modules are discussed in section 2.3.

Calculations based on precision requirements

For each main domain of interest U_d (it is recalled that the main domain is a domain such as a region or province for which reliable estimates are expected), let us consider that the objective of the estimation is the total amount of the main target variable Y, with a relative error not greater than CV^* (a precision of 10 percent is usually recommended for estimation at domain level). An initial sample size is provided by:

$$m_d = \frac{CV_{yU_d}^2}{CV^{*2} + CV_{yU_d}^2/N_d}$$

where N_d is the size of the population (holdings, points, segment) of domain U_d (to be calculated from the frame) and $CV_{yU_d} = S_{yU_d} \big/ \bar{y}_{U_d}$ is the coefficient of variation of the target variable Y in U_d. This can be estimated from previous surveys (censuses) or administrative data. Alternatively, it can be calculated using an auxiliary variable X, available in the sampling frame and strongly correlated with Y.

The sample size m_d is the size that would be achieved if one-stage simple random sampling of holding is employed in the given domain. In this case, a stratified two-stage sampling is used, which is usually less efficient than simple random sampling. When comparing the sampling variance of total estimator in the two-stage design with respect to the simple random sampling, the design effect can be expressed in the following manner (Kalton *et al*., 2005):

$$D_{eff} = 1 + (m_{d0} - 1)\bar{\rho}$$

where m_{d0} is the (constant) number of sample holdings (or points or segments) to select in each PSU (usually decided according to practical criteria – in other words, the interviewer's workload), while $\bar{\rho}$ is the average within-stratum measure of homogeneity, that is, a measure of the homogeneity of the Y values of holdings (segments or points) belonging to the same PSU. Commonly observed values of $\bar{\rho}$ in household surveys range from 0.02 to 0.09, and unfortunately higher values are to be expected when Y refers to crops. More generally, in developing countries, the two-stage selection of households provides a D_{eff} that can range from 2 to 6 (Petterson and do Nascimento Silva, 2005).

In this setting, an approximate idea of the overall number of households to select in domain U_d via two-stage design is:

$$\tilde{m}_d = m_d \times \tilde{D}_{eff}$$

where $\tilde{D}_{eff}$ is an estimate (guess) for the design effect (derived by considering the chosen m_{d0} and a rough estimate of $\bar{\rho}$). Usually, it is suggested to enlarge the sample size to account for possible nonresponse, especially if g is the expected response rate. Then:

$$m_d{}^* = \tilde{m}_d \times \frac{1}{g} = m_d \times \tilde{D}_{eff} \times \frac{1}{g}$$

Calculations based on the available budget

If the cost of a single interview is c and the budget available for the domain is C_d, then the actual sample size will be simply:

$$m_d^* = \frac{C_d}{c}\frac{1}{g}$$

Sample allocation in strata

After the size of the sample of SSUs in the domain has been calculated, the next step is to allocate the sample to strata. The Neyman (1934) optimal allocation is recommended because when compared to equal and proportional allocation, it ensures a better precision of estimates. It enables obtaining the size m_{dh} of SSUs in each stratum r with the formula below:

$$m_{dh} = m_d^* \frac{N_{dh} S_{ydh}}{\sum_r N_{dh} S_{ydh}}$$

where N_{dh} is the size of the stratum h and S_{ydh} is the standard deviation of the variable of interest Y. S_{ydh} can be estimated from the data of previous surveys or can be substituted by the standard deviation of a variable X available in the sampling frame and having a strong correlation with Y.

An alternative allocation criterion is the allocation proportional to the total Y (or X). Such an allocation is optimal if Y's coefficient of variation is constant over the strata.

$$m_{dh} = m_d^* \frac{t_{ydh}}{t_{yd}}$$

where t_{ydh} and t_{yd} are respectively the total of Y in the stratum h and in the domain.

Number of PSUs

Usually, the number of SSUs selected in each sampled PSU is constant (m_{d0}) because it depends to a large extent on the interviewers' workload. If m_{d0} is the number of SSUs to be selected in each PSU of domain d, the number of PSUs (n_{dh}) to select in the stratum h of the domain d is therefore simply:

$$n_{dh} = \frac{m_{dh}}{m_{d0}}$$

In case of non-integer values, it is considered to be the largest integer not greater than n_{dh} or the smallest integer not less than n_{dh}.

5.9.1.2. Option 2: starting with the size of the sample of PSUs

Theoretically, for each sampling domain U_d a large number of PSUs is recommended to achieve better estimates. However, generally, in surveys there are some budget constraints that should be taken into account. Kish (1965, equation 8.3.7) provided an optimal (the most economical) value of the number of SSUs m_{d0} *to be selected in each PSU:

$$m_{d0}{}^{*} = \sqrt{\frac{c_p \times (1-\bar{\rho})}{c \times \bar{\rho}}}$$

where c_p and c are respectively the cost of adding an additional PSU into the sample and the unit cost of an interview. The intraclass correlation $\bar{\rho}$ can be estimated from previous surveys by:

$$\bar{\rho} = \frac{D_{eff} - 1}{\tilde{m}_{d0} - 1}$$

As previously mentioned, the design effect D_{eff} is the ratio of the sampling variance of the total estimator in the two-stage design with respect to the variance in a simple random sampling, and $\tilde{m}_{d0}$ is the average number of SSUs selected per PSU in the previous survey considered.

The optimal value m_{d0}* is a good threshold against which to decide the final value m_{d0} of SSUs per PSU and the number of PSUs n_d to be selected in the domain U_d. This final value m_d should take into account possible nonresponse as described in Option 1 above. Then, the final total size of the sample of SSUs will be:

$$m = \sum_{d} n_d \times m_{d0}$$

In this case too, the sample allocation to strata can be performed using the optimal Neyman allocation described in detail in Option 1 above.

5.9.2. Stratified one-stage sampling

Calculations based on precision requirements

The following procedure is suggested for determining the number of holdings to select for the non-household sector. Let us consider a domain of interest U_d, where the objective of the estimation is the total amount of the main target variable Y, with a relative error not greater than CV^* (usually, a precision of 10 percent is recommended for estimation at domain level). The overall number of holdings to select is (see Cochran, 1977, Equation 5.46):

$$\widetilde{m}_d = \frac{\left(\sum_h M_{dh} S_{ydh}\right)^2}{t_{yd}^2 \times CV^{*2} + \sum_h M_{dh} {S_{ydh}}^2)}$$

Where t_{yd} is the total Y in the domain U_d, and S_{ydh} is the standard deviation of Y in the stratum h of domain U_d, both the quantities can be estimated from previous surveys or can be substituted with corresponding estimates related to an auxiliary variable X that is strongly correlated with Y. Note that the above formula is valid on the assumption that the allocation of units among the strata follows the Neyman criterion, that is:

$$\widetilde{m}_{dh} = \widetilde{m}_d \frac{M_{dh} S_{ydh}}{\sum_h M_{dh} S_{ydh})}$$

In some cases, before allocating the units, the optimal sample size can be increased to compensate for unit nonresponse. In particular, if g is the expected response rate, then the size can be considered:

$${m_d}^* = \frac{\widetilde{m}_d}{g}$$

To determine optimal sample size and the corresponding optimal allocation among strata in multidomain problems, it is possible to resort to the Bethel algorithm (1989). This algorithm also takes multicharacter problems into account (that is, optimal sample size with more than one target variable).

Calculations based on available budget

If the cost of a single interview is c and the budget available for the domain is C_d, then the actual sample size will be simply:

$${m_d}^* = \frac{C_d}{c} \frac{1}{g}$$

with g being the expected response rate. An underestimation of g may take up such a great proportion of the budget that it may no longer be sufficient to interview all of the holdings planned.

Useful R packages linked to the stratification of sampling frame and decisions concerning sample size are provided in annex 7 of this handbook.

5.10. MODULAR ARCHITECTURE: CORE AND MODULES

As discussed above, the sample size of the Core Module may be different from the sample size of the Rotating Modules. In addition, the different Rotating Modules may have different sample sizes. In the end, the national agencies responsible for AGRIS implementation will decide the sample size and the sampling strategy, also on the basis of operational issues such as budget constraints and ease of implementation.

Where subsampling is possible, the process of selecting the subsample may be performed in a number of ways, depending on the overall sampling design (one-stage or two-stage sampling design).

TABLE 5.2. RECOMMENDED AGRIS MODULE FLOW.

	Years	1	2	3	4	5	6	7	8	9	10
Core Module	Agricultural holding (AH) Roster	•	•	•	•	•	•	•	•	•	•
	Crop + livestock production	•	•	•	•	•	•	•	•	•	•
	Other key variables	•	•	•	•	•	•	•	•	•	•
Rot. Module 1	Economy	•		•		•		•		•	
Rot. Module 2	Labour		•				•				
Rot. Module 3	Production Methods and the Environment				•				•		
Rot. Module 4	Machinery, Equipment and Assets	•				•					

5.10.1. Two-stage sampling design

5.10.1.1. Subsampling of SSUs in PSUs

If a multistage sampling design is adopted, this can be easily implemented in the last stage of selection. For the Rotating Modules, if a two-stage sampling design is performed, a random selection of a portion of the sample of holdings selected for the core in each PSU may be made.

The notation is the same as that established in section 5.8.1. Let us suppose that t_{hi} SSUs are subsampled in PSU i of stratum h. The weight w_{shij} of the SSU j selected in the subsample for the Rotating Module s is:

$$w_{shij} = \frac{m_{hi}}{t_{hi}} w_{hij}$$

N.B.: If, in each PSU, 25 percent of the sample of SSUs are subsampled, $\frac{m_{hi}}{t_{hi}} = 4$.
Thus, $w_{shij} = 4w_{hij}$.If y_{shij} is a variable collected as part of the Rotating Module s (for example, the number of tractors of holding j considering the Rotating Module "Machinery and Equipment", if a list frame is used), the estimator of the variable at the national level (total number of tractors in the country) is:

$$\hat{Y}_{shij} = \sum_{h,i,j} w_{shij} y_{shij}$$

5.10.1.2. Subsampling the PSUs

Another option for selecting the sample of the Rotating Module is to select a subsample of the PSU and cover all or a part of the SSUs sampled in each PSU. This option may be less costly; however, it is also less efficient. Indeed, in two-stage sampling, the design effect is equal to $[1 + (m_{d0} - 1)\bar{\rho},]$ with m_{d0} being the number of SSUs per PSU and $\bar{\rho}$ the intraclass correlation. Therefore, it is the number of SSUs per PSU that should be reduced, and not the number of PSUs.

Let us suppose that a subsample of n_{sh} PSUs is selected from among the sample of n_h PSUs. In each subsampled PSU i of stratum h, t_{hi} SSUs are selected through simple random sampling.

The subsample of PSUs may be selected with equal probability. The corresponding probabilities of selection are then:

$$\pi_{shi} = n_h \frac{F_{hi}}{F_h} \frac{n_{sh}}{n_h} = \frac{F_{hi} n_{sh}}{F_h}$$

Thus, the weight w_{shij} of the SSU j subsampled in PSU i of stratum h is:

$$w_{shij} = \frac{F_h}{F_{hi} n_{sh}} \frac{n_{sh}}{t_{hi}} = \frac{F_h}{F_{hi} t_{hi}}$$

If y_{shij} is a variable collected as part of the Rotating Module s (for example, the number of employees of the holding f considering the Rotating Module "Labour", if a list frame is used), the estimator of the variable at the national level (total number of agricultural employees in the country) is:

$$\hat{Y}_{shij} = \sum_{h,i,j} w_{shij} y_{shij}$$

5.10.2. One-stage sampling design

It is recalled that for some recommended list frames for AGRIS, a stratified simple random sampling is suitable. In these cases, a subsample (to be drawn from the sample for the core) of n_{sh} SSUs can be selected for the Rotating Modules. The weight w_{shj} of the SSU j subsampled in stratum h is:

$$w_{shj} = \frac{N_h}{n_h} \frac{n_h}{n_{sh}} = \frac{N_h}{n_{sh}}$$

5.11. Longitudinal analysis

Analyses often require repeated observations of a set of variables for the same agricultural holdings over a period of time. These longitudinal analyses are interesting at the individual level (such as the holding); they may also be relevant at the farm-type level (when a farm typology is available). Performing longitudinal analyses requires observation of a subset of sample units over time. Two mechanisms to achieve overlapping between two sample surveys in different years, t_1 and t_2, are the panel design and the sample rotation with partial replacement. Most developing countries appear to perform either a panel survey or a total renewal of the sample each year. However, the latter option does not allow for longitudinal studies.

5.11.1. Panel design

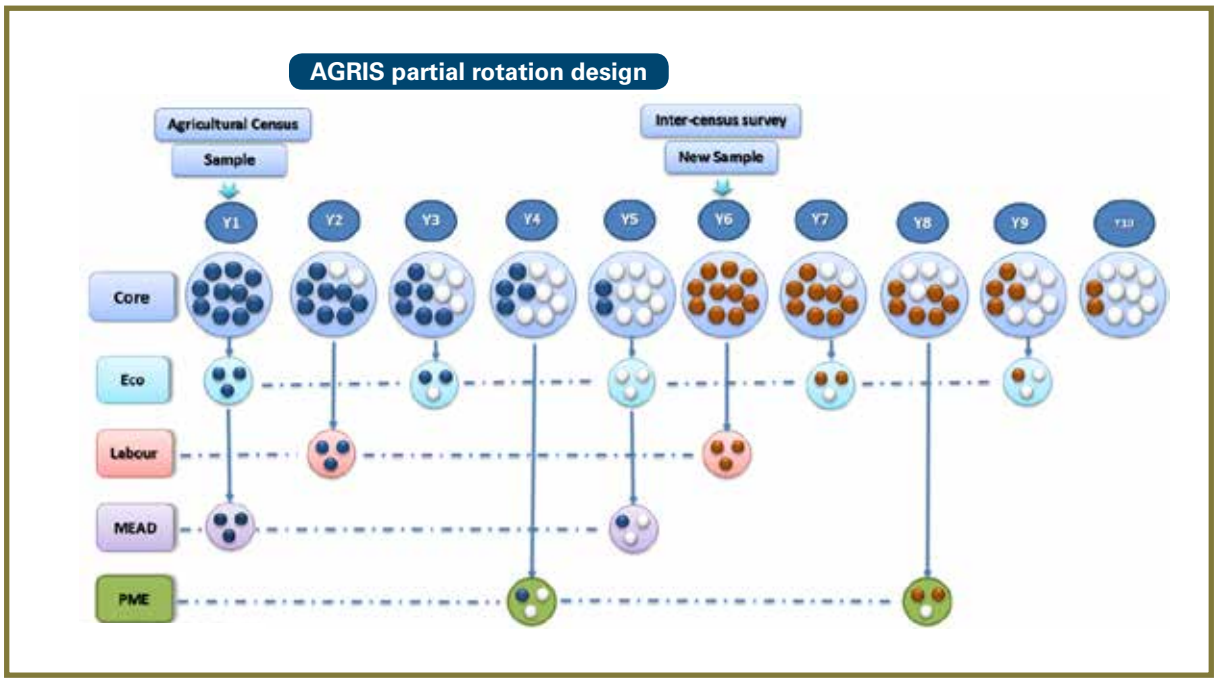
The panel design consists in surveying the same units of a single sample of holdings over a number of years (usually three or five years, in developing countries). Thus, it enables carrying out a longitudinal analysis with the survey data collected during that period. Several developing countries already use a panel sample for their agricultural surveys. The panel survey is cost-effective and has a number of operational advantages. However, increased sample attrition and sample obsolescence issues may arise, especially when the panel covers a long period of time. The burdens posed by the interviews may lead some respondents to refuse to participate after a number of years. In addition, if structural changes occur in the population, the sample will never reflect the actual structure of the population. The Global Strategy (2014 a and b, chapter 4) proposes a number of methods to improve estimations when implementing a panel survey and such changes have taken place.

5.11.2. Partial sample rotation design

The partial sample rotation approach is rarely adopted in agricultural surveys. This design consists in replacing a part of the sample units every year with new units selected on an ad hoc basis. The partial replacement reduces the sample attrition undergone by panel samples, while enabling longitudinal analyses.

If a country is willing to implement AGRIS with a partial sample rotation design, a rotation of 20 percent of the sample every year may be suitable, because AGRIS suggests completely renewing the sample every five years due to the rapid obsolescence of the list frame. In these cases, approximately four fifths of the holdings observed on each new survey occasion will already have been observed on the previous occasion. In addition, one fifth of the sample will have been observed over five years before the sample is completely renewed (see figure 5.10 below).

FIGURE 5.9. AGRIS PARTIAL ROTATION DESIGN.



This may be performed using two different techniques for drawing the sample units:

- a technique based on permanent random numbers; or
- a technique based on replicated samples.

The first technique, which is easier to implement, requires that the every sample unit involved in the different stages of selection be assigned a Permanent Random Number (PRN) generated from a $U(0,1)$ distribution (Lawrence *et al*., 2000). Each sample selection for a specific survey occasion is carried out using the unit's PRN.

The first technique also enables taking into account of the population's newborn units.

5.11.2.1. The PRN technique

Given a population of N units, let i $(i=1,\ldots, N)$ denote the generic unit in the population and let π_i denote its inclusion probability. Eventually, let n indicate the sample size, being:

$$n = \sum_{i=1}^{N} \pi_i$$

The technique, which realizes a Pareto sampling, is implemented in the following steps:

First, independent random numbers $U_1,..., U_i,..., U_N$ from $U(0,1)$ are generated for each unit. The U_i is a PRN that will remain the same for all selection processes in which the i-th unit will be involved. Then, on the t-th (t=1,2,3,…) survey occasion, the following steps are carried out:

1. The quantities G_{ti} are calculated:

$$G_{ti} = \begin{cases} U_i + k_t & \text{if } U_i + k_t \leq 1 \\ U_i + k_t - 1 & \text{if } U_i + k_t > 1 \end{cases}$$

with

$$k_t = \begin{cases} k_{t-1} + 0.20 & \text{if } k_{t-1} + 0.20 \leq 1 \\ k_{t-1} + 0.20 - 1 & \text{if } k_{t-1} + 0.20 > 1 \end{cases}$$

in which

$$k_0 = 0.$$

2. The Pareto-distributed ranking variables

$$Q_{ti} = \frac{G_{ti}(1-\pi_i)}{\pi_i(1-G_{ti})}$$

are computed.

3. The n units that have the lowest Q values are selected.

This technique presents several advantages:

- Pareto sampling is the most efficient design of the many other sampling designs with other *Qs*; see Rosén (1997a and 1997b). The true inclusion probabilities only approximately agree with the π_i s. Rosén has advocated for the Pareto design, which is generally as close to optimal design as possible.
- Pareto sampling greatly facilitates the taking into account of population changes. A newborn unit in the population receives its PRN and can be considered on subsequent survey occasions. The units that die are simply cancelled from the population.
- If the π_i do not change, this simple mechanism ensures that two consecutive survey occasions overlap by approximately four fifths of the sample units.
- However, the π_i can be updated on each survey occasion, thus permitting consideration of the changes in the population structure. It is clear that if these changes are relevant, the target level of overlap between two consecutive samples may not be achieved.
- Pareto sampling allows for a very simple treatment of nonresponse. If a unit is nonrespondent, the sample is simply enlarged by including the $n+1$-th unit in the rank.

5.11.2.2. Replicated sampling

The essential input quantities for developing this technique are:

- the total number of survey occasions, denoted with O; and
- the theoretical sample size n of the units to be observed on a given survey occasion.

Then, the technique is implemented in the following steps:

1. On the first survey occasion, $\ddot{n}$ units are selected, with

$$\ddot{n} = n\frac{K}{5},$$

in which

$$K=5+O-1.$$

2. The $\ddot{n}$ units are randomly grouped into K replicates ranked from 1 to K.
3. The first five replicates in the rank are observed on the first survey occasion. On the *second* survey occasion, the replicates ranking from 2 to 6 are observed. This process is repeated until the *last*, the O-th, survey occasion, on which the last K replicates in the rank are observed.

This technique presents the following characteristics:

- The theoretical inclusion probabilities of each survey occasion t remain those that were theoretically defined for the base design with n units.
- Simple estimators of the variances may be computed on the basis of the variances of the estimate of each replicate.
- It does not allow for taking into account changes in the population because the sample is selected on the first survey occasion.
- It is not simple to treat total nonresponse, a factor that can seriously affect the quality of the survey.

5.11.2.3. Practical issues on sample rotation

In stratified one-stage sampling design, the rotation should be performed independently, stratum by stratum, for example by adopting the PRN technique in each stratum. Rotation obviously depends on the sample and the sizes of the strata; it may be straightforward in strata where the sampling fraction is small, while it will be impossible in strata for which all units must be observed (consider a situation in which a specific stratum is composed of very large units, with a high influence on final survey estimates) on all survey occasions.

Partial sample rotation is less straightforward in two-stage sampling design. In these cases, it would be preferable to fix the sample of PSUs selected in the first stage and rotate the SSUs within each PSU sampled. This strategy is feasible if sampling fractions within PSUs are relatively small – in other words, if for example $m_{20} = 15$ holdings are to be selected in each PSU, and on each survey occasion, 20 percent of the units must be rotated (three holdings), to ensure a regular rotation over the five-year period, the PSU should include at least 27 holdings.

5.12. Conclusion

This chapter discusses the methodological issues relating to sampling frames and sampling design for the implementation of AGRIS and the production of reliable estimates and high-quality agricultural statistics in developing countries. The document provides clear and precise guidance and recommendations under basic principles of efficiency, practicability and cost-effectiveness, relying upon the most relevant and recent publications on the subject.

The agricultural holding is considered to be the statistical unit; it is recommended to develop an MSF with a multiple frame consisting of either two list frames or a combination of an area frame and two complementary list frames. Accordingly, the most suitable sampling designs are proposed and discussed, as well as the estimators and variances. The document also covers issues relating to frame maintenance, sample size and allocation and longitudinal analysis.

Survey managers and national statisticians will find both theoretical and practical tools useful, as well as relevant references for the development of a frame and a sampling design to start implementing the AGRIS system.

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Annex 1

Classifications

The use of standard international classifications and statistical frameworks is a key principle in AGRIS, allowing for the data collected and disseminated to be useful over time, comparable across adopting countries and consistent with other statistical data sets. While the merits of adopting standard classifications are clear, in some cases it may be desirable to incorporate country-specific customization into the AGRIS components. Customization can have the advantage of better representing the agricultural profile of a country, improving the answerability of the AGRIS questions for respondents, or providing data to address country-specific needs and priorities. If customization is to be applied within the AGRIS context, it is highly recommended that it be done within the framework of existing classifications. This can be accomplished by adding more detail than provided by a standard classification, while respecting the hierarchy of the classification. This solution maintains the benefits inherent in the use of standard classifications, while adding value for the adopting country to reflect its unique data requirements.

The classifications used in AGRIS are presented in this annex for reference. The table below summarizes the main classifications and identifies the modules of AGRIS to which they apply.

Classifications and their application within the components of AGRIS						
		AGRIS module				
Annex	Classification and source	Core	Economy	Labour	Machinery, Equipment and Assets	Production Methods and the Environment
1-1a	International Standard Industrial Classification of All Economic Activities, Revision 4 ISIC Rev.4 ISIC Rev.4 classification detail for the activities in scope for inclusion in AGRIS https://unstats.un.org/unsd/publication/seriesM/seriesm_4rev4e.pdf	X	X	X	X	X
1-1b	International Standard Industrial Classification of All Economic Activities, Revision 4 ISIC Rev.4 Other economic activities reflected in AGRIS modules and their related ISIC Rev.4 references https://unstats.un.org/unsd/publication/seriesM/seriesm_4rev4e.pdf	X	X	X		
1-1c	Activity codes in AGRIS modules	X	X	X		
1-2	Indicative Crop Classification, Version 1.1 ICC Ver.1.1 http://www.fao.org/3/a-i4913e.pdf World Programme for the Census of Agriculture 2020 (Annex 4 contains the ICC Ver.1.1)	X	X			X
1-3	Central Product Classification, Version 2.1 official expansion for agricultural statistics, FAOSTAT expansion and for use in AGRIS CPC Ver.2.1 https://unstats.un.org/unsd/cr/downloads/CPCv2.1_complete%28PDF%29_English.pdf (Section C of Part 5, Alternative structures, contains the official expansion of CPC Ver.2.1 for agricultural statistics)	X	X			X
1-4	System of National Accounts 2008 SNA 2008 Holdings, household/non-household sector https://unstats.un.org/unsd/nationalaccount/docs/SNA2008.pdf	X	X	X	X	X

Classifications and their application within the components of AGRIS						
		AGRIS module				
Annex	Classification and source	Core	Economy	Labour	Machinery, Equipment and Assets	Production Methods and the Environment
1-5	International Standard Classification of Occupations ISCO-08 http://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publication/wcms_172572.pdf			X		
1-6	Classification of Machinery and Equipment http://www.fao.org/3/a-i4913e.pdf (WCA 2020, annex 7 contains the Classification of Machinery and Equipment)				X	
1-7	International Standard Classification of Education ISCED 2011 Highest level of education completed http://uis.unesco.org/sites/default/files/documents/international-standard-classification-of-education-isced-2011-en.pdf	X	X*	X*	X*	

*Through linkages with data from the Core Module for household members identified in Rotating Modules.

ANNEX 1-1A: INTERNATIONAL STANDARD INDUSTRIAL CLASSIFICATION OF ALL ECONOMIC ACTIVITIES, REV.4 (ISIC REV.4) - CLASSIFICATION DETAIL FOR THE ACTIVITIES IN-SCOPE FOR INCLUSION IN AGRIS

Source: https://unstats.un.org/unsd/publication/seriesM/seriesm_4rev4e.pdf

The International Standard Industrial Classification of All Economic Activities (ISIC), Rev.4[1] was officially released on 11 August 2008 and provides a framework against which economic entities can be classified according to the activities they carry out. A subset of groups within Section A of the classification (Agriculture, forestry and fishing) is in scope for inclusion in the AGRIS.

The high-level hierarchy below identifies the ISIC Rev.4 activities of Section A – Agriculture, forestry and fishing, Division 01 – Crop and animal production, hunting and related service activities, and whether they are considered in scope or out of scope for AGRIS.

The key to being included as in scope for AGRIS is the presence of activity in the parts of Section A identified below. Some operations engage in activities associated with several industry classification categories. As long as the in-scope requirement is satisfied, they are eligible for coverage by AGRIS. Therefore, an operation involved in in-scope activities alone, or in combination with other in-scope or out-of-scope activities, is eligible for inclusion in AGRIS.

Other parts of Section A of ISIC, Rev.4 involve service activities that support agriculture or are other related activities. On their own, they are out of scope for AGRIS. Therefore, if operations are involved in those activities without also being engaged in any of the in-scope activities, they should not be included in AGRIS.

Section: A - Agriculture, forestry and fishing
Division: 01 - Crop and animal production, hunting and related service activities
Groups: 011 to 017 (listed below, based on their status as in scope or out of scope for AGRIS)

In scope for AGRIS	Out of scope for AGRIS
Groups: 011 – Growing of non-perennial crops 012 – Growing of perennial crops 013 – Plant propagation 014 – Animal production 015 – Mixed farming	Groups: 016 – Support activities to agriculture and post-harvest crop activities 017 – Hunting, trapping and related service activities

Other activities in Section A of the ISIC Rev.4 that are out of scope for AGRIS in the absence of in-scope activities are:

- division 02 - Forestry and logging
- division 03 - Fishing and aquaculture

The table below provides the classification detail and explanatory notes for the AGRIS in-scope activities.

1 UNSD. 2008. *International Standard Industrial Classification of All Economic Activities (ISIC), Rev.4*. http://unstats.un.org/unsd/cr/registry/regcst.asp?Cl=27. Accessed 30 October 2016.

CLASSIFICATION DETAIL FOR THE ISIC REV.4 ACTIVITIES IN SCOPE FOR INCLUSION IN AGRIS

DIVISION 01 – CROP AND ANIMAL PRODUCTION, HUNTING AND RELATED SERVICE ACTIVITIES (AGRIS IN-SCOPE PORTIONS ONLY)

Related ISIC Rev.4 description		
Group	**Class**	**Explanatory note**
011 - Growing of non-perennial crops	0111 - Growing of cereals (except rice), leguminous crops and oil seeds	This class includes all forms of growing of cereals, leguminous crops and oil seeds in open fields, including those considered organic farming and the growing of genetically modified crops. The growing of these crops is often combined within agricultural units. **This class includes:** **Growing of cereals such as:** • wheat • grain maize • sorghum • barley • rye • oats • millets • other cereals n.e.c. **Growing of leguminous crops such as:** • beans • broad beans • chick peas • cow peas • lentils • lupins • peas • pigeon peas • other leguminous crops **Growing of oil seeds such as:** • soya beans • groundnuts • castor bean • linseed • mustard seed • niger seed • rapeseed • safflower seed • sesame seed • sunflower seed • other oil seeds **This class excludes:** Growing of maize for fodder, see 0119
	0112 - Growing of rice	**This class includes:** Growing of rice (including organic farming and the growing of genetically modified rice)

Related ISIC Rev.4 description		
Group	**Class**	**Explanatory note**
011 - Growing of non-perennial crops	0113 - Growing of vegetables and melons, roots and tubers	**This class includes:** **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 This class excludes: Growing of mushroom spawn, see 0130 Growing of chilies and peppers (capsicum spp.) and other spices and aromatic crops, see 0128
	0114 - Growing of sugar cane	**This class includes:** Growing of sugar cane This class excludes: Growing of sugar beet, see 0113
	0115 - Growing of tobacco	**This class includes:** Growing of unmanufactured tobacco
	0116 - Growing of fibre crops	**This class includes:** 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

Related ISIC Rev.4 description		
Group	**Class**	**Explanatory note**
011 - Growing of non-perennial crops	0119 - Growing of other non-perennial crops	This class includes the growing of non-perennial crops not elsewhere classified. **This class includes:** 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 **This class excludes:** Growing of sunflower seeds, see 0111 Growing of non-perennial spice, aromatic, drug and pharmaceutical crops, see 0128
012 - Growing of perennial crops	0121 - Growing of grapes	**This class includes:** Growing of wine grapes and table grapes in vineyards
	0122 - Growing of tropical and subtropical fruits	**This class includes:** Growing of tropical and subtropical fruits: • avocados • bananas and plantains • dates • figs • mangoes • papayas • pineapples • other tropical and subtropical fruits
	0123 - Growing of citrus fruits	**This class includes:** Growing of citrus fruits: • grapefruit and pomelo • lemons and limes • oranges • tangerines, mandarins and clementines • other citrus fruits
	0124 - Growing of pome fruits and stone fruits	**This class includes:** **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

Related ISIC Rev.4 description		
Group	**Class**	**Explanatory note**
012 - Growing of perennial crops	0125 - Growing of other tree and bush fruits and nuts	**This class includes:** **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 **This class excludes:** Growing of coconuts, see 0126
	0126 - Growing of oleaginous fruits	**This class includes:** **Growing of oleaginous fruits:** • coconuts • olives • oil palms • other oleaginous fruits **This class excludes:** Growing of soya beans, groundnuts and other oil seeds, see 0111
	0127 - Growing of beverage crops	This class includes: Growing of beverage crops: • coffee • tea • maté • cocoa • other beverage crops
	0128 - Growing of spices, aromatic, drug and pharmaceutical crops	**This class includes:** **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
	0129 - Growing of other perennial crops	**This class includes:** 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 **This class excludes:** Gathering of tree sap or rubber-like gums in the wild, see 0230

Related ISIC Rev.4 description		
Group	**Class**	**Explanatory note**
013 - Plant propagation	0130 - Plant propagation	This class includes the production of all vegetative planting materials including cuttings, suckers and seedlings for direct plant propagation or to create plant grafting stock into which selected scion is grafted for eventual planting to produce crops. **This class includes:** Growing of plants for planting Growing of plants for ornamental purposes, including turf for transplanting Growing of live plants for bulbs, tubers and roots; cuttings and slips; mushroom spawn Operation of tree nurseries, except forest tree nurseries **This class excludes:** Growing of plants for the purpose of seed production, see groups 011 and 012 Operation of forest tree nurseries, see 0210
014 - Animal production	0141 - Raising of cattle and buffaloes	**This class includes:** Raising and breeding of cattle and buffaloes Production of raw cow milk from cows or buffaloes Production of bovine semen **This class excludes:** Processing of milk, see 1050
	0142 - Raising of horses and other equines	**This class includes:** Raising and breeding of horses (including racing horses), asses, mules or hinnies **This class excludes:** Operation of racing and riding stables, see 9319
	0143 - Raising of camels and camelids	**This class includes:** Raising and breeding of camels (dromedary) and camelids
	0144 - Raising of sheep and goats	**This class includes:** Raising and breeding of sheep and goats Production of raw sheep or goat milk Production of raw wool **This class excludes:** Sheep shearing on a fee or contract basis, see 0162 Production of pulled wool, see 1010 Processing of milk, see 1050

Related ISIC Rev.4 description		
Group	**Class**	**Explanatory note**
014 - Animal production	0145 - Raising of swine/pigs	This class includes: Raising and breeding of swine (pigs)
	0146 - Raising of poultry	This class includes: Raising and breeding of poultry: • fowls of the species Gallus domesticus (chickens and capons), ducks, geese, turkeys and guinea fowls Production of eggs Operation of poultry hatcheries This class excludes: Production of feathers or down, see 1010
	0149 - Raising of other animals	This class includes: Raising and breeding of semi-domesticated or other live animals: • ostriches and emus • other birds (except poultry) • insects • rabbits and other fur animals Production of fur skins, reptile or bird skins from ranching operation Operation of worm farms, land mollusc farms, snail farms etc. Raising of silk worms, production of silk worm cocoons Bee-keeping and production of honey and beeswax Raising and breeding of pet animals (except fish): • cats and dogs • birds, such as parakeets etc. • hamsters etc. Raising of diverse animals This class excludes: Production of hides and skins originating from hunting and trapping, see 0170 Operation of frog farms, crocodile farms, marine worm farms, see 0321, 0322 Operation of fish farms, see 0321, 0322 Training of pet animals, see 9609
015 - Mixed farming	0150 - Mixed farming	This class includes the combined production of crops and animals without a specialized production of crops or animals. The size of the overall farming operation is not a determining factor. If either production of crops or animals in a given unit exceeds 66 per cent or more of standard gross margins, the combined activity should not be included here, but allocated to crop or animal farming. **This class excludes:** Mixed crop farming, see groups 011 and 012 Mixed animal farming, see group 014

ANNEX 1-1B: OTHER ECONOMIC ACTIVITIES REFLECTED IN AGRIS MODULES AND THEIR RELATED ISIC REV.4 REFERENCES

Source: https://unstats.un.org/unsd/publication/seriesM/seriesm_4rev4e.pdf

The agricultural activities of agricultural holdings can be characterized as activities that are directly related to primary agricultural production – that is, the production of plant and animal products without any transformation by a manufacturing process (therefore, grains, raw milk, etc.). In addition, AGRIS collects information on other economic activities undertaken by the holding. This is of interest because the means of production (such as machinery and equipment) of the holding are often used for other activities, and collecting this data gives a fuller picture of how agricultural holdings (and households) function as economic units.

The other economic activities of interest in the AGRIS context are:

a. Aquaculture and fishery production (inland and marine water aquaculture, fisheries, other aquaculture)
b. Forestry production (biomass for heating or cooking, lumber, wood processing, other forestry products)
c. On-farm processing of agricultural products (milling, beverage manufacture/distillation, food processing, etc.)
d. Accommodations, restaurant, catering and other leisure/educational activities
e. Making handicrafts
f. Production of electricity from renewable sources
g. Other activities directly related to the agricultural holding (custom work provided to other holdings, boarding or training of animals, etc.)

The ISIC Rev.4 descriptions set out below provide details on the other economic activities of interest in AGRIS.

ISIC Rev.4 descriptions for other economic activities of interest in AGRIS			
Section	**Division**	**Group**	**Class**
A - Agriculture, forestry and fishing	01 - Crop and animal production, hunting and related service activities	016 - Support activities to agriculture and post-harvest crop activities	0161 - Support activities for crop production
			0162 - Support activities for animal production
	02 - Forestry and logging	021 - Silviculture and other forestry activities	0210 - Silviculture and other forestry activities
		023 - Gathering of non-wood forest products	0230 - Gathering of non-wood forest products
	03 - Fishing and aquaculture	031 - Fishing	0311 - Marine fishing
		032 - Aquaculture	0321 - Marine aquaculture
			0322 - Freshwater aquaculture

ISIC Rev.4 descriptions for other economic activities of interest in AGRIS			
Section	**Division**	**Group**	**Class**
C - Manufacturing	10 - Manufacture of food products	101 - Processing and preserving of meat	1010 - Processing and preserving of meat
		102 - Processing and preserving of fish, crustaceans and molluscs	1020 - Processing and preserving of fish, crustaceans and molluscs
		103 - Processing and preserving of fruit and vegetables	1030 - Processing and preserving of fruit and vegetables
		104 - Manufacture of vegetable and animal oils and fats	1040 - Manufacture of vegetable and animal oils and fats
		105 - Manufacture of dairy products	1050 - Manufacture of dairy products
		106 - Manufacture of grain mill products, starches and starch products	1061 - Manufacture of grain mill products
			1062 - Manufacture of starches and starch products
		107 - Manufacture of other food products	1079 - Manufacture of other food products n.e.c.
		108 - Manufacture of prepared animal feeds	1080 - Manufacture of prepared animal feeds
	11 - Manufacture of beverages	110 - Manufacture of beverages	1101 - Distilling, rectifying and blending of spirits
			1102 - Manufacture of wines
			1103 - Manufacture of malt liquors and malt
	12 - Manufacture of tobacco products	120 - Manufacture of tobacco products	1200 - Manufacture of tobacco products
	13 - Manufacture of textiles	131 - Spinning, weaving and finishing of textiles	1311 - Preparation and spinning of textile fibres
			1312 - Weaving of textiles
			1313 - Finishing of textiles
		139 - Manufacture of other textiles	1391 - Manufacture of knitted and crocheted fabrics
			1392 - Manufacture of made-up textile articles, except apparel
			1393 - Manufacture of carpets and rugs
			1394 - Manufacture of cordage, rope, twine and netting
			1399 - Manufacture of other textiles n.e.c.
	14 - Manufacture of wearing apparel	141 - Manufacture of wearing apparel, except fur apparel	1410 - Manufacture of wearing apparel, except fur apparel
		142 - Manufacture of articles of fur	1420 - Manufacture of articles of fur
		143 - Manufacture of knitted and crocheted apparel	1430 - Manufacture of knitted and crocheted apparel

ISIC Rev.4 descriptions for other economic activities of interest in AGRIS			
Section	**Division**	**Group**	**Class**
C - Manufacturing	15 - Manufacture of leather and related products	151 - Tanning and dressing of leather; manufacture of luggage, handbags, saddlery and harness; dressing and dyeing of fur	1511 - Tanning and dressing of leather; dressing and dyeing of fur
		151 - Tanning and dressing of leather; manufacture of luggage, handbags, saddlery and harness; dressing and dyeing of fur	1512 - Manufacture of luggage, handbags and the like, saddlery and harness
		152 - Manufacture of footwear	1520 - Manufacture of footwear
	16 - Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	161 - Sawmilling and planing of wood	1610 - Sawmilling and planing of wood
		162 - Manufacture of other products of wood; manufacture of articles of cork, straw and plaiting materials	1629 - Manufacture of other products of wood; manufacture of articles of cork, straw and plaiting materials
			1629 - Manufacture of other products of wood; manufacture of articles of cork, straw and plaiting materials
	17 - Manufacture of paper and paper products	170 - Manufacture of paper and paper products	1709 - Manufacture of other articles of paper and paperboard
	31 - Manufacture of furniture	310 - Manufacture of furniture	3100 - Manufacture of furniture
	32 - Other manufacturing		
D - Electricity, gas, steam and air conditioning supply	35 - Electricity, gas, steam and air conditioning supply	351 - Electric power generation, transmission and distribution	3510 - Electric power generation, transmission and distribution
G - Wholesale and retail trade; repair of motor vehicles and motorcycles	47 Retail trade, except of motor vehicles and motorcycles	478 Retail sale via stalls and markets	4781 Retail sale via stalls and markets of food, beverages and tobacco products
I - Accommodation and food service activities	55 - Accommodation	551 - Short term accommodation activities	5510 - Short term accommodation activities
		552 - Camping grounds, recreational vehicle parks and trailer parks	5520 - Camping grounds, recreational vehicle parks and trailer parks
		559 - Other accommodation	5590 - Other accommodation
	56 - Food and beverage service activities	561 - Restaurants and mobile food service activities	5610 - Restaurants and mobile food service activities
			5621 - Event catering
			5629 - Other food service activities

ISIC Rev.4 descriptions for other economic activities of interest in AGRIS			
Section	**Division**	**Group**	**Class**
L - Real estate activities	68 - Real estate activities	681 - Real estate activities with own or leased property	6810 - Real estate activities with own or leased property
M- Professional, scientific and technical activities	69 Legal and accounting activities		
	70 Activities of head offices; management consultancy activities		
N - Administrative and support service activities	77 - Rental and leasing activities	773 - Renting and leasing of other machinery, equipment and tangible goods	7730 - Renting and leasing of other machinery, equipment and tangible goods
P - Education	85 - Education	854 - Other education	8549 - Other education n.e.c.
R - Arts, entertainment and recreation	93 - Sports activities and amusement and recreation activities	932 - Other amusement and recreation activities	9329 - Other amusement and recreation activities n.e.c.

ANNEX 1-1C: ACTIVITY CODES IN AGRIS MODULES

The list of activities used in AGRIS is developed on the basis of ISIC Rev.4. It outlines the detailed tasks carried out on holdings to report on the types of work carried out by the labour resources involved in the sector.

There are two basic groups of activities included: those that are related to primary agricultural production, or the transformation of primary agricultural products; and those that are related to other economic activities on the holding.

In the list of activities, ISIC Section A (Agriculture, forestry and fishing), Division 01 (Crop and animal production, hunting and related service activities), Groups 011 (Growing of non-perennial crops), 012 (Growing of perennial crops), 013 (Plant propagation), 014 (Animal production), and 015 (Mixed farming) – the in-scope activities of AGRIS modules – are further broken down into:

- Codes 11 to 17 – a detailed breakdown of the activities linked to the crop production cycle; and
- Codes 21 to 28 – a detailed breakdown of the activities linked to the livestock production cycle.

Code 31, with the subcategories linked to on-farm processing of agricultural products, is based on ISIC Section A, Division 01, Group 016 (Support activities to agriculture and post-harvest crop activities), and Section C (Manufacturing), Divisions 10 (Food products), 11 (Beverages), 12 (Tobacco products), 13 (Textiles), and 15 (Leather and related products).

Codes 32 to 39 are based on other relevant ISIC divisions (see annex 1-1b).

Activity codes in AGRIS modules		
Codes		**Description**
Activities related to primary agricultural production, or the transformation of primary agricultural products		
11		Land clearing
12		Ploughing
13		Sowing/planting
14		Pest control
15		Weed control
16		Harvesting, including collecting fruits
17		Preparation of non-processed crops for primary markets (cleaning, trimming, grading, disinfecting, packaging, etc.)
21		Grazing
22		Feeding
23		Shearing
24		Milking
25		Slaughtering
26		Breeding
27		Animal and veterinary care
28		Preparation of non-processed animals/animal products for primary markets (cleaning, grading, disinfecting, packaging of raw milk, etc.)
31		On-farm processing of agricultural products

Activity codes in AGRIS modules		
Codes		**Description**
	31.11	Grain milling: production of flour, groats, meal or pellets of wheat, rye, oats, maize (corn) or other cereal grains
	31.12	Rice milling: production of husked, milled, polished, glazed, parboiled or converted rice; production of rice flour
	31.13	Processing and preserving of fruit and vegetables
	31.14	Manufacture of crude vegetable oils: olive oil, soybean oil, palm oil, sunflower-seed oil, cotton-seed oil, rape, colza or mustard oil, linseed oil, etc.
	31.15	Manufacture of wines
	31.16	Distillation of spirit drinks
	31.17	Manufacture of tobacco products (cigars, chewing tobacco, etc.)
	31.21	Processing and preserving meat
	31.22	Manufacture of dairy products
	31.23	Manufacture of leather and related products
Other economic activities		
32		Selling of holding's products at the market/shop (including preparation, packaging and transport of processed products)
33		Production of forestry products
34		Production, processing and preserving of fish, crustaceans and molluscs
	34.11	Production of fish, crustaceans and molluscs
	34.12	Processing and preserving of fish, crustaceans and molluscs
35		Production of renewable energy
36		Contractual work for other holdings using production means of this holding
37		Accommodation, restaurant, catering and other leisure/educational activities
38		Making handicrafts
39		Training of animals
41		Management and/or administration for the holding
99		Other (specify)

ANNEX 1-2: INDICATIVE CROP CLASSIFICATION VERSION 1.1 (ICC 1.1)

Source: FAO, World Programme for the Census of Agriculture 2020, available at http://www.fao.org/3/a-i4913e.pdf (in the above link, annex 4 contains the ICC 1.1).

For crops grown on the holding, AGRIS uses the Indicative Crop Classification (ICC) v. 1.1, which was introduced in the WCA 2020.

The ICC reflects crops' growing cycles (temporary or permanent) and species. Its structure takes into account the major crops at the international level; however, countries may also adapt this structure by adding local crops or reducing detail, based on national needs. The ICC version 1.1 was updated in alignment with the Central Product Classification Version 2.1 (CPC Ver.2.1). The CPC itself is based on the Harmonized Commodity Description and Coding System (HS) of the World Customs Organization, a classification system for traded goods. The CPC is also broadly compatible with ISIC, in that the industry of origin is related to ISIC. The ICC is also consistent with the classification of commodities used in FAO's online database, FAOSTAT.

The key difference between product and crop classifications is that the ICC refers to crops that are grown in agricultural holdings (that is, to the plants), while the CPC refers to the products generated from the crops; for example, "mustard" (ICC, subclass 4.03.03) is an oilseed crop, whereas "mustard seed" (CPC, subclass 01442) is the oilseed product. In the ICC, a given crop is classified only once in the classification, regardless of how the crop is used; for example, maize is assigned to Group 1, "Cereals", without distinguishing whether the maize is used for flour, oil, or other uses.

There are three main features to consider when classifying crops with ICC Product types. On the basis of the CPC's structure, crops are first divided into groups (for example, cereals or vegetables); each group is then further subdivided by crop type (such as leafy/stem vegetables or fruit-bearing vegetables). The genus or species is at the lowest level of the classification. At this level, each crop is described by its botanical name; however, the ICC is not a botanical classification and the groupings are based more on the crops' agricultural use than on their botanical similarities. While the distinction between temporary and permanent crops is irrelevant to product classification, it is fundamental to crop classification.

If a country wishes to identify the different uses of a crop (such as food or other uses) it has two options: (a) further subdivide the crop in the crop classification according to end use, or (b) include an additional item in the questionnaire on the crop's end use (FAO, 2015; Global Strategy, 2015a). However, it should be noted that it may be difficult for respondents to provide crop estimates by final use at the time of data collection.

Indicative Crop Classification Version 1.1					
Group	Class	Sub class	Order	Title	Crop type*
1				**Cereals**	**T**
	1.01			**Wheat**	**T**
	1.02			**Maize**	**T**
	1.03			**Rice**	**T**
	1.04			**Sorghum**	**T**
	1.05			**Barley**	**T**
	1.06			**Rye**	**T**
	1.07			**Oats**	**T**
	1.08			**Millet**	**T**
	1.09			**Triticale**	**T**
	1.10			**Buckwheat**	**T**
	1.11			**Fonio**	**T**
	1.12			**Quinoa**	**T**
	1.13			**Canary seed**	**T**
	1.14			**Mixed cereals**	**T**
	1.90			**Other cereals, n.e.c.**	**T**
2				**Vegetables and melons**	**T**
	2.01			**Leafy or stem vegetables**	**T**
		2.01.01		▸ *Artichokes*	T
		2.01.02		▸ *Asparagus*	T
		2.01.03		▸ *Cabbages*	T
		2.01.04		▸ *Cauliflower & 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 & 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 (including shallots)*	T
		2.03.05		▸ *Leeks & other alliaceous vegetables*	T
		2.03.90		▸ *Other root, bulb or tuberous vegetables, n.e.c.*	T
	2.04			**Mushrooms and truffles**	**T**
	2.05			**Melons**	**T**
		2.05.01		▸ *Watermelons*	T
		2.05.02		▸ *Cantaloupes & other melons*	T
	2.90			**Other vegetables n.e.c.**	**T**

Indicative Crop Classification Version 1.1					
Group	Class	Sub class	Order	Title	Crop type*
3					
	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 & mangosteens*	P
		3.01.07		▸ *Papayas*	P
		3.01.08		▸ *Pineapples*	P
		3.01.90		▸ *Other tropical & subtropical fruits, n.e.c.*	P
	3.02			**Citrus fruits**	**P**
		3.02.01		▸ *Grapefruit & pomelo*	P
		3.02.02		▸ *Lemons & 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 & sour cherries*	P
		3.05.05		▸ *Peaches & nectarines*	P
		3.05.06		▸ *Pears & quinces*	P
		3.05.08		▸ *Plums & sloes*	P
		3.05.90		▸ *Other pome fruits & 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

Indicative Crop Classification Version 1.1					
Group	Class	Sub class	Order	Title	Crop type*
	3.90			**Other fruits, n.e.c.**	**P**
4				**Oilseed crops and oleaginous fruits**	
	4.01			**Soybean**	**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		▸ *Tallowtree*	T
		4.03.90		▸ *Other temporary oilseed crops, n.e.c.*	T
	4.04			**Permanent oilseed crops**	**P**
		4.04.01		▸ *Coconuts*	P
		4.04.02		▸ *Olives*	P
		4.04.03		▸ *Oil palms*	P
		4.04.90		▸ *Other oleaginous fruits, n.e.c.*	P
5				**Root/tuber crops with high starch or inulin content**	**T**
	5.01			**Potatoes**	**T**
	5.02			**Sweet potatoes**	**T**
	5.03			**Cassava**	**T**
	5.04			**Yams**	**T**
	5.05			**Taro**	**T**
	5.06			**Yautia**	**T**
	5.90			**Other roots & 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 & 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

Indicative Crop Classification Version 1.1					
Group	Class	Sub class	Order	Title	Crop type*
			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 & other similar crops	T
			9.02.01.04	▪ Flax	T
			9.02.01.05	▪ Hemp	T
			9.02.01.90	▪ Other temporary fibre crops, n.e.c.	T
		9.02.02		▸ *Permanent fibre crops*	P
			9.02.02.01	▪ Ramie	P
			9.02.02.02	▪ Sisal	P
			9.02.02.90	▪ Other permanent fibre crops, n.e.c.	P
	9.03			**Medicinal, pesticidal or similar crops**	
		9.03.01		▸ *Temporary medicinal, pesticidal or similar crops*	T
			9.03.01.01	▪ Mint	T
			9.03.01.02	▪ Basil	T
			9.03.01.90	▪ Other temporary medicinal, pesticidal or similar crops	T

Indicative Crop Classification Version 1.1					
Group	Class	Sub class	Order	Title	Crop type*
		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 crops	P
	9.04			**Rubber**	**P**
	9.05			**Flower crops**	
		9.05.01		▸ *Temporary flower crops*	T
		9.05.02		▸ *Permanent flower crops*	P
	9.06			**Tobacco**	**T**
	9.90			**Other crops, n.e.c.**	
		9.90.01		▸ *Other crops, n.e.c. – temporary*	T
		9.90.02		▸ *Other crops, n.e.c. – permanent*	P

*T = temporary, P = permanent.

ANNEX 1-3: CENTRAL PRODUCT CLASSIFICATION REVISION 2.1 (CPC REV.2.1) EXPANDED FOR AGRICULTURAL STATISTICS AND FOR USE IN AGRIS

Sources: https://unstats.un.org/unsd/cr/downloads/CPCv2.1_complete%28PDF%29_English.pdf
(in the above link, section C of part 5, Alternative structures contains the CPC Rev.2.1 with official expansions for agricultural statistics).

The CPC is a comprehensive classification of products into a system of categories that are both exhaustive and mutually exclusive. It is based on a set of internationally agreed concepts, definitions, principles and classification rules. The term "products" follows the SNA definition: all output of economic activities that can be the object of domestic or international transactions or that can be entered into stocks, including transportable goods, nontransportable goods, services and other products. The CPC is highly compatible with the HS and ISIC:

- HS subheadings are used as building blocks for the goods part of the CPC, because the HS is a detailed classification of transportable goods that is accepted for use in international trade statistics by all countries; and
- alignment with ISIC is ensured because the CPC classifies products on the basis of the products' physical properties and intrinsic nature, as well as of the principle of industrial origin (although the products may sometimes be outputs of several ISIC industries).

The CPC is a general-scope classification, meaning that it covers products of all economic activities (and is therefore not sector-specific) but can be customized for sectoral applications; it is also a general-purpose classification, meaning that it can be applied in fields ranging from production to trade, prices and consumption (GSARS, 2015a).

AGRIS uses the latest version of the CPC (Ver.2.1) except for crops grown for which the ICC ver. 1.1 is used.

There are two types of expansions to the CPC that have provided more detail within the classification categories. This increased detail is required for various applications within the context of agricultural statistics, and are relevant for the purposes of AGRIS. The expansions are:

- The latest version of the CPC (Ver.2.1) includes a number of alternative structures for specific applications. The official annex developed by FAO to meet the needs of agricultural statistics is called the *CPC expanded for agricultural statistics*. This expansion appears as two digits after a decimal following the subclass level of the standard CPC (see case 2 in the table below for details on the numbering within the classification which reflects this expansion).
- There are further expansions for Division 02 – Live animals and animal products (excluding meat), Group 021 – Live animals, to meet the needs of AGRIS modules. The expanded code set provides additional detail on the type of livestock raised and is obtained by adding a capital letter as: (a) the sixth digit after the lower level (subclass) of the standard CPC (case 3 in the table below), or (b) the eighth digit after the official expanded CPC for agricultural statistics (case 4 in the table below). These cases provide details on the numbering within the classification which reflect this expansion.

How the CPC code has been expanded to accommodate FAO detail and AGRIS detail									
	CPC (Ver.2.1)						Expansions		
Number of digits →	1	2	3	4	5	.	6	7	8
CASE 1 – CPC Ver.2.1	Section	Division	Group	Class	Subclass				
CASE 2 – CPC Ver.2.1 Official expansion for agricultural statistics	Section	Division	Group	Class	Subclass		**Official CPC expansion for agricultural statistics (01, 02, 03, etc.)**		
CASE 3 – CPC Ver.2.1 expanded for AGRIS	Section	Division	Group	Class	Subclass		**AGRIS detail (A, B, C, etc.)**		
CASE 4 – CPC Ver.2.1 with official expansions for agricultural statistics and further expanded for AGRIS	Section	Division	Group	Class	Subclass		**Official CPC expansion for agricultural statistics (01, 02, 03, etc.)**		**AGRIS detail (A, B, C, etc.)**

CPC VER.2.1 expanded for agricultural statistics and for use in AGRIS

Legend for the use of colour in the table:
Orange text is the expanded CPC Version 2.1 classification with official expansions for use in agricultural statistics
Green text is the expansion for use in AGRIS

Note that Section 0 (Agriculture, forestry and fishery products), Division 01 (Products of agriculture, horticulture and market gardening) is presented in the table below for completeness; however, the collection and dissemination of AGRIS crop data are based on the Indicative Crop Classification Version 1.1 (ICC 1.1), as presented in Annex 1-2.

CPC VER.2.1 expanded for agricultural statistics and for use in AGRIS						
Section	Division	Group	Class	Sub-Class	Additional expansions	Description
0						**Agriculture, forestry and fishery products**
0	**01**					**Products of agriculture, horticulture and market gardening**
0	**01**	**011**				**Cereals**
						Wheat
			0111	01111		Wheat, seed
				01112		Wheat, other
						Maize (corn)
			0112	01121		Maize (corn), seed
				01122		Maize (corn), other
						Rice
			0113	01131		Rice, seed
				01132		Rice paddy, other (not husked)
						Sorghum
			0114	01141		Sorghum, seed
				01142		Sorghum, other

CPC VER.2.1 expanded for agricultural statistics and for use in AGRIS						
Section	Division	Group	Class	Sub-Class	Additional expansions	Description
						Barley
			0115	01151		Barley, seed
				01152		Barley, other
						Rye
			0116	01161		Rye, seed
				01162		Rye, other
						Oats
			0117	01171		Oats, seed
				01172		Oats, other
						Millet
			0118	01181		Millet, seed
				01182		Millet, other
			0119			Other cereals
				01191		Triticale
				01192		Buckwheat
				01193		Fonio
				01194		Quinoa
				01195		Canary seed
				01199		Other cereals n.e.c.
					01199.01	Teff
					01199.02	Mixed grain
					01199.90	Cereals n.e.c.
0	**01**	**012**				**Vegetables**
						Leafy or stem vegetables
				01211		Asparagus
				01212		Cabbages
				01213		Cauliflowers and broccoli
			012	01214		Lettuce and chicory
				01215		Spinach
				01216		Artichokes
				01219		Other leafy or stem vegetables
					01219.01	Cassava leaves
					01219.90	Other leafy or stem vegetables n.e.c.
			01221			Melons
				01221		Watermelons
				01229		Cantaloupes and other melons
			0123			Fruit-bearing vegetables
				01231		Chillies and peppers, green (Capsicum spp. and Pimenta spp.)
				01232		Cucumbers and gherkins
				01233		Eggplants (aubergines)
				01234		Tomatoes
				01235		Pumpkins, squash and gourds

CPC VER.2.1 expanded for agricultural statistics and for use in AGRIS						
Section	Division	Group	Class	Sub-Class	Additional expansions	Description
						Other fruit-bearing vegetables
				01239	01239.01	Okra
					01239.90	Other fruit-bearing vegetables n.e.c.
						Green leguminous vegetables
						Beans, green
				01241	01241.01	String beans
			0124		01241.90	Other beans, green
				01242		Peas, green
				01243		Broad beans and horse beans, green
				01249		Other green leguminous vegetables
						Root, bulb or tuberous vegetables
				01251		Carrots and turnips
				01252		Green garlic
						Onions
			0125	01253	01253.01	Onions and shallots, green
					01253.02	Onions and shallots, dry (excluding dehydrated)
				01254		Leeks and other alliaceous vegetables
				01259		Other root, bulb and tuberous vegetables, n.e.c.
			0126	01260		Vegetable seeds, except beet seeds
			0127	01270		Mushrooms and truffles
						Vegetables, fresh, n.e.c.
			0129	01290	01290.01	Green corn (maize)
					01290.90	Other vegetables, fresh n.e.c.
0	**01**	**013**				**Fruit and nuts**
						Tropical and subtropical fruits
				01311		Avocados
						Bananas
				01312	01312.01	Bananas Cavendish
					01312.02	Other bananas (excluding Cavendish and cooking bananas)
						Plantains and others
				01313	01313.01	Plantains
					01313.02	Cooking bananas
			0131	01314		Dates
				01315		Figs
				01316		Mangoes, guavas, mangosteens
					01316.01	Mangoes
					01316.02	Guavas
					01316.03	Mangosteens
				01317		Papayas
				01318		Pineapples
				01319		Other tropical and subtropical fruits, n.e.c.

CPC VER.2.1 expanded for agricultural statistics and for use in AGRIS						
Section	Division	Group	Class	Sub-Class	Additional expansions	Description
						Citrus fruits
				01321		Pomelos and grapefruits
				01322		Lemons and limes
				01323		Oranges
			0132			Tangerines, mandarins, clementines
				01324	01324.01	Tangerines and mandarins
					01324.02	Clementines
				01329		Other citrus fruit, n.e.c.
			0133	01330		Grapes
						Pome fruits and stone fruits
				01341		Apples
						Pears and quinces
				01342	01342.01	Pears
					01342.02	Quinces
				01343		Apricots
						Cherries
			0134	01344	01344.01	Sour cherries
					01344.02	Cherries
				01345		Peaches and nectarines
				01346		Plums and sloes
						Other pome fruits and stone fruits
				01349	01349.10	Other pome fruits
					01349.20	Other stone fruits
						Berries and other fruits
						Currants and gooseberries
				01351	01351.01	Currants
					01351.02	Gooseberries
				01352		Kiwi fruit
				01353		Raspberries, blackberries, mulberries and loganberries
					01353.01	Raspberries
					01353.02	Blackberries, mulberries and loganberries
				01354		Strawberries
			0135			Other berries; fruits of the genus Vaccinium
					01355.01	Blueberries
				01355	01355.02	Cranberries
					01355.90	Other berries and fruits of the genus Vaccinium n.e.c.
				01356		Locust beans (carobs)
						Other fruits n.e.c.
				01359	01359.01	Persimmons
					01359.02	Cashewapple
					01359.90	Other fruits, n.e.c.
			0136	01360		Fruit seeds

CPC VER.2.1 expanded for agricultural statistics and for use in AGRIS						
Section	**Division**	**Group**	**Class**	**Sub-Class**	**Additional expansions**	**Description**
						Nuts (excluding wild edible nuts and groundnuts), in shell
				01371		Almonds, in shell
				01372		Cashew nuts, in shell
				01373		Chestnuts, in shell
				01374		Hazelnuts, in shell
				01375		Pistachios, in shell
			0137	01376		Walnuts, in shell
				01377		Brazil nuts, in shell
						Other nuts (excluding wild edible nuts and groundnuts), in shell
				01379	01379.01	Areca nuts
					01379.02	Kola nuts
					01379.90	Other nuts (excluding wild edible nuts and groundnuts), in shell, n.e.c.
0	**01**	**014**				**Oilseeds and oleaginous fruits**
			0141			Soya beans
				01411		Soya beans, seed for planting
				01412		Soya beans, other
						Groundnuts, excluding shelled
			0142	01421		Groundnuts, seed for planting
				01422		Groundnuts in shell
						Cottonseed
			0143	01431		Cottonseed, seed for planting
				01432		Cottonseed, other
						Other oilseeds
				01441		Linseed
				01442		Mustard seed
				01443		Rapeseed or colza seed
				01444		Sesame seed
				01445		Sunflower seed
			0144	01446		Safflower seed
				01447		Castor oil seeds
				01448		Poppy seed
						Other oil seeds, n.e.c.
				01449	01449.01	Melonseed
					01449.02	Hempseed
					01449.90	Other oil seeds, n.e.c.
			0145	01450		Olives
			0146	01460		Coconuts, in shell

CPC VER.2.1 expanded for agricultural statistics and for use in AGRIS						
Section	**Division**	**Group**	**Class**	**Sub-Class**	**Additional expansions**	**Description**
						Other oleaginous fruits
						Palm nuts and kernels
				01491	01491.01	Oil palm fruit
					01491.02	Palm kernels
				01492		Copra
			0149			Other oleaginous fruits, n.e.c.
					01499.01	Karite nuts (sheanuts)
					01499.02	Tung nuts
				01499	01499.03	Jojoba seeds
					01499.04	Tallowtree seeds
					01499.05	Kapok fruit
					01499.90	Other oleaginous fruits, n.e.c.
0	**01**	**015**				**Edible roots and tubers with high starch or inulin content**
			0151	01510		Potatoes
						Cassava
			0152	01520	01520.01	Cassava, fresh
					01520.02	Cassava, dry
			0153	01530		Sweet potatoes
			0154	01540		Yams
			0155	01550		Taro
						Other edible roots and tubers with high starch or inulin content
			0159	01591		Yautia
				01599		Other edible roots and tubers with high starch or inulin content, n.e.c.
0	**01**	**016**				**Stimulant, spice and aromatic crops**
			0161	01610		Coffee, green
						Tea leaves
			0162	01620	01620.01	Green tea
					01620.02	Black tea
			0163	01630		Maté leaves
			0164	01640		Cocoa beans

CPC VER.2.1 expanded for agricultural statistics and for use in AGRIS						
Section	**Division**	**Group**	**Class**	**Sub-Class**	**Additional expansions**	**Description**
						Spice and aromatic crops, raw
				01651		Pepper (Piper spp.), raw
				01652		Chillies and peppers, dry (Capsicum spp. and Pimenta spp.), raw
				01653		Nutmeg, mace, cardamoms, raw
			0165	01654		Anise, badian, coriander, cumin, caraway, fennel and juniper berries, raw
				01655		Cinnamon and cinnamon-tree flowers, raw
				01656		Cloves (whole stems), raw
				01657		Ginger, raw
				01658		Vanilla, raw
				01659		Hop cones
						Stimulant, spice and aromatic crops, n.e.c.
			0169	01691		Chicory roots
				01699		Other stimulant, spice and aromatic crops, n.e.c.
0	**01**	**017**				**Pulses (dried leguminous vegetables)**
						Pulses (dried leguminous vegetables)
				01701		Beans, dry
				01702		Broad beans and horse beans, dry
				01703		Chick peas, dry
				01704		Lentils, dry
				01705		Peas, dry
			0170	01706		Cow peas, dry
				01707		Pigeon peas, dry
				01708		Bambara beans, dry
				01709		Pulses, n.e.c.
					01709.01	Vetches
					01709.02	Lupins
					01709.90	Other pulses n.e.c.
0	**01**	**018**				**Sugar crops**
						Sugar crops
				01801		Sugar beet
			0180	01802		Sugar cane
				01803		Sugar beet seeds
				01809		Other sugar crops n.e.c.
0	**01**	**019**				**Forage products; fibre crops; plants used in perfumery, pharmacy, or for insecticidal, fungicidal or similar purposes; beet, forage plant and flower seeds; natural rubber; living plants, cut flowers and flower buds; unmanufactured tobacco; other raw vegetable materials**

CPC VER.2.1 expanded for agricultural statistics and for use in AGRIS						
Section	Division	Group	Class	Sub-Class	Additional expansions	Description
			0191			Forage products
				01911		Maize for forage
				01912		Alfalfa for forage
				01913		Cereal straw, husks, unprepared, ground, pressed, or in the form of pellets
				01919		Forage products, n.e.c.
					01919.01	Sorghum, for forage
					01919.02	Rye grass, for forage
					01919.03	Clover, for forage
					01919.90	Other forage products
			0192			Fibre crops
				01921		Cotton, whether or not ginned
					01921.01	Seed cotton, unginned
					01921.02	Cotton lint, ginned
				01922		Jute, kenaf, and other textile bast fibres, raw or retted, except flax, true hemp and ramie
					01922.01	Jute, raw or retted
					01922.02	Kenaf, and other textile bast fibres, raw or retted
				01929		Other fibre crops, raw, n.e.c.
					01929.01	Flax, raw or retted
					01929.02	True hemp, raw or retted
					01929.03	Kapok fibre, raw
					01929.04	Ramie, raw or retted
					01929.05	Sisal, raw
					01929.06	Agave fibres, raw, n.e.c.
					01929.07	Abaca, manila hemp, raw
					01929.08	Coir, raw
					01929.90	Other fibre crops, raw, n.e.c.
			0193	01930		Plants and parts of plants used primarily in perfumery, in pharmacy, or for insecticidal, fungicidal or similar purposes
					01930.01	Peppermint, spearmint
					01930.02	Pyrethrum, dried flowers
					01930.03	Pyrethrum marc
					01930.04	Tea n.e.c. (herbal tea)
					01930.90	Other plants and parts of plants used primarily in perfumery, in pharmacy, or for insecticidal, fungicidal or similar purposes, n.e.c.
			0194	01940		Beet seeds (excluding sugar beet seeds) and seeds of forage plants

CPC VER.2.1 expanded for agricultural statistics and for use in AGRIS						
Section	Division	Group	Class	Sub-Class	Additional expansions	Description
			0195	01950		Natural rubber in primary forms or in plates, sheets or strip
					01950.01	Natural rubber in primary forms
					01950.02	Natural rubber in other forms
			0196			Living plants; cut flowers and flower buds; flower seeds
				01961		Live plants; bulbs, tubers and roots; cuttings and slips; mushroom spawn
				01962		Cut flowers and flower buds including bouquets, wreaths, floral baskets and similar articles
				01963		Flower seeds
			0197	01970		Unmanufactured tobacco
			0199	01990		Other raw vegetable materials, n.e.c.
0	**02**					**Live animals and animal products (excluding meat)**
0	**02**	**021**				**Live animals**
			0211			Bovine animals, live
				02111		Cattle
					02111.A	Dairy cow
					02111.B	Other cow
					02111.C	Cattle less than one year old
					02111.D	Other cattle (bulls, etc.)
				02112		Buffalo
					02112.A	Dairy females
					02112.B	Other females
					02112.C	Buffaloes less than one year old
					02112.D	Other buffaloes (bulls, etc.)
				02119		Other bovine animals

CPC VER.2.1 expanded for agricultural statistics and for use in AGRIS						
Section	Division	Group	Class	Sub-Class	Additional expansions	Description
						Other ruminants
				02121		Camels and camelids
					02121.01	Camels
					02121.02	Other camelids
					02121.02.A	Llamas and vicugnas
					02121.02.B	Other camels and camelids
						Sheep
					02122.A	Dairy females
			0212	02122	02122.B	Other females
					02122.C	Sheep less than one year old
					02122.D	Other sheep (rams, etc.)
						Goats
					02123.A	Dairy females
				02123	02123.B	Other females
					02123.C	Goats less than one year old
					02123.D	Other goats (bucks, etc.)
				02129		Other ruminants, n.e.c.
						Horses and other equines
						Horses
					02131.A	Saddle or racing mares
				02131	02131.B	Other mares
			0213		02131.C	Saddle or racing horses (excluding mares)
					02131.D	Other horses (excluding mares)
				02132		Asses
				02133		Mules and hinnies
						Swine / pigs
					02140.A	Piglets
			0214	02140	02140.B	Breeding sows
					02140.C	Other pigs (boars, etc.)
						Poultry
						Chickens
					02151.A	Broilers
				02151	02151.B	Laying hens
			0215		02151.C	Other chickens
				02152		Turkeys
				02153		Geese
				02154		Ducks
				02155		Guinea fowls

CPC VER.2.1 expanded for agricultural statistics and for use in AGRIS						
Section	Division	Group	Class	Sub-Class	Additional expansions	Description
						Other live animals
						Rabbits and hares
				02191	02191.A	Rabbits - Breeding females
					02191.B	Rabbits - other
			0219	02192		Other mammals
				02193		Ostriches and emus
				02194		Other birds
				02195		Reptiles
				02196		Bees
				02199		Other live animals
0	**02**	**022**				**Raw milk**
						Raw milk from bovine animals
			0221	02211		Raw milk of cattle
				02212		Raw milk of buffalo
						Other raw milk
				02291		Raw milk of sheep
			0229	02292		Raw milk of goats
				02293		Raw milk of camel
				02299		Other raw milk n.e.c.
0	**02**	**023**				**Eggs of hens or other birds in shell, fresh**
			0231			Hen eggs in shell, fresh
				02311		Hen eggs in shell fresh, for hatching
				02312		Other hen eggs in shell fresh
			0232			Eggs from other birds in shell, fresh, n.e.c.
				02321		Eggs from other birds in shell fresh, for hatching
				02322		Other eggs from other birds fresh in shell
0	**02**	**024**				**Reproductive materials of animals**
						Semen
			0241	02411		Bovine semen
				02419		Semen, n.e.c.
			0242	02420		Embryos
0	**02**	**029**				**Other animal products**
			0291	02910		Natural honey
			0292	02920		Snails, fresh, chilled, frozen, dried, salted or in brine, except sea snails
			0293	02930		Edible products of animal origin n.e.c.

CPC VER.2.1 expanded for agricultural statistics and for use in AGRIS						
Section	Division	Group	Class	Sub-Class	Additional expansions	Description
						Raw animal materials used in textiles
				02941		Shorn wool, greasy, including fleece-washed shorn wool
				02942		Pulled wool, greasy, including fleece-washed pulled wool; coarse animal hair
			0294		02942.01	Pulled wool, greasy, including fleece-washed pulled wool
					02942.02	Coarse goat hair
					02942.90	Other coarse animal hair
				02943		Fine animal hair, not carded or combed
					02943.01	Fine goat hair
					02943.90	Fine animal hair, n.e.c.
				02944		Silk-worm cocoons suitable for reeling
						Hides, skins and furskins, raw
				02951		Raw hides and skins of bovine animals
					02951.01	Raw hides and skins of cattle
					02951.02	Raw hides and skins of calves
					02951.03	Raw hides and skins of buffaloes
					02951.90	Other raw hides and skins of bovine animals
				02952		Raw hides and skins of equine animals
					02952.01	Raw hides and skins of horses
					02952.02	Raw hides and skins of asses
					02952.03	Raw hides and skins of mules
					02952.90	Other raw hides and skins of equine animals
				02953		Raw hides and skins of sheep or lambs
			0295		02953.01	Raw hides and skins of sheep or lambs, with wool
					02953.02	Raw hides and skins of sheep or lambs, without wool
				02954		Raw hides and skins of goats or kids
				02955		Raw furskins
					02955.01	Karakul skins
					02955.02	Rabbit skins
					02955.90	Other raw furskins
				02959		Raw skins of other animals
					02959.01	Raw skins of swine
					02959.02	Raw skins of camels
					02959.90	Other raw skins of other animals
				02960		Insect waxes and spermaceti, whether or not refined or coloured
			0296		02960.01	Beeswax
					02960.02	Spermaceti
					02960.90	Other insect waxes

CPC VER.2.1 expanded for agricultural statistics and for use in AGRIS						
Section	Division	Group	Class	Sub-Class	Additional expansions	Description
2						**Food products, beverages and tobacco; textiles, apparel and leather products**
2	**21**					**Meat, fish, fruits, vegetables, oils and fats**
2	**21**	**211**				**Meat and meat products**
			2111			Meat of mammals, fresh or chilled
			2112			Meat of poultry, fresh or chilled
			2113			Meat of mammals, frozen
			2114			Meat of poultry, frozen
			2115			Edible offal of mammals, fresh, chilled or frozen
			2116			Edible offal of poultry, fresh, chilled or frozen
			2117			Other meat and edible offal, fresh, chilled or frozen
			2118			Preserves and preparations of meat, meat offal or blood
			2119			Flours, meals and pellets of meat or meat offal, inedible; greaves
2	**21**	**213**				**Prepared and preserved vegetables, pulses and potatoes**
2	**21**	**214**				**Prepared and preserved fruits and nuts**
2	**21**	**215**				**Animal fats**
			2151			Animal fats, unrendered
			2152			Animal fats, rendered
			2159			Animal fats and their fractions, partly or wholly hydrogenated, inter-esterified, re-esterified or elaidinised, whether or not refined, but not further prepared
2	**21**	**216**				**Vegetable oils**
			2161			Soya bean oil
			2162			Groundnut oil
			2163			Sunflower-seed and safflower-seed oil
			2164			Rape, colza and mustard oil
			2165			Palm oil
			2166			Coconut oil
			2167			Olive oil
			2168			Cottonseed oil
			2169			Other vegetable oils, n.e.c.
2	**22**					**Dairy products and egg products**
2	**22**	**221**				**Processed liquid Milk, cream and Whey**
			2211			Processed liquid milk
			2212			Cream, fresh
			2213			Whey
2	**22**	**222**				**Other dairy products**
			2221			Milk and cream in solid forms

CPC VER.2.1 expanded for agricultural statistics and for use in AGRIS						
Section	Division	Group	Class	Sub-Class	Additional expansions	Description
			2222			Milk and cream, concentrated or containing added sugar or other sweetening matter, other than in solid forms
			2223			Yoghurt and other fermented or acidified milk and cream
			2224			Butter and other fats and oils derived from milk
			2225			Cheese, fresh or processed
			2226			Casein
			2227			Ice cream and other edible ice
			2229			Dairy products n.e.c.
2	**23**					**Grain mill products, starches and starch products; other food products**
2	**23**	**231**				**Grain mill products**
			2311			Wheat and meslin flour
			2312			Other cereal flours
			2313			Groats, meal and pellets of wheat and other cereals
			2314			Other cereal grain products (including corn flakes)
			2316			Rice, semi- or wholly milled, or husked
			2317			Other vegetable flours and meals
			2318			Mixes and doughs for the preparation of bakers' wares
2	**23**	**239**				**Food products n.e.c.**
			2391			Coffee and tea
			2392			Spices and aromatics, processed
			2399			Other food products
2	**24**					**Beverages**
2	**24**	**242**				**Wines**
			2421			Wine of fresh grapes, whether or not flavoured; grape must
			2422			Vermouth and other wine of fresh grapes flavoured with plants or aromatic substances
			2423			Cider, perry, mead and other fermented beverages, except wine of fresh grapes and beer made from malt
2	**25**					**Tobacco products**
2	**25**	**250**				**Tobacco products**
			2501			Cured stemmed/stripped tobacco leaves
			2502			Cigars, cheroots, cigarillos and cigarettes of tobacco or tobacco substitutes

CPC VER.2.1 expanded for agricultural statistics and for use in AGRIS						
Section	**Division**	**Group**	**Class**	**Sub-Class**	**Additional expansions**	**Description**
			2509			Other manufactured tobacco and manufactured tobacco substitutes; "homogenized" or "reconstituted" tobacco; tobacco extracts and essences
2	**26**					**Yarn and thread; woven and tufted textile fabrics**
2	**26**	**261**				**Natural textile fibres prepared for spinning**
			2611			Raw silk (not thrown)
			2613			Wool, degreased or carbonized, not carded or combed
			2614			Noils of wool or of fine animal hair
			2615			Wool and fine or coarse animal hair, carded or combed
			2616			Cotton, carded or combed
			2617			Jute and other textile bast fibres (except flax, true hemp and ramie), processed but not spun; tow and waste of these fibres
			2619			Other vegetable textile fibres, processed but not spun; tow and waste of these fibres
2	**26**	**263**				**Textile yarn and thread of natural fibres**
			2631			Silk yarn and yarn spun from silk waste; silk-worn gut
			2632			Yarn of wool, containing 85% or more by weight of wool, not put up for retail sale
			2633			Yarn of wool, containing less than 85% by weight of wool, not put up for retail sale
			2634			Yarn of wool, not put up for retail sale; yarn of fine or coarse animal hair or of horse hair (including gimped horsehair yarn), whether or not put up for retail sale
			2635			Cotton sewing thread
			2636			Cotton yarn (other than sewing thread), containing 85% or more by weight of cotton
			2637			Cotton yarn (other than sewing thread), containing less than 85% by weight of cotton
			2638			Yarn of vegetable textile fibres other than cotton (including flax, jute, coir and true hemp); paper yarn
2	26	265				Woven fabrics (except special fabrics) of natural fibres other than cotton
			2651			Woven fabrics of silk or of silk waste
			2652			Woven fabrics of carded wool or of carded fine animal hair, containing 85% or more by weight of wool or fine animal hair

CPC VER.2.1 expanded for agricultural statistics and for use in AGRIS						
Section	**Division**	**Group**	**Class**	**Sub-Class**	**Additional expansions**	**Description**
			2653			Woven fabrics of combed wool or of combed fine animal hair, containing 85% or more by weight of wool or fine animal hair
			2654			Woven fabrics of wool or fine animal hair, containing less than 85% by weight of wool or fine animal hair
			2655			Woven fabrics of coarse animal hair or of horsehair
			2656			Woven fabrics of flax
			2657			Woven fabrics of jute and other textile bast fibres (except flax, true hemp and ramie)
			2659			Woven fabrics of other vegetable textile fibres; woven fabrics of paper yarn
2	**26**	**266**				**Woven fabrics (except special fabrics) of cotton**
			2661			Woven fabrics of cotton, containing 85% or more by weight of cotton, weighing not more than 200 g/m2
			2662			Woven fabrics of cotton, containing 85% or more by weight of cotton, weighing more than 200 g/m2
			2663			Woven fabrics of cotton, containing less than 85% by weight of cotton, mixed mainly or solely with man-made fibres
			2669			Other woven fabrics of cotton
2	**26**	**268**				**Special fabrics**
			2681			Woven pile fabrics and chenille fabrics (other than terry towelling and narrow fabrics) of cotton
			2682			Woven pile fabrics and chenille fabrics (other than terry towelling and narrow fabrics) of man-made fibres
			2683			Other woven pile fabrics and chenille fabrics (other than terry towelling and narrow fabrics)
			2684			Terry towelling and similar woven terry fabrics (other than narrow fabrics) of cotton
			2685			Other terry towelling and similar woven terry fabrics (other than narrow fabrics)
			2686			Gauze (other than narrow fabrics)
			2688			Tufted textile fabrics, other than carpets
			2689			Woven fabrics (including narrow fabrics) of glass fibres

CPC VER.2.1 expanded for agricultural statistics and for use in AGRIS						
Section	Division	Group	Class	Sub-Class	Additional expansions	Description
2	27					**Textile articles other than apparel**
2	27	271				**Made-up textile articles**
			2711			Blankets and travelling rugs (except electric blankets)
			2712			Bed linen, table linen, toilet linen and kitchen linen
			2713			Curtains (including drapes) and interior blinds; curtain or bed valances
			2714			Other furnishing articles n.e.c.; sets of woven fabric and yarn for making up into rugs, tapestries, embroidered table cloths or serviettes, or similar textile articles, put up in packings for retail sale
			2715			Sacks and bags, of a kind used for the packing of goods
			2716			Tarpaulins, sails for boats etc., awnings, sunblinds, tents and camping goods (including pneumatic mattresses)
			2717			Parachutes
			2718			Quilts, eiderdowns, cushions, pouffes, pillows, sleeping bags and the like, fitted with springs or stuffed or internally fitted with any material or of cellular rubber or plastics
			2719			Other made-up textile articles (including floor-cloths, dish-cloths, dusters and similar cleaning cloths, life-jackets and life-belts)
2	27	272				**Carpets and other textile floor coverings**
			2721			Carpets and other textile floor coverings, knotted
			2722			Carpets and other textile floor coverings, woven, not tufted or flocked
			2723			Carpets and other textile floor coverings, tufted
			2729			Other carpets and textile floor coverings (including those of felt)
2	27	273				**Twine, cordage, ropes and cables and articles thereof (including netting)**
			2731			Twine, cordage, rope and cables
			2732			Knotted netting of twine, cordage or rope; made up nets of textile materials; articles of yarn, strip, twine, cordage, rope or cables n.e.c.
2	27	279				**Textiles n.e.c.**
			2791			Tulles, lace, narrow woven fabrics, trimmings and embroidery
			2792			Felt and nonwovens
			2799			Other textile articles
2	28					**Knitted or crocheted fabrics; wearing apparel**

CPC VER.2.1 expanded for agricultural statistics and for use in AGRIS						
Section	Division	Group	Class	Sub-Class	Additional expansions	Description
2	**28**	**281**				**Knitted or crocheted fabrics**
			2811			Pile fabrics and terry fabrics, knitted or crocheted
			2819			Other knitted or crocheted fabrics
2	**28**	**282**				**Wearing apparel, except fur apparel**
			2821			Panty hose, tights, stockings, socks and other hosiery, knitted or crocheted
			2822			Wearing apparel, knitted or crocheted
			2823			Wearing apparel, of textile fabric, not knitted or crocheted; brassieres, corsets, suspenders and similar articles, whether or not knitted or crocheted
			2824			Apparel and clothing accessories, of leather, composition leather or plastics
			2825			Garments made up of felt or nonwovens; garments made up of textile fabrics impregnated or coated with plastics, rubber or other materials
			2826			Hats and headgear
2	**28**	**283**				**Tanned or dressed furskins and artificial fur; articles thereof (except headgear)**
			2831			Tanned or dressed furskins
			2832			Articles of apparel, clothing accessories and other articles of furskin (except headgear)
			2833			Artificial fur and articles thereof (except headgear)
2	**29**					**Leather and leather products; footwear**
2	**29**	**291**				**Tanned or dressed leather; composition leather**
			2911			Chamois leather; patent leather and patent laminated leather; metallized leather
			2912			Other leather, of bovine or equine animals, without hair on
			2913			Other leather, without hair on (including sheep, lamb, goat or kid skin leather); composition leather with a basis of leather or leather fibre
2	**29**	**292**				**Luggage, handbags and the like; saddlery and harness; other articles of leather**

CPC VER.2.1 expanded for agricultural statistics and for use in AGRIS						
Section	Division	Group	Class	Sub-Class	Additional expansions	Description
			2921			Saddlery and harness, for any animal, of any material
			2922			Luggage, handbags and the like, of leather, composition leather, plastic sheeting, textile materials, vulcanized fibre or paperboard; travel sets for personal toilet, sewing or shoe or clothes cleaning
			2923			Watch straps, except of metal
			2929			Other articles of leather or composition leather (including articles of a kind used in machinery or mechanical appliances or for other technical uses) n.e.c.

ANNEX 1-4: SYSTEM OF NATIONAL ACCOUNTS 2008 (SNA 2008)

Source: https://unstats.un.org/unsd/nationalaccount/docs/SNA2008.pdf.

a) System of National Accounts 2008

The System of National Accounts (SNA) 2008 provides a standard national accounting framework for reporting national income and product statistics. International standards for concepts, definitions and classifications are presented by the United Nations (UNSD, 2009).

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 crops on a significant scale is considered to be two establishments, corresponding to the two types of activities.

Under the SNA, an establishment in the agricultural industry (ISIC groups 011, 012, 013, 014 and 015) is one whose principal activity falls within one of the designated ISIC groups. Such an establishment may also have a secondary activity that is 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 (FAO, 2015, annex 1).

b) Household and non-household sectors in SNA 2008

The concept of “agricultural holding” is closely related to the concept of “household”. “The concept of “household” is based on the arrangements made by persons, individually or in groups, for providing themselves with food and other essentials for living. A household may be either (a) a one- person household, that is to say, a person who makes provision for his or her own food and other essentials for living without combining with any other person to form a multi-person household; or (b) a multiperson household, that is to say, a group of two or more persons living together who make common provision for food and other essentials for living. The persons in the group may pool their resources and may have a common budget; and they may be related or unrelated persons, or constitute a combination of persons both related and unrelated.” (UNSD, 2015b; FAO, 2015).

The SNA defines the household in a similar way. Households may take a wide variety of forms in different societies or cultures depending on tradition, religion, education, climate, geography, history and other socio-economic factors. The SNA recognizes the importance of deferring to country survey statisticians in defining a household within a given country because it is likely to approximate closely to the concept of a household as defined in the SNA.

The SNA 2008 defines the household and non-household sectors from a production perspective as follows: (i) households without production activity; (ii) households with unincorporated enterprises; and (iii) households with quasi-corporations. Only households with unincorporated enterprises are included in the household sector, while those with quasi-corporations are classified in the non-household sector.

Unincorporated household enterprises (UNSD, 2009, p. 4.155 to 4.156)

Households may undertake agricultural activities and produce agricultural products for their own consumption, for barter, and for the market. They can range from a single person to a large enterprise employing people outside the household. The unincorporated household enterprise can also include partnerships where the partners belong to different households. When the liability of the partners for the debts of the enterprises is unlimited, the partnership must be treated as an unincorporated enterprise and remain within the household sector, as all of the assets of the household, including the dwelling itself, are at risk if the enterprise goes bankrupt. Partnerships whose partners enjoy limited liability are effectively separate legal entities and are treated as corporations.

Household with quasi-corporation (UNSD, 2009, p. 4.42–4.43 and 4.156–4.157)

The SNA 2008 (UNSD, 2009, p. 4.42–4.43 and 4.156–4.157) recognizes the existence of households as quasi-corporations. All household enterprises that can be treated as quasi-corporations are classified in the corporation sector and are therefore excluded from the household sector. These are households with agricultural activities which are operated and behave like privately owned corporations, even if they are not effectively separated legal entities. They should be treated as quasi-corporations provided that complete sets of accounts are available or can be compiled if requested.

The distinction between holdings in the household and non-household sectors will follow current practices in individual countries, using the variables related to the legal status of the holder and to the legal status of the holding (see section 3.2 of the Core Module). In practice, many countries define the holdings in the household sector as those where the holder is a civil (natural) person or group of civil (natural) persons. However, in some cases, a combination of the legal status of the holder and the legal status of the holding is used to refine the limits between the household and non-household sector holdings. It also possible to use a size threshold or the level of own-consumption to make this distinction.

The other units from the SNA that can have production activities are (i) corporations and (ii) non-profit institutions. They are usually registered as legal or social units and are classified in the non-household sector.

Corporation (UNSD, 2009, p. 4.38–4.41)

Corporations are all entities that are:

- capable of generating profit or other financial gain for their owners;
- recognized at law as separate legal entities from their owners who enjoy limited liability; and
- set up for purposes of engaging in market production

Depending on the national legislation in force, corporations can be public or private companies, limited companies, joint-stock companies, cooperatives, limited liability partnerships etc., or quasi-corporations (SNA 2008, UNSD, 2009, p. 4.42). Quasi-corporations, though not legal entities, are considered to fall within the corporation sector if they are unincorporated enterprises owned by an institutional unit, have sufficient information to compile a complete set of accounts and are operated as if they were separate corporations.

Non-profit institutions (UNSD, 2009, p. 4.83)

Non-profit institutions are legal or social entities, created for the purpose of producing goods and services, whose status does not permit them to be a source of income, profit or other financial gain for the units that establish, control or finance them.

ANNEX 1-5: INTERNATIONAL STANDARD CLASSIFICATION OF OCCUPATIONS (ISCO-08)

Source: http://www.ilo.org/public/english/bureau/stat/isco/isco08/index.htm

The governing body of the International Labour Organization (ILO) endorsed the International Standard Classification of Occupations (ISCO-08) in March 2008[2]. The ISCO provides a tool for organizing jobs into groups based on tasks and duties performed. Within part 3.5 of the Labour Module pertaining to external workers, question 13 is based on ISCO-08. For each category of workers (based on type of worker and sex), the number of workers is reported in five occupational categories. The occupation types, with the corresponding high-level ISCO-08 references with which they align are:

- Production managers (ISCO-08 Major group 1, Managers)
- Professional and technical production staff (ISCO-08 Major group 3, Technicians and Associate Professionals)
- Machinery, equipment and facilities operators (ISCO-08 Major group 6, Skilled Agricultural, Forestry and Fishery Workers, ISCO-08 Major group 8, Plant and Machine Operators and Assemblers)
- General labourers (ISCO-08 Major group 9, Elementary Occupations)
- Other occupations (accountants, clerical staff, mechanics, watchmen, etc.) (ISCO-08 Other major groups and occupations)

The table below provides excerpts from the ISCO-08 at the Major Group, Sub-major Group, Minor Group and Occupation levels which provide examples of the types of work covered by the AGRIS occupation categories.

2 ILO. 2008. International Standard Classification of Occupations ISCO-08 Structure, index correspondence with ISCO-88. http://www.ilo.org/public/english/bureau/stat/isco/isco08/index.htm. Accessed 11 April 2017.

ISCO-08 codes for section 3, part 3.5 of the AGRIS Labour Module - Common examples found in the agricultural sector			
Major Group	**Sub-major Group**	**Minor Group**	**Occupation**
Q13a Code 1	13	131	1311
Title Managers	Production and Specialized Services Managers	Production Managers in Agriculture, Forestry and Fisheries	Agricultural and Forestry Production Managers
Managers plan, direct, coordinate and evaluate the overall activities of enterprises, governments and other organizations, or of organizational units within them, and formulate and review their policies, laws, rules and regulations. Competent performance in most occupations in this major group requires skills at the fourth ISCO skill level, except for Sub-major Group 14: Hospitality, Retail and Other Services Managers, for which skills at the third ISCO skill level are generally required. Tasks performed by managers usually include: formulating and advising on the policy, budgets, laws and regulations of enterprises, governments and other organizational units; establishing objectives and standards and formulating and evaluating programmes and policies and procedures for their implementation; ensuring appropriate systems and procedures are developed and implemented to provide budgetary control; authorizing material, human and financial resources to implement policies and programmes; monitoring and evaluating performance of the organization or enterprise and of its staff; selecting or approving the selection of staff; ensuring compliance with health and safety requirements; planning and directing daily operations; representing and negotiating on behalf of the government, enterprise or organizational unit managed in meetings and other forums.	Production and specialized services managers plan, direct and coordinate the production of the goods and the provision of the specialized professional and technical services provided by an enterprise or organization, either as the manager of a department or as the general manager of an enterprise or organization that does not have a hierarchy of managers. They are responsible for manufacturing, mining, construction, logistics, information and communications technology operations for large-scale agricultural, forestry and fisheries operations, and for the provision of health, education, social welfare, banking, insurance and other professional and technical services. Competent performance in most occupations in this sub-major group requires skills at the fourth ISCO skill level.	Production managers in agriculture, forestry and fisheries plan, direct and coordinate production in large-scale agricultural, horticultural, forestry aquaculture and fishery operations such as plantations, large ranches, collective farms and cooperatives, to grow and harvest crops, breed and raise livestock, fish and shellfish and to catch and harvest fish and other forms of aquatic life.	Agricultural and forestry production managers plan, direct and coordinate production in large-scale agricultural, horticultural and forestry operations such as plantations, large ranches, collective farms and agricultural cooperatives to grow and harvest crops, and breed and raise livestock. Tasks include: (a) monitoring agricultural and forestry market activity and planning production to meet contract requirements and market demand; (b) establishing and managing budgets, monitoring production output and costs, recording information such as farm management practices, and preparing financial and operational reports; (c) conferring with buyers to arrange for the sale of crops and livestock; (d) contracting with farmers or independent owners for production of crops and livestock, or for management of production; (e) planning the type, intensity and sequence of farm operations (e.g. determining the best times for planting, spraying and harvesting); (f) analysing soil to determine types and quantities of fertilizer required for maximum production; (g) purchasing machinery, equipment and supplies such as tractors, seed, fertilizer and chemicals; (h) identifying and controlling agricultural and forest environmental toxins, weeds, pests and diseases; (i) organizing farming operations such as maintaining buildings, water supply systems and equipment; (j) directing and coordinating activities such as planting, irrigation, chemical application, harvesting and grading; (k) inspecting plantations and fields to determine maturity dates of crops, or to estimate potential crop damage from weather; (l) overseeing the selection, training and performance of agricultural and forestry workers and contractors. Examples of the occupations classified here: • Forestry manager • Plantation manager • Ranch manager

ISCO-08 codes for Section 3, Part 3.5 of the AGRIS Labour Module - Common examples found in the agriculture sector			
Major Group	**Sub-major Group**	**Minor Group**	**Occupation**
Q13b Code 3	31	314	3142
Title Technicians and Associate Professionals	Science and engineering associate professionals	Life Science Technicians and Related Associate Professionals	Agricultural Technicians
Technicians and associate professionals perform technical and related tasks connected with research and the application of scientific or artistic concepts and operational methods, and government or business regulations. Competent performance in most occupations in this major group requires skills at the third ISCO skill level. Tasks performed by technicians and associate professionals usually include: undertaking and carrying out technical work connected with research and the application of concepts and operational methods in the fields of physical sciences including engineering and technology, life sciences including the medical profession, and social sciences and humanities; initiating and carrying out various technical services related to trade, finance and administration including administration of government laws and regulations, and to social work; providing technical support for the arts and entertainment; participating in sporting activities; executing some religious tasks. Supervision of other workers may be included.	Science and engineering associate professionals perform technical tasks connected with research and operational methods in science and engineering. They supervise and control technical and operational aspects of mining, manufacturing, construction and other engineering operations, and operate technical equipment including aircraft and ships. Competent performance in most occupations in this sub-major group requires skills at the third ISCO skill level. Tasks performed by workers in this sub-major group usually include: setting up, monitoring and operating instruments and equipment, conducting and monitoring experiments and tests of systems; collecting and testing samples; recording observations and analysing data; preparing, revising and interpreting technical drawings and diagrams; coordinating, supervising, controlling and scheduling the activities of other workers; operating and monitoring switchboards, computerized control systems, and multi-function process control machinery; performing technical functions to ensure safe and efficient movement and operations in ships, aircraft and other equipment.	Life science technicians and related associate professionals perform a variety of technical tasks to support life science professionals with their research, development, management, conservation and protection work, in areas such as biology, botany, zoology, biotechnology and biochemistry, and to agriculture, fisheries and forestry. Tasks performed usually include: conducting tests, experiments, laboratory analyses, field research and surveys to collect information by using accepted scientific methods; keeping records; assisting in analysing data and preparing reports; operating and maintaining equipment.	Agricultural technicians perform tests and experiments, and provide technical and scientific support to agricultural scientists, farmers and farm managers. Tasks include: (a) preparing materials and equipment for experiments, tests and analyses; (b) collecting and preparing specimens such as soils, plant or animal cells, tissues or parts of animal organs for experiments, tests and analyses; (c) assisting with and performing experiments, tests and analyses applying methods and techniques such as microscopy, histochemistry, chromatography, electrophoresis and spectroscopy; (d) identifying pathogenic micro-organisms and insects, parasites, fungi and weeds harmful to crops and livestock, and assisting in devising methods of control; (e) analysing produce to set and maintain standards of quality; (f) conducting or supervising operational programmes such as fish hatchery, greenhouse and livestock production programmes; (g) analysing samples of seeds for quality, purity and germination rating; (h) collecting data and estimating quantities and costs of materials and labour required for projects; (i) organizing maintenance and repairs of research equipment. Examples of the occupations classified here: • Dairy technician • Field crop technician • Herd tester • Horticultural technician • Poultry technician Some related occupations classified elsewhere: • Artificial inseminator – 3240 • Veterinary technician – 3240

ISCO-08 codes for Section 3, Part 3.5 of the AGRIS Labour Module - Common examples found in the agriculture sector			
Major Group	**Sub-major Group**	**Minor Group**	**Occupation**
Q13c Code 6	61	611	6111
Title Skilled Agricultural, Forestry and Fishery Workers	Market-oriented Skilled Agricultural Workers	Market Gardeners and Crop Growers	Field Crop and Vegetable Growers
Skilled agricultural, forestry and fishery workers grow and harvest field or tree and shrub crops; gather wild fruits and plants; breed, tend or hunt animals; produce a variety of animal husbandry products; cultivate, conserve and exploit forests; breed or catch fish; and cultivate or gather other forms of aquatic life in order to provide food, shelter and income for themselves and their households. Competent performance in most occupations in this major group requires skills at the second ISCO skill level. Tasks performed by skilled agricultural, forestry and fishery workers usually include: preparing the soil; sowing, planting, spraying, fertilizing and harvesting field crops; growing fruit and other tree and shrub crops; growing garden vegetables and horticultural products; gathering wild fruits and plants; breeding, raising, tending or hunting animals mainly to obtain meat, milk, hair, fur, skin, or sericultural, apiarian or other products; cultivating, conserving and exploiting forests; breeding or catching fish; cultivating or gathering other forms of aquatic life; storing and carrying out some basic processing of their produce; selling their products to purchasers, marketing organizations or at markets. Supervision of other workers may be included.	Market-oriented skilled agricultural workers plan, organize and perform farming operations to grow and harvest field or tree and shrub crops; and to produce a variety of animals and animal products for sale or delivery on a regular basis to wholesale buyers, marketing organizations or at markets. Competent performance in most occupations in this sub-major group requires skills at the second ISCO skill level. Tasks performed by workers in this sub-major group usually include: preparing the soil; sowing, planting, spraying, fertilizing and harvesting field crops; growing fruit and other tree and shrub crops; growing garden vegetables and horticultural products; raising, breeding and tending animals mainly to obtain meat, milk, hair, fur, skin, or sericultural, apiarian or other products; storing and carrying out some processing of produce; selling their products to purchasers, marketing organizations or at markets. Supervision of other workers may be included.	Market gardeners and crop growers plan, organize and perform operations to grow and harvest field crops; to grow fruit and other tree and shrub crops; to grow garden vegetables and medicinal and other plants; and to produce horticultural and horticultural nurseries products for sale or delivery on a regular basis to wholesale buyers, marketing organizations or at markets. Tasks performed usually include: monitoring market activity and conditions, determining types and quantities of crops to be grown, and planning and coordinating production accordingly; purchasing seeds, bulbs and fertilizer; investing in land and land improvements; preparing land, sowing, planting, cultivating and harvesting various crops; tending working animals and maintaining farm buildings, machinery and equipment; producing saplings, bulbs and seeds; storing and carrying out some processing of produce; delivering or marketing farm products. Supervision of other workers may be included.	Field crop and vegetable growers plan, organize and perform farming operations to grow and harvest various types of field crop such as wheat and other cereals, rice, beetroot, sugar-cane, groundnuts, tobacco, reed or other field crops, and potatoes, cabbages or other field vegetables, for sale or delivery on a regular basis to wholesale buyers, marketing organizations or at markets. Tasks include: (a) monitoring market activity and conditions, determining types and quantities of crops to be grown, and planning and coordinating production accordingly; (b) preparing soil by hand or machine, and spreading fertilizers and manure; (c) selecting and sowing seeds, and planting seedlings; (d) maintaining crops by cultivating soil, by transplanting, pruning or thinning plants, and by setting up and operating irrigation equipment; (e) controlling weeds, pests and diseases by applying herbicides and pesticides; (f) harvesting crops and destroying diseased or superfluous crops; (g) inspecting, cleaning, grading, packaging, storing and loading crops for sale or delivery to market; (h) tending working animals and maintaining farm buildings, structures, equipment and water supply systems; (i) storing and carrying out some processing of produce; (j) promoting and marketing products, arranging the sale, purchase and transportation of produce and supplies and maintaining and evaluating records of farm activities and transactions; (k) training and supervising workers in crop production, maintenance duties, and health and safety precautions, and hiring and discharging workers and contractors. Examples of the occupations classified here: • Cereal farmer • Cotton farmer • Potato farmer • Rice farmer • Skilled farm worker (field crops) • Sugar-cane grower • Some related occupations classified elsewhere: • Agricultural production manager – 1311 • Crop farm labourer – 9211

ISCO-08 codes for Section 3, Part 3.5 of the AGRIS Labour Module - Common examples found in the agriculture sector			
Major Group	**Sub-major Group**	**Minor Group**	**Occupation**
Q13c Code 6			
Title Skilled Agricultural, Forestry and Fishery Workers	61	611	6112 Tree and Shrub Crop Growers
			Tree and shrub crop growers plan, organize and perform farming operations to grow and harvest trees and shrubs such as fruit and nut trees, tea and coffee bushes, grape vines, berry-bearing bushes, cocoa trees and rubber trees, and to collect sap, for sale or delivery on a regular basis to wholesale buyers, marketing organizations or at markets. Tasks include: (a) monitoring market activity and conditions, determining types and quantities of crops to be grown, and planning and coordinating production accordingly; (b) preparing soil by hand or machine, and spreading fertilizers and manure; (c) selecting and sowing seeds, and planting seedlings; (d) maintaining crops by cultivating soil, by transplanting, pruning or thinning trees and shrubs, and by setting up and operating irrigation equipment; (e) controlling weeds, pests and diseases by applying herbicides and pesticides; (f) tending trees or bushes, collecting sap and harvesting crops; (g) inspecting, cleaning, grading, packaging, storing and loading crops for sale or delivery to market; (h) tending working animals and maintaining farm buildings, structures, equipment and water supply systems; (i) storing and carrying out some processing of produce; (j) promoting and marketing products, arranging the sale, purchase and transportation of produce and supplies, and maintaining and evaluating records of farm activities and transactions; (k) training and supervising workers in crop production, maintenance duties, and health and safety precautions, and hiring and discharging workers and contractors. Examples of the occupations classified here: • Fruit farmer • Rubber farmer • Rubber tapper • Tea grower • Viticulturist Some related occupations classified elsewhere: • Plantation manager – 1311 • Fruit picker – 9211

ISCO-08 codes for Section 3, Part 3.5 of the AGRIS Labour Module - Common examples found in the agriculture sector			
Major Group	**Sub-major Group**	**Minor Group**	**Occupation**
Q13c Code 6	61	611	6113
Title Skilled Agricultural, Forestry and Fishery Workers	Market-oriented Skilled Agricultural Workers	Market Gardeners and Crop Growers	Gardeners, Horticultural and Nursery Growers
			Gardeners, horticultural and nursery growers plan, organize and perform operations to cultivate and maintain trees, shrubs, flowers and other plants in parks and private gardens, and to produce saplings, bulbs and seeds or grow vegetables and flowers, by intensive cultivation techniques for sale or delivery on a regular basis to wholesale buyers, marketing organizations or at markets. Tasks include: (a) monitoring market activity and conditions determining kinds and amounts of vegetables, horticultural and nursery products to be grown, and planning and coordinating production accordingly; (b) preparing land by conditioning soil, levelling ground and installing and operating irrigation and drainage systems; (c) planting trees, hedges, garden plants and grass; (d) pruning and trimming trees, shrubs and hedges, installing plant supports and protection, and rolling, mowing, aerating and edging lawns; (e) constructing features and facilities within gardens, such as paths or paved areas, walls, rockeries, garden beds, ponds and water features, sheds and fences; (f) checking the health of plants and trees, identifying and treating weeds, pests and diseases, and applying mulch and fertilizers; (g) producing saplings, bulbs and seeds and raising plants from seeds or cuttings; (h) harvesting crops, inspecting, cleaning, grading, packaging, storing and loading products for sale or delivery to market; (i) maintaining buildings, greenhouses and other structures, equipment and water supply systems; (j) storing and carrying out some processing of produce; (k) promoting and marketing products, arranging the sale, purchase and transportation of produce and supplies, and maintaining and evaluating records of activities and transactions; (l) training and supervising workers in production, maintenance duties, and health and safety precautions, and hiring and discharging workers and contractors. Examples of the occupations classified here: Horticulturist, Landscape gardener, Market gardener, Mushroom cultivator Some related occupations classified elsewhere: • Horticultural scientist – 2132 • Garden labourer – 9214 • Horticultural labourer – 9214

ISCO-08 codes for Section 3, Part 3.5 of the AGRIS Labour Module - Common examples found in the agriculture sector			
Major Group	**Sub-major Group**	**Minor Group**	**Occupation**
Q13c Code 6	61	611	6114
Title Skilled Agricultural, Forestry and Fishery Workers	Market-oriented Skilled Agricultural Workers	Market Gardeners and Crop Growers	Mixed Crop Growers
			Mixed crop growers plan, organize and perform farming operations to grow and harvest specific combinations of field crops, field vegetables, tree and shrub crops, and garden, horticultural and nursery products, for sale or delivery to wholesale buyers, marketing organizations or at markets. Tasks include: (a) monitoring market activity and conditions, determining types and quantities of crops to be grown, and planning and coordinating production accordingly; (b) preparing soil by hand or machine, and spreading fertilizers and manure; (c) selecting and sowing seeds, and planting seedlings; (d) maintaining crops by cultivating soil, by transplanting, pruning or thinning crops, trees and shrubs, and by setting up and operating irrigation equipment; (e) growing flowers and vegetables by intensive cultivation; (f) producing saplings, bulbs and seeds; (g) harvesting crops and inspecting, cleaning, grading, packaging, storing and loading products for sale or delivery to market; (h) tending working animals and maintaining farm buildings, structures, equipment and water supply systems; (i) storing and carrying out some processing of produce; (j) promoting and marketing products, arranging the sale, purchase and transportation of produce and supplies, and maintaining and evaluating records of activities and transactions; (k) training and supervising workers in production, maintenance duties, and health and safety precautions, and hiring and discharging workers and contractors. Examples of the occupations classified here: • Mixed crop farmer • Skilled farm worker (mixed crops) Some related occupations classified elsewhere: • Agricultural production manager – 1311 • Plantation manager – 1311 • Crop farm labourer – 9211 • Fruit picker – 9211

ISCO-08 codes for Section 3, Part 3.5 of the AGRIS Labour Module - Common examples found in the agriculture sector			
Major Group	**Sub-major Group**	**Minor Group**	**Occupation**
Q13c Code 6	61	612	6121
Title Skilled Agricultural, Forestry and Fishery Workers	Market-oriented Skilled Agricultural Workers	Animal Producers	Livestock and Dairy Producers
		Animal producers plan, organize and perform farming operations to breed and raise domesticated animals, poultry, insects and non-domesti-cated animals for the production of meat, dairy products, honey, skins, textiles and other products, or for use as working, sporting or recreational animals, for sale or delivery to wholesale buyers, marketing organizations or markets. Task performed usually include: monitoring market activity and conditions, determining kinds and amounts of products to produce and planning and coordinating production; raising, feeding and tending animals; preparing animals or animal products for market; monitoring and examining animals to detect illness, injury or disease, and to check physical condition such as rate of weight gain; performing duties related to animal reproduction such as breeding, artificial insemination and helping with animal births; renting or investing in, and maintaining and cleaning, buildings, machinery, equipment and structures; storing and carrying out some processing of produce; promoting and marketing products, arranging the sale, purchase and transportation of stock, produce and supplies, and maintaining and evaluating records of activities and transactions; training/supervising workers in animal care procedures, maintenance duties and health and safety precautions, and hiring and discharging workers and contractors.	Livestock and dairy producers plan, organize and perform farming operations to breed and raise domesticated animals (excluding poultry), such as cattle, sheep, pigs, goats, horses and camels, for the production of meat, milk and other dairy products, skins and wool or for use as working, sporting or recreational animals, for sale or delivery to wholesale buyers, marketing organizations or at markets. Tasks include: (a) monitoring market activity and conditions, determining kinds and amounts of stock to produce, and planning and coordinating production accordingly; (b) cultivating pastures and providing and monitoring fodder and water supplies to maintain appropriate nutritional levels and condition of livestock; (c) monitoring and examining animals to detect illness, injury or disease, and to check physical condition such as rate of weight gain; (d) grooming, marking, clipping, trimming, drenching and/or castrating animals, and shearing coats to collect hair or wool; (e) herding livestock to pastures for grazing or to scales, sheds, vehicles or other enclosures; (f) milking animals by hand or using milking machines; (g) mixing feed, additives and medicines in prescribed portions and distributing or hand-feeding to animals for consumption; (h) performing duties related to livestock reproduction, such as breeding, artificial insemination and helping with animal births; (i) maintaining and cleaning farm buildings, machinery, equipment and structures; (j) slaughtering and skinning animals and preparing them for market; (k) storing and carrying out some processing of animal and dairy produce; (l) promoting and marketing products, arranging the sale, purchase and transportation of livestock, produce and supplies, and maintaining and evaluating records of farm activities and transactions; (m) training and supervising workers in animal care procedures, maintenance duties and health and safety precautions, and hiring and discharging workers and contractors. Examples of the occupations classified here: Cattle farmer, Dairy farmer, Dog breeder, Drover, Goat farmer, Horse breeder, Shearer, Sheep farmer, Shepherd, Stockman/woman. Some related occupations classified elsewhere: • Agricultural production manager – 1311 • Ranch manager – 1311

ISCO-08 codes for Section 3, Part 3.5 of the AGRIS Labour Module - Common examples found in the agriculture sector			
Major Group	**Sub-major Group**	**Minor Group**	**Occupation**
Q13c Code 6	61	612	6122
Title Skilled Agricultural, Forestry and Fishery Workers	Market-oriented Skilled Agricultural Workers	Animal Producers	Poultry Producers
			Poultry producers plan, organize and perform farming operations to breed and raise chickens, turkeys, geese, ducks and other poultry to produce meat, eggs and breeding stock for sale or delivery to wholesale buyers, marketing organizations or at markets. Tasks include: (a) monitoring market activity, planning and coordinating production accordingly, and maintaining and evaluating records of farming activities; (b) growing and purchasing feed and other supplies needed to maintain appropriate nutritional levels and condition of poultry; (c) monitoring and examining poultry to detect illness, injury or disease and to check physical condition such as rate of weight gain, and removing weak, ill and dead poultry from flock; (d) mixing feed and feed additives and filling feed and water containers; (e) vaccinating poultry via drinking water, injection or dusting of air; (f) collecting and storing eggs and packaging them for sale or delivery to market; (g) determining sex of chicks and facilitating breeding, artificial insemination and hatching of eggs; (h) renting or investing in, and maintaining and cleaning, farm buildings, machinery, equipment and structures; (i) slaughtering and dressing poultry for sale or delivery to market; (j) storing and carrying out some processing of produce; (k) arranging the sale, purchase and transportation of stock, produce and supplies; (l) training and supervising workers in poultry production procedures, maintenance duties and health and safety precautions, and hiring and discharging workers and contractors. Examples of the occupations classified here: • Poultry breeder • Poultry farmer • Poultry tender

ISCO-08 codes for Section 3, Part 3.5 of the AGRIS Labour Module - Common examples found in the agriculture sector			
Major Group	**Sub-major Group**	**Minor Group**	**Occupation**
Q13c Code 6	61	612	6123
Title Skilled Agricultural, Forestry and Fishery Workers	Market-oriented Skilled Agricultural Workers	Animal Producers	Apiarists and Sericulturists
			Apiarists and sericulturists plan, organize and perform operations to breed, raise and tend insects such as honey bees, silkworms and other species to produce honey, beeswax, silk and other products for sale or delivery to wholesale buyers, marketing organizations or at markets. Tasks include: (a) monitoring market activity and conditions, determining kinds and amounts of insect products to produce, and planning and coordinating production accordingly; (b) purchasing insects and growing or purchasing feed and other supplies; (c) breeding, raising and tending insects and collecting their products; (d) renting or investing in, and maintaining and cleaning, buildings, machinery, equipment and structures; (e) storing and carrying out some processing of produce; (f) arranging the sale, purchase and transportation of stock, produce and supplies, and maintaining and evaluating records of farming activities; (g) training and supervising workers in production procedures, maintenance duties and health and safety precautions, and hiring and discharging workers and contractors. Examples of occupations classified here: • Apiarist • Sericulturist

ISCO-08 codes for Section 3, Part 3.5 of the AGRIS Labour Module - Common examples found in the agriculture sector			
Major Group	**Sub-major Group**	**Minor Group**	**Occupation**
Q13c Code 6	61	612	6124
Title Skilled Agricultural, Forestry and Fishery Workers	Market-oriented Skilled Agricultural Workers	Animal Producers	Animal Producers Not Elsewhere Classified
			This unit group covers market-oriented animal producers not classified elsewhere in Minor Group 612: Animal Producers. For instance, the group includes those engaged in breeding, raising and tending non-domesticated mammals, game and other birds (except poultry), snails, snakes and other reptiles, as well as various insects and animals used for laboratory tests, for sale or delivery on a regular basis to wholesale buyers, marketing organizations, zoos and circuses, or at markets. In such cases tasks would include: (a) monitoring market activity and conditions, determining kinds and amounts of products to produce, and planning and coordinating production accordingly; (b) raising, feeding and tending animals; (c) monitoring and examining animals to detect illness, injury or disease, and to check physical condition such as rate of weight gain; (d) performing duties related to animal reproduction, such as breeding, artificial insemination and helping with animal births; (e) renting or investing in, and maintaining and cleaning, buildings, machinery, equipment and structures; (f) slaughtering and skinning animals and preparing animal products for market; (g) storing and carrying out some processing of produce; (h) promoting and marketing products, arranging the sale, purchase and transportation of stock, produce and supplies, and maintaining and evaluating records of activities and transactions; (i) training and supervising workers in animal care procedures, maintenance duties and health and safety precautions. Examples of the occupations classified here: • Crocodile farmer • Fur farmer (non-domesticated animals) • Game bird breeder • Ostrich farmer • Snail breeder • Some related occupations classified elsewhere: • Pet groomer – 5164 • Zoo keeper – 5164 • Game warden – 5419 • Poultry breeder – 6122

ISCO-08 codes for Section 3, Part 3.5 of the AGRIS Labour Module - Common examples found in the agriculture sector			
Major Group	**Sub-major Group**	**Minor Group**	**Occupation**
Q13c Code 6	61	612	6130
Title Skilled Agricultural, Forestry and Fishery Workers	Market-oriented Skilled Agricultural Workers	Minor Group 613 Mixed Crop and Animal Producers	Mixed Crop and Animal Producers
		Mixed crop and animal producers plan, organize and perform farming operations to grow and harvest field, tree and various other crops, as well as to breed, raise and tend animals and to produce a variety of animal husbandry products, for sale or delivery to wholesale buyers, marketing organizations or at markets. Tasks performed usually include: monitoring market activity and conditions, determining kinds and amounts of crops to be grown and animals to be raised, and planning and coordinating production accordingly; purchasing seeds, fertilizer, and other supplies; performing operations such as land preparation, sowing, planting, cultivating and harvesting crops; producing or buying fodder and other food supplies; breeding, raising and tending animals; killing and skinning animals, and preparing animals or animal products for market; renting or investing in, and maintaining and cleaning, farm buildings, machinery, equipment and structures; storing and carrying out some processing of produce; promoting and marketing products, arranging the sale, purchase and transportation of livestock, produce and supplies, and maintaining and evaluating records of farm activities and transactions; training and supervising workers in animal care procedures, maintenance duties and health and safety precautions, and hiring and discharging workers and contractors.	Mixed crop and animal producers plan, organize and perform farming operations to grow and harvest field, tree and various other crops, as well as to breed, raise and tend animals and to produce a variety of animal husbandry products, for sale or delivery to wholesale buyers, marketing organizations or at markets. Tasks include: (a) monitoring market activity and conditions, determining kinds and amounts of crops to be grown and animals to be raised, and planning and coordinating production accordingly; (b) purchasing seeds, fertilizer, and other supplies; (c) performing operations such as land preparation, sowing, planting, cultivating and harvesting crops; (d) producing or buying fodder and other food supplies; (e) breeding, raising and tending animals; (f) killing and skinning animals, and preparing animals or animal products for market; (g) renting or investing in and maintaining and cleaning farm buildings, machinery, equipment, and structures; (h) storing and carrying out some processing of produce; (i) promoting and marketing products, arranging the sale, purchase and transportation of livestock, produce and supplies and maintaining and evaluating records of farm activities and transactions; (j) training and supervising workers in animal care procedures, maintenance duties, and health and safety precautions and hiring and discharging workers and contractors. Examples of the occupations classified here: • Farmer (mixed farming) • Skilled farm worker (mixed farming) • Some related occupations classified elsewhere: • Agricultural production manager – 1311 • Plantation manager – 1311 • Mixed farm labourer – 9213

ISCO-08 codes for Section 3, Part 3.5 of the AGRIS Labour Module - Common examples found in the agriculture sector			
Major Group	**Sub-major Group**	**Minor Group**	**Occupation**
Q13d Code 9	92	921	9211
Title Elementary Occupations	Agricultural, Forestry and Fishery Labourers	Agricultural, Forestry and Fishery Labourers	Crop Farm Labourers
Elementary occupations involve the performance of simple and routine tasks which may require the use of hand-held tools and considerable physical effort. Most occupations in this major group require skills at the first ISCO skill level. Tasks performed by workers in elementary occupations usually include: cleaning, restocking supplies and performing basic maintenance in apartments, houses, kitchens, hotels, offices and other buildings; washing cars and windows; helping in kitchens and performing simple tasks in food preparation; delivering messages or goods; carrying luggage and handling baggage and freight; stocking vending-machines or reading and emptying meters; collecting and sorting refuse; sweeping streets and similar places; performing various simple farming, fishing, hunting or trapping tasks; performing simple tasks connected with mining, construction and manufacturing including product-sorting; packing and unpacking produce by hand, and filling shelves; providing various street services; pedalling or hand-guiding vehicles to transport passengers and goods; driving animal-drawn vehicles or machinery. Supervision of other workers may be included.	Agricultural, forestry and fishery labourers perform simple and routine tasks in the production of crops and livestock, cultivation and maintenance of gardens and parks, exploitation and conservation of forests, and conduct of aquaculture and fisheries operations. Most occupations in this sub-major group require skills at the first ISCO skill level. Tasks performed by workers in this sub-major group usually include: digging, raking and shovelling using hand tools; loading, unloading and stacking supplies, produce and other materials; watering, thinning, weeding and tending crops by hand or using hand tools; planting, harvesting, picking and collecting produce by hand; feeding, watering and cleaning animals and keeping their quarters clean; monitoring livestock and reporting on their condition; preparing and operating nets, lines and other fishing tackle and deck equipment; grading, sorting, bunching and packing produce into containers; performing minor repairs on fixtures, buildings, equipment, vessels and fences.	Agricultural, forestry and fishery labourers perform simple and routine tasks in the production of crops and livestock, cultivation and maintenance of gardens and parks, exploitation and conservation of forests, and conduct of aquaculture and fisheries operations. Tasks performed usually include: digging, raking and shovelling, using hand tools; loading unloading and stacking supplies, produce and other materials; watering, thinning, weeding and tending crops by hand or using hand tools; planting, harvesting, picking and collecting produce by hand; feeding, watering and cleaning animals and keeping their quarters clean; monitoring livestock, reporting on their condition; preparing and operating nets, lines and other fishing tackle and deck equipment; grading, sorting, bunching and packing produce into containers; performing minor repairs on fixtures, buildings, equipment, vessels and fences.	Crop farm labourers perform simple and routine tasks on farms in the production of crops such as fruit, nuts, grains and vegetables. Tasks include – (a) digging and shovelling to clear ditches or for other purposes; (b) loading and unloading supplies, produce and other materials; (c) raking, pitching and stacking straw, hay and similar materials; (d) watering, thinning and weeding crops by hand or using hand tools; (e) picking fruit, nuts, vegetables and other crops; (f) planting and harvesting field crops such as rice, by hand; (g) grading, sorting, bunching and packing produce into containers; (h) performing minor repairs on fixtures, buildings, equipment and fences. Examples of the occupations classified here: • Cane planter • Fruit picker • Rice farm labourer • Vegetable picker • Some related occupations classified elsewhere: • Skilled farm worker (field crops) – 6111 • Construction labourer (building work) – 9313 • Firewood collector – 9624 • Water collector – 9624

ISCO-08 codes for Section 3, Part 3.5 of the AGRIS Labour Module - Common examples found in the agriculture sector			
Major Group	**Sub-major Group**	**Minor Group**	**Occupation**
Q13d Code 9	92	921	9212
Title Elementary Occupations	Agricultural, Forestry and Fishery Labourers	Agricultural, Forestry and Fishery Labourers	Livestock Farm Labourers
			Livestock farm labourers perform simple and routine tasks in the farm production of animals, including poultry and insects. Tasks include: (a) digging and shovelling to clear ditches or for other purposes; (b) loading and unloading supplies, produce and other materials; (c) feeding, watering and cleaning animals and keeping their quarters clean; (d) monitoring livestock and reporting on their condition; (e) assisting with maintaining the health and welfare of livestock; (f) assisting with herding, droving and separating livestock for milking, shearing, transportation or slaughter, and between pastures; (g) collecting eggs and placing in incubators; (h) raking, pitching, stacking and storing hay, straw and other types of animal feed and bedding; (i) grading, sorting and packing produce into containers; (j) performing minor repairs on fixtures, buildings, equipment and fences. Examples of the occupations classified here: • Livestock farm labourer Some related occupations classified elsewhere: • Drover – 6121 • Shepherd – 6121 • Skilled farm worker (livestock) – 6121 • Firewood collector – 9624 • Water collector – 9624

ISCO-08 codes for Section 3, Part 3.5 of the AGRIS Labour Module - Common examples found in the agriculture sector			
Major Group	**Sub-major Group**	**Minor Group**	**Occupation**
Q13d Code 9	92	921	9213
Title Elementary Occupations	Agricultural, Forestry and Fishery Labourers	Agricultural, Forestry and Fishery Labourers	Mixed Crop and Livestock Farm Labourers
			Mixed crop and livestock farm labourers perform simple and routine tasks in farm production of both crops and animals. Tasks include: (a) digging and shovelling to clear ditches or for other purposes; (b) loading and unloading supplies, produce and other materials; (c) raking, pitching and stacking straw, hay and similar materials; (d) watering, thinning and weeding crops by hand or using hand tools; (e) picking fruit, nuts, vegetables and other crops and collecting eggs; (f) planting and harvesting field crops such as rice, by hand; (g) feeding, watering and cleaning animals and keeping their quarters clean; (h) monitoring livestock and reporting on their condition; (i) assisting with herding, droving and separating livestock for milking, shearing, transportation or slaughter, and between pastures; (j) grading, sorting, bunching and packing produce into containers; (k) performing minor repairs on fixtures, buildings, equipment and fences. Examples of the occupations classified here: • Farm labourer • Some related occupations classified elsewhere: • Skilled farm worker (mixed farming) – 6130 • Firewood collector – 9624 • Water collector – 9624

ISCO-08 codes for Section 3, Part 3.5 of the AGRIS Labour Module - Common examples found in the agriculture sector			
Major Group	**Sub-major Group**	**Minor Group**	**Occupation**
Q13d Code 9	92	921	9214
Title Elementary Occupations	Agricultural, Forestry and Fishery Labourers	Agricultural, Forestry and Fishery Labourers	Garden and Horticultural Labourers
			Garden and horticultural labourers perform simple and routine tasks in operations to cultivate and maintain trees, shrubs, flowers and other plants in parks and private gardens, to produce saplings, bulbs and seeds, or to grow vegetables and flowers by intensive cultivation techniques. Tasks include: (a) loading, unloading and moving supplies, produce and equipment; (b) preparing garden sites and plots using hand tools and simple machines; (c) assisting with planting and transplanting flowers, shrubs, trees and lawns; (d) maintaining gardens by watering, weeding and mowing lawns; (e) cleaning gardens and removing rubbish; (f) assisting with propagating, planting and potting seeds, bulbs and cuttings; (g) tending plants by hand watering and weeding; (h) harvesting and packaging plants for sale and transport; (i) performing minor repairs on fixtures, buildings, equipment and fences. Examples of the occupations classified here: • Garden labourer • Horticultural labourer • Lawn mower • Nursery labourer Some related occupations classified elsewhere: • Horticulturist – 6113 • Landscape gardener – 6113 • Market gardener – 6113 • Crop farm labourer – 9211

ANNEX 1-6: CLASSIFICATION OF MACHINERY AND EQUIPMENT

Source: http://www.fao.org/3/a-i4913e.pdf
(in the above link, annex 7 contains the Classification of Machinery and Equipment).

The WCA 2020 classification of machinery identifies three main groups of machinery and equipment (manually operated, animal-powered and machine-powered) used on the holding, wholly or partly for agricultural production (machinery and equipment used exclusively for purposes other than agricultural production are excluded, as well as those owned by the holder but not used). 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 (including everything from simple hand tools, such as a hoe, to complex machinery, such as a combine harvester) (GSARS, 2015a).

The WCA classification of machinery envisages 72 types of machinery listed in three main groups, which are subdivided into five classes and four subclasses. It follows a three-level structure (group, class, subclass), as presented in the table below. Slight modifications have been made for AGRIS purposes in this classification. These are noted with an asterisk and red text in the table. Concordance with the Harmonized System 2012 for the classification of goods is also provided in the table.

Classification of machinery and equipment from the WCA 2020, with modifications for AGRIS and HS 2012 concordance

Group	Class	Subclass	Descriptor	Types of machinery and equipment included	HS 2012 code
1			Manually operated equipment	Seed/fertilizer drill	8432.30
				Transplanter	8432.30
				Thresher	8433.52
				Winnower	8437.10
				Sprayer	8424.81
				Duster	8424.81
				Hand pump or other hand irrigation devices	8413.20
				***AGRIS suggests: Country-specific options**	-
				***AGRIS uses: Other (specify)**	-
2			Animal-powered equipment	Wooden plough	8432.10
				Steel plough	8432.10
				Cultivator	8432.20
				Disk harrow	8432.21
				Seed/fertilizer drill	8432.30
				Leveller	8429.20
				Animal cart	8716.10
				Animal-operated irrigation devices* ***AGRIS uses: Animal-powered irrigation devices**	84.24
				***AGRIS uses: Other (specify)**	-

Classification of machinery and equipment from the WCA 2020, with modifications for AGRIS and HS 2012 concordance					
Group	**Class**	**Subclass**	**Descriptor**	**Types of machinery and equipment included**	**HS 2012 code**
3			Machine-powered equipment		
	31		Machines for general farm use	Internal combustion engine* ***AGRIS uses:** **Stand-alone combustion engines**	8407
				External combustion engine* ***AGRIS uses:** **Stand-alone combustion engines**	8412.80
				Electric generator* ***AGRIS uses:** **Generators for the production of electricity**	85.01
				Electric motor ***AGRIS uses:** **Stand-alone electric motors**	85.01
				Computer used for farm management* ***AGRIS uses:** **Computers, laptops, tablets or smart phones used for farm management**	84.70
				Other electronic equipment used for farm management ***AGRIS uses:** **Other electronic equipment used for farm management (specify)**	8470.90
	32		Tractors, bulldozers and other vehicles	Track-laying tractor	8701.30
				Four-wheel tractor* ***AGRIS uses:** **Four-wheel drive tractor**	8701.90
				Single-axle tractor* ***AGRIS uses:** **Two-wheel drive tractor**	8701.10
				Bulldozer	8429.11
				Carryall* ***Not included in AGRIS**	
				Truck	8704.10-.90
				Boat	8901.20-.90; 8902
				Other vehicle ***AGRIS uses:** **Other vehicles (specify)**	8701.90
				Trailer	8716.20

Classification of machinery and equipment from the WCA 2020, with modifications for AGRIS and HS 2012 concordance					
Group	**Class**	**Subclass**	**Descriptor**	**Types of machinery and equipment included**	**HS 2012 code**
3	33		Crop machinery and equipment		
		331	Land preparation and planting machinery and equipment	Power tiller	8432.10
				Plough	8432.10
				Rotary tiller	8432.10
				Rotary harrow	8432.29
				Disk harrow	8432.21
				Grain drill	8432.80
				Broadcast seeder	8432.30
				Seed/fertilizer drill	8432.30
				Cultivator	8432.29
				Planters	8432.30
				Levellers	8429.20
				Diggers* ***AGRIS uses:** **Diggers used for land preparation**	8429.51-.59
				Land plane	8432.80
				Transplanter	8432.30
				***AGRIS uses:** **Other land preparation and planting equipment (specify)**	-
		332	Crop maintenance machinery and equipment	Manure spreader	8432.40
				Fertilizer broadcaster	8432.40
				Sprayer	8424.81
				Duster	8424.81
				***AGRIS uses:** **Other crop maintenance equipment (specify)**	-
				Water pump	8424.81
				Drip irrigation	8424.81
				Sprinkler irrigation	8424.81
				Sprayers and other localized irrigation devices	8424.81
				Other irrigation equipment	8424.81

Classification of machinery and equipment from the WCA 2020, with modifications for AGRIS and HS 2012 concordance					
Group	**Class**	**Subclass**	**Descriptor**	**Types of machinery and equipment included**	**HS 2012 code**
3	33	333	Crop harvesting machinery and equipment	Mower for grass crops	8433.10
				Hay rake	8433.30
				Hay baler	8433.40
				Forage harvester	8433.59
				Forage blower	8433.59
				Combine harvester	8433.51
				Corn picker	8433.59
				Digger, potato harvester* ***AGRIS uses:** **Potato harvesters**	8433.53
				Sugar beet harvester* ***AGRIS uses:** **Sugar beet harvesters or harvesters for other root crops**	8433.59
				***AGRIS uses:** **Sugar cane harvesters**	-
				Reaper-binder	-
				***AGRIS uses:** **Other crop harvesting equipment (specify)**	-
		334	Post-harvest machinery and equipment	Thresher	8433.52
				Grain cleaner	8437.10
				Sorters and graders	8437.10
				***AGRIS uses:** **Other post-harvest equipment (specify)**	-
	34		Livestock machinery and equipment	Milking machine	8434.10
				Dairy machine* ***AGRIS uses:** **Other dairy equipment (packing, etc.)**	8434.20
				Milk cooler	8419.89
				Cream separator	8421.11
				Incubator	8436.20
				Beekeeping machine* ***AGRIS uses:** **Beekeeping equipment (honey extractors, etc.)**	8436.80
				*** AGRIS uses:** **Other livestock equipment (specify)**	-
	35		Aquacultural machinery and equipment	***Not included in AGRIS**	8438.80

ANNEX 1-7: INTERNATIONAL STANDARD CLASSIFICATION OF EDUCATION (ISCED 2011)

Source: http://uis.unesco.org/sites/default/files/documents/international-standard-classification-of-education-isced-2011-en.pdf.

The United Nations Educational, Scientific and Cultural Organization (UNESCO) has a statistical office, the UNESCO Institute for Statistics, which is responsible for the improvement, development and delivery of statistics related to education, science and technology, culture and communication.

In 2011, the UNESCO General Conference adopted the International Standard Classification of Education 2011 (ISCED 2011). While ISCED 2011 includes many components, it is the framework for education levels that is applied within AGRIS.

The AGRIS Core Module collects the highest level of education completed for holders and managers of agricultural holdings. For holdings in the household sector, these data are also collected for all persons residing in the households of holders. As well as providing counts by level of education, this variable can be used to cross-tabulate the level of education of holders and household members with other variables collected on the Core (or where common samples exist, variables collected in other AGRIS modules) to provide a rich data set for program development purposes. This is perhaps most relevant with Economy Module variables (economic decision makers by education), Labour Module variables (work and payment profiles by education), or Machinery, Equipment and Assets Module variables (asset ownership by education).

The table below outlines the ISCED 2011 classification compared to the educational data collected in AGRIS.

Classification of education levels in ISCED and AGRIS		
ISCED – Level of educational attainment		AGRIS – Highest level of education completed
Level	Description	Description
0	Less than primary education	Less than primary
1	Primary education	Primary
2	Lower secondary education	Lower secondary
3	Upper secondary education	Upper secondary
4	Post-secondary, non-tertiary education	Tertiary/Post-secondary
5	Short-cycle tertiary education	
6	Bachelor's or equivalent level	
7	Master's or equivalent level	
8	Doctoral or equivalent level	
9	Not elsewhere classified	None

Annex 2

Indicators calculated from AGRIS

The AGRIS modules provide a wealth of agricultural data. How those data are compiled and disseminated will go a long way to determining the ultimate use and value of AGRIS as a data source.

AGRIS data have the potential to meet a broad set of data requirements for a range of data users.

Prospective users of AGRIS data include:

- Governments
  - to fulfil international reporting requirements
  - to make decisions regarding the development of programs and policies
  - to evaluate programs and policies
- International agencies
  - to monitor progress in attaining the stated goals of priority international initiatives (such as Sustainable Development Goals, or SDGs)[1]
- Agricultural producer groups
  - to provide sector information to their members
  - to represent their members to the public and governments, on the basis of facts
- Agricultural holders
  - to evaluate their holdings within the context of the agricultural sector of their country
  - to have facts to add to the decision-making processes related to their agricultural business
- Agricultural product and service providers
  - to make production, investment and marketing decisions
- Academics
  - to study the performance of the agricultural sector

When tabulating AGRIS data, there are a number of options for adopting countries, ranging from the most direct and basic approach to more complex arrangements of the data.

1 SDG indicators are not included in this annex but in section 1.2.2 of the methodological notes for each of the AGRIS modules (see chapter 4 of this handbook).

The role of AGRIS data is to provide input into the calculation of relevant indicators for the agriculture sector. Such indicators are generally widely accepted and used broadly within a field of interest, and each subject matter has its own set of appropriate indicators: economy, labour, environment, etc. As such, they are meaningful for a variety of users. Some indicators relate to the survey process itself rather than to a topic area. Refusal rate is an example of a survey-related indicator.

In some cases, indicators can be calculated using data obtained directly from one AGRIS module.

Many indicators are not strictly related to one module. Often, there are interrelationships between the types of information collected in two or more AGRIS modules. For example, data from the Production Methods and the Environment Module requires data from the Core Module for the production of some relevant indicators. Some economic indicators use data from the Economy Module, the Core Module, the Labour Module and the Machinery, Equipment and Assets Module. In these cases, allowance must be made in the analysis to account for the fact that data for rotating modules may be collected in, and for, different reference periods.

For other types of indicators, the data are not directly available from AGRIS, but AGRIS variables can be used in combination with other information to impute the required values. For example, a number of economic indicators require a measure for “Total costs”. While the Economy Module collects variable costs and cash costs, data mined from other modules can be used to impute for non-cash costs and capital costs. For example, a wage rate (obtained from sources other than AGRIS, or derived from responses within the Labour Module) can be applied to the unpaid work reported in the AGRIS Labour Module to estimate the value of the unpaid labour input. For capital costs such as depreciation, a depreciation rate (obtained from sources other than AGRIS) can be applied to data from the Machinery, Equipment and Assets Module on numbers, types and ages of machinery to impute a value for the purposes of the indicator. Again, it is important to account for the fact that data from different rotating modules may be collected in, and for, different reference periods.

The remaining parts of annex 2 provide details on the main indicators for each of the AGRIS modules, as shown in the table below. The list of indicators provided below cannot be seen as exhaustive.

TABLE A2.1. CONTENTS OF ANNEX 2.

Annex	AGRIS module to which the indicators in the annex relate	Indicator categories presented in detail
2-1	Core Module	• Indicators related to survey administration • Main indicators related to agricultural production • Indicators related to the organization of agricultural production • Other indicators
2-2	Economy Module	• Cost-of-Production indicators • Profitability indicators • **Productivity indicators** • Other indicators
2-3	Labour Module	• Labour input indicators • Organization of labour on the holding indicators • Cost of labour indicators • Wages and earnings of workers indicators • Other relevant labour/economy indicators
2-4	Production Methods and the Environment Module	• Indicators related to holding's prospects • Indicators related to the use of natural resources • Indicators related to crop and livestock production methods • Other indicators related to agricultural practices
2-5	Machinery, Equipment and Assets Module	• Indicators related to ownership of agricultural assets • Indicators related to the level of mechanization • **Analysis related to non-residential buildings** • Characteristics of dwellings and assets • Other indicators

TYPES OF INDICATORS

Compiling totals (for example, the total number of cattle) and counts (such as the number of holdings reporting cattle) is the most basic form of dissemination, and is valuable in its own right. This form of the data is most often required for international reporting purposes. Data distributions can provide added context about the agriculture sector by showing the allocation of farms within a number of categories (such as the number of holders by age category, or number of farms reporting cattle by herd size). The formulation of cross-tabulations linking relevant data together can begin to provide a profile of how the agricultural sector operates: for example, tabulating tillage methods by age of holder or by size of holding.

1. Counts, totals, averages

The Core Module contains many questions related to agricultural production, where counts and totals are an appropriate and meaningful method for tabulating the results. In these cases, there is value in knowing the absolute quantities reported in the data. It may be useful to organize these data into smaller geographic areas, as well as tabulating country-level counts and totals. Examples of data to be tabulated in this fashion are:

- Total number of farms
- Total number of goats
- Total number of acres/ha of rice

Along with totals, the average amount of a given commodity per holding can be calculated, for example the average number of goats per holding in region X. When calculating these averages, the denominator should reflect the number of holdings reporting the commodity being tabulated, and not all holdings.

$$Average\ of\ commodity\ X\ per\ reporting\ holding = \left(\frac{Total\ amount\ of\ commodity\ X\ reported}{Total\ number\ of\ holdings\ reporting\ a\ non\ zero\ quantity\ of\ commodity\ X}\right)$$

2. Distributions

Distributions are an appropriate way to present data when there is value in understanding how many, or what share of the population, fits into different categories or classes. The categories may be qualitative, classifying holdings reporting different practices (in ownership or agricultural production for example). The categories may also be quantitative in nature, tabulating the number of holdings based on groupings such as the number of animals reporting, the area of crops grown, sales classes, etc.

The entire population of interest should be covered by the categories. The population of interest could be all holdings, holdings reporting a specific commodity or practice, or holders depending on the situation.

In establishing distributions, categories should be mutually exclusive. In most cases, this will ensure that each member of the population of interest is included in one, and only one, distribution category.

For cases where respondents provide a numeric response to AGRIS questions (number of cattle, for example), categories can be established by adopting countries to reflect international standards or national characteristics of the agriculture sector. Statistical approaches such as deciles or quintiles can also be used to establish categories. Comparability over space (geographical jurisdictions) and over time within a given geography should be considerations in establishing the categories. See case 1 in the table below.

Some AGRIS questions provide response categories for respondents to select from. If the interview instruction is for respondents to select only one response, the categories are mutually exclusive, and each member of the population of interest will be included only once in the distribution (see case 2 in the table below).

Where several response categories are presented and respondents are instructed to "select all that apply", respondents may indicate multiple answers. In this case, the statistical agency must make some decisions from among a number of options:

a. Ensuring that members of the population of interest are represented only once within the distribution, by deciding on appropriate groupings of the possible combinations of responses to create categories to ensure a one-to-one relationship between population members and response categories. Ways to accomplish this include:
   - retaining response categories for each singular response possible and adding an additional category called "multiple responses" (see case 3a in the table below)
   - grouping potential responses into meaningful categories for the adopting country (see case 3b in the table below)
   - grouping holdings according to the number of responses selected, as opposed to the actual response categories selected (see case 3c in the table below)

b. Ensuring that each selected response is counted only once in the distribution, and allowing members of the population of interest to be represented more than once. This is appropriate when there is value in understanding all of the options for practices used by population members. In this example, members of the population of interest are represented in the distribution according to the number of response categories they selected; a member selecting one response category is counted once, while a member selecting four response categories will be counted four times in the distribution (see case 3d in the table below). There may be value in cross-tabulating this categorization of responses with the scenario explained in case 3c.

TABLE A2.2 – POSSIBLE DISTRIBUTIONS ACCORDING TO THE FORMAT OF AGRIS QUESTIONS

AGRIS question formats and examples	Scenario for tabulation	Potential categories for distributions of tabulated data	Distribution categories established by:		A population member is represented in the distribution	
			AGRIS	Country	Once	According to # of responses
Case 1 **Numeric responses** AGRIS example: Number of dairy cows as of today	From numeric entries, categories are created and tabulated, taking into consideration: International standards National characteristics Statistical approaches (deciles, quintiles, etc.)	1. 1 to 2 2. 3 to 4 3. 5 to 9 4. 10 to 19 5. 20 to 49 6. 50 to 99 7. 100 to 499 8. 500 or more		X	X	
Case 2 **Response categories – single response** AGRIS example: Share of working time spent working on the holding (Fill in one circle only) • Less than half (<40%) • About half (40%–59%) • Most/almost all (60%–99%) All (100%)	Responses representing a holder/co-holder/manager's single selection from a list of response categories are tabulated in the categories provided on the questionnaire	1. Less than half (<40%) 2. About half (40%–59%) 3. Most / almost all (60%–99%) 4. All (100%)	X		X	

AGRIS question formats and examples	Scenario for tabulation	Potential categories for distributions of tabulated data	Distribution categories established by:		A population member is represented in the distribution	
			AGRIS	Country	Once	According to # of responses
Case 3 **Response categories – multiple responses** AGRIS example: What were your main information sources used for agricultural information during the reference period? (fill in all that apply) Government or other public institutions Other individual farmers Farmers' groups or associations Non-governmental organizations (NGO) or non-governmental project Trader or market stakeholder Other (specify)* *Responses of "other" should be verified during processing to ensure that they are valid and to move write-in responses to other response categories where appropriate.	**Case 3a scenario** Single responses are tabulated in the detailed categories provided on the questionnaire, and all multiple responses are grouped into one category called "multiple responses"	Single responses: 1. Government or other public institutions 2. Other individual farmers 3. Farmers' groups or associations 4. Non-governmental organizations (NGO) or non-governmental project 5. Trader or market stakeholder 6. Other* Multiple responses: 7. Multiple responses	X		X	
	Case 3b scenario Detailed categories are grouped into meaningful categories for the adopting country, with each holding being counted only once in the distribution. For example, a jurisdiction is particularly interested in the distinction between holdings that glean information from government sources and those that do not use government sources.	1. Single source of information - Government or other public institutions 2. Multiple sources of information, includes Government or other public institutions 3. Single source of information, NOT government of other public institutions 4. Multiple sources of information, does NOT include Government or other public institutions		X	X	

AGRIS question formats and examples	Scenario for tabulation	Potential categories for distributions of tabulated data	Distribution categories established by:		A population member is represented in the distribution	
			AGRIS	Country	Once	According to # of responses
Case 3 **Response categories – multiple responses**	**Case 3c scenario** Detail on the number of responses selected by holdings is of value. This may be of value on its own, or cross-tabulated with the scenario outlined in case 3d.	1. One information source used 2. Two information sources used 3. Three or more information sources used		X	X	
	Case 3d scenario Detail on each of the responses selected is more valuable than distinguishing single-response holdings from multiple-response holdings. All responses are tabulated in the categories on the questionnaire. Holdings are included in the tabulation according to the number of responses they provided (that is, if a holding reported in 6 categories, it would be included in the distribution 6 times).	1. Government or other public institutions 2. Other individual farmers 3. Farmers' groups or associations 4. Non-governmental organizations (NGO) or non-governmental project 5. Trader or market stakeholder 6. Other	X			X

When the distribution is in the form of shares, the sum of the percentages calculated for the categories within a distribution should equal 100 percent. When it is based on absolute numbers, the sum of the categories will be equal to the total number of holdings in the population of interest, or the total number of responses (as presented in case 3d in the table above).

$$Distribution\ of\ holdings\ presented\ as\ a\ share = \left(\frac{Number\ of\ holdings\ in\ category\ (A, B, C, D \ldots n)}{Total\ number\ of\ holdings\ reporting\ in\ categories\ A\ to\ n\ (= population\ of\ interest)}\right) \times 100$$

ANNEX 2-1: INDICATORS RELATED TO THE CORE MODULE OF AGRIS

This part presents the main types of indicators related to the Core Module. Indicators related to survey administration provide information about how AGRIS is functioning as a data collection tool. Indicators on agricultural production are fundamental elements of AGRIS, providing valuable information to describe the agricultural sector. Other indicators focus on specific topics, such as those related to sustainable agricultural practices focusing specifically on measuring interactions between agriculture and the environment. The structure of the Core Module, along with the main themes and list of indicators, is presented in Chapter 4 of this handbook, titled "Core Module: generic questionnaire and methodological note". For more detailed indicators related to labour (section 7 of the Core Module), refer to annex 2-3 (Labour Module).

1. Indicators related to survey administration

Indicators related to the administration of AGRIS as a data collection tool will help adopting countries to inform decisions about data processing and the resulting data. They will allow analysis that can lead to adaptations in the conduct of the AGRIS Core and Rotating Modules with the aim of improving the respondent experience and the quality of AGRIS data.

Refusal rate

The refusal rate is a typical measure calculated and is often cited as a performance measure for surveys. Respondents may refuse for a number of reasons. AGRIS provides the ability for interviewers to capture the reasons for refusals as comments. This will be very useful information for survey administrators to complement the refusal rate. If patterns of refusals can be established and addressed in subsequent surveys, it may be possible to reduce the rate of refusals and increase the quality of the survey data. The contribution that the refusal respondents would have made to the survey estimates should be accounted for, either by replacing them in the field during data collection, or through imputation during data processing.

$$Refusal\ Rate = \left(\frac{Number\ of\ holdings\ successfully\ contacted\ but\ refusing\ to\ participate\ in\ survey}{Total\ number\ of\ holdings\ in\ the\ survey\ sample}\right) \times 100$$

Description of variables:

Refusal to participate comes directly from the questionnaire. To make use of the accompanying comments to better understand the reasons for survey refusals, the comments collected by interviewers will need to be captured, reviewed and classified into categories, to be determined by adopting countries. These categories should be determined prior to survey collection, with training provided to interviewers on collecting this information from respondents. Some potential categories could be:

a. Not enough time
b. Do not have the required information to be able to respond
c. Information is too sensitive/invasion of privacy
d. Not interested in the survey/not convinced there is value to the survey
e. Other, specify

AGRIS source:

Core Module

section 1, part 1.1 (Survey preparation); comments in section 9

Interview duration

The length of time required to complete a survey is one measure of respondent burden. Tabulating the duration within a number of categories will provide survey administrators with useful information to be able to evaluate the distribution related to the investment of time on the part of respondents to provide the data required by the AGRIS Core Module. Duration categories may be determined by the adopting countries to align with other measures, or once the Core Module data are available (to produce a normal distribution with the results). There may be value in cross-tabulating the interview duration categories with respondents' responses to the question in part 9.2 of the Core Module questionnaire on their opinion of the length of the survey (acceptable, too long). This will help to determine respondent tolerance related to interview durations.

$$Interview\ duration = \left(\frac{Number\ of\ holdings\ taking\ between\ X\ and\ Y\ to\ complete\ the\ Core\ Module}{Total\ number\ of\ holdings\ in\ the\ survey\ sample}\right) \times 100$$

Description of variables:

Interview duration is an important measure related to surveying. Start time and end times are recorded by the interviewer and the interview duration is subsequently calculated by the CAPI application. The categories to be used to tabulate the duration data may align with other such measures in the adopting country.

AGRIS source:

Core Module

section 1, part 1.1 (Survey preparation); section 9, part 9.1 (Survey timing); part 9.2 (Respondent opinion of survey burden)

Response burden/interview difficulties

Respondents' opinions on their survey experience are useful for survey administrators in evaluating current surveys and planning future surveys. Two questions in the Core Module allow adopting countries to measure respondent acceptance. One asks for the respondent's judgment on the difficulty of the survey (acceptable, too difficult), while the other asks for judgment on the length of the survey (acceptable, too long). These variables can be tabulated separately, or together.

$$Response\ burden\ (respondent\ opinion\ of\ difficulty\ and\ survey\ length) = \left(\frac{Number\ of\ holdings\ in\ opinion\ category}{Total\ number\ of\ holdings\ completing\ the\ survey}\right) \times 100$$

Description of variables:
If the variables are tabulated separately for the question on difficulty and the question on duration, the variables will be acceptable and not acceptable (too difficult, or too long, depending on the question being tabulated). If it is determined that there is value in tabulating the two questions together, the variable categories would be:

f. Acceptable difficulty and acceptable length of survey
g. Acceptable difficulty and unacceptable (too long) length of survey
h. Unacceptable difficulty (too difficult) and acceptable length of survey
i. Unacceptable difficulty (too difficult) and unacceptable length of survey (too long)

All categories are mutually exclusive, so the sum of shares of the categories will equal 100 percent.

AGRIS source:
Core Module
section 9, part 9.2 (Respondent opinion of survey burden)

2. Main indicators related to agricultural production

Crop yields
This is an indicator that can be calculated taking into account all the producers of the considered crop. It can be also calculated and, then, compared, on diverse subpopulations: irrigation used or not, fertilization used or not, use of PPPs or not, organic farming or not, different sizes of farms, at national level or for different regions, etc.

$$Yield\ of\ crop\ X = \left(\frac{Quantity\ harvested}{Area\ harvested}\right)$$

If there are many farms on which the areas planted and harvested are very different, the calculated yield can be multiplied by area planted to calculate the potential production, in order to estimate the loss of production (potential production minus actual production).

The Core Module questionnaire allows for the calculation of yield of crops by harvest (for crops with more than one harvest during the agricultural year) and comparison of yields by harvest.

Description of variables:
Areas planted, harvested, quantities harvested

AGRIS source:
Core Module
section 3 (Crop production)

Milk production per cow and per year

This is an indicator of cattle-raising performance:

- The average lactation period is calculated in number of days (multiplied by 7 if the answer in the questionnaire is in weeks or by 30 if it is in months).
- Number of milking cows is asked
- Quantity of raw milk produced per day is calculated (on the basis of the option chosen by respondents)

$$Milk\ production\ per\ cow\ and\ per\ year = \left(\frac{Milk\ daily\ production\ per\ farm\ x\ average\ duration\ of\ lactation\ period\ in\ days}{number\ of\ milking\ cows}\right)$$

It is interesting to calculate this indicator on homogeneous subpopulations regarding the number of animals raised and, then, to compare the results between the populations.

Description of variables:

Number of animals, lactation period, milk production

AGRIS source:

Core Module

section 4 (Livestock production), part 4.1.2

The calculation of production of milk for other type of livestock (sheep, goat, etc.) is similar to this one.

Annual production of eggs

This is an indicator of laying hens' performance. The amount of eggs produced at farm level can be estimated by multiplying the declared quantity for the chosen answering period by the number of answering periods in the production period, or all chosen periods can be recalculated in days (as shown below):

- The average number of days of egg collection per year (production period) is asked.
- The daily production of eggs has to be calculated if the answer is not in days (divided by 7 if the answer is in weeks, by 91 if it is for three months and by 365 if it is for 12 months).

$$Eggs\ production\ per\ year = Number\ of\ production\ days\ x\ Average\ daily\ production$$

It is interesting to calculate this indicator on homogeneous subpopulations regarding the number of animals raised and, then, to compare the results between the populations.

AGRIS source:

Core Module

section 4 (Livestock production), part 4.1.10

Production of meat

This survey is a source that enables estimation of the meat produced by farmers, at holding level. This meat production can be estimated from the total carcass weight of the animals slaughtered on the farm plus the animals slaughtered in a slaughterhouse on behalf of the holding.

If the reference period used in the questionnaire is less than one year, as occurs for poultry for example, it is still necessary to be able to estimate yearly production by adding an estimation of the production for the rest of the reference year.

In some countries, on-farm slaughtering practices can be of great importance. The rate of on-farm slaughtering (calculated at national or regional level) by type of livestock is calculated as the carcass weight from on-farm slaughtering (by type of livestock) divided by the total carcass weight produced in the country or region (by type of livestock); or as the number of animals slaughtered on the farm divided by the total number of slaughtered animals (by type of livestock). On-farm slaughtering reflects the holding's activity. The total slaughtering, and therefore the total meat production, in the country or region is obtained by adding the total quantities of meat produced in slaughterhouses on behalf of operators other than farmers. This latter data can be derived from administrative data or direct interrogation of slaughterhouses on their overall activity (number of animals slaughtered and carcass weight produced), which is very often beyond the scope of agricultural surveys and belongs to industry-sector surveys.

AGRIS source:

Core Module

section 4 (Livestock production)

Relevant agricultural production distributions in the Core Module are listed below.

3. Indicators related to the organization of agricultural production

These indicators are presented mainly as the share of holdings belonging to a given category.

Agricultural production legal framework

The legal status of the holder and the holding provide information about the structure of the agriculture sector in a given jurisdiction.

Legal status of the holder:

- Civil (natural) person
- Group of civil (natural) persons
- Legal person

Legal status of the holding:

The categories for this characteristic are to be country-specific selections, which are to be determined by adopting countries. Response categories will provide the framework for the distribution.

AGRIS source for the two distributions described above:

Core Module

section 1, part 1.2 (Identification of the holding)

Registration of agricultural activity

This distribution identifies the extent to which holdings keep records on their agricultural operations. The population of interest to be reflected in the denominator is all holdings in the AGRIS population. Categories within the distribution are the response categories to the question "Does the holding record its agricultural activity or finances on registers or logbooks?":

- No, never
- Yes, only occasionally or partially
- Yes, systematically

Further detail related to the nine types of information registered can be distributed for holdings reporting systematic record keeping. Holdings may report to multiple categories in this question.

AGRIS source:

Core Module

section 1, part 1.3 (Agricultural Activity)

Intended destination of agricultural production

All AGRIS holdings can be classified along a continuum of categories describing the intended destination of the holding's agricultural production. The continuum ranges from primarily for own consumption to primarily for sale based on a percentage of production to be sold: The following categories are to be used in the distribution:

- 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 (selling more than 10 percent, and up to 50 percent)
- Producing primarily for own consumption (selling 10 percent or less)

AGRIS source:

Core Module

section 1, part 1.3 (Agricultural Activity)

Land tenure

Holdings report all of the categories that apply among the eight presented to describe the tenure of the agricultural land used by the holding. For this reason, adopting agencies must decide how to deal with multiple responses by holdings (refer to case 3 in the table A2.2). The distribution categories are:

- Owned with written documentation (a title deed, a will, a purchase agreement, etc.)
- Owned without written documentation
- Rented-in, leased or sharecropped with written agreement
- Rented-in, leased or sharecropped without written agreement
- State or communal land used with written agreement (certified use rights)
- State or communal land used without written agreement (uncertified use rights)
- Occupied/squatted without any permission
- No agricultural land

AGRIS source:

Core Module

section 1, part 1.3 (Agricultural Activity)

Demographic characteristics of holders, co-holders and managers

Holders, co-holders and managers can be shown in distributions reflecting a number of demographic characteristics (age, sex, education, nationality) and work characteristics (working time on the holding, other activities outside the holding). They can be tabulated all together as one group, or according to their classifications as holders or managers, with or without adding the element of the legal status of the holder/holding. The groupings and distribution categories for these are listed below. In all cases except age, respondents are limited to one choice from the list provided in each question. Age is a write-in response.

Age:

A numeric write-in response of number of years is provided to this question. The distribution categories are to be determined by adopting countries, to reflect data needs in the country. Considerations should be made regarding the definitions of the active working population (lower and upper limits). These may vary by country, but are often cited as 15 years being the lower limit, and 64 as the upper limit. If these limits are to be used, a potential distribution could be:

- Less than 15 years
- 15–24 years
- 25–34 years
- 35–44 years
- 45–54 years
- 55–64 years
- 65 years or more

Sex:

- Male
- Female

Nationality:

- Local country
- Neighbouring country
- Other

Highest level of education completed:

- None
- Less than primary
- Primary
- Lower secondary
- Upper secondary
- Tertiary/post-secondary

Share of working time spent on the holding:

- Less than half (<40 percent)
- About half (40–59 percent)
- Most/almost all (60–99 percent)
- All (100 –)

Does the holder/co-holder/manager have another gainful activity outside of the holding?:

- No
- Yes

AGRIS source for the six distributions described above:

Core Module

section 2 (Characteristics of the holders and managers)

Area utilized

The total area utilized in each of the eight categories provides useful information with which to profile the agricultural land use of a jurisdiction. Calculating the percentage falling within each of the categories is a valuable distribution.

$$Distribution\ of\ AAU\ according\ to\ land\ use\ type = \left(\frac{Area\ of\ land\ in\ land\ use\ category\ X}{Total\ agricultural\ area\ utilized}\right) \times 100$$

The land use categories are:

- Temporary crops under greenhouses or high shelters
- Temporary crops outdoors or under low shelters
- Temporary fallow
- Temporary meadows and pastures
- Kitchen gardens and backyards
- Permanent crops under greenhouses or high shelters
- Permanent crops outdoors or under low shelters
- Permanent meadows and pastures

Another distribution of interest could be the grouping of subcategories, for example:

- Arable land (including the four categories of temporary crops)
- Kitchen gardens and backyards
- Permanent crops
- Permanent meadows and pastures

AGRIS source:

Core Module

section 3, part 3.2 (Area utilized)

Cropping practices

A number of cropping practices are reported for each type of crop reported by holdings. Calculated on their own as absolute numbers, or as a percentage of the total number of holdings reporting a given crop, are useful tabulations. They can also be cross-classified to study the combinations of practices used. The relevant variables are:

- Presence of fertilizer use by crop type in the reference period
- Presence of the use of plant production products by crop type in the reference period
- Presence of the use of irrigation by crop type (in the last six months for continuous crops or during each harvest cycle). To calculate this in conjunction with the previous two variables, reporting by holding must be unduplicated so that the responses reflect the entire reference period.

AGRIS source for the two distributions described above:

Core Module

section 3, part 3.1 (Crop production and destinations)

Type of seeds used

Three questions provide a profile of the types of seeds used for each temporary crop produced. While they can be tabulated on their own, cross-tabulating the number of varieties with categories for the type of seed is also useful.

Number of varieties:

- Number of holdings using one variety for crop X
- Number of holdings using more than one variety for crop X

Type of seed:

- Percent of seed for crop X that was certified modern varieties
- Percent of seed for crop X that was uncertified varieties

Distribution categories for percentages to be determined by adopting countries

Genetically Modified Organisms (GMOs):

For those reporting certified varieties, an indication (yes/no) if any were GMOs

AGRIS source for the two distributions described above:

Core Module

section 3, part 3.3 (Crop production modes)

Production and marketing contracts

Similar questions for production contracts and marketing contracts for crop or livestock provide indicators related to strategies for selling crops produced or livestock raised. It would be interesting to calculate this indicator for subpopulations, either by main activity of the holding (crop, livestock, mixed crop and livestock), for more detailed breakdowns (cereal producers, beef producers, etc.), or by size of farms.

Presence of production contracts/marketing contracts:

- Number of holdings having a production contract/marketing contract for crop X/livestock Z
- Number of holdings without a production contract/marketing contract for crop X/livestock Z

Coverage of production contracts/marketing contracts:

- Number of holdings where contract covers 100 percent of crop X grown/livestock Z raised
- Number of holdings where contract does not cover 100 percent of crop X grown/livestock Z raised

AGRIS source for the two distributions described above:

Core Module

section 3, part 3.3 (Crop production modes)

Core Module

section 4, part 4.2 (Raising practices)

Crop intentions for the 12 months after the reference period

Two distributions can be calculated related to upcoming plans for individual crops. One selection is made from the list of response categories for each of the two following questions. While useful in their own right, cross-classifying the two questions will provide even more information.

Area to dedicate to crop type X in the upcoming period:

- Similar
- Greater
- Lower
- None

The main reason for the intended changes for crop type X:

- Crop rotation
- Technical
- Economic
- Other (specify)[2]

AGRIS source for the two distributions described above:

Core Module

section 3, part 3.4 (Intentions for crop production for the 12 months after the reference period)

Similar indicator can be calculated for Livestock intentions for the next 12 months

Core Module

section 4, part 4.3 (Intentions for livestock production for the 12 months after the reference period)

Existence and importance of other activities on the holding

Two distributions can be calculated related to other activities on the holding. All of the other activities that a holding is engaged in are selected from the list of response categories for the type of activity, while one selection is made from the list of two choices (significant, marginal) to describe the contribution of other activities to the holding. Adopting countries will have to decide on the best arrangement of distribution categories, according to their data needs (see table A2.2 for a description). It may be useful to calculate the percentage of all holdings reporting at least one "other activity" as a general measure of holding diversification, as well as more detailed distributions. While the type of activity and the importance are useful in their own right, cross-classifying the two questions will provide even more information.

AGRIS source:

Core Module

section 5, part 5.1 (Other activities of the holding)

Household income from accounted for by agricultural income, share and evolution

For holdings in the household sector, two distributions can be calculated relating to the contribution and evolution of the importance of agricultural income to household income. While the indicator of the contribution of agriculture to household income and the rating of how that has changed since the previous year are useful in their own right, cross-classifying the two questions will provide even more information.

2 Responses of "other" should be verified during processing to ensure that they are valid and to move write-in responses to other response categories, where appropriate.

Distribution categories for **share of household income accounted for by agricultural income**:

- None/close to 0 (Less than 10 percent)
- Less than half (10 percent–39 percent)
- About half (40 percent–59 percent)
- Most/almost all (60 percent–99 percent)
- All (100 percent)

Categories for the **rating of the contribution of agricultural income to household income this year compared to the previous year**:

- Similar
- Greater
- Lower

AGRIS source:

Core Module

section 5, part 5.1 (Other activities of the holding)

Information sources

The information sources used by holders and the method with which they are consulted provide an indicator for program and policy-makers that will help to inform their decisions on the most effective means of communicating with the agricultural holdings under their responsibility. Two questions combine to provide this profile: information sources (described in detail in table A2.2 above as cases 3a, 3b, 3d and 3d), and how they are consulted. As with many of the indicators, cross-tabulating data from the two questions will provide the most complete distribution.

Categories for **information sources**: see table A2.2 (case 3) above.

Distribution categories for **method of consultation**:

- Direct discussion
- Telephone (including calls and SMS)
- Radio
- Television
- Internet
- Press
- Other (specify)[3]

AGRIS source:

Core Module

section 5, part 5.1 (Other activities of the holding)

3 Responses of "other" should be verified during processing to ensure that they are valid, and to move write-in responses to other response categories where appropriate.

Shocks

Six questions within the Core Module deal with shocks to the holding and the household. These can be tabulated on their own or in various combinations of cross-tabulations, depending on the analytical interests of the adopting country. A description of the distribution categories contained within the questions follows:

Question 1 – Severe shocks to the holding or household in the reference period:

- No
- Yes

Question 2 – Identification of the three most severe shocks:

This question is relatively unique in that it asks respondents not only to make a maximum of three selections from a list of ten production-related shocks and six household-related shocks, but also in that it asks respondents to rank their selections in order of severity (with a score of 1 being the most severe). Therefore, statistical agencies may choose to incorporate the ranking information as well as the information on the type of shocks into the distributions that they tabulate. The categories of shocks are presented below. These categories may be grouped for the analysis, to reduce the total number of categories. For example, the ten production shocks could be regrouped into four categories: weather/environment-related shocks, pests or disease, price-related shocks, and other shocks.

Production shocks:

- Weather/environment-related shocks, including
    - Drought or erratic rains
    - Floods
    - Landsides
    - Extreme temperatures (too hot or too cold)
- Pests or disease, including
    - Unusually high level of crop pests
    - Unusually high level of livestock diseases
- Price-related shocks, including
    - Unusually low prices for agricultural output
    - Unusually high prices for agricultural inputs
- Other shocks, including
    - Theft of agricultural assets, outputs, money or valuables
    - Other (specify)[4]

AGRIS source:

Core Module

section 5, part 5.1 (Other activities of the holding)

4 Responses of "other" should be verified during processing to ensure that they are valid, and to move write-in responses to other response categories where appropriate.

Demographic characteristics of household members (for holdings in the household sector)
Similar to holders and managers, the demographic characteristics of household members provide a description of the people who may contribute to and be supported by the agricultural holding. The number of household members per household will be a useful distribution, with the categories to be determined by adopting countries. Age, sex and education variable categories are the same as described in Demographic characteristics of holders, co-holders and managers, above. Other distribution categories that can be tabulated on their own, or in cross-tabulations with others, are described below.

Formal training in agriculture (for household members aged 15 years or more):
- No
- Yes

Participation in decisions concerning crops and livestock (what/when to plant/harvest; what to grow/raise, etc.) (for household members aged 15 years or more):
- No
- Yes

Work on the holding during the reference period, even for one day (for household members aged 15 years or more):
- No
- Yes

AGRIS source for the six distributions described above:
Core Module
section 6, part 6.1 (Socio-economic characteristics of the households of the holders and co-holders)

Holder dwelling (for holdings in the household sector)
The Core Module provides data for a distribution on the type of holder dwelling. More information and indicators on dwelling characteristics can be found in the Machinery, Equipment and Assets Module, and are presented in detail in annex 2-5.

AGRIS source:
Core Module
section 8, part 8.1 (Household dwelling and assets)

Household services (for holdings in the household sector)
The distribution categories for household services are provided below and provide a profile of the power and communications capabilities of households in the agricultural sector. Because respondents are to select all of the items that apply, statistical agencies must determine the best format of distribution to compile from the available categories and combinations (as described in table A2.2). While useful on its own, there may also be interest in cross-classifying this distribution with that reported in section 5 for the methods of accessing information used on the holding. This makes it possible to identify whether there are households with communications capacity that is not being leveraged to bring agricultural information into the household or holding.

Household services:

- Electricity
- Landline telephone
- Cell phone
- Radio
- Television
- Internet
- None of the above

AGRIS source:

Core Module

section 8, part 8.1 (Household dwelling and assets); section 5, part 5.1 (Other activities of the holding)

Bank accounts (for holdings in the household sector)

Two questions provide direct information on bank accounts. The first identifies if anyone in the household has a bank account (No/Yes), while a follow-up questions identifies the household members (up to a maximum of three) with bank accounts. This data becomes of value when cross-classifying holders of bank accounts with the demographic information reported in section 6 of the Core Module. See the description in Demographic characteristics of household members, above, for descriptions on the possible characteristics of interest.

AGRIS source:

Core Module

section 8, part 8.1 (Household dwelling and assets); section 6, part 6.1 (Sociodemographic characteristics of the households of holders and co-holders).

4. Other indicators

Ratio of AAU to the total area of the holding

This is an indication of the balance between agricultural and non-agricultural land on holdings.

$$Ratio\ of\ non\ agricultural\ land\ to\ agricultural\ land = \left(\frac{Agricultural\ area\ utilised\ (AAU)}{Total\ area\ of\ the\ holding}\right)$$

To be included in the total are:

- Total agricultural area utilized (AAU)
- Farm buildings and farmyards
- Forest and other wooded land
- Aquaculture on the holding
- Other land (unutilized, rocks, wetlands, etc.)

AGRIS source:

Core Module

section 3, part 3.2 (Area utilized)

Farm Specialization

Specialization can be analysed in light of environmental sustainability. Specialization can cause a loss of diversity in farmland habitats, associated flora and fauna, crop varieties and livestock breeds, and leads to changes in management practices and land use intensity, as production is limited to only a few agricultural products (see Fusco, D. et al., 2014)[5].

$$Percent\ of\ farms\ by\ Specialization = \left(\frac{Number\ of\ farms\ reporting\ specialization\ type\ X}{Total\ number\ of\ holdings}\right) \times 100$$

Description of variables

Specialization type = from an economic perspective, this can be mainly crop production, mainly livestock production, or a mix of crop and livestock production. Specialization can be broken down further within crops and livestock to determine if there is a prevalent crop or livestock type, or if there are mixed crops or mixed livestock. All farms should fall into one and only one of the specialization types. Therefore, the sum of the percentages calculated for the different specialization types should equal 100 percent.

AGRIS source:

Core Module

section 1, part 1.3 (Agricultural activity)

Farm concentration

The concentration of productive activity refers to the reduction of the number of farms (often accompanied by an increase in their average size), and to the reduction of the number of small farms with the consequent abandonment of the countryside and loss of agricultural landscape. This indicator provides a ratio of small farms relative to large farms, where a calculated indicator of 1 denotes that the number of small farms and large farms is in balance. A result of greater than 1 indicates a prevalence of small farms relative to large farms; a result lower than one denotes a prevalence of large farms rather than small ones. It should be noted that mid-sized farms are not included in the calculation of this indicator (see Fusco, D. *et al*., 2014).

$$Farm\ concentration = \left(\frac{Number\ of\ small\ holdings}{Number\ of\ large\ holdings}\right)$$

Description of variables

Farms with small size/Farms with large size – the size is based on the AAU. Countries should set these categories (small size, large size) depending on the distribution in the country.

AGRIS source:

Core Module

section 3 (Crop production)

5 Fusco, D., Giordano, P., Greco, M. & Moretti, V. 2014. *Sustainable Agriculture Index. Paper prepared for the Giornate della Ricerca in ISTAT conference*, 10-11 November 2014. Rome. Available at: http://www.istat.it/it/files/2014/10/Paper_Sessione-IV_Fusco_Giordano_Greco_Moretti.pdf. Accessed on 20 July 2017.

It may be interesting to study the concentration of particular agricultural productions or groups of productions (cereals, wheat, vegetables, bovine livestock, etc.). Very often, some productions are concentrated in a small number of farms. It is necessary to sort all concerned farms in decreasing order regarding the variable of interest and then, to calculate the number of the largest ones representing, for example, 80 percent of the considered area or livestock (cumulated data).

The lower the value, the stronger is the concentration.

$$Farm\ concentration\ for\ production\ X = \left(\frac{Number\ of\ the\ largest\ holdings\ representing\ 80\%\ of\ area\ or\ livestock\ X}{Total\ number\ of\ holdings\ having\ area\ or\ livestock\ X}\right) x\ 100$$

Description of variables

Areas where crops or groups of crops were produced and numbers of livestock raised during the observation period. Countries should set the level of production to to determine the concentration level (it is generally near 80 percent).

AGRIS source:

Core Module

section 3 (Crop production), section 4 (Livestock production)

Generational replacement

This is an indicator of human capital. It illustrates the generational replacement of the holders in the agricultural sector. Young farmers are essential for the development and vitality of rural areas. Compared to older holders, they show a greater propensity to introduce innovations. The presence of young people also contributes to the vitality of rural areas. This indicator provides a ratio of young holders relative to older holders, where a calculated indicator of 1 denotes that the number of young and older holders is in balance. A result greater than 1 indicates the presence of more young holders relative to older ones; and a result lower than one, the presence of more older holders than young ones. It should be noted that middle-aged holders are not included in the calculation of this indicator (see Fusco, D. *et al*., 2014).

$$Generational\ replacement = \left(\frac{Number\ of\ holder\ under\ 35\ years\ of\ age}{Number\ of\ holders\ over\ 65\ years\ of\ age}\right)$$

Description of variables

While the age cutoffs recommended are a young category of holders less than 35 years of age and an older category of holders 65 years of age and above, these age limits can be adjusted to take national characteristics and requirements into account.

AGRIS source:

Core Module

section 2 (Characteristics of the holders and managers)

Female entrepreneurship

This is an indicator of equal opportunities. It calculates the distribution of holders in the agricultural sector according to gender. This indicator provides a ratio of female holders relative to male holders, where a calculated indicator of 1 denotes that the number of women and men holders is in balance. A result greater than 1 indicates more female holders relative to males; and a result lower than one, the presence of more men than women (see Fusco, D. *et al*., 2014).

$$Female\ entrepreneurship = \left(\frac{Number\ of\ female\ holders}{Number\ of\ male\ holders}\right)$$

Description of variables

Number of female holders/Number of male holders

AGRIS source:

Core Module

section 2 (Characteristics of the holders and managers)

ANNEX 2-2: INDICATORS RELATED TO THE ECONOMY MODULE OF AGRIS

In this part, the economic indicators that can be generated with data from the Economy Module (and other AGRIS modules) are presented in detail. They use data from the module on tenure, income, inputs, other finances, and marketing and storage to tabulate indicators which provide a comprehensive picture of economic activities on agricultural holdings.

The structure of the Economy Module, along with the main themes and list of indicators associated with it, is presented in chapter 4 of this handbook, titled Economy Module: generic questionnaire and methodological notes.

For useful background on the types of calculations often used as indicators, see *Types of indicators* above for descriptions of these arrangements of data and general instructions and best practices for their use.

Some indicators respond to the primary measurement objective of the module – measurement of the value of agricultural production – by quantifying the production levels, the income and the costs related to agricultural production, and the destination of the agricultural commodities produced. Others fulfill secondary objectives with a focus on ancillary activities, to round out the economic picture of agricultural holdings and expand the analytical capacity of the data set.

Economic indicators supported by the primary data of the Economy Module

Data from the primary elements of the Economy Module can be used to calculate a number of important economic indicators for the agricultural sector related to cost of production, productivity and profitability. Such measures can be beneficial for farmers in assessing the performance of their commodity mix compared to other holdings, for agricultural service providers in the commercial and extension realms to better plan and focus services for their agricultural clients, and for policy-makers in improving the focus and efficiency of their policies and programs for the agriculture sector[6]. This chapter provides detailed descriptions of the main indicators and their components.

6 GSARS. 2016b. *Handbook on Agricultural Cost of Production Statistics*. GSARS Handbook: Rome. Available at: http://gsars.org/en/handbook-on-agricultural-cost-of-production-statistics-2/. Accessed 26 January 2017.

1. Cost of Production indicators

The main components of costs of production are summarized in table A2.3. below[7]. In some cases, data for these components are available directly from AGRIS components, while in others, they can be imputed using AGRIS or other data sources.

TABLE A2.3. VARIABLES USED IN COST OF PRODUCTION INDICATORS.

Total costs =	Variable costs	+ Fixed costs
	Cash costs	Capital costs
	Purchased seed, feed, fertilizers, etc.	Depreciation costs and opportunity costs of capital on owned machinery, buildings and farm equipment
	Paid labour	
	Custom services (machinery, etc.)	
	Non-cash costs	Farm overhead costs
		Unallocated fixed costs
		Farm-level taxes, permits, licenses, etc.
	Unpaid (family) labour	Land costs
	Farm-produced inputs	Land rents and imputed rents, land-related taxes, etc.
	Owned animals and machinery	

The main Cost of Production indicators that can be calculated with data generated by AGRIS are enumerated below.

Costs of Production per hectare (ha)

A number of indicators can provide insights into agricultural production costs per area of farm production.

a. Total costs per hectare (ha)

$$CoP\_ha = (Cash\ Costs + Non\ Cash\ Costs + Land\ Costs + Capital\ Costs + Farm\ Overhead\ Costs)/(Land\ Area\ in\ ha\ )$$

While it can be calculated for all activities on holdings, this indicator is best suited to crop production. Where agricultural holdings are only involved in crop production, this is straightforward to calculate. Where there is a mix of crop and livestock activities on the holding, the crop-related portions of costs for inputs that are shared between crop and livestock activities must be estimated and costs entirely related to livestock production must be excluded if the indicator is to be applied to the crop enterprise only.

AGRIS source:

Core Module

section 1 (part 1.3 – Agricultural activity) provides details on the main activities (crop, livestock or combination crop/livestock) for the holding.

7 *Ibid.*

Description of variables

- **Cash costs**: inputs purchased by the farmer by direct cash payment, such as fertilizers, fuel, and pesticides or wages paid.

AGRIS sources:

Economy Module

section 3 (part 3.2 – Inputs and services used for crop production, part 3.3 – Inputs and services used for livestock production, part 3.4 – Labour inputs used by the agricultural holding, part 3.5 – Other inputs used by the agricultural holding).

Labour Module

section 1 (part 1.2 – Activities of the agricultural holding during the reference year) provides insights into the types of activities performed by different types of workers. Labour paid in cash and in kind are covered in section 2 (part 2.3 – Payments for work on the holding – Household members) and section 3 (part 3.6 – Payments for work on the holding – External workers). For custom services by contractors, section 4 (part 4.1 – Work by contractors on the holding and payments for work on the holding) provides data.

- **Non-cash costs**: inputs produced and supplied by the agricultural holding, or received from a third party as in-kind payments or indirect subsidies to the agricultural holding that do not result in a monetary transaction. The value of these inputs is established by according a market value to quantities used. Common examples include:
  - Unpaid family labour: spouse, children, farmer, etc.
  - Self-supplied inputs: manure, seeds, etc.
  - Owned machinery and animals

AGRIS sources:

Economy Module

for owned animals, section 1 (part 1.3 – Livestock) provides numbers of animals and tenure by livestock type which can be used by applying a unit value to the reported quantities to obtain a derived value for use of owned livestock.

Section 5 (part 5.1 – Destination of commodities produced) gives an indication of crop production used for own-use as seed or feed.

Labour Module

For unpaid family labour, section 2 provides the information necessary to derive a value for household members. For household members reported as not receiving payment in part 2.3 (Payments for work on the holding), their person-hours can be obtained in part 2.1 (Agricultural work on the holding). Then, a wage rate can be applied to those reported person-hours to obtain a derived value for the unpaid labour.

Production Methods and the Environment Module

For self-supplied inputs – manure – section 3 (part 3.1 – Use of fertilizers) quantifies the amounts of manure applied on the holding and specifies when the manure was brought from a different holding. A unit value can be applied to the calculated quantities of manure produced and used on the holding to obtain a derived value for own nutrients.

For self-supplied inputs – seeds – section 2 (part 2.2 – Soil management) presents the areas of crops and section 3 (part 3.3 – Crop and seed varieties) gives the share of seed used that was produced on the holding for each crop. A unit value can be applied to the reported quantities to obtain a derived value for own seed.

Machinery, Equipment and Assets Module

For owned machinery, section 1 (part 1.2 – Manually operated equipment, part 1.3 – Animal-powered equipment, and part 1.4 – Machine-powered equipment) provides details that can be used by applying a unit value to the reported quantities to obtain a derived value for use of owned assets.

- **Land costs**: Costs associated with owning or using the land for agricultural production (rental value or imputed rental cost, opportunity cost of using owned land, etc.)

AGRIS sources:

Core Module

section 3 (part 3.2 – Area utilized) provides details on the area used for crops.

Economy Module

section 1 (part 1.2 – Land) gives a breakdown of the areas of land under different tenure arrangements. Section 3 (part 3.1 – Resource inputs used by the agricultural holding) provides land rental expenses. To calculate an imputed rental cost or opportunity cost of using owned land, rental rates can be applied to the area reported in section 1 (part 1.2 – Land). For land taxes, section 3 (part 3.6 – Taxes and licenses paid).

- **Capital costs**: Allowance for the depreciation and eventual replacement costs and the opportunity costs of owned capital, such as owned machinery, farm equipment and buildings. Capital costs are imputed by applying a depreciation rate or opportunity cost rate to capital as reported to AGRIS.

AGRIS source:

Machinery, Equipment and Assets Module

section 1 (part 1.2 – Manually operated equipment, part 1.3 – Animal-powered equipment, part 1.4 (Machine-powered equipment) provides numbers, tenure and age of equipment, to which depreciation rates can be applied to derive depreciation. Section 2 (part 2.1 – Non-residential buildings or structures used for crops, part 2.2 – Non-residential buildings or structures used for livestock) provides information on the volume or size and tenure of buildings used by the holding. Applying depreciation rates to these buildings can provide a derived value for depreciation of buildings.

- **Farm overhead expenses**: Unallocated fixed costs, and farm-level taxes, licences, etc.

AGRIS source:

Economy Module

section 3 (part 3.1 – Resource inputs used by the agricultural holding) provides electricity costs. Section 3 (part 3.6 – Taxes and licenses paid) provides farm-level taxes and licensing costs. Section 4 (part 4.2 – Loans and financing) provides the amount paid in loan repayments. Section 4 (part 4.3 – Insurance) provides the cost of insurance premiums.

- **Land area**: Area in crops

AGRIS source:

Production Methods and the Environment Module

section 2 (part 2.2 – Soil management) breaks down the AAU by use, allowing to identify areas used for cropping versus livestock purposes.

b. Cost per hectare by item

This indicator is a variation of the indicator described in (a) above. The numerator reflects the cost of the chosen item (labour, land, etc.) rather than the overall costs. The denominator remains the same. Examples of cost items often used in this indicator are:

- **Labour costs**: Family labour and Hired labour; includes salaries, social payments and in-kind benefits of hired labour. An imputed cost for unpaid labour can be added by applying a salary rate to the quantities of unpaid labour reported to AGRIS. The component for unpaid labour may or may not be included in the calculation of the indicator, depending on the objective of the indicator.

AGRIS sources:

Economy Module

Labour paid in cash and in kind are covered in section 3 (part 3.4 – Labour inputs used by the agricultural holding).

Labour Module

Labour paid in cash and in kind, and unpaid labour, are covered in section 2 (part 2.3 – Payments for work on the holding – Household members) and section 3 (part 3.6 – Payments for work on the holding – External workers). For unpaid external workers, person-hours are reported in section 3 (part 3.4 – Time worked). A value can be derived by applying a wage rate to the person-hours reported in part 3.4 for unpaid workers. For unpaid household members, section 2 provides the information to derive a value. For household members reported as not receiving payment in part 2.3, their person-hours can be obtained in part 2.1. Then, a wage rate can be applied to those reported person-hours.

- **Land costs**: Defined in Total costs per hectare (ha), above
- **Capital costs**: Defined in Total costs per hectare (ha), above
- **Fertilizer costs**: Purchased fertilizers as well as holding-supplied fertilizers (manure, organic matter, etc.). The value of inputs produced and supplied by the agricultural holding is established by according a market value to quantities used. Both purchased and holding-provided fertilizers should be included in the calculation.

AGRIS source:

Economy Module

section 3 (part 3.2 – Inputs used for crop production) provides quantities of fertilizer used and (as a subset) quantities of fertilizers purchased, as well as the amount paid for purchased fertilizer. A unit value based on reported values for purchased fertilizer can be applied to the amounts of fertilizer used but not purchased.

Production Methods and the Environment Module

For self-supplied inputs – manure – section 3 (part 3.1 – Use of fertilizers) quantifies the amounts of manure applied on the holding and specifies when the manure was brought from a different holding. A unit value can be applied to the calculated quantities of manure produced and used on the holding to obtain a derived value for own nutrients.

- **Plant protection costs**: Both purchased and unpurchased products should be included in the calculation. The value of unpurchased products is established by according a market value to the quantities of unpurchased products used.

AGRIS source:

Economy Module

section 3 (part 3.2 – Inputs used for crop production) provides quantities of provides quantities of plant protection products used and (as a subset) quantities purchased, as well as the amount paid for purchased plant protection products. A unit value based on reported values for purchased products can be applied to the amounts used but not purchased.

- **Water costs**: this may include one-time or annual licenses/fees and payments depending on consumption. The value of water when fees are charged according to use is calculated by applying a unit price for water to the quantity of the water used.

AGRIS source:

Economy Module

section 3 (part 3.1 – Resource inputs used by the agricultural holding) provides water costs. Section 3 (part 3.6 – Taxes and licenses paid) provides license costs for water access rights where applicable.

c. Cost per hectare by cost categories

Groups of costs can be categorized in many ways. Examples of categories that can be calculated are variable versus fixed costs, and cash versus non-cash costs.

- **Variable Costs and Fixed Costs**: Often a division between variable costs and fixed costs is used where:
  Total Costs = Variable Costs + Fixed Costs

This indicator is a variation of the indicator described in (a) above. It takes a grouping of cost items which reflect either fixed or variable costs for the numerator. The denominator remains unchanged.

- **Variable Costs (also known as Operating Costs)**: costs that vary according to the quantities produced. These can be cash and non-cash costs. Examples of variable costs are:
  - Input Costs: Seed, Fertilizers, Plant protection products, Custom work, Animal feed, Veterinary expenses
  - Machinery Variable Costs: Fuel, Maintenance and repair of machinery and equipment
  - Irrigation Costs: Costs associated with the use and maintenance of irrigation infrastructure
  - Labour Costs: Hired labour expenses and value of unpaid labour

AGRIS source:

Economy Module

section 3 (parts 3.1, 3.2, 3.3, 3.4 and 3.6) provides the cost of inputs related to production.

- **Fixed Costs (also know as Overhead Costs)**: costs that are independent from the quantities of agricultural products produced. Examples of fixed costs are:
  - Office Costs: Office supplies
  - Land and Building Costs: Taxes, Interest on land and building loans, Insurance, Depreciation costs, Repair of buildings
  - Machinery Fixed Costs: Interest on machinery loans, Insurance, Depreciation costs, Licences
  - Purchase of Breeding Livestock

AGRIS sources:

Economy Module

Section 3 (parts 3.6 – Taxes and licenses paid), provides information on the cost of licenses. Section 4 (part 4.1 – Capital investments) provides purchases of breeding stock. Section 4 (part 4.2 – Loans and financing) provides loan repayments (principal and interest) from which interest can be estimated, and section 4 (part 4.3 – Insurance) provides insurance premiums paid.

Machinery, Equipment and Assets Module

capital costs (depreciation) as defined in Total costs per hectare (ha), above.

- **Cash Costs and Non-cash Costs**: This is another categorization often found in cost of production studies. Definitions are found in Total costs per hectare (ha), above.
  This indicator is a variation of the indicator described in (a) above. It takes a grouping of cost items which reflect either cash or non-cash costs for the numerator. The denominator remains unchanged.

- **Costs of Production per unit of output**
  These indicators relate costs to the outputs produced. The outputs (denominator of the indicator) can be measured as a physical quantity of output or a monetary value for the quantity of output produced.

$$CoP\_qty = \frac{Total\ Costs}{Output}$$

a. Cost per physical unit of output (quantity of output)

This variation of the indicator represents the output in the denominator by a physical measure of the output produced. This indicator is appropriate and meaningful when holdings produce a single commodity or similar commodities (for example, wheat and barley). It is not meaningful when trying to assign a physical measure for multiple and different commodities (for example, maize and cattle).

Description of variables

- **Total costs**: defined in Total costs per hectare (ha), above
- **Quantity of output**: the output should be measured in the appropriate quantity unit, such as tonnes, pounds or even non-standard units (bags, truckloads, etc.), provided that conversion factors to standard units are known.

AGRIS sources:

Core Module

quantities of crops produced are found in section 3 (part 3.1 – Crop production and destinations). Quantities of livestock and animal products produced are found in section 4 (part 4.1.1 to 4.1.12 – Livestock raising activities and production).

Economy Module

quantities produced for crops and animal products are found in section 2 (part 2.1 – Income from agricultural production).

b. Cost per monetary unit of output (value of output)

This variation of the indicator represents the output in the denominator by a monetary value for the output produced. This indicator is appropriate and meaningful regardless of the mix of agricultural products produced.

Description of variables:

Value of output: revenue from the sale of agricultural products and value of unsold output. The price used to value the output should be as close as possible to the farm-gate price.

AGRIS sources:

Core Module

a value can be obtained directly for quantities of products sold. For production used for farm or household use, or for payment for labour or inputs, a value can be derived by applying a price to the quantities reported for those purposes. Section 3 (part 3.1 – Crop production and destinations) and section 4 (part 4.1.1 to 4.1.12 – Livestock-raising activities and production) provide information on quantities of products by destination, but do not distinguish household use from use for the holding.

Economy Module

he detailed reporting of the destination of production in section 5 (part 5.1 – Destination of commodities produced) provides the percentage share of commodities sold, used for the household, used to pay for farm inputs (labour or other inputs) and used for the farm as inputs (seed or feed). The shares reported can be applied to the quantities produced and the dollar values as reported in section 2 (part 2.1 – Income from agricultural production). The greater detail provided by the Economy Module makes it a better source for this measure than the Core Module.

2. Profitability indicators

The main profitability indicators that can be calculated with data generated by AGRIS are enumerated below.

Gross return or gross margin

$$Gross\ Margin = \frac{Value\ of\ Output - Variable\ Costs}{Value\ of\ Output}$$

This indicator is generally expressed as a ratio or percentage, and measures the difference between the value of output and the costs directly associated with production (variable costs) as a percentage of the value of output.

Description of variables:
Value of Output: defined in Cost per monetary unit of output (value of output), Cost per monetary unit of output (value of output), above

Variable Costs: defined in Cost per hectare by cost categories, above

Net return or net margin

$$Net\ Margin = \frac{Value\ of\ Output - Total\ Costs}{Value\ of\ Output}$$

This indicator is generally expressed as a ratio or percentage, and measures the difference between the value of the output and the total costs incurred by holdings (cash costs, non-cash costs, land and capital costs, as well as farm overhead expenses) as a percentage of the value of output.

Description of variables:
Value of Output: defined in Cost per monetary unit of output (value of output), above

Total Costs: defined in Cost per hectare by cost categories, above

a. Returns per measure of production

$$Returns(*)\ per\ measure\ of\ production = \frac{Value\ of\ Output - \ Costs(*)}{Quantity\ of\ Output}$$

(*) For gross returns per measure of production, subtract variable costs; for net returns per measure, subtract total costs. Both gross returns and net returns can be calculated per measure of production. This indicator is appropriate and meaningful when holdings produce a single commodity or similar commodities (for example, wheat and barley). It is not meaningful when trying to assign a physical measure to multiple and different commodities (for example, maize and cattle).

3. Productivity indicators

Productivity is the notion of the efficiency of production, measured as the ratio of outputs to inputs. The main productivity measure possible using data generated by AGRIS is described below.

Total factor productivity

Total factor productivity accounts for output as it relates to all inputs used in the production process, including capital (land, machinery and livestock), labour and material inputs such as feed and fertilizer. Different models and approaches can be used to calculate the measure; two approaches are reflected in Tonini, Saravia Matus and Gomez y Paloma (2011)[8] and by the Economic Research Service of the US Department of Agriculture[9]. Regardless of the approach used, the data requirements are similar. Rather than level estimates of total factor productivity, the rate of change of outputs vis à vis the rate of change of inputs is typically calculated as an index.

Description of variables

Measures of outputs and inputs as described in earlier parts of the chapter can be used over time to produce this indicator as an index as a measure of change in productivity.

Value of inputs: defined in Total costs per hectare (ha), above

Value of output: defined in Cost per monetary unit of output (value of output), above

4. Other indicators

Other high-level indicators for the agricultural holding and the household that can be calculated using data generated by AGRIS are enumerated below.

Value of output

The value of the output of an agricultural holding is an indicator of size. The analysis of other characteristics of agricultural holdings, classified by categories of the value of output of holdings can provide insights into production practices and efficiency. Two variations of this indicator can be calculated: one where only the value of products sold is used; and another where products that are consumed or used in further processes are attributed a value.

a. Agricultural sales

This variation of the indicator includes only the value of agricultural products sold. This is most relevant when analysing holdings in the non-household sector and those in the household sector whose production is not primarily for own consumption.

8 Tonini, A., Saravia Matus, S. & Gomez y Paloma, S. 2011. *A Bayesian Total Factor Productivity Analysis of Tropical Agricultural Systems in Central-Western Africa And South-East Asia*. Paper prepared for presentation at the European Association of Agricultural Economists (EAAE) 2011 Congress, Change and Uncertainty – Challenges for Agriculture, Food and Natural Resources. Zurich.

9 USDA/ERS. 2017. International Agricultural Productivity. Available at https://www.ers.usda.gov/data-products/international-agricultural-productivity/. Accessed 9 March 2017.

Description of variables

Agricultural sales: revenue from the sale of agricultural products

AGRIS source:

Economy Module

section 2 (part 2.1 – Income from agricultural production).

b. Value of output

This variation of the indicator includes both the value of agricultural products sold as well as a valuation of products used for own consumption or as inputs to other processes. This is a more relevant indicator when holdings with a significant level of own consumption or value-added activities are present.

Description of variables

Value of output: defined in Cost per monetary unit of output (value of output), above

Household income

An economic indicator for households, household income is the sum of all income from all sources for all people residing in the household.

Household income: this indicator relates only to holdings in the household sector (holdings for which the holder is a civil (natural) person or group of civil (natural) persons, or defined as a combination between the legal status of the holder and the legal status of the holding; for more details, see annex 1-4 of this handbook). For all members of the household, income from the following sources is measured: net self-employment income from operating an agricultural holding or other business, wages and salaries, investment income, rental income, pensions, grants and transfers.

AGRIS source:

Economy Module

the determination of holdings as being within the household uses information reported in section 1 (part 1.1 – Identification of the agricultural holding). Household members' income that is not related to the agricultural holding is found in section 2 (part 2.9 – Household members' sources of income not related to the agricultural holding). The income related to the agricultural holding can be derived by subtracting expenses from receipts as found in a number of sections and parts, including section 2 (part 2.1 – Income from agricultural production, Part 2.8 – Subsidies and transfers received) and section 3 (parts 3.1, 3.2, 3.3, 3.4 and 3.6 which outline the expenses for the agricultural holding). Other sources of income from sources other than the agricultural holding are found in section 2 (parts 2.2 to 2.7).

While the Economy Module provides the majority of data for economic indicators, virtually all other modules contribute to the calculation of some indicators. Table A2.4. below provides a summary of the economic indicators presented above, along with the parts of the various AGRIS modules which provide the data for their calculation.

TABLE A2.4. SUMMARY OF ECONOMIC INDICATORS AND THEIR AGRIS DATA SOURCES.

Indicator	AGRIS Module data sources				
	Core	Economy	Labour	Machinery, Equipment and Assets	Production Methods and the Environment
1. Cost of production indicators					
I. Cost of production per hectare					
a. Total costs per hectare	Part 1.3 Part 3.2	Part 1.2 Part 1.3 Part 3.1 Part 3.2 Part 3.3 Part 3.4 Part 3.5 Part 3.6 Part 4.2 Part 4.3 Part 5.1	Part 1.2 Part 2.3 Part 3.6 Part 4.1	Part 1.2 Part 1.3 Part 1.4 Part 2.1 Part 2.2	Part 2.2 Part 3.1 Part 3.3
b. Cost per hectare per item	Part 3.2	Part 1.2 Part 3.1 Part 3.2 Part 3.3 Part 3.4 Part 3.5 Part 3.6	Part 2.1 Part 2.3 Part 3.5 Part 3.6	Part 1.2 Part 1.3 Part 1.4 Part 2.1 Part 2.2	Part 3.1
c. Cost per hectare by cost categories	Part 3.2	Part 1.2 Part 1.3 Part 3.1 Part 3.2 Part 3.3 Part 3.4 Part 3.5 Part 3.6 Part 4.1 Part 4.2 Part 4.3 Part 5.1	Part 1.2 Part 2.1 Part 2.3 Part 3.5 Part 3.6	Part 1.2 Part 1.3 Part 1.4 Part 2.1 Part 2.2	Part 2.2 Part 3.1 Part 3.3
II. Costs of production per unit of output					
a. Cost per physical unit of output (quantity of output)	Part 3.1 Part 3.2 Parts 4.1.1 to 4.1.12	Part 1.2 Part 1.3 Part 2.1 Part 3.1 Part 3.2 Part 3.3 Part 3.4 Part 3.5 Part 3.6 Part 4.2 Part 4.3	Part 1.2 Part 2.3 Part 3.6 Part 4.1	Part 1.2 Part 1.3 Part 1.4 Part 2.1 Part 2.2	Part 2.2 Part 3.1 Part 3.3
b. Cost per monetary unit of output (value of output)	Part 3.1 Part 3.2 Parts 4.1.1 to 4.1.12	Part 1.2 Part 1.3 Part 2.1 Part 3.1 Part 3.2 Part 3.3 Part 3.4 Part 3.5 Part 3.6 Part 4.2 Part 4.3 Part 5.1	Part 1.2 Part 2.3 Part 3.6 Part 4.1	Part 1.2 Part 1.3 Part 1.4 Part 2.1 Part 2.2	Part 2.2 Part 3.1 Part 3.3

Indicator	AGRIS Module data sources				
	Core	Economy	Labour	Machinery, Equipment and Assets	Production Methods and the Environment
2. Profitability indicators					
I. Gross return or gross margin	Part 3.1 Part 3.2 Parts 4.1.1 to 4.1.12	Part 1.2 Part 1.3 Part 2.1 Part 3.1 Part 3.2 Part 3.3 Part 3.4	Part 1.2 Part 2.1 Part 2.3 Part 3.6 Part 4.1	Part 1.2 Part 1.3 Part 1.4 Part 2.1 Part 2.2	Part 2.2 Part 3.1 Part 3.3
II. Net return or net margin	Part 1.3 Part 3.1 Part 3.2 Parts 4.1.1 to 4.1.12	Part 1.2 Part 1.3 Part 2.1 Part 3.1 Part 3.2 Part 3.3 Part 3.4 Part 3.5 Part 3.6 Part 4.2 Part 4.3 Part 5.1	Part 1.2 Part 2.1 Part 2.3 Part 3.6 Part 4.1	Part 1.2 Part 1.3 Part 1.4 Part 2.1 Part 2.2	Part 2.2 Part 3.1 Part 3.3
3. Productivity indicators					
I. Total factor productivity	Part 1.3 Part 3.1 Part 3.2 Parts 4.1.1 to 4.1.12	Part 1.2 Part 1.3 Part 2.1 Part 3.1 Part 3.2 Part 3.3 Part 3.4 Part 3.5 Part 3.6 Part 4.2 Part 4.3 Part 5.1	Part 1.2 Part 2.3 Part 3.6 Part 4.1	Part 1.2 Part 1.3 Part 1.4 Part 2.1 Part 2.2	Part 2.2 Part 3.1 Part 3.3
4. Other indicators					
I. Value of output					
a. Agricultural sales		Part 2.1			
b. Value of output	Part 3.1 Parts 4.1.1 To 4.1.12	Part 2.1 Part 5.1			
III. Household income		Part 1.1 Part 2.1 Part 2.2 Part 2.3 Part 2.4 Part 2.5 Part 2.6 Part 2.7 Part 2.8 Part 2.9 Part 3.1 Part 3.2 Part 3.3 Part 3.4 Part 3.5 Part 3.6			

ANNEX 2-3: INDICATORS RELATED TO THE LABOUR MODULE OF AGRIS

The structure of the Economy Module, along with the main themes and list of indicators associated with it, is presented in chapter 4 of this handbook, titled Economy Module: generic questionnaire and methodological notes.

Detailed descriptions of the main indicators that can be calculated based on data from the AGRIS Labour Module, including the required variables and calculations, may be found in this annex. Twenty-one indicators are presented, under the themes of:

- Labour input
- Organization of labour on the holding
- Cost of labour
- Wages and earnings of workers
- Other relevant labour/economy indicators

The proposed indicators can provide a way to organize data from the Labour Module (and other AGRIS modules) to help shed light on the labour characteristics of the agricultural sector.

For useful background on the types of calculations often used as indicators, see Types of indicators above for descriptions of these arrangements of data and general instructions and best practices for their use.

Main indicators derived from the Labour Module

Data from the Labour Module can be used to calculate a number of relevant indicators for the agricultural sector related to this important input into agricultural production. These measures can be beneficial for farmers in assessing the performance of their own holding compared to other holdings, for agricultural service providers in the commercial and extension realms to better plan and focus services for their agricultural clients and for policy-makers as they seek to improve the focus and efficiency of their policies and programmes for the agricultural sector[10].

The International Labour Organization (ILO) has established a set of 17 "Key Indicators of the Labour Market" (KILM). The ninth edition, published in 2016, contains the recommended indicators for international use[11]. Data from the Labour Module does not fully satisfy requirements for these indicators. However, there are three for which the indicators can be applied in a partial way to increase understanding of the labour situation in the agriculture sector. The three indicators are: KILM #7 – Hours of work; #15 – Wages and compensation costs; and #16 – Labour productivity. Linkages to KILM are noted among the indicators presented in the following sections.

10 GSARS. 2016b. *Handbook on Agricultural Cost of Production Statistics*. GSARS Handbook: Rome. Available at: http://gsars.org/en/handbook-on-agricultural-cost-of-production-statistics-2/. Accessed 26 January 2017.

11 ILO. 2016. *Key Indicators of the Labour Market, Ninth edition*. ILO Publication: Geneva. Available at: http://www.ilo.org/wcmsp5/groups/public/---dgreports/---stat/documents/publication/wcms_498929.pdf. Accessed 10 April 2017.

1. Labour input indicators

The main labour input indicators that can be calculated with data generated by the AGRIS Labour Module are enumerated below.

I. Total labour input

The total labour input (time) on holdings provided from all types of workers provides an aggregate look at labour requirements related to agricultural holdings. Calculating it involves summing the time worked by each type of worker. The time period of the resulting indicator will mirror the reference period for the Labour Module, which is the "past N months". The default value for N is 12 months, but this may vary by adopting country and by collection methodology (whether one or two waves).

$$\begin{aligned} &Total\ labour\ input\ (time) in\ the\ past\ N\ months \\ &\quad = \Sigma\ Labour\ time\ of\ household\ workers + \Sigma\ Labour\ time\ of\ external\ workers \\ &\quad + \Sigma\ Labour\ time\ of\ contractors \end{aligned}$$

The indicator includes both the time spent on agricultural activities (related to primary agricultural production), and the labour related to other economic activities on the holding that are closely related to agriculture and that may use the holding's means of production. Some examples are the processing of agricultural products, the selling of agricultural products at market, production of aquaculture or forestry products, renewable energy production, providing contractual services for other holdings, making handicrafts or providing accommodation, and catering.

Household member worker information is collected for each member separately. The time spent is collected for the entire reference period of N months as one single block of time. Work done on the holding for agricultural activities is reported separately from work done on the holding for other economic activities. The two would be added together to establish the total labour time on the holding for household workers.

Household member worker 1's hours worked during the past N months can be calculated as follows:

$$\begin{aligned} &Household\ member\ worker\ \#1\ hours\ worked\ in\ the\ past\ N\ months \\ &\quad = Number\ of\ months\ worked \times Number\ of\ days\ worked\ per\ month \\ &\quad \times\ Number\ of\ hours\ worked\ per\ day \end{aligned}$$

This would be calculated and summed for *Household member worker 1* to *Household member worker N* for all holdings, where *N* is the total number of household members who worked on the holding.

External worker information is collected in an aggregate way for each type or sex grouping of workers.

The time worked for each grouping is reported separately for each month of the N months in the reference period. The time reported for external workers includes the time spent working on agricultural activities and other economic activities combined.

External worker type or sex grouping 1's hours worked during the past N months can be calculated as follows: *m = Month from Month 1 to Month N*

$$\text{External worker type/sex grouping \#1 } hours\ worked\ during\ the\ past\ N\ months = \sum_{m=1}^{N} Number\ of\ person\ days\ worked\ in\ the\ month \times Number\ of\ hours\ worked\ per\ day$$

This would be calculated and summed for *External worker type 1* to *External worker type 10* for all holdings. External worker types are:

1. External managers – adult males
2. External managers – adult females
3. External, paid, long-term employees – adult males
4. External, paid, long-term employees – adult females
5. External, paid, temporary workers – adult males
6. External, paid, temporary workers – adult females
7. External, paid, casual workers – adult males
8. External, paid, casual workers – adult females
9. Unpaid, external workers – adult males
10. Unpaid, external workers – adult females

In some cases, it may be preferable to include the work time of contractors in the equation; in other cases, it may be excluded. The calculation of labour time for contractors is not direct; however, by using data from the questionnaire, a time value may be imputed. The module provides a total dollar amount paid to contractors during the past N months. It also provides an amount for the last payment and the time period to which the last payment refers. Calculating the ratio between the "time to amount paid" for the last payment and applying it to the amount paid in the past N months will provide an imputed figure for contractor time in the past N months.

Summed for all holdings, this gives a total labour figure for the period of N months for the geographic area being tabulated. Dividing this figure by the number of holdings would give an average total labour per holding for the period of *N* months.

To adjust the indicator to provide a "total hours per month", the calculation result can be divided by N. A weighted average per worker can be calculated for household members and external workers by calculating the average total hours per month for each worker, summing them and dividing the sum by the number of workers. Likewise, the "total hours per week" for household members and external workers can be calculated. The calculation to be applied for household member workers is shown below.

$$Average\ total\ hours\ per\ week = \frac{\sum_{w=1}^{n}(Number\ of\ months\ worked \times Number\ of\ days\ per\ month \times Number\ of\ hours\ per\ day)}{Number\ of\ weeks\ in\ the\ reference\ \ period\ of\ N\ months}$$

Description of variables

Time worked by household members and external workers:

AGRIS source:

Labour Module

section 2: Household workers (parts 2.1 and 2.2) provide information on the number of months, days per month and hours per day worked by each household member worker during the reference period of N months. Section 3: External workers (part 3.4 – Time worked) provides information on the days per month and hours per day worked in each of the N months for each category of worker.

Time worked by contractors

AGRIS source:

Labour Module

section 4, part 4.1 (Contractors, Work on the holding and payments for work on the holding) provides the data required to impute a time worked by contractors.

II. Proportion of holdings facing lack of labour

A number of indicators can provide insights into the significance and the nature of shortages of labour for agricultural holdings.

a. Percentage of holdings facing lack of labour

$$Percent\ of\ holdings\ facing\ lack\ of\ labour = \left(\frac{Number\ of\ farms\ reporting\ lack\ of\ labour}{Total\ number\ of\ farms}\right) \times 100$$

Description of variables

Number of farms reporting lack of labour:

AGRIS source:

Labour Module

section 1, part 1.2 (Activities of the agricultural holding during the reference year)

Total number of farms

AGRIS source:

Labour Module

section 1, part 1.2 (Activities of the agricultural holding during the reference year)

b. Percentage of holdings facing lack of labour by main reason for labour shortage

This indicator is a variation of the indicator described in (a) above.

$$Percent\ of\ holdings\ facing\ lack\ of\ labour\ by\ main\ reason\ for\ labour\ shortage$$
$$= \left(\frac{Number\ of\ farms\ reporting\ lack\ of\ labour\ for\ "main\ reason"}{Total\ number\ of\ farms\ (*\ OR\ Number\ of\ farms\ reporting\ lack\ of\ labour)}\right) \times 100$$

The numerator reflects those reporting a specific main reason identified for the lack of labour. Respondents report only one of three possible response choices: (a) lack of workers, (b) workers are available, but lack adequate skills, and (c) wages are too high; the holding cannot afford labour.

The denominator can be either the total number of farms, or the number of farms reporting a lack of labour, depending on the requirements of the adopting agency.

Description of variables

Number of farms reporting lack of labour, by main reason

AGRIS source:

Labour Module

section 1, part 1.2 (Activities of the agricultural holding during the reference year)

Total number of farms OR number of farms reporting lack of labour

AGRIS source:

Labour Module

section 1, part 1.2 (Activities of the agricultural holding during the reference year)

c. Percentage of holdings facing lack of labour by consequence of labour shortage

This indicator is a variation of the indicator described in (a) above.

$$Percent\ of\ holdings\ facing\ lack\ of\ labour\ by\ consequence\ of\ labour\ shortage$$
$$= \left(\frac{Number\ of\ farms\ reporting\text{"consequence"}\ of\ lack\ of\ labour}{Total\ number\ of\ farms\ (OR\ Number\ of\ farms\ reporting\ lack\ of\ labour)}\right) \times 100$$

The numerator reflects those reporting a specific consequence identified related to the lack of labour. Respondents can report as many consequences as apply from a list of six: (a) no impact on the holding's activities, (b) reduced production, (c) reduced marketable surplus, (d) reduced the amount of land cultivated or the number of livestock raised, (e) reduced product quality, and (f) other, specify. Because multiple responses can be provided, refer to case 3 in table A2.2 for details on the best tabulation methods.

Description of variables

Number of farms reporting lack of labour by consequence

AGRIS source:

Labour Module

section 1, part 1.1 (Identification of the agricultural holding)

Total number of farms OR number of farms reporting lack of labour

AGRIS source:

Labour Module

section 1, part 1.1 (Identification of the agricultural holding)

2. Organization of labour on the holding indicators

This group of indicators provides a profile of the types of workers engaged in performing various types of work.

I. Labour profile for household members

The following indicators highlight the nature of work for household members related to the primary agricultural production on the holding and other economic activities of the holding.

a. Proportion of household members engaged in agricultural activities on the holding (by age, sex)

While examining the aggregate percentage of household members working on agricultural activities may be useful, disaggregating by age or sex will provide further insights into household members' activities.

$$Percent\ of\ holdings\ facing\ lack\ of\ labour\ by\ main\ reason\ for\ labour\ shortage$$
$$= \left(\frac{Number\ of\ farms\ reporting\ lack\ of\ labour\ for\ "main\ reason"}{Total\ number\ of\ farms\ (*\ OR\ Number\ of\ farms\ reporting\ lack\ of\ labour)}\right) \times 100$$

Description of variables

Number of household members by age or sex reporting agricultural work

AGRIS source:

Core Module

section 6 (part 6.1 – Sociodemographic characteristics of the households of the holders and co-holders) provides the age and sex information for each household member.

Labour Module

section 2 (part 2.1)

Total number of household members by age or sex

AGRIS source:

Core Module

section 6 (part 6.1 – Sociodemographic characteristics of the households of the holders and co-holders)

b. Average time household members spent on agricultural work and other economic activities on the holding

While all holdings must accomplish agricultural work to produce primary agricultural output, many holdings also participate in other economic activities that are closely related to primary agriculture and that may use the holding's means of production. It is useful to understand household members' participation in these other economic activities on the holding relative to the time spent on agricultural work. As in the case of the indicator in (a) above, there are valuable insights to be gained by disaggregating this measure by age or sex.

This indicator parallels KILM #7 – Hours of work. While it is not the full expression of a household member's working hours (since household members may have other employment or work outside the holding), it does provide an indicator for the holding-based work. Typically, this indicator is expressed as the average number of hours per week. While the calculation of an aggregate average for hours of work may be useful, individuals' average hours can be calculated to produce ranges and distribution tables. Distribution categories for dissemination are usually: < 15 hours; 15–29 hours; 30–34 hours; 35–39 hours; 40–48 hours; and 49 hours and more. These may be customized to reflect the conditions and priorities in adopting countries. Because of the seasonal nature of agricultural production, the timing of collection will have an effect on the averages reported.

$$Average\ total\ hours\ per\ week\ per\ worker = \sum_{tw=1}^{2} \frac{(Number\ of\ months\ worked \times Number\ of\ days\ per\ month \times Number\ of\ hours\ per\ day)}{((Number\ of\ months\ worked \times Number\ of\ days\ per\ month)\ \div Number\ of\ work\ days\ per\ week)}$$

In the calculation above, tw = type of work; 1=agricultural activities; and 2=other economic activities.

Once the average is calculated for each worker, the indicator can be tabulated for all household member workers, or disaggregated by age or sex.

Description of variables

Time worked on the holding by household members on agricultural activities or on other economic activities, by age or sex

AGRIS source:

Core Module

section 6 (part 6.1 – Sociodemographic characteristics of the households of the holders and co-holders) provides age and sex information for each household member.

Labour Module

section 2: Household workers (part 2.1 – Agricultural work and part 2.2 – Work on other economic activities)

II. Labour profile of external workers and contractors

a. Proportion of holdings using external workers (by category of external worker)

This indicator provides a measure of holdings' reliance on workers from outside of the household unit. An aggregate measure is useful; however, breaking it down by category will provide more detail on the types of external workers that are most engaged within the sector. Categories include: manager; paid, long-term employee; paid, temporary worker; paid, casual worker; and unpaid external worker.

Should there be value in demographic detail, each of the external worker types can be further broken down into the following broad demographic categories: adult male, adult female, and children under 15 years of age.

$$Percent\ of\ holdings\ using\ external\ workers = \left(\frac{Number\ of\ holdings\ using\ external\ workers\ (by\ category\ of\ worker)}{Total\ number\ of\ holdings}\right) \times 100$$

Description of variables

Number of holdings using external workers by category of external worker

AGRIS source:

Labour Module

section 3 (part 3.1) provides information on whether external workers are engaged on the holding, and if so, which types (tenure and broad demographic category).

Total number of holdings

AGRIS source:

Labour Module

section 1 (part 1.1)

b. Average time external workers worked on the holding (by category of external worker, sex)

This indicator parallels KILM #7 – Hours of work. While it is not the full expression of a worker's working hours (since workers may have other employment off of the holding), it does provide an indicator for the holding-based work. Typically, this indicator is expressed as an average number of hours per week. While the calculation of an aggregate average for hours of work may be useful, individuals' average hours can be calculated to produce ranges and distribution tables. Distribution categories for dissemination are usually: < 15 hours; 15–29 hours; 30–34 hours; 35–39 hours; 40–48 hours; and 49 hours and more. These may be customized to reflect the conditions and priorities in adopting countries. Because of the seasonal nature of agricultural production, the timing of collection will have an effect on the averages reported.

Once the average is calculated for each worker, the indicator can be tabulated for all workers, or disaggregated by worker type or sex.

$$Average\ total\ hours\ per\ week\ per\ worker = \frac{\sum_{m=1}^{N} \frac{(Number\ of\ days\ per\ month \times Number\ of\ hours\ per\ day)}{(Number\ of\ days\ per\ month \div Number\ of\ work\ days\ per\ week)}}{Number\ of\ months\ (N)}$$

Description of variables

Time worked on the holding by external workers on agricultural activities and/or on other economic activities by worker type, sex

AGRIS source:

Labour Module

section 3 (part 3.1 – Demographic characteristics) provides the type of worker and sex information.

Section 3 (part 3.4 – Time worked over the past N months) provides the work information.

c. Proportion of holdings using contractors

This indicator provides information on the prevalence of contractors on holdings in a given jurisdiction.

$$Percent\ of\ holdings\ using\ contractors = \left(\frac{Number\ of\ holdings\ using\ contractors}{Total\ number\ of\ holdings}\right) \times 100$$

Description of variables
Number of holdings using contractors

AGRIS source:
Labour Module
section 4 (part 4.1) identifies holdings using contractors in the reference period.

Total number of holdings
AGRIS source:
Labour Module
section 1 (part 1.1)

3. Cost of labour indicators

I. Total labour costs

The total cost of labour includes all direct and indirect costs to an employer. Therefore, this indicator should include cash wages and the value of in-kind payments (direct costs), as well as the benefits (indirect costs) paid by the employer[12]. This aligns with KILM #15 – Wages and compensation costs. The indicator is valuable in its nominal (current) form for use within the jurisdiction where the data are collected. For use over time, and between jurisdictions, adjustment to real (constant) values is useful.

$$\begin{aligned} &Total\ labour\ cost\ in\ the\ past\ N\ months \\ &= \sum Direct\ labour\ costs\ for\ household\ workers \\ &+ \sum Indirect\ labour\ costs\ for\ household\ workers \\ &+ \sum Direct\ labour\ costs\ for\ external\ workers \\ &+ \sum Indirect\ labour\ costs\ for\ household\ workers \end{aligned}$$

The data will have to be adjusted so that all elements of the calculation relate to the same time period, as they are collected for different periods (see description of variables below).

Description of variables
Direct labour costs for household and external workers

AGRIS source:
Labour Module
section 2 (part 2.3 – Payment for work on the holding) provides information on the last payment period to which it refers for cash wages and the value of in-kind payment for household workers.
Section 3 (part 3.6 – Payment for work on the holding) provides information on the cash and in-kind payments to external workers for a respondent-specified period.

12 Eurostat. 2016. *Statistics explained – Glossary*. Eurostat Publication: Luxembourg. Available at: http://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:Labour_cost. Accessed 23 May 2017.

Indirect labour costs for household and external workers

AGRIS source:

Labour Module

section 2 (part 2.4 – Benefits for work on the holding) provides information on the employer's contributions on behalf of household workers for pension and health insurance during the last month.

Section 3 (part 3.7 – Benefits for work on the holding) provides information on the contributions made by type of external worker for pension and health insurance during the last month. It also provides information on other benefits such as transportation, housing, and family allowances during the last month.

II. Type of pay and benefit arrangements

a. Proportion of household member workers by payment type

It may be of interest to calculate the share of household member workers by whether or not they were paid; and for those who were paid, by the type of payment.

$$Percent\ of\ household\ members\ by\ payment\ method$$
$$= \left(\frac{Number\ of\ household\ members\ working\ on\ the\ holding\ and\ being\ paid\ by\ method\ (x)}{Total\ number\ of\ household\ members\ working\ on\ the\ holding}\right) \times 100$$

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b. Proportion of external workers by payment type

This is the same indicator as above, but for external workers instead of household members.

Description of variables

External workers by payment type

AGRIS source:

Labour Module

section 3 (part 3.1 – Demographic characteristics) identifies unpaid external workers.

Section 3 (part 3.6 – Payments for work on the holding) provides an indicator for those paid exclusively in kind. Entered values for cash payments and the value of in-kind payments can be used to identify those paid only in cash and those paid in a cash/in-kind combination.

Total number of external workers

AGRIS source:

Labour Module

section 3 (part 3.1 – Demographic characteristics) identifies the total number of external workers by summing all worker types reported.

c. Proportion of household member workers who received benefits

Employment positions with benefits are generally considered to be more attractive for workers. It is therefore useful to establish what portion of household workers who receive pay also receive benefits, in the form of contributions towards pension and health insurance, for their work on the holding.

$$Percent\ of\ paid\ household\ member\ workers\ receiving\ benefits$$
$$= \left(\frac{Number\ of\ household\ members\ working\ on\ the\ holding\ and\ receiving\ benefits}{Total\ number\ of\ household\ members\ working\ on\ the\ holding}\right) \times 100$$

d. Proportion of external workers who received benefits

Similar to the indicator above for household member workers, this provides an indication of the share of external worker positions offering benefits.

This indicator can be calculated for workers in the following categories:

- No benefits
- Pension or health insurance benefits only
- "Other" benefits only
- "Other" benefits and pension or health insurance benefits

4. Wages and earnings of workers indicators

I. Average wages of paid household members

This indicator aligns with KILM #15 – Wages and compensation costs. Because the payment period is respondent-selected, responses must be standardized before they are aggregated. As with many labour indicators, there may be value in calculating average wages by age and/or sex of worker. The wages to be calculated include cash wages and the value of in-kind payments. While nominal (current) values are useful in the jurisdiction where the data are collected, adjustments to real (constant) values may be more appropriate for use over time and across jurisdictions.

Average wage of paid household member workers (by age and/or sex)

$$= \frac{Total\ cash\ wages\ received\ and\ value\ of\ in\ kind\ payment\ for\ household\ member\ workers\ by\ age/sex}{Total\ number\ of\ paid\ household\ member\ workers\ by\ age/sex}$$

While the calculation above gives an aggregate average wage, individuals' average wages can be calculated to produce ranges and distribution tables.

Description of variables

Cash wages and value of in-kind payments for household workers

AGRIS source:

Core Module

section 6 (part 6.1 – Sociodemographic characteristics of the households of the holders and co-holders) provides information on the age and sex of each household member.

Labour Module

section 2 (part 2.3 – Payment for work on the holding) provides information on the last payment period to which it refers for cash wages and the value of in-kind payment for household workers.

Total number of household workers

AGRIS Source:

Labour Module

section 2 (part 2.1 – Agricultural work on the holding) identifies the total number of household member workers who received payment.

II. Average wages of external workers

Similar to the indicator above, this aligns with KILM #15 – Wages and compensation costs, as it relates to external workers. As for household member workers, the payment period for external workers is respondent-selected; therefore, responses must be standardized before they are aggregated. The wages to be calculated include cash wages and the value of in-kind payments.

Average wage of external workers (by age and/or sex)

$$= \frac{Total\ cash\ wages\ received\ and\ value\ of\ in\ kind\ payment\ for\ external\ workers\ by\ age/sex}{Total\ number\ of\ external\ workers\ by\ age/sex}$$

While the calculation above gives an aggregate average wage, individuals' average wages can be calculated to produce ranges and distribution tables.

Description of variables

Cash wages and value of in-kind payments for external workers

AGRIS source:

Labour Module

section 3 (part 3.6 – Payment for work on the holding) provides information on the cash and in-kind payments made to external workers for a respondent-specified period.

Total number of external workers

AGRIS source:

Labour Module

section 3 (part 3.1 – Demographic characteristics) identifies the total number of external workers.

III. Average benefits of paid household member workers

This indicator provides an average per worker for the contributions made on their behalf for pension and/or health benefits. Because the payment period for benefits is respondent-selected, responses must be standardized before they are aggregated. As with many labour indicators, there may be value in calculating average wages by the age and/or sex of worker.

Average benefits of external workers (by age and/or sex)

$$= \frac{Total\ benefits\ (pension, health\ benefits\ \&\ other\ benefits)\ received\ by\ external\ workers\ by\ age/sex}{Total\ number\ of\ external\ workers\ receiving\ benefits\ by\ age/sex}$$

IV. Average benefits of external workers

Similar to the indicator above, this relates to external workers. As for household member workers, the payment period for external workers is respondent-selected; therefore, responses must be standardized before they are aggregated. The benefits to be calculated for external workers include an amount for pension and/or health benefits, as in the case for household members, but also includes an amount for "other" benefits as described in Proportion of external workers who received benefits, above.

5. Other relevant labour and economy indicators

A number of economic indicators are calculated using data from the Labour Module in conjunction with data from other AGRIS modules. The key indicators are listed below and are presented with more detail in annex 2-2, on indicators related to the AGRIS Economy Module.

I. Profitability indicators

A number of indicators can provide insights into agricultural production costs per area of farm production.

a. Cost of Production per hectare – Total Costs per hectare (ha) (see annex 2-2, Economy Module)

b. Cost of Production per hectare – Cost per hectare by item (see annex 2-2, Economy Module)

II. Productivity indicators

a. Labour productivity

Labour productivity accounts for output as it relates to labour used in the production process. The indicator relates to KILM #16 – Labour productivity. Rather than level estimates of labour productivity, the rate of change of outputs vis-à-vis the rate of change of inputs is typically calculated as an index. Both the Economy Module and the Labour Module collect data related to other economic activities on the holding beyond primary agricultural production. Therefore, labour productivity can include all activities on the holding, not only agricultural activities.

Description of variables

The value of the output of an agricultural holding exists in two variations: one in which only the value of the products sold is used; and another which the value of all output is used – that is, where products that are consumed or used in further processes are attributed a value.

Value of products sold

AGRIS source:

Economy Module

section 2 (part 2.1 – Income from agricultural production; part 2.2 – Aquaculture and Fishery production; part 2.3 – Forestry production; part 2.4 – Other sources of income directly related to the agricultural holding; part 2.5 – On-farm processing of agricultural products; part 2.6 – Other diversification activities; part 2.7—Electricity produced).

Value of output

This variation of the indicator includes both the value of agricultural products sold as well as a valuation of products that are used for own consumption or as inputs into other processes. This is a more relevant indicator when holdings with a significant level of own consumption or value-added activities are present. In this case, the value of output is the revenue from the sale of agricultural products and the value of the unsold output. The price used to value the output should be as close as possible to the farm-gate price.

AGRIS sources:

Core Module

a value can be obtained directly for quantities of products sold. For production used for farm or household use, or for payment for labour or inputs, a value can be derived by applying a price to the quantities reported for those purposes. Section 3 (part 3.1 – Crop production and destinations) and section 4 (part 4.1 – Livestock raising activities and production) provide information on quantities of products by destination, but do not break out household use from use for the holding.

Economy Module

the detailed reporting of the destination of production in section 5 (part 5.1 – Destination of commodities produced) provides the percentage share of commodities sold, used for the household, used to pay for farm inputs (labour or other inputs) and used for the farm as inputs (seed or feed). The shares reported can be applied to the quantities produced and the dollar values as reported in section 2 (part 2.1 – Income from agricultural production). The greater detail provided by the Economy Module makes it a better source for this measure than the Core Module.

Labour input

This is the total hours worked to achieve the output.

Time worked by household members and external workers

AGRIS source:

Labour Module

section 2 – Household workers (part 2.1) provides information on the number of months, days per month and hours per day worked on agricultural activities by each household member worker during the reference period of N months.

Section 3 – External workers (part 3.4 – Time worked) provides information on the days per month and hours per day worked in each of the N months for each category of worker, and part 3.5 identifies those for whom agricultural activities are the main work.

Time worked by contractors

AGRIS source:

Labour Module

section 4 (part 4.1) provides the data required to impute a time worked by contractors on agricultural activities.

ANNEX 2-4: INDICATORS RELATED TO THE AGRIS PRODUCTION METHODS AND THE ENVIRONMENT MODULE

The AGRIS Production Methods and the Environment (PME) Module collects data on a broad range of topics related to agricultural practices and their intersection with the environment in which the agriculture sector operates. Topics include the use of natural resources, production methods related to crop and livestock activities, organic farming, agroforestry, information services, infrastructure and communal resources, greenhouse gases (GHGs), climate change and waste management. Informative indicators are presented in this annex to enhance the use and interpretation of PME data. It should be noted that the data from the PME Module are to be analysed together with the data collected with the AGRIS Core Module.

In addition to the indicators presented in this annex, the information from the PME Module can be used as input in the models used for the compilation of GHG emissions inventories or other agro-environmental indicators.

For useful background on the types of calculations often used as indicators, see *Types of indicators* above for descriptions of these arrangements of data and general instructions and best practices for their use.

The structure of the Economy Module, along with the main themes and list of indicators associated with it, is presented in chapter 4 of this handbook, titled *Economy Module: generic questionnaire and methodological notes*.

1. Indicators related to the holding's prospects

I. Prospects for the holding

a. Prospects

Respondents report their perception of the prospects for the development of the holding's activities in the upcoming two to three years. A distribution of the responses to that question sets the stage for further development of the subject with subsequent questions.

$$\textit{Distribution of prospects for the holding in the next 2 to 3 years} = \left(\frac{\textit{Number of holdings in prospects category X}}{\textit{Total number of holdings}}\right) \times 100$$

Response categories for prospects for the holding's activity development in the next two to three years:

- The holding is stable and no major changes or developments are planned
- The holding will develop, without any major obstacles having been identified
- The holding will not develop, due to certain constraints
- The holding is likely to stop its agricultural activities in the next two to three years

AGRIS source:

Production Methods and the Environment Module

section 1, part 1.2 (Prospects for development of the holding)

b. Constraints

Where responses indicate that holdings will not develop due to constraints, or that the holding will stop activity, further details provide insights into the reasons behind a lack of development in the following categories, which can be calculated as a distribution. Respondents may select as many constraints as apply; therefore, adopting countries will need to determine how they wish to deal with single and multiple responses (see case 3 in table A2.2 for options).

Constraint response categories:

- Access to land
- Access to water
- Access to financial resources
- Access to machinery and equipment
- Access to labour
- Access to other agricultural inputs (water, irrigation, PPPs, veterinary products or services, etc.)
- Not enough demand/buyers for the products of the holding
- Selling prices are to low
- Decreasing soil fertility
- Natural disasters (including floods or droughts)
- Lack of safety, thefts, etc.
- Poor transportation and/or infrastructure
- Other (specify)[13]

AGRIS source:

Production Methods and the Environment Module

section 1, part 1.2 (Prospects for development of the holding)

13 Responses of "other" should be verified during processing to ensure that they are valid, and to move write-in responses to other response categories where appropriate.

2. Indicators related to the use of natural resources

I. Energy use

Respondents indicate all of the energy sources used by the holding for agriculture activity. Because multiple responses are possible, statistical agencies must determine how to account for this when establishing their distribution classes
(see case 3 in table A2.2 for options).

Questionnaire categories for energy sources are:

- Network electricity
- Petroleum fuels (gasoline, kerosene, diesel, oil, etc.)
- Coal
- Natural gas
- Propane
- Biomass (wood, plant material, etc.)
- Biogas or methane
- Solar energy
- Wind energy
- Hydro force
- Other energy or fuel (specify)[14]

While all of the individual categories can be included in the distribution, analysts may wish to group them to reduce the number of classes.

Potential categories for grouping the energy sources and accounting for single and multiple responses:

- One energy source, renewable
- One energy source, non-renewable
- Multiple energy sources, all renewable
- Multiple energy sources, all non-renewable
- Multiple energy sources, mix of renewable and non-renewable

Renewable sources include biomass, biogas/methane, solar energy, wind energy and hydro source. Non-renewable sources include petroleum fuels, coal, natural gas and propane. Network electricity can either be renewable or non-renewable depending on its source. Entries in the category of "other (specify)" should be reviewed so that they can be placed in the appropriate category in this form of the tabulation.

AGRIS source:

Production Methods and the Environment Module
section 2, part 2.1 (Energy sources)

II. Soil/land management

a. Agricultural area utilized (AAU) by land use type

Eight categories of land are combined to constitute agricultural area utilized (AAU). A presentation of each component as a share of the total provides a profile of land use in a given jurisdiction.

14 Responses of "other" should be verified during processing to ensure that they are valid, and to move write-in responses to other response categories where appropriate.

$$Distribution\ of\ AAU\ according\ to\ land\ use\ type = \left(\frac{Area\ of\ land\ in\ land\ use\ category\ X}{Total\ agricultural\ area\ utilized}\right) \times 100$$

Land use categories are:

- Temporary crops under greenhouses or high shelters
- Temporary crops outdoors or under low shelters
- Temporary fallow
- Temporary meadows and pastures
- Kitchen gardens and backyards
- Permanent crops under greenhouses or high shelters
- Permanent crops outdoors or under low shelters
- Permanent meadows and pastures

For more information, see the similar indicator, Area utilized, in annex 2.1 above.

AGRIS source:

Production Methods and the Environment Module
section 2, part 2.2 (Soil management)

b. Share of arable land with crop rotation or other soil management practices

A distribution of all holdings according to their use of crop rotation is possible with the following detail in categories:

- No crop rotation
- Yes, crop rotation on a small part of the area of temporary crops
- Yes, crop rotation on about half of the area of temporary crops
- Yes, crop rotation on most or all of the area of temporary crops

For distributions including a full range of practices and features, all of the "Yes" categories of crop rotation will be combined into a single one, to be included in the following distribution:

- Crop rotation
- Fallowing or shifting cultivation
- Vegetative strips
- Liming
- Terraces
- Windbreaks and hedges
- Rotational grazing
- Other practices and features to reduce soil erosion, salinity, compaction, drainage of soil water, etc. (specify)[15]

AGRIS source:

Production Methods and the Environment Module
section 2, part 2.2 (Soil management)

15 Responses of "other" should be verified during processing to ensure that they are valid, and to move write-in responses to other response categories where appropriate.

c. Burning of plant material on the holding

A series of questions related to burning practices on agricultural holdings can be calculated as separate or combined distributions depending on the data requirements of adopting countries (see case 3 in table A2.2 for options).

Categories of types of burning include:

- Burning of crop residues by crop type burned and share (six categories) of the area of crop type for which residues were burned
- Burning of temporary fallow and share (six categories) of temporary fallow land that was burned
- Burning of forest or other wooded land and share (six categories) of forest or other wooded land that was burned
- Burning of unutilized agricultural area and share (6 categories) of unutilized agricultural land that was burned
- Slash and burn used for clearing land

AGRIS source:

Production Methods and the Environment Module
section 2, part 2.2 (Soil management)

d. Use of crop residues: burning, and their use for feed and/or bedding

While there may be interest in different burning practices on the holding on different types of land, there may be value in combining distributions on practices related to crop residues: burning, and their use for livestock feed or bedding.

Categories of practices related to crop residues:

- Burning of crop residues by crop type burned and share (6 categories) of the area of crop type for which residues were burned
- Feeding/bedding of crop residues by crop type and share (6 categories) of the area of crop types for which residues were used for livestock feed and/or bedding

AGRIS source:

Production Methods and the Environment Module
section 2, part 2.2 (Soil management)

e. Tillage practices

Conservation tillage reduces or prevents soil sealing and crusting, which inhibit water infiltration and induce surface runoff and soil erosion. It provides economic benefits for the farmer (namely, fuel savings and reduced working hours) and important benefits for the environment.

$$Share\ of\ arable\ areas\ by\ tillage\ type = \left(\frac{Area\ of\ arable\ areas\ under\ tillage\ type\ X}{Total\ area\ of\ arable\ land}\right) \times 100$$

Description of variables

Conservation (low) tillage is one of three tillage types reported in the PME Module.
The others are **conventional tillage** and **zero tillage (no tillage)**.
Arable land is defined as land under temporary crops outdoors or under low shelters.
For the purposes of measuring agricultural practices, it is the share of arable land under conservation (low) tillage that is of the most interest.

AGRIS source:

Production Methods and the Environment Module
section 2, part 2.2 (Soil management).

f. Soil cover

The soil cover of arable lands with plants and crop residues provides many environmental benefits, as such residues protect soils from erosion risk, reduce runoff of nutrients and pesticides, and contribute to the maintenance of biodiversity.

$$Share\ of\ area\ \ by\ soil\ covertype = \left(\frac{Area\ of\ arable\ areas\ with\ soil\ cover\ type\ X}{Total\ area\ of\ arable\ land}\right) \times 100$$

Description of variables

Considering the longest intercropping period, the categories of responses that qualify to be included in the numerator of this calculation are the area covered by (a) bare soil, (b) plant residues, (c) a cover crop or intermediate crop, or (d) the next seasonal crop. For the purposes of measuring agricultural practices, it is the share of arable land covered by plants or plant residues that is of interest.
Arable land is defined as land under temporary crops outdoors or under low shelters.

AGRIS source:

Production Methods and the Environment Module
section 2, part 2.2 (Soil management)

g. Irrigation methods

The main environmental impacts on water resulting from the different systems of irrigation are: water pollution, damage to habitats and aquifer exhaustion, salinization, and the ecological effects of large-scale water transfers associated with irrigation projects. Sprinkler, drip, spray or microsprinkler and bubbler irrigation entail a more minor water consumption than the others.

$$Share\ of\ farms\ with\ minor\ water\ consumption\ irrigation\ methods = \left(\frac{Number\ of\ farms\ using\ minor\ water\ consumption\ irrigation\ methods}{Number\ of\ farms\ with\ irrigated\ area\ at\ least\ once\ a\ year}\right) \times 100$$

Description of variables

Minor water consumption irrigation methods collected in the AGRIS PME Module are: sprinkler irrigation, drip irrigation, spray or microsprinkler irrigation and bubbler irrigation. These methods use less water than surface irrigation.

AGRIS source:

Production Methods and the Environment Module

section 2, part 2.3 (Irrigation and drainage).

h. Sources of irrigation water

The use of groundwater for irrigation causes a greater environmental pressure. If the exploitation of the water exceeds the capacity for refill, the level of the groundwater could decrease and, near the sea, the salt invasion could cause a qualitative impoverishment of the water.

$$Share\ of\ farms\ using\ off\ farm\ water\ from\ common\ water\ supply\ as\ the\ main\ or\ only\ source = \left(\frac{Number\ of\ farms\ using\ off-farm\ common\ water\ for\ irrigation}{Number\ of\ farms\ with\ irrigated\ area\ at\ least\ once\ a\ year}\right) \times 100$$

Description of variables

The variable of off-farm common water supply can be covered by including the AGRIS categories of (a) off-farm surface water (lakes, rivers, water courses).

AGRIS source:

Production Methods and the Environment Module

section 2, part 2.3 (Irrigation and drainage).

3. Indicators related to crop and livestock production methods

I. Crop inputs

a. Fertilizers

The first in a series of questions on fertilizers allows users to establish the number and share of holdings classified according to whether fertilizers were used on the holding. For the holdings not using fertilizers, a distribution of the underlying reasons is possible, with the reason categories being:

- Fertilizers were too expensive
- Fertilizers were not available
- Other (specify)[16]

For holdings reporting the use of fertilizers, all types of fertilizers are reported, along with the area of the different land types on which each was applied.

$$Distribution\ of\ land\ use\ types\ according\ to\ fertilizer\ types\ used = \left(\frac{Area\ of\ land\ use\ type\ applied\ with\ fertilizer\ type\ X}{Total\ area\ of\ land\ use\ type}\right) \times 100$$

Categories of **land use**:

- Temporary crops
- Temporary meadows and pastures
- Permanent crops

Categories of **fertilizer types**:

- Mineral fertilizers
- Organo-mineral fertilizers
- Compost
- Mulch
- Bio fertilizers
- Solid dung, incorporated within X hours after spreading
- Solid dung, incorporated more than X hours after spreading
- Solid dung, not incorporated
- Liquid manure, incorporated within X hours after spreading
- Liquid manure, incorporated more than X hours after spreading
- Liquid manure, not incorporated
- Slurry, incorporated within X hours after spreading
- Slurry, incorporated more than X hours after spreading
- Slurry, not incorporated
- Other (specify)[17]

The information on the type of fertilizers should be combined with the data on the use of fertilizers by crop (see AGRIS Core Module, section 3)

16 Responses of "other" should be verified during processing to ensure that they are valid, and to move write-in responses to other response categories where appropriate.

17 Responses of "other" should be verified during processing to ensure that they are valid, and to move write-in responses to other response categories where appropriate.

AGRIS source:

Production Methods and the Environment Module

section 3, part 3.1 (Use of fertilizers)

b. Plant protection products (PPPs)

The areas of each type of PPP provide an indicator of the use of products. As well as the number of acres, the average area per holding reporting PPP use can also be calculated. The categories of PPPs are:

- Insecticides
- Herbicides
- Fungicides
- Rodenticides
- Other (specify)[18]

For an additional indicator, detail on the quantities of PPP by commercial name or purpose allow for tabulation of total quantities by PPP type.

The information on the type of PPP should be combined with the data on the use of PPP by crop (see AGRIS Core Module, section 3)

AGRIS source:

Production Methods and the Environment Module

section 3, part 3.2 (Use of plant protection products)

c. Types of seeds

For each temporary crop grown on the holding, respondents report the following information, whose data can be organized to provide a profile of seed use:

- Modern varieties, certified seed
- Modern varieties, uncertified seed
- Traditional varieties, uncertified seed

The share of holdings using each type of seed can be calculated to display the prevalence of the use of modern versus traditional, certified and uncertified seeds. Seed types for crops can be cross-classified with data from other questions to reveal the sources of seeds and whether the seeds are GMOs. The variables involved in this mapping are outlined below:

For each temporary crop:

- Modern varieties, certified seed
    - GMO
    - Non-GMO
- Modern varieties, uncertified seed
    - Seeds produced on the holding
    - Seeds obtained at exchanges within the community
    - Seeds purchased from local market
    - Seeds purchased from seed company
- Traditional varieties, uncertified seed
    - Seeds produced on the holding

18 Responses of "other" should be verified during processing to ensure that they are valid, and to move write-in responses to other response categories where appropriate.

- Seeds obtained at exchanges within the community
- Seeds purchased from local market
- Seeds purchased from seed company

AGRIS source:

Production Methods and the Environment Module

section 3, part 3.3 (Crop and seed varieties)

d. Permanent crops

For each permanent crop grown in plantations or in scattered plots, a number of questions provide data that can be tabulated to furnish a profile at the crop level. The variable mapping is:

For each permanent crop:

- Number of varieties grown
- Number of trees/plants (reported directly or calculated from area and density)
- Production in the reference period
  - No
  - Yes

More information on the calculation of density can be found in chapter 4 of this handbook (Part 4.4 PME methodological note).

AGRIS source:

Production Methods and the Environment Module

section 3, part 3.4 (Permanent crops)

e. Pollination

A distribution on practices to enhance pollination can be tabulated. Because all practices that apply are reported by holdings, the agencies tabulating the data must decide whether the relevant denominator is total holdings reporting pollination enhancing practices or total practices reported.

The **pollination practices** to be categorized are:

- Planting of wildflower-rich fallows or strips (such as “bee pastures”)
- Presence of flowering hedgerows
- Use of nectar-producing cover crops
- Use of dedicated nectar and pollen seed mixes
- Provision of nesting sites (“bee hotels” for many bees, or nesting tubes for megachilid bees)
- Protection of existing ground-bee nesting sites or trees in which wild species of bees nest
- Use of managed honeybee hives
- Use of managed stingless bee hives
- Use of managed bumblebee boxes
- Use of managed leafcutter nesting sites
- Other (specify)[19]

AGRIS source:

Production Methods and the Environment Module

section 3, part 3.5 (Pollination practices)

19 Responses of “other” should be verified during processing to ensure that they are valid, and to move write-in responses to other response categories where appropriate.

f. Rice cultivation

For each rice type grown (rice indica, rice japonica, rice aromatic, rice glutinous), a number of questions provide data that can be tabulated to furnish a profile at the crop level. Statistical agencies will determine which variables to combine and how to deal with multiple responses, according to their data requirements. The potential variable mapping is:

For each rice type:

- Length of growing period (in months)
  - distribution to be determined by adopting country
- Irrigation methods (multiple responses possible)
  - Flooded pre-season, for less than 30 days
  - Flooded pre-season, 30 days or more
  - Not flooded pre-season, for less than 180 days
  - Not flooded pre-season, for 180 days or more
- Irrigation methods/water regimes (multiple responses possible)
  - Irrigated, continuously flooded
  - Irrigated, intermittently flooded with single aeration
  - Irrigated, intermittently flooded with multiple aerations
  - Regularly rain-fed
  - Deep water
  - Drought-prone

AGRIS source:

Production Methods and the Environment Module

section 3, part 3.6 (Rice cultivation)

g. Intensive agriculture

The intensity of the agricultural activities undertaken affects the characteristics of agro-ecosystems and, therefore, the agricultural landscape. Intensity in this context is related to a relatively high use of inputs to increase production on agricultural land. Some crops are more related to intensive production than others. Intensive agriculture could have negative effects on the agricultural landscape and on the extent of soil management.

$$Percent\ of\ farmland\ in\ intensive\ agriculture = \left(\frac{Area\ of\ intensive\ crops}{Total\ utilized\ agricultural\ area\ (AAU)\ on\ holdings}\right) \times 100$$

Description of variables

Intensive crops are potatoes, vegetables, vineyards, citrus plantations, palm-oil tree plantations, fruit plantations, stimulant crops (coffee, tea, cacao), among others.

The term AAU indicates the total area taken up by arable land, permanent pasture and meadow, land used for permanent crops and kitchen gardens. The AAU is found in section 2, part 2.2. For practical reasons, countries may need to adapt this definition to their particular conditions.

AGRIS source:

Core Module

section 3, part 3.1 (Crop production and destinations); part 3.2 (Area utilized) where the Core and PME Modules are conducted concurrently.

Production Methods and the Environment Module

section 2, part 2.2 (Soil management) and section 3 (Crops and production methods) in cases where the module is conducted as a stand-alone module.

I. Livestock production methods

a. Animal reproduction

A distribution of the main type of reproduction technique used for each livestock type can be calculated.

AGRIS source:

Production Methods and the Environment Module

section 4, part 4.1 (Animal breeding and reproduction)

b. Use of veterinary services

The share of holdings that report livestock and also report the use of veterinary services, along with the share of livestock accounted for by those holdings is an indicator that provides details on the health care of livestock and the relative importance of the holdings using animal healthcare services.

$$Share\ of\ livestock\ on\ holdings\ that\ use\ veterinary\ services = \left(\frac{Number\ of\ all\ livestock\ on\ holdings\ reporting\ the\ use\ of\ veterinary\ services}{Total\ number\ of\ livestock\ on\ all\ holdings}\right) \times 100$$

AGRIS source:

Production Methods and the Environment Module

section 4, part 4.2 (Use of veterinary productions and traditional methods)

Core Module

section 4, part 4.1 (Raising activities and production) (provides the number of livestock)

c. Types of veterinary services and products and traditional medicines used on livestock

Questions asked on the types of veterinary services, hormones, antibiotics and traditional medicine for livestock are similar in format and can be tabulated in similar ways. In all cases, use is reported for each type of livestock. All of the questions allow for multiple responses, so that all of the relevant services or products can be reported.

The categories that can be tabulated for each of the types of products or services are outlined below.

Veterinary services:

- Reproduction
- Curative treatment, surgical procedures
- Curative treatment, other (specify)[20]
- Preventative medicine, vaccinations
- Preventative medicine, deworming (anthelmintic)
- Preventative medicine against parasites
- Preventative medicine, other (specify)[21]

Hormone types:

- Hormone Type 1 (country-specific, to be determined by adopting countries)
- Hormone Type 2 (country-specific, to be determined by adopting countries)
- Other hormones (specify)[22]
- None of the above

Antibiotic types:

- Antibiotic Type 1 (country-specific, to be determined by adopting countries)
- Antibiotic Type 2 (country-specific, to be determined by adopting countries)
- Other antibiotics (specify)[23]
- None of the above

Traditional medicine types:

- Reproduction
- Curative
- Preventative
- Other (specify)
- None of the above

AGRIS source:

Production Methods and the Environment Module

section 4, part 4.2 (Use of veterinary productions and traditional methods)

20 Responses of "other" should be verified during processing to ensure that they are valid, and to move write-in responses to other response categories where appropriate.

21 Responses of "other" should be verified during processing to ensure that they are valid, and to move write-in responses to other response categories where appropriate.

22 Responses of "other" should be verified during processing to ensure that they are valid, and to move write-in responses to other response categories where appropriate.

23 Responses of "other" should be verified during processing to ensure that they are valid, and to move write-in responses to other response categories where appropriate.

d. Feeding and watering practices

A number of detailed and interrelated questions on feeding practices provide a wealth of data on this aspect of animal care. All feed data is furnished for each livestock type. While extremely useful, this level of detail also introduces some complexity in the calculation of the associated indicators. Adopting countries should review which combination of variables best responds to their data needs on this topic, and should combine data accordingly.

Distribution for each type of livestock of feeding technique (reported as a percentage of the herd; sum of entries to equal 100percent):

- Only grazing, including scavenging
- Mainly grazing, including scavenging, with some feeding
- Mainly feeding, with some grazing, including scavenging
- Only feeding (zero grazing or scavenging)

A potential combination of variables is type of feed along with source of feed. The variables follow:

Type of feed:

- Forages, including roughages (for ruminants only)
- Crops and agro-industrial by-products, including concentrate
- Swill and household wastes

Source of feed:

- Produced on the holding
- Common pasture
- Purchased
- Exchanged
- Received for free

Another useful combination would be the profile of purchased feed and grazing/pasture use.
A profile of water use by livestock type profiles the different strategies used at different points of the year, as outlined below.

Main water source during (a) the entire reference period, (b) the dry season, (c) the rainy season:

- Borehole
- Well
- Dam or lake
- River, spring or stream
- Rainwater harvesting
- Other (specify)[24]

These data can be further combined with the identification of problems encountered in watering livestock, and the solutions implemented.

AGRIS source:

Production Methods and the Environment Module

section 4, part 4.5 (Feed and use of pastures); part 4.6 (Watering of animals)

24 Responses of "other" should be verified during processing to ensure that they are valid, and to move write-in responses to other response categories where appropriate.

e. Animal housing

Animal housing systems are often associated with environmental problems (namely, ammonia release, surplus of nitrogen and offensive smell). The PME questionnaire collects information on the main type of housing system used by type of livestock. An indicator of the share of this housing system can be calculated by type of livestock. An example is given below.

$$Share\ of\ total\ cattle\ with\ no\ housing\ = \left(\frac{Number\ of\ cattle\ with\ no\ housing}{Total\ cattle}\right) \times 100$$

AGRIS source:

Production Methods and the Environment Module

section 4, part 4.3 (Animal housing) Core Module – section 4, part 4.1 (Raising activities and production) (provides the number of livestock by type)

f. Manure management

Analysis of manure management is particularly interesting in large livestock breeders to determine if there are regions or other zones where livestock is too intensive compared to the area available for spreading.

The share of manure sold or given to other farms is an indicator of the difficulty the farm encounters in managing the whole manure produced and the necessity to find other farms to use this manure.

The manure storage capacity in good conditions (covered and waterproof) is the other indicator of good management.

AGRIS source:

Production Methods and the Environment Module

part 4.7 Manure management

III. Organic production

a. Organic crops and crops in conversion to organic certification

Organic production is an overall system of farm management and agri-environmental production that combines criteria such as best environmental practices, a high level of biodiversity, preservation of natural resources, and the application of strict criteria in animal welfare.

$$Percentage\ of\ organic\ farming\ area = \left(\frac{Area\ of\ organic\ crops}{Total\ UAA}\right) \times 100$$

Description of variables

Area of crops under organic production is determined by using the indicator of organic production (section 5) and linking it to crop areas as reported in the Core Module, section 3, part 3.1 (where conducted concurrently). The AAU indicates the total area taken up by arable land, permanent pasture and meadow, land used for permanent crops and kitchen gardens.

b. Organic livestock production and livestock in conversion to organic certification

Similar indicators to those calculated in (a) above for crops can be calculated for livestock.

It may be more interesting to study the organic farming practice of particular agricultural productions or groups of productions (cereals, wheat, vegetables, bovine livestock, etc.). Very often, organic farming is more frequent for some productions (vegetables, for example) than for others (such as industrial crops). The general indicator on AAU is mainly influenced by large areas (cereals, etc.). Therefore, it is interesting to study what is the reality on smaller areas (vegetables, fruits, etc.).
The same kind of study can be done for each species of livestock.
All these data can be also analysed in homogeneous subpopulations based on farm size.

AGRIS source:

Core Module

section 3 (Crop production), section 4 (Livestock production);

Production Methods and the Environment Module

section 5 (Organic farming).

4. Other indicators related to agricultural practices

I. Agroforestry

a. Share of holdings reporting agroforestry

This indicator provides a distribution of holdings by their activity in agroforestry.

Agroforestry categories are:

- No agroforestry
- Agro-sylvicultural area (crops and trees) only
- Sylvo-pastoral area (trees and livestock) only
- Agro-sylvo-pastoral area (crops, treesand livestock) only
- Agro-sylvocultural and sylvo-pastoral areas
- Agro-sylvocultural and agro-sylvo-partoral areas
- Sylvo-pastoral and agro-sylvo-pastoral areas
- Agro-sylvocultural, sylvo-pastoral and agro-sylvo-pastoral areas

AGRIS source:

Production Methods and the Environment Module
section 6 (Agroforestry)

II. Information, infrastructure and communal resources

a. Share of holdings that are isolated

This is an indicator of interest to program and policy-makers. Holdings that are isolated will have more difficulties to access services for their agricultural operations. Adopting countries may choose the factors related to infrastructure and communication that define isolation within the country's context. Potential indicators of isolation are:

- Lack of access to vehicles
- Lack of access to public transportation/long travel times to public transportation station
- Lack of communication services and systems
- Lack of access to communal resources (grazing land, forest or other wooded land, communal area for aquaculture, irrigation facilities)

Once the markers of isolation have been determined, the share of holdings exhibiting those characteristics can be tabulated as a percentage of all holdings.

AGRIS source:

Production Methods and the Environment Module
section 7 (Infrastructure, transportation, communications and access to facilities)

b. Agricultural information

This indicator combines the data from questions on agricultural information, to provide an integrated profile of the types of information used by holdings, and the source of and method of obtaining the information. The categories for the related distributions (to be calculated individually, or in combination) are:

Types of information (multiple responses possible):

- Crop rotation and other sustainable practices
- Crop types to be produced
- Use of fertilizers and/or plant protection products
- Crop health issues
- Livestock health issues
- Livestock feed issues
- Livestock breeding
- Availability of inputs (including machinery and equipment)
- Prices of inputs
- Prices of outputs
- Weather forecasts affecting production
- Other environmental information

Main source of information (single response only):

- Government or extension service
- Other individual farmer
- Farmers' group or association
- NGO or non-governmental project
- Trader or market stakeholder
- Other (specify)[25]

Main method of consulting the information source (single response only):

- Face-to-face discussions
- Telephone calls
- Radio
- Television
- Internet or SMS
- Press or newspapers
- Other (specify)[26]

AGRIS source:

Production Methods and the Environment Module

section 7, part 7.1 (Agricultural information)

25 Responses of "other" should be verified during processing to ensure that they are valid, and to move write-in responses to other response categories where appropriate.

26 Responses of "other" should be verified during processing to ensure that they are valid, and to move write-in responses to other response categories where appropriate.

c. Access to communal resources

The share of holdings with access to communal resources in a general sense can be calculated by identifying holdings with different access profiles. The communal resources covered in the questionnaire are:

- grazing land
- forest or other wooded land
- communal areas for aquaculture
- irrigation facilities

Access profiles can account for all possible combinations of responses to these questions so that the breadth of communal resources available is reflected in the indicator.

For each of the communal resource types, a distribution can be calculated to reflect the possible scenarios for the related questions.

- Is the communal resource available?
  - No
  - Yes
- If available, was it used?
  - No
  - Yes
- If not used, identify main reason
  - Not applicable
  - Not necessary
  - Too expensive
  - No access granted
  - Problems with other users
  - Problems with the quality and quantity of the resource
  - Other (specify)[27]

AGRIS source:

Production Methods and the Environment Module

section 7, part 7.3 (Access to communal resources)

III. Greenhouse gases and environmental issues, adaptation to climate change

a. Protected areas

The share of holdings partially or totally located in an officially protected area can be calculated as an indicator of holdings operating in sensitive areas. It would be useful to calculate this indicator at subnational level or for particular agro-ecological zones, where officially protected areas are established.

$$Share\ of\ holdings\ partially\ or\ totally\ located\ in\ officially\ protected\ areas = \left(\frac{Number\ of\ holdings\ located\ in\ offically\ protected\ areas}{Total\ number\ of\ holdings}\right) \times 100$$

27 Responses of "other" should be verified during processing to ensure that they are valid, and to move write-in responses to other response categories where appropriate.

AGRIS source:

Production Methods and the Environment Module

section 8 (Greenhouse gas and environmental issues)

b. Contaminated sites

This indicator is very similar to the previous one. It calculates the share of holdings on which there are contaminated sites.

AGRIS source:

Production Methods and the Environment Module

section 8 (Greenhouse gas and environmental issues)

IV. Adaptation to climate change and mitigation strategies

a. Extreme events

The share of holdings experiencing extreme events during the reference period can be calculated by the type of event. Since multiple responses to the question on extreme events are possible, statistical agencies will have to determine how to reflect the possible combinations of responses in the distribution. The denominator in the equation will be the total number of holdings.

Extreme events:

- Drought
- Heavy rainfall or heavy winds
- Extreme temperatures (cold or heat)
- Tsunamis
- Earthquakes
- Other (specify)

In a related indicator, human impacts of extreme events can also be tabulated as a count (number reported in each category) for:

- Number of people killed
- Number of people injured
- Number of people rendered homeless
- People evacuated
- Other (specify)

AGRIS source:

Production Methods and the Environment Module

section 9 (Adaptation to climate change and mitigation strategies)

b. Adaptation to climate change

The share of holdings engaged in practices to adapt to climate change during the reference period can be calculated by the type of practices. As multiple responses are possible to the question on adaptations, statistical agencies will have to determine how to reflect the possible combinations of responses in the distribution. One possible option for the presentation of results would be to calculate the most frequently used practice.

Practices to adapt to climate change:

- Multicropping
- Shifting cultivation
- Use of traditional agricultural heritage practices and knowledge
- Use of traditional crop and animal varieties
- Use of seeds adapted to local conditions and stresses
- Use of new practices or technologies
- Other (specify)
- None of the above

AGRIS source:

Production Methods and the Environment Module

section 9 (Adaptation to climate change and mitigation strategies)

V. Waste management

Lack of waste management can have important environmental consequences. Indicators can be calculated by farm size and specialization and for each type of waste.

$$Share\ of\ without\ waste\ management = \left(\frac{Number\ of\ farms\ where\ waste\ are\ not\ treated}{Total\ number\ of\ farms\ producing\ waste}\right) \times 100$$

Description of variables

Produced waste

Wastewater can be considered treated when it is discharged in the environment after treatment.
Other waste can be considered treated when it is taken away from the holding by a professional.

AGRIS source:

Production Methods and the Environment Module

section 10 – Waste management

ANNEX 2-5: INDICATORS RELATED TO THE AGRIS MACHINERY, EQUIPMENT AND ASSETS MODULE

The structure of the Economy Module, along with the main themes and list of indicators associated with it, is presented in chapter 4 of this handbook, titled Economy Module: generic questionnaire and methodological notes.

The Machinery, Equipment and Assets (MEA) Module provides data related to agricultural machines and equipment, agricultural buildings and structures, and household dwellings and assets. The characteristics of resources, as well as tenure, are key elements of the variables collected. The tabulation of these data into distributions, ratios and level estimates can provide adopting countries with a better understanding of the nature of these tools and assets with the agriculture sector in their jurisdiction. The indicators recommended with this goal in mind can be found in detail below.

The indicators and types of analysis presented below involve necessarily information from other AGRIS modules, in particular the Core Module.

For useful background on the types of calculations often used as indicators, see Types of indicators above for descriptions of these arrangements of data and general instructions and best practices for their use.

1. Indicators related to the ownership of agricultural assets

Identifying the general ownership profile and the demographic characteristics of the owners of assets in the agriculture sector can address a number of data needs related to gender issues and potential for generational transfer, among others.

I. Tenure of machinery and equipment

For machine-powered machinery and equipment, a distribution of the share of equipment in each tenure category (owned, co-owned with another holding, rented without an operator, other arrangement) can be calculated.

$$\textit{Share of machinery and equipment by tenure category} = \left(\frac{\textit{Number of machinery type in tenure type}}{\textit{Total number of machines in machinery type}}\right) \times 100$$

Description of variables

Machinery type can be general (machine-powered), by category (for example, land preparation and planting equipment) or specific by groupings or individual types of equipment (for example, all tractors or four-wheel drive tractors).

Tenure type categories are:

- Owned
- Co-owned with another holding
- Rented without an operator
- Other arrangements.

AGRIS source:

Machinery, Equipment and Assets Module

section 1, part 1 (Machinery and Equipment).

II. Ownership profile of agricultural assets

This indicator is based on a distribution tabulation, and is relevant for holdings in the household sector. The tabulation can be useful to show the degree of asset ownership by women, or the extent to which younger household members have active ownership of assets, as examples. It can also show whether there are different ownership profiles for different types of assets (for example, machinery versus land). For selected categories of assets (machinery and equipment, land, livestock), the demographic profile of the household member owners can be shown as a distribution. Multiple owners can be reported in the MEA Module; therefore, it is recommended to take into account assets owned by one person as opposed to those owned by multiple persons.

$$Share\ of\ assets\ by\ tenure\ category = \left(\frac{Number\ of\ asset\ type\ owned\ by\ demographic\ group}{Total\ number\ of\ asset\ type}\right) \times 100$$

Description of variables

Asset type can be specific types of machinery and equipment (within the categories of manually operated equipment, animal-powered equipment or machine-powered equipment), land, or livestock.

Demographic groups can be based on sex and age categories, with age categories to be established by adopting countries. Single versus multiple owners should be taken into account. Including the dimension of single and multiple owners in the groupings will ensure that each asset has only one owner demographic category associated with it, which in turn will ensure that the sum of the percentages calculated will equal 100 percent of assets.

An example of demographic groups that take the number of owners and the gender of owners into account is below:

a. Single owner, female
b. Single owner, male
c. Multiple owners, all female
d. Multiple owners, all male
e. Multiple owners, mix of female and male

Age is likely to be a meaningful variable to be incorporated into the demographic groups. Doing so will increase the number of categories to be included in the distribution accordingly.

AGRIS source:

Core Module

section 6 (Households of the holders and co-holders).

Machinery, Equipment and Assets Module

section 1 (Machinery and Equipment); section 3, part 3.1 (Land and Livestock)

2. Indicators related to the level of mechanization

I. Mechanization

a. Level of mechanization profile

This indicator is based on a distribution tabulation. It categorizes holdings by the types of machinery and equipment they use: manually operated, animal-powered and machine-powered. It provides information on the mix of equipment types used by holdings for agricultural production. While the indicator is interesting in its own right, cross-tabulating this variable with holding size, geographic location or production type may provide even more insights into the nature of mechanization among holdings and the characteristics of holdings of similar mechanization profiles. Since the seven mechanization groups cover all possible combinations, the sum of the calculated shares will equal 100 percent of holdings.

$$Share\ of\ holdings\ by\ level\ of\ mechanization\ category = \left(\frac{Number\ of\ holdings\ by\ level\ of\ mechanization\ group}{Total\ number\ of\ holdings}\right) \times 100$$

Description of variables

The level of mechanization variable reflects the mix of machinery and equipment used by holdings, and will provide a profile of the breadth of combinations that exist in a given jurisdiction (from the least to the most mechanized, as well as mixes of machinery and equipment of different levels of mechanization). The groups to be tabulated are:

a. Only manually operated machinery and equipment used
b. Only animal-powered machinery and equipment used
c. Only machine-powered machinery and equipment used
d. Both manually operated and animal-powered machinery and equipment used
e. Both manually operated and machine-powered machinery and equipment used
f. Both animal-powered and machine-powered machinery and equipment used
g. Manually operated, animal-powered and machine-powered machinery and equipment used

In a variation of this indicator, the distribution on level of mechanization can be crossed with a distribution of categories for the AAU, to be determined by the country's statistical agency. Distributions based on the number of certain types of livestock can also be used in this way to describe relationships between a holding's size and its mechanization profile. The Core Module furnishes the AAU and livestock data necessary for this variation.

AGRIS source:

Machinery, Equipment and Assets Module
section 1 (Machinery and Equipment)

Core Module
section 3, part 3.2 (Area utilized) provides the agricultural area utilized (AAU); section 4, part 4.1 (Raising activities and production) provides data on livestock numbers

b. Machinery/labour profile

Machinery and labour are two inputs that are often characterized as substitutes; increased mechanization can reduce the need for human labour resources. Therefore, an indicator that combines data on these two inputs can provide information on the way that holdings make use of resources to produce agricultural output. The total number of tractors (track-laying, four-wheel drive and two-wheel drive) can be used as an indicator of machinery use. Using data from the Core Module on: (a) the number of holders/household members working on the holding and (b) the number of external workers working during the main season can provide an indicator of the level of labour use. The Labour Module provides more detailed data on labour use, but the joined administration of Core and MEA Modules makes the Core Module a good choice for the data source for labour data in this indicator.

$$Machinery: labour\ profile = \left(\frac{(Track\ laying\ tractors + Four\ wheel\ drive\ tractors + two\ wheel\ drive\ tractors)}{(Holders\ \&\ household\ members\ working\ on\ the\ holding + External\ workers\ working\ during\ the\ main\ season}\right)$$

In an alternate version of this indicator, combining either the calculated profile described above or distributions of the machinery and labour variables, with data distributions on the size of holdings (area, number of animals, sales class or by type of production – crop, livestock, or more detailed breakdown) in cross-classifications, will illustrate the tendencies of larger and smaller holdings with respect to the machinery/labour balance.

These indicators would also be useful when calculated over time, to observe the evolution of the machinery/labour relationship.

AGRIS source:

Machinery, Equipment and Assets Module

section 1, part 1.4.2 (Tractors, bulldozers, other vehicles)

Core Module

section 7, part 7.1 (Work on the holding by the holder and his/her household members); part 7.2 (Work on the holding by external workers)

c. Age of equipment

This indicator classifies equipment types that are owned according to age categories, furnishing a distribution of the average age responses provided by holdings responding to the MEA Module. The age categories are to be determined by adopting countries, keeping depreciation guidelines in mind. An example classification is:

- Less than 2 years
- 2–5 years
- 6–9 years
- 10–19 years
- 20 years or over

Whatever classification is selected, it should be used for all types of machinery that will have a distribution classified. This will allow for comparisons between machinery types.

AGRIS source:

Machinery, Equipment and Assets Module

section 1, part 1.3 (Animal-powered equipment); part 1.4 (Machine-powered equipment)

d. Average number of tractors

One example of an indicator for the level of mechanization is the **average number of tractors** per holding reporting tractor use. This is also possible for other types of machinery and equipment. Simply tracking the number of machine-powered machinery and equipment types over time may also be useful in tracking the evolution of agricultural production and mechanization in a given jurisdiction.

AGRIS Source:

Machinery, Equipment and Assets Module

section 1, part 1.4.2 (Tractors, bulldozers, other vehicles); section 1 (Machinery and equipment used by the holding) for other types of equipment

e. Average area by tractor use

Another related indicator provides the AAU per tractor. While this is an indicator that describes the land-related characteristics of holdings that have tractors, it does not imply that the entire area on holdings with tractors is actually worked using a tractor. Some areas may fall within land use categories where the land is not regularly worked, and some areas may be worked using animal-powered or manually operated equipment.

$$Average\ area\ per\ tractor = \left(\frac{Sum\ of\ the\ AAUs\ for\ all\ holdings\ reporting\ tractors}{Total\ number\ of\ tractors}\right)$$

AGRIS source:

Machinery, Equipment and Assets Module

section 1, part 1.4.2 (Tractors, bulldozers, other vehicles)

Core Module

section 3, part 3.2 (Area utilized) provides the AAU

3. Analysis related to non-residential buildings

I. Crop storage

The storage capacity can be studied in two main respects: (1) to verify whether a lack of storage capacity can explain some losses after harvest because of bad storage conditions; (2) to analyse storage capacity in economic terms.

It is important to know whether the farmers can wait to sell their harvests to obtain best prices, and, thus, whether they are influencing prices.

II. Buildings for livestock

Buildings for livestock can be analysed jointly with other sanitary data. In economic terms, it is one of the reasons that can explain the difficulty to increase the number of animals raised.

In the household sector, it may be one of the aspects of living conditions and health-related issues, considering the number of cases of humans sharing buildings with animals.

AGRIS source:

Machinery, Equipment and Assets Module

section 2 (Non-residential buildings or structures),

Core Module

section 3 (Crops), section 4 (Livestock)

4. Characteristics of dwelling and assets

These indicators are relevant for holdings in the household sector, and provide indicators related to the non-agricultural assets under the control of the households of holders.

I. Dwelling characteristics

A number of questions relate to the household dwelling and can be tabulated in distributions separately, or in combination to provide a statistical picture to describe dwellings related to the agricultural sector.

a. Tenure of the dwelling

A straightforward percentage distribution can be tabulated for dwellings in four tenure categories.

$$\textit{Share of holdings in the household sector by tenure of the household dwelling} = \left(\frac{\textit{Number of holdings by level of dwelling tenure category}}{\textit{Total number of holdings in the household sector}}\right) \times 100$$

The **tenure categories** to be used are:

- Owned
- Rented
- Used for free
- Used under another arrangement (specify)[28]

AGRIS source:

Machinery, Equipment and Assets Module

section 3, part 3.2 (Household dwelling)

28 Responses of "other" should be verified during processing to ensure that they are valid, and to move write-in responses to other response categories where appropriate.

b. Characteristics of dwelling owners

When the dwelling is owned, the household members who own the dwelling are identified. Multiple members may be reported as owners. The sociodemographic characteristics of owners and non-owners can be compared to determine if there are any trends. It may be useful for analysts to take into consideration single-owner dwellings versus multiple-owner dwellings when creating the distribution categories. See section 1, on the Indicators related to ownership of agricultural assets, II. Ownership profile of agricultural assets, for suggestions on tabulating this indicator.

AGRIS source:

Machinery, Equipment and Assets Module

section 3, part 3.2 (Household dwelling)

Core Module

section 6 (Households of the holders and co-holders).

c. Dwelling characteristics

There are four questions related to the construction and facilities of the dwelling that can be tabulated as separate distributions, or in combination to provide a profile of holder dwellings. The four questions relate to the walls, roof, floor and toilet facilities of the dwelling. The categories for potential distributions are provided in the MEA questionnaire (see chapter 4 of this handbook):

AGRIS source:

Machinery, Equipment and Assets Module

section 3, part 3.2 (Household dwelling)

II. Household assets

The types of household assets to be collected by the AGRIS MEA Module will be specified by adopting countries to reflect meaningful assets within the context of the country.

5. Other indicators

Other calculations based on the machinery reported on holdings may be useful for adopting countries.

I. Crop storage capacity

a. Characteristics of crop storage capacity

Access to storage capacity for crops gives holders an opportunity to make decisions about the timing of selling of their crops to help maximize their returns. The MEA Module contains data about storage capacity (excluding commercial storage) and tenure, while the Core Module provides data on the quantities of crops harvested in the most recent harvest.

Cross-classifying the distributions below will give an indication of the capacity, use and tenure during the reference period.

Types of crops stored:

- Grain crops
- Root crops
- Fruit and vegetables
- Other crops (specify)[29]

Capacity of the storage used – categories:

- To be determined by adopting country

Tenure:

- Owned
- Rented
- Used under another arrangement (specify)[30]

AGRIS source:

Machinery, Equipment and Assets Module

section 2, part 2.1 (Non-residential buildings or structures used for crops)

29 Responses of "other" should be verified during processing to ensure that they are valid, and to move write-in responses to other response categories where appropriate.

30 Responses of "other" should be verified during processing to ensure that they are valid, and to move write-in responses to other response categories where appropriate.

Annex 3

AGRIS and farm typology

WHY A FARM TYPOLOGY IS IMPORTANT FOR AGRIS

A farm typology enables classification of agricultural holdings by multiple dimensions, aiming at achieving a better understanding of farm structures and production diversity between countries and within a country. A farm typology is particularly useful for more efficient targeting in agricultural and rural policies and investments.

A farm typology is an important element for an efficient agricultural statistical system at national level. The classification of farms into homogeneous types will (1) enable analysis of their structure, performance and sustainability; (2) allow for the formulation, implementation and evaluation of policies that focus on different aspects of sustainable development; and (3) provide, at national level, elements for more efficient sample design and data matching through stratification of the vastly diversified population of agricultural holdings.

BOX 1. THE EUROPEAN UNION (EU) FARM TYPOLOGY – AN EXAMPLE.

Since 1985, the European Union (EU) has used a farm typology as a tool to facilitate analysis of the structure and economic results of agricultural holdings. Currently, the EU Member States apply the same methodology for the *Community typology of agricultural holdings (type of farming)*[1], based on the Standard Output[2] of agricultural products (crops and livestock). The typology classifies agricultural holdings using three classification dimensions: type of farming (product specialization), farm size (expressed in economic terms), and importance of other gainful activities related to the agricultural holding (expressed in terms of the share of the other gainful activities (OGA) in the total turnover of the agricultural holdings).

The typology is calculated based on agricultural censuses, farm structure surveys (FSS) and the Farm Accountancy Data Network (FADN). It is used for the presentation and analysis of results per group of farm as specified in the abovementioned classification. It is also used for the design of the FADN sample, which is the main source of information on farm income levels, evolution and distribution, farm structure, farm assets, etc. in the EU, and used for the design and evaluation of the Common Agricultural Policy (CAP).

1 European Commission, Commission Regulation (EC) No 1242/2008 of 8 December 2008 establishing a Community typology for agricultural holdings; Commission Delegated Regulation (EU) No 1198/2014of 1 August 2014 supplementing Council Regulation (EC) No 1217/2009 setting up a network for the collection of accountancy data on the incomes and business operation of agricultural holdings in the European Union

2 The "standard output" (SO) of an agricultural product (crop or livestock) is the average monetary value of the agricultural output at farm-gate price. The SO excludes direct payments, value-added tax and taxes on products. The Member States calculate regional SO coefficients for each product as average values over the reference period (Committee for the Farm Accountancy Data Network. 2016. *Typology Handbook*, RI/CC 1500. European Commission Publication: Brussels).

For the purposes of the farm typology, the term "agricultural holding" covers all farms, including the small units that produce mainly for own consumption, as well as privately or state-owned agricultural enterprises, regardless of legal status.

The farm typology covers agricultural holdings as defined at national level and focuses on crops and livestock activities. Other activities, such as forestry, fishery and aquaculture, will be treated as farm diversification activities. Units that have no crop or livestock activities but do have at least one of the diversification activities would remain outside the scope of the farm typology.

The first attempt at global level to define a global farm typology in economic terms has been undertaken by the Global Strategy to improve Agricultural and Rural Statistics[1]. On the basis of the initial analysis, the classification is founded on several dimensions: farm size, commodity specialization, market orientation and diversification, etc. Any group of farms made from the intersection of the typology dimensions is called "farm type". A list of classification variables is being developed.

Some variables, such as the legal status of the holding and market orientation, can be directly obtained at the level of the farm from an agricultural census or farm survey, an agricultural section of population census or other relevant household surveys. Others, such as farm size and commodity specialization, require a calculation of variables at aggregated level using different data sources, for example production and prices surveys. An important source of data for the development of farm typology is AGRIS.

1 The Guidelines on Farm typology will be available in 2018.

Data production: how AGRIS helps to build a farm typology

The farm typology is created on the basis of individual data (microdata) on agricultural holdings. As such, the farm typology may be applied to the individual data from AGRIS, while on the other hand, data obtained from AGRIS can be used to calculate the more complex classification variables. The farm typology is designed in such a way that all classification variables are available in or can be derived from the AGRIS Core and Rotating Modules.

Key dimensions

Considering the key dimensions identified, notably farm size, commodity specialization, market orientation and diversification, the AGRIS Core and Rotating Modules are a good starting point in gathering the data required, from the very first year of the implementation. In this regard, the Core Module is designed to provide data mainly on farm identification and agricultural production, as well as some additional information on economy and labour, covering all of the four dimensions required to produce the main economic indicators linked to production and productivity.

Farm size is a dimension of the greatest importance when analysing farming systems. The simplest option is to express farm size in terms of agricultural area using the item "Area of holding according to land use types" from the AGRIS Core Module (section 3, part 3.2, question Q11). This approach, however, does not directly consider the size of the livestock breeding activities of the farm. To overcome this issue, livestock numbers (section 4, part 4.1, questions on number of livestock and movements in the herds during the reference period) may be expressed in terms of livestock units and converted to an area equivalent. Farm size may be also expressed as economic size, considering all aspects of agricultural production and production systems. A better option, as a subsequent step, is to combine data from the AGRIS Core and Economy Modules to calculate farm size in economic terms and express it as the value of the total agricultural output of the holding (section 3, part 3.1 of the Core Module for crop production, and section 4, part 4.1 questions on number of livestock and movements in the herds; in addition, see information on prices for products sold and estimation of own-consumption and other uses from section 2, part 2.1 of the Economy Module). National or regional averages of output per hectare of crop and per head of livestock type (considering the agro-ecological specifics of the regions, irrigation and other features) may be calculated using production and price items from the AGRIS Core Module and the Economy Rotating Module.

Commodity specialization provides useful breakdowns for policy analysis by farm specialization. The "Main focus of the holding (crops/livestock/mix)" item from the AGRIS Core Module (section 1, part 1.3, questions Q26 to Q28) may be used directly to classify farms according to farmer declarations. Subsequently, a more objective method for defining the main production system may be applied using the AGRIS Core Module's data items for agricultural production and the Economy Module's data items for the average price per product sold (the same items mentioned in the previous key dimension are used to calculate the output at product level), and then calculating the share of each production in the total value of the holding's agricultural output.

Market orientation refers to the share of production designated for the market and for own consumption. This dimension is often the main focus for policy development. It can be directly defined by the "Main intended destination of production of the holding (in economic terms)" item from the AGRIS Core Module (section 1, part 1.3, question 29). Additional useful information for more refined analysis can be obtained with the Production Methods and the Environment Rotating Module, especially with regard to constraints upon marketing the holding's production.

Farm diversification can be defined by the "Other economic activities of the holding" items (section 5, part 5.1, questions Q01 to Q03) of the AGRIS Core Module. Additional economic information about the diversification activity is collected in the Economy Module, focusing on the importance of these other economic activities for the economy of the holding (section 2, parts 2.2 to 2.7).

An important indicator for households' farms is the share of agricultural income in the total household income. This indicator shows the capacity of households to cope with severe shocks. *The diversification of incomes* refers to the presence of income from activities other than agricultural ones and can be defined with the "Share of agricultural income in total income" items (section 5, part 5.1, question Q13) of the AGRIS Core Module.

Other dimensions can be applied for a more detailed classification at national level, to reflect country particularities. For example, in the context of developing countries, it is particularly important to distinguish between *agricultural holdings associated with households and holdings from the non-household sector*. The "Type of holder (civil person/ group of civil persons/legal person)" (section 1, part 1.2, question Q10) and "Legal status of holding" (section 1, part 1.2, question Q11) items of the AGRIS Core Module can be used. This grouping could be applied to refine the four key dimensions (see above) and may be subject to the policy relevance and the actual structure of the agriculture in the given country.

Another classification with regional importance is related to the *production systems and impact of farm activities on the environment*. Production systems can be classified at the level of agro-ecological zones using the data items of the AGRIS Rotating Module for Production Methods and the Environment on irrigated/non-irrigated/flooded crop production systems, grazing/mixed/intensive livestock systems, etc.

Timing considerations

A simple farm typology can be defined with the Core and Economy Modules from year 1 of AGRIS implementation. A basic analysis of farm productivity can be performed, combining the information from these two modules and the Machinery, Equipment and Assets Module. Adding more detailed data on labour input in year 2 will provide additional important information for the analysis of labour productivity by type of farms (especially for classes based on farm size and on commodity specialization). A more sophisticated farm typology based on economic criteria for farm size and commodity specialization can be achieved in year 3, with the calculation of a three-year average agricultural output and averages for a large set of indicators related to the farm structure, production, income, assets, etc. An even more detailed classification and analysis at agro-ecological zone level considering the production systems and environmental impact of agricultural activities can be done in year 4, through the Rotating Module on agricultural Production Methods and the Environment.

Data use: better analysis with a farm typology

A farm typology may be used upstream for the sample design of statistical surveys, and downstream for the presentation and analysis of results.

It classifies agricultural holdings in homogeneous groups and is often used to define the strata in the stratified sample design for the purposes of agricultural sample surveys.

On the other hand, the presentation of results by farm type facilitates sectoral analysis and the comparison of structural and economic results by region, farm type and through time.

Sampling

The use of stratified sampling is generally considered to improve the representativeness of the sample by reducing the sampling error. The stratified sample often requires a smaller sample size, which can save resources and time. Including sufficient units from each stratum makes it possible to analyse each individual stratum. Thus, more focused data analysis is possible at the level of each farm type, as well as a comparison of the main technical and economic indicators between farm types, economic size or regions.

When the farm typology is calculated, each agricultural holding from the existing agricultural census, population census or another list of farms is defined by farm type. This new farm characteristic is an important stratification variable in the context of sample design. The stratification by farm type at lower geographical levels (such as regions or agro-ecological zones) will allow for a significant decrease in the sample size of agricultural sample surveys. The example of the EU's FADN shows that with a sample size of approximately 1.6 percent of the total field of observation, representative results on farm structure and income for economic analysis by farm type may be obtained at both national and regional level, and by main farm types.

When no farm typology is available, other stratification criteria may be used (often based on physical size of the main agricultural characteristics); otherwise, other sampling techniques may be applied. In this case, a good precision of the estimates of the agricultural indicators can be achieved; however, presentation and analysis by farm type would not be possible. The progressive calculation of a farm typology and the introduction of stratified samples by farm type will provide statisticians and data users with more refined samples and with a facility for analysing results by farm type, and thus better focus policy design and evaluation.

AGRIS data more relevant and better focused on the priorities of the policy agenda

Grouping farms by farm type provides a valuable possibility to engage in complex analyses by matching data from different AGRIS modules for holdings of the same farm type. This method would facilitate integration between modules and allow for complex data tabulations.

BOX 2. USES OF FARM TYPOLOGY FOR DATA PRESENTATION AND ANALYSIS.

The main advantage of the farm typology lies in the presentation and analysis of the results of surveys designed using that same farm typology. The use of the same typology definitions in time makes it possible to analyse farm productivity and study trends per farm type, as well as to design models for evaluating the impact of different policy measures.

As an example, farm productivity, calculated as income per labour unit, may be compared per farm type, per region and through the years. More sophisticated analyses are possible at farm-type-level, such as sector analysis; analysis of the economic development of the agricultural holdings covering their physical and financial structure, labour and land intensity; analysis of the differences between farm types; differences due to agro-ecological specifics, size, production methods used; and modelling of the impact of new policy measures.

A large number of indicators may be calculated and analysed per farm type, such as:

- Farm income and income components
- Farm assets and liabilities
- Share of paid and unpaid labour and labour costs
- Share of rented land and rent price
- Farm structure
- Production and utilization of agricultural products (own consumption, farm use, sales)
- Input and output prices

These can be calculated at the level of agro-ecological zones for a more focused analysis by type of production system.

Furthermore, integration between AGRIS and relevant household surveys for holdings associated with households can be envisaged in the mid-term, provided that the farm typology is also applied to the data from relevant household surveys. The application of the farm typology to all AGRIS modules and to other regular surveys will enable linkage between the AGRIS items and other available information.

Annex 4

Data items for individual-level questionnaire, optional module

MEASUREMENT OBJECTIVE

The AGRIS Core and Rotating Modules all refer to the holding and are basically answered by the holder.

This Individual-Level Questionnaire is different. It refers to selected individuals associated with selected holdings, and should be answered by the individual selected. The module is optional, as its objectives are structurally different from those of the Core and Rotating Modules.

No particular guidance is provided in terms of the timing of the module within the ten-year AGRIS cycle, as implementing agencies will first need to articulate it with other individual-level survey questionnaires, typically individual-level modules of household budget surveys, multi-topic household surveys or labour force surveys. This handbook does not propose a generic questionnaire, corresponding to these proposed data items.

No specific guidance is provided in terms of the sampling individuals to be surveyed within selected agricultural holdings. National implementing agencies may refer to the literature and guidelines elsewhere available on the subject.

The objective is to generate individual-level information on issues that matter at the individual level. Some of these issues, such as those relating to labour, can be covered through the holding-level AGRIS Core or Rotating Modules. However, having additional information from the individuals themselves can be relevant, provided that national implementing agencies have a priori knowledge on how to reconcile possible divergent estimates resulting from the two approaches. Measurement objectives relate to (1) decision-making on the holding; (2) ownership of assets linked with the agricultural production on the holding; (3) ownership of land; and (4) labour. Except for labour, these measurement objectives are most relevant for individuals associated with holdings from the household sector.

DATA ITEMS

1. Identification and general characteristics of the holding[1]	
	1.1 ID of the holding to which the individual is associated
2. Respondent details	
	2.1 Name and surname
	2.2 Sex
	2.3 Age in completed years
	2.4 Marital status
	2.5 Highest level of education completed
	2.6 School attendance during the current year
	2.7 Nationality
	2.8 Ethnic group
	2.9 Function on the holding
	2.10 Physical address
	2.11 Phone number
	2.12 Relation to the head of the household
	2.13 Relation to the holder of the holding
	2.14 Relation to the manager of the holding
3. Contribution to decision-making on the holding during the observation period	
	3.1 Participation of the respondent in decision-making, on:
	3.1-a Use of the land
	3.1-b Investments made to the land
	3.1-c Types of crops to be grown[2]
	3.1-d Types and quantities of inputs to use (PPP, fertilizers, etc.)
	3.1-e Daily routine crop related decisions
	3.1-f Destination/end use of crop products (sell, store, keep, etc.)
	3.1-g Where and when to sell crop products
	3.1-h Types of livestock to be raised[3]
	3.1-i Destination/end use of livestock products (sell, store, keep, etc.)
	3.1-j Where and when to sell the livestock products
	3.1-k Whether to apply for credit for agricultural activities
	3.1-l How to use the earnings from the sales of agricultural products
	3.2 ID[4] of the other two main decision-makers, when respondent is not the decision-maker on:
	3.2-a Use of the land
	3.2-b Investments made to the land
	3.2-c Types of crops to be grown[5]
	3.2-d Types and quantities of inputs to use (PPP, fertilizers, etc.)
	3.2-e Daily routine crop-related decisions
	3.2-f Destination/end use of crop products (sell, store, keep, etc.)
	3.2-g Where and when to sell crop products
	3.2-h Types of livestock to be raised[6]
	3.2-i Destination/end use of livestock products (sell, store, keep, etc.)
	3.2-j Where and when to sell the livestock products
	3.2-k Whether to apply for credit for agricultural activities
	3.2-l How to use the earnings from the sales of agricultural products

4. Ownership of assets linked with the agricultural production on the holding	
	4.1 Ownership of selected assets[7]
	4.1-a Ownership in the respondent name, alone
	4.1-b Ownership in the respondent name, jointly with another person
	4.1-c Ownership as part of the household
	4.1-d No ownership
5. Ownership of land, during the observation period	
	5.1 Ownership of a land parcel operated by the holding
	5.1-a Ownership in the respondent name, alone
	5.1-b Ownership in the respondent name, jointly with another person
	5.1-c Ownership as part of the household
	5.1-d No ownership
	5.2 Type of ownership document[8]
	5.2-a A title deed
	5.2-b A certificate of customary ownership
	5.2-c A certificate of occupancy
	5.2-d A will/certificate of hereditary acquisition
	5.2-e A purchase agreement
	5.2-f A certificate of perpetual/long-term lease
	5.2-g Other, specify
	5.2-h No document
	5.2-i Do not know
	5.3 Individual right to sell any of the parcels owned
	5.4 Individual right to bequeath any of the parcels owned
6. Labour, during the observation period	
	6.1 Payment in cash and in kind received, for agricultural work on the holding (Yes/No)
	6.2 Contribution for a pension fund received, for agricultural work on the holding (Yes/No)
	6.3 Contribution for a health insurance received, for agricultural work on the holding (Yes/No)
	6.4 Exposure to dangerous/hazardous tasks through agricultural work on the holding (Yes/No)
	6.5 Injuries/illness through agricultural work on the holding (Yes/No)
	6.6 Desire to change current work on the holding

1 The individual interviewed should be associated with a holding surveyed through the AGRIS Core Module (or a Rotating Module). Therefore, the holding will be identified directly from the Core Module, using the holding's ID. The case being, appropriate identification of the holding should be ensured in this individual-level questionnaire.

2 Detailed information on these decision-makers, including gender, will be available through the individual roster built with the AGRIS Core Module.

3 Detailed information on these decision-makers, including gender, will be available through the individual roster built with the AGRIS Core Module.

4 Detailed information on these decision-makers, including gender, will be available through the individual roster built with the AGRIS Core Module.

5 This item, as well as the following related items on crops (resp. livestock), could be further divided by crop types (resp. livestock type).

6 This item, as well as the following related items on crops (resp. livestock), could be further divided by crop types (resp. livestock type).

7 To be listed by national implementing agencies.

8 This item could be further divided into different items, for each parcel owned by the respondent.

Annex 5

CAPI and survey solutions

WHY SURVEY SOLUTIONS?

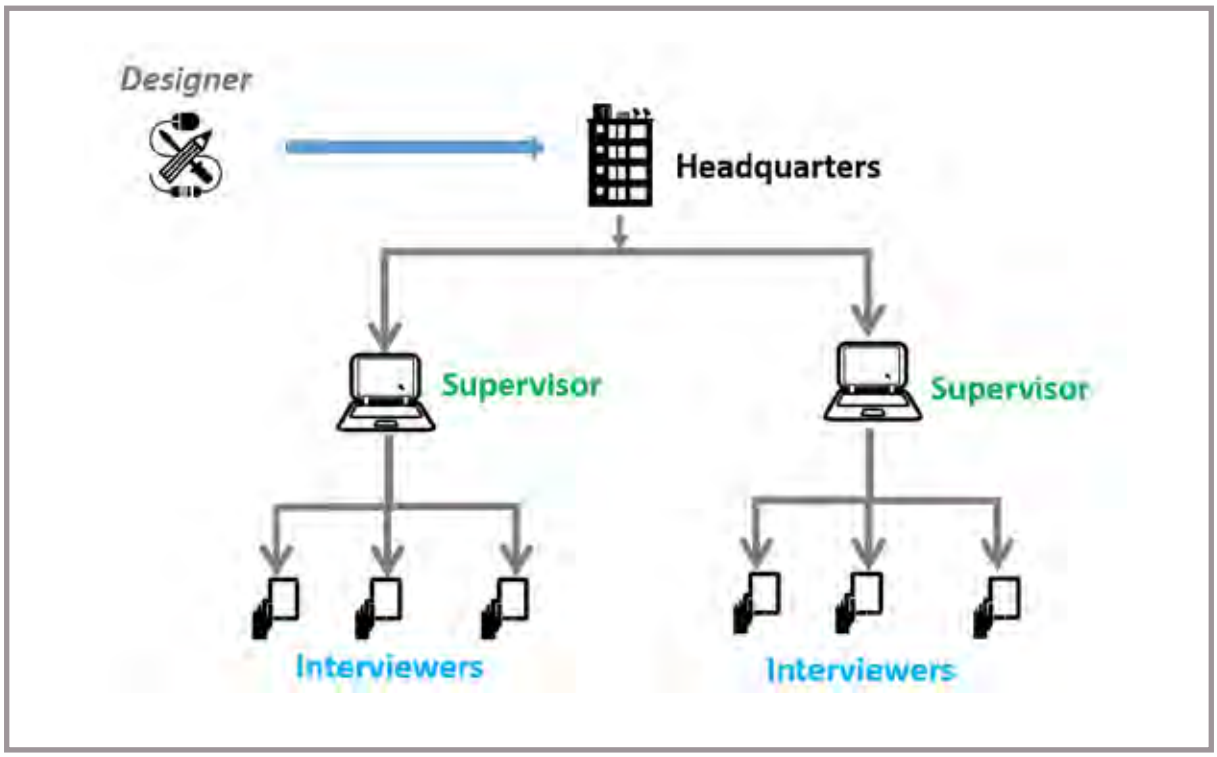
The CAPI software chosen for the implementation of AGRIS is Survey Solutions. In response to a comparative study undertaken by the IRIS Center of the University of Maryland (Shaw *et al*., 2011), Survey Solutions was conceived to fill the existing gaps in CAPI software and be made available to National Statistics Systems (NSS) free of charge. The Global Office of the Global Strategy to improve Agricultural and Rural Statistics invested heavily in its development within the Computation Tools and Living Standard Measurement Study teams at the World Bank. The first official release of Survey Solutions occurred in September 2013. Since then, it has been used to implement more than 300 surveys in 65 countries for approximately four million interviews, and has undergone monthly updates to add useful functionalities.

What sets Survey Solutions apart from other CAPI software is it user-friendliness, and the availability of out-of-the-box survey/case management tools. In most CAPI software, complex coding and syntax is required to develop questionnaires. The result is that there is an onerous training requirement, and in many cases, expert consultants must be recruited. It also implies that once an individual obtains a high level of proficiency, he or she can access lucrative consultancy markets and may choose to leave the NSS. Survey Solutions, on the other hand provides, an easy-to-use point–and-click interface for questionnaire development, allowing users to create questionnaires with minimal training. As a result, NSSs can build capacity within their institutions relatively quickly.

The survey management tools of Survey Solutions enforce good practices. With Survey Solutions, every completed questionnaire must be validated by field-level and headquarters staff. Furthermore, it provides easy ways for supervisors and field staff to communicate with one another about specific interviews and even specific questions, thus making it easy for enumerators to correct errors and provide high quality data.

Survey Solutions consists of four main pieces: Questionnaire Designer, Headquarters, Supervisor, and Interviewer. The name of each piece implies their relative roles and responsibilities in the data collection process. Figure 1 is a conceptual diagram that illustrates the relationships between each of these pieces.

FIGURE 1. OVERVIEW OF SURVEY SOLUTIONS PIECES.



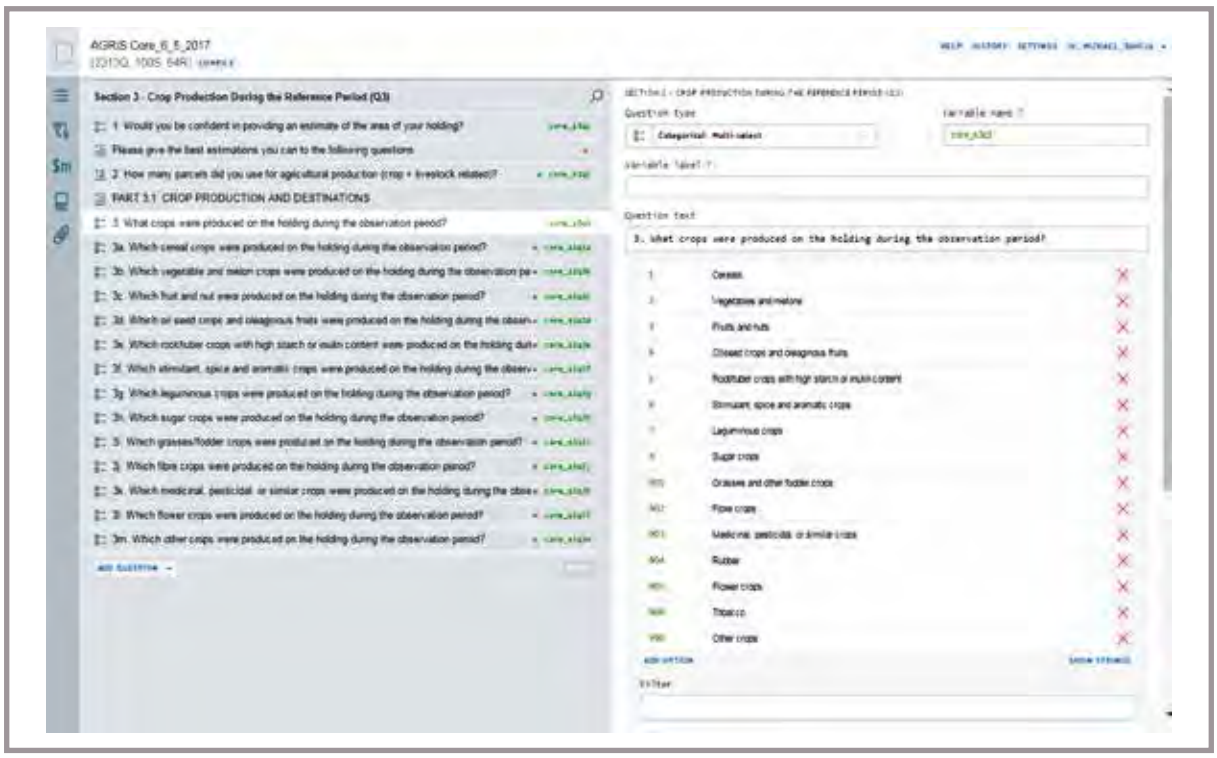
Interviews flow downward from the Headquarters, which does the sampling, to the Interviewer, who conducts the interviews and enters the data into the questionnaire. Once an interview is completed (that is, all data has been entered), it flows back up the hierarchy, undergoing quality checks by the Supervisor and Headquarters along the way. The transmission of information between the pieces takes place using a central server. All of the pieces connect to the server via the Internet. For field surveys, the pieces usually connect to the server using mobile data networks. The following paragraphs contain a more detailed description of each piece with screenshots.

Questionnaire Designer role

The Questionnaire Designer may be accessed at https://solutions.worldbank.org. This piece is tasked with creating the questionnaire in Survey Solutions. Accordingly, it creates and manages all questions, validation and enablement conditions, translations, photos used in the questionnaire, etc. Anyone can create an account and immediately start creating questionnaires for free. The designer uses a point-and-click interface with two panes: one for navigation, and one for creating questions, rosters, pieces of static text, etc. Figure 2 below shows a question from the AGRIS Core Module where the crop groups for crops produced on the holding are selected.

All AGRIS CAPI questionnaires are stored in the Questionnaire Designer. AGRIS staff can provide copies of the questionnaires to users through the Questionnaire Designer upon request. Thereafter, users can make changes to copies of the AGRIS questionnaires to adapt them to the country context.

FIGURE 2. AGRIS CORE MODULE IN QUESTIONNAIRE DESIGNER.



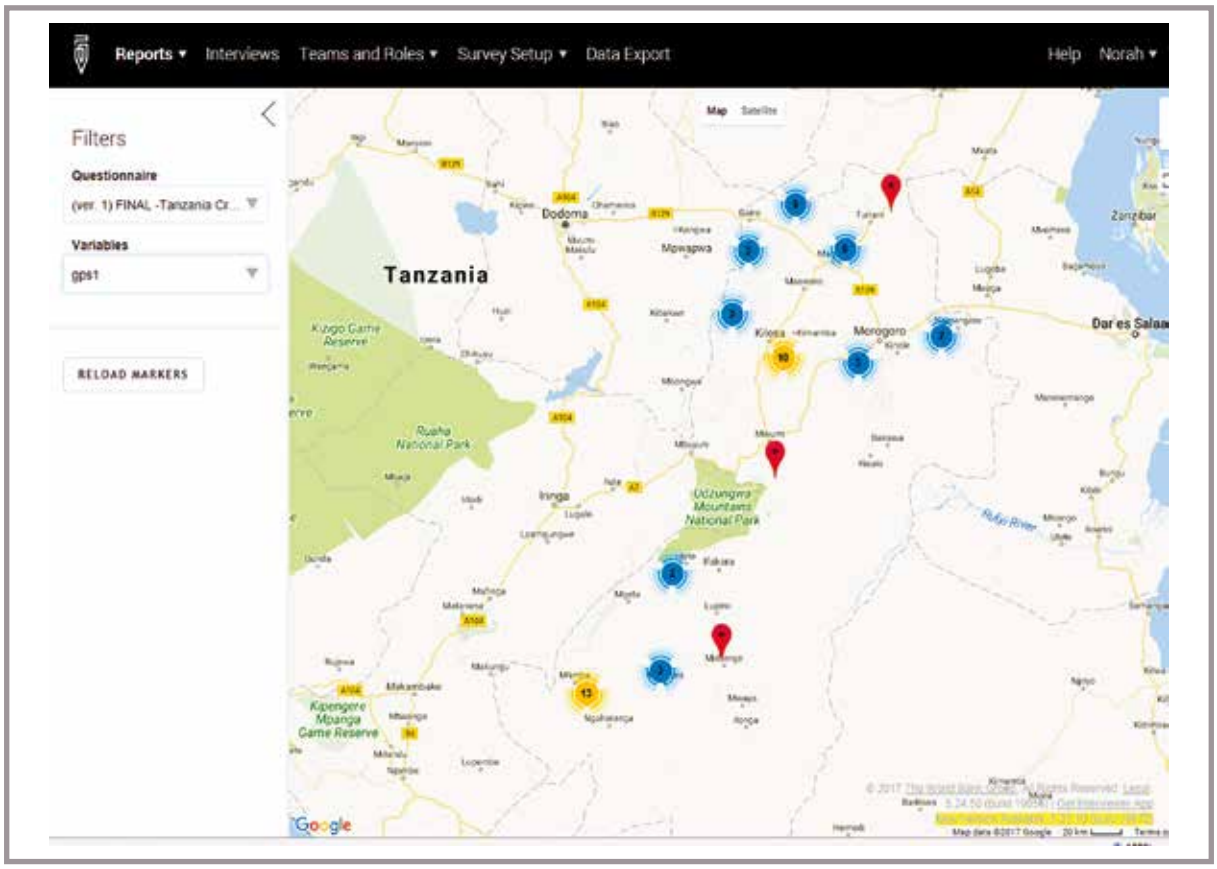
Headquarters role

The Headquarters role is responsible for creating the survey teams, assigning the sample, managing supervisors' workload, and validating data. The Headquarters role can also export data, and create basic reports to monitor survey teams.

The Headquarters role is accessed through a web interface. Once a server has been set up for the survey, a URL is generated which allows users to login and access the Headquarters user interface. The server can either be locally hosted in the country, or a free cloud server can be provided free of charge by the World Bank. The decision regarding the location of the server should be taken on the basis of the national laws for the privacy of microdata, and the institutional capacity to maintain a secure server.

Figure 3 shows an example of a standard Map Report that can be generated using Headquarters. The blue circles containing numbers reveal the number of interviews that have taken place in that particular area. As the user zooms in on the map, the individual interviews separate into their more specific locations, and appear as a red point with a black dot, as can be seen on the northernmost point on the map below. When the user hovers his or her mouse over an individual point, interview-level information appears, indicating the enumerator, supervisor, and time completed for the respective interview.

FIGURE 3. MAP REPORT IN HEADQUARTERS MODE.

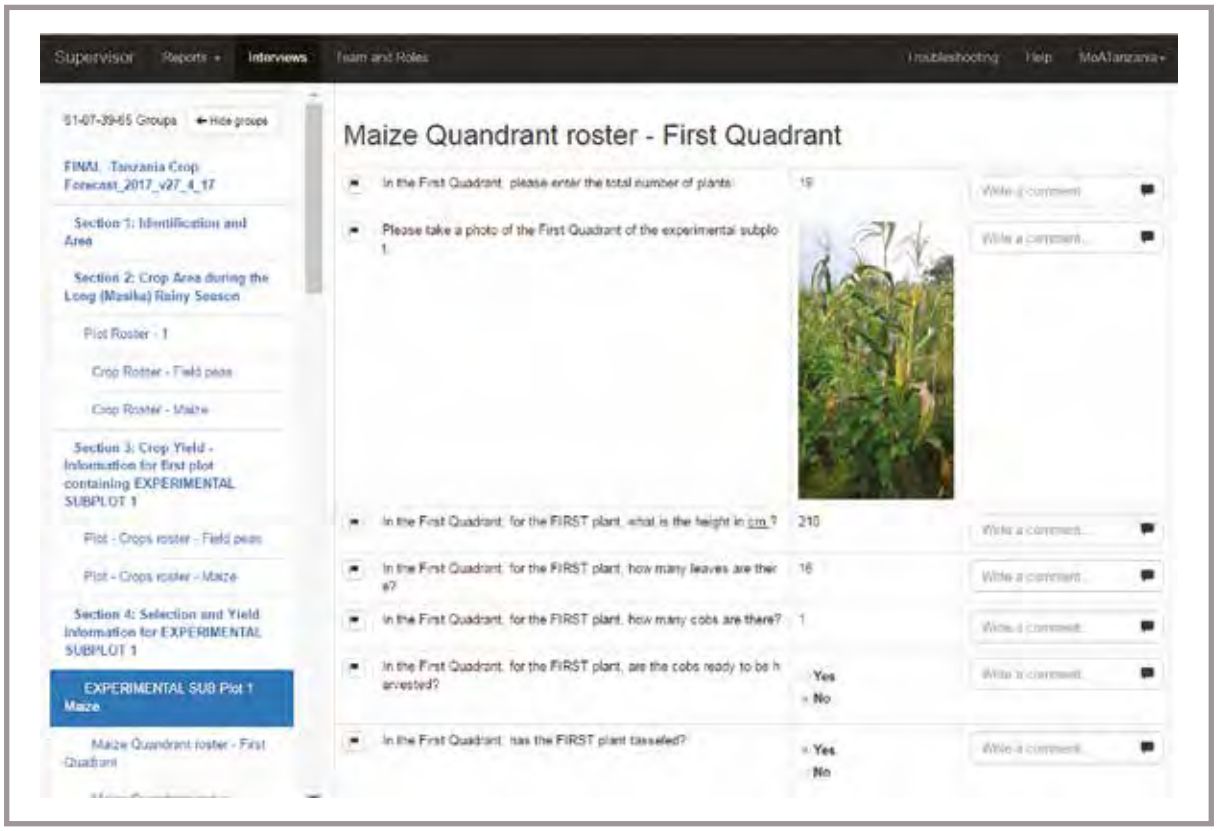


Supervisor role

The Supervisor role was created for field supervisors. Typically, field supervisors travel with survey teams, and manage the enumerators' work by assigning them specific interviews, and perform data quality checks of completed questionnaires. Survey Solutions provides a specific user interface into the server to facilitate these processes.

The user interface of Supervisor looks exactly the same as Headquarters; however, it has less functionalities. Figure 4 below is a screenshot of the user interface that supervisors may use to review a completed questionnaire.

FIGURE 4. COMPLETED QUESTIONNAIRE IN SUPERVISOR MODE



Interviewer role

Interviewer is an application that runs on Android tablets, in which the data is entered during interviews. Interviewer sends completed questionnaires to Supervisor through the Internet, which is usually accessed via a cell phone data network. Interviewer also receives questionnaire assignments, and completed questionnaires which have been rejected by the Supervisor using the same mechanism. Notably, interviewers do not need to have access to the Internet during an interview, but rather only when sending or receiving questionnaires. Figure 5 below shows how Interviewer uses colour codes to indicate to enumerators which parts of the questionnaires have been completed (green), not completed (blue), and contain errors (red).

FIGURE 5. SHOWING THE COLOUR CODING OF SECTIONS.

For additional information on Survey Solutions, there is a detailed support site and user forum located at https://support.mysurvey.solutions.

Annex 6

The question bank – how it helps

The Question Bank is an open-source software developed by the World Bank through which users can create a repository for the metadata of their projects.

The Question Bank enables survey designers to organize all of the information related to their work in a straightforward and comprehensive way. Moreover, although it may be useful during the design phase of a survey, the Question Bank has greater impact in the presentation of survey metadata to data users and other stakeholders.

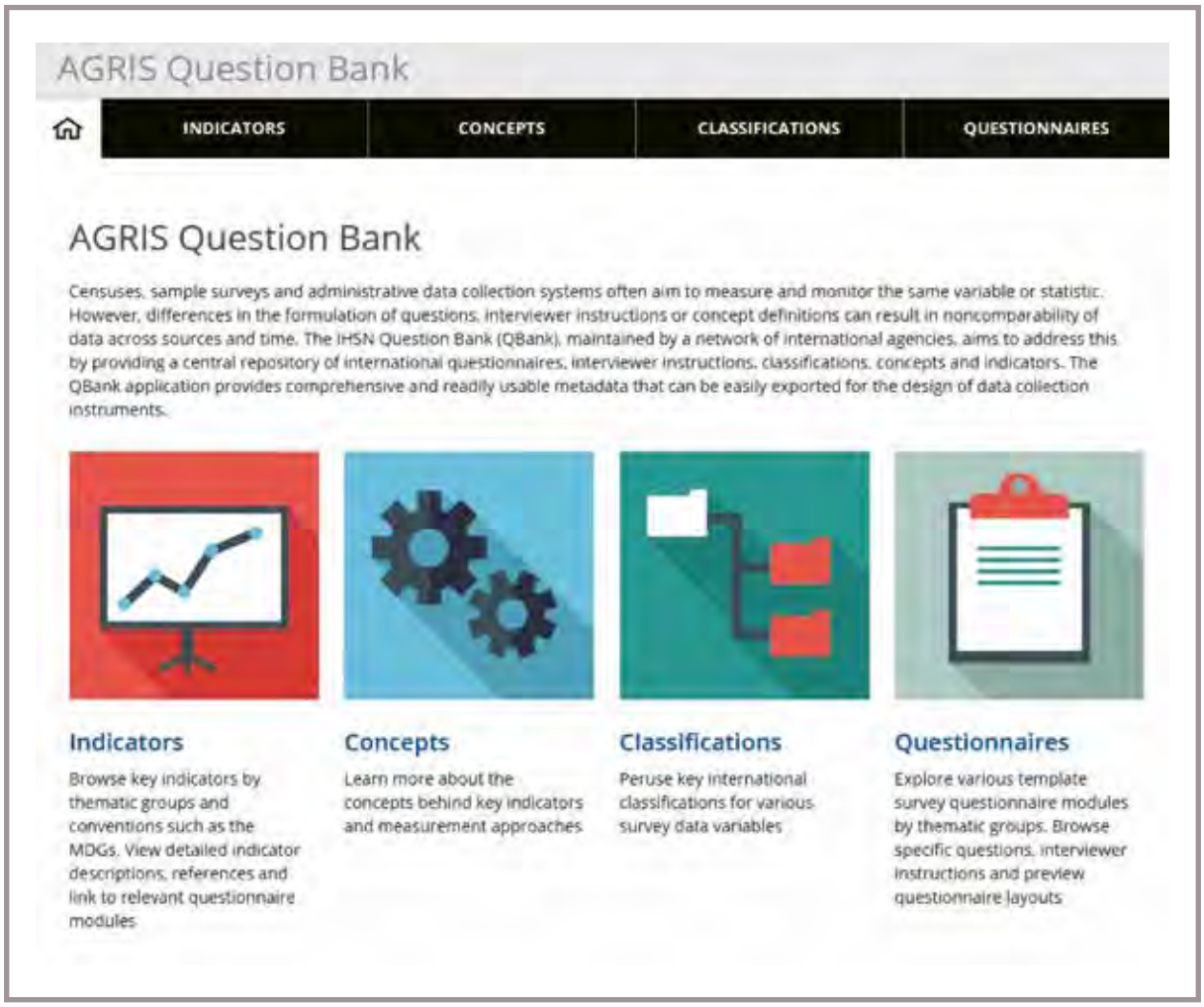
The advantages of the software are mainly related to its structure, which enables organization of information across the interrelated domains of indicators, classifications, concepts and questionnaires. The software allows for linking the elements of different domains and mapping them to each module. The Question Bank is DDI-compliant[1] and is envisaged to be compatible with Survey Solutions (SuSo), the data collection software for conducting Computer-Assisted Personal Interviews used in AGRIS (see annex 5).

For AGRIS, the Question Bank is used to improve coherence between the different survey modules, by linking the questionnaires' sections to the relevant classifications, concepts and definitions. The content of the methodological notes and of the generic questionnaires are presented, and the mapping between the different elements enables a better appreciation of the purpose of each section of the questionnaires.

Figure 1 presents the homepage of the Question Bank, with its intuitive interface. The AGRIS Question Bank can be accessed on the website of the Global Strategy (http://www.qbank.gsars.org/).

1 The DDI (Data Documentation Initiative) is an international standard for describing the data produced by surveys and other observational methods in the social, behavioral, economic, and health sciences (https://www.ddialliance.org/).

FIGURE 1. QUESTION BANK HOMEPAGE. THE INTERRELATED DOMAINS CHARACTERIZING THE QUESTION BANK ARE EXPLAINED IN MORE DETAIL BELOW.

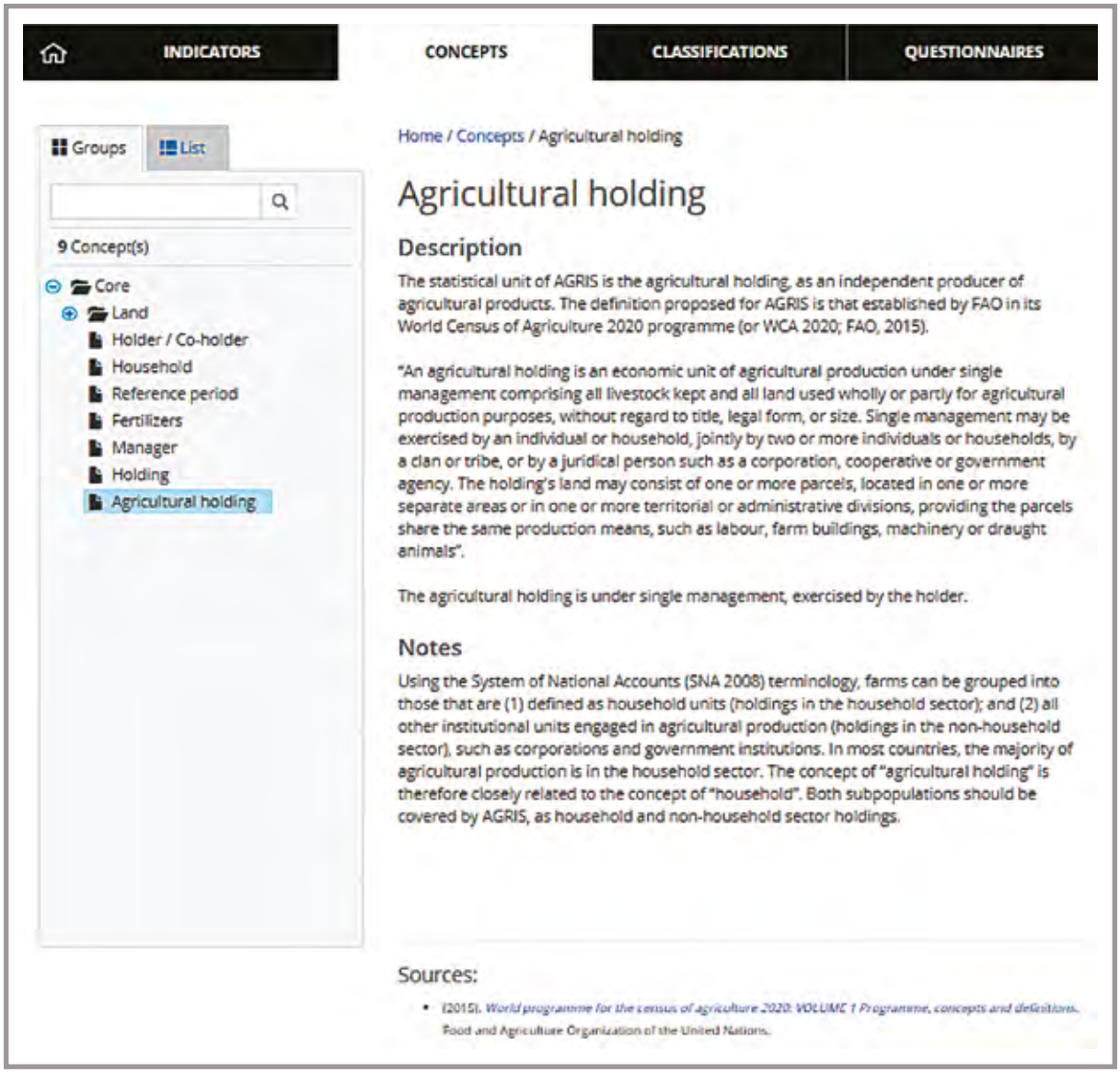


Concepts

Concepts are the broad topics related to the data collection or to some variables. An example of a concept that is present throughout the AGRIS modules is that of agricultural holding.

Figure 2 displays how the concept of agricultural holding is presented in the Question Bank, together with its source.

FIGURE 2. THE CONCEPT OF AGRICULTURAL HOLDING.



The information related to each concept could be voluminous. First, the official definition of a concept is given, together with its source. Then, each concept may be linked to indicators, classifications and questionnaires which, in turn, will also be linked to it.

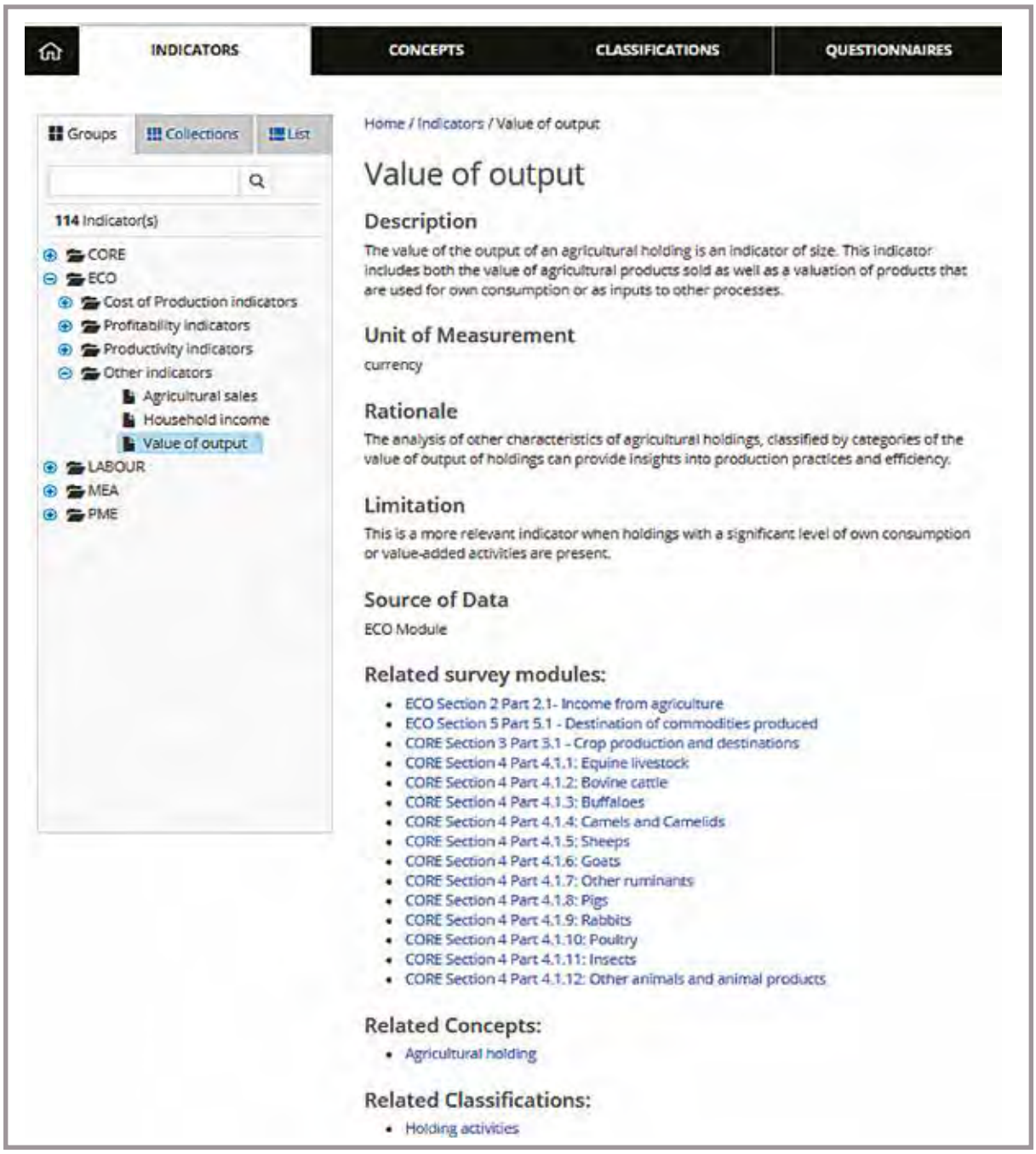
Indicators

The indicator field enables presentation of how the data from a specific questionnaire could be used to represent and measure various phenomena. In this field, the rationale for each indicator, the formula needed to compute it and the unit of measure are described, and the indicators are linked to the questionnaires' sections, concepts and classifications.

Example

The value of output, presented in Figure 3, is an indicator of holding economic size including the value of agricultural products sold and the value of products used for own consumption or as inputs. Therefore, the concept, classification and questionnaires' sections related to the agricultural holding, its activities and the value of the products are linked to the indicator considered.

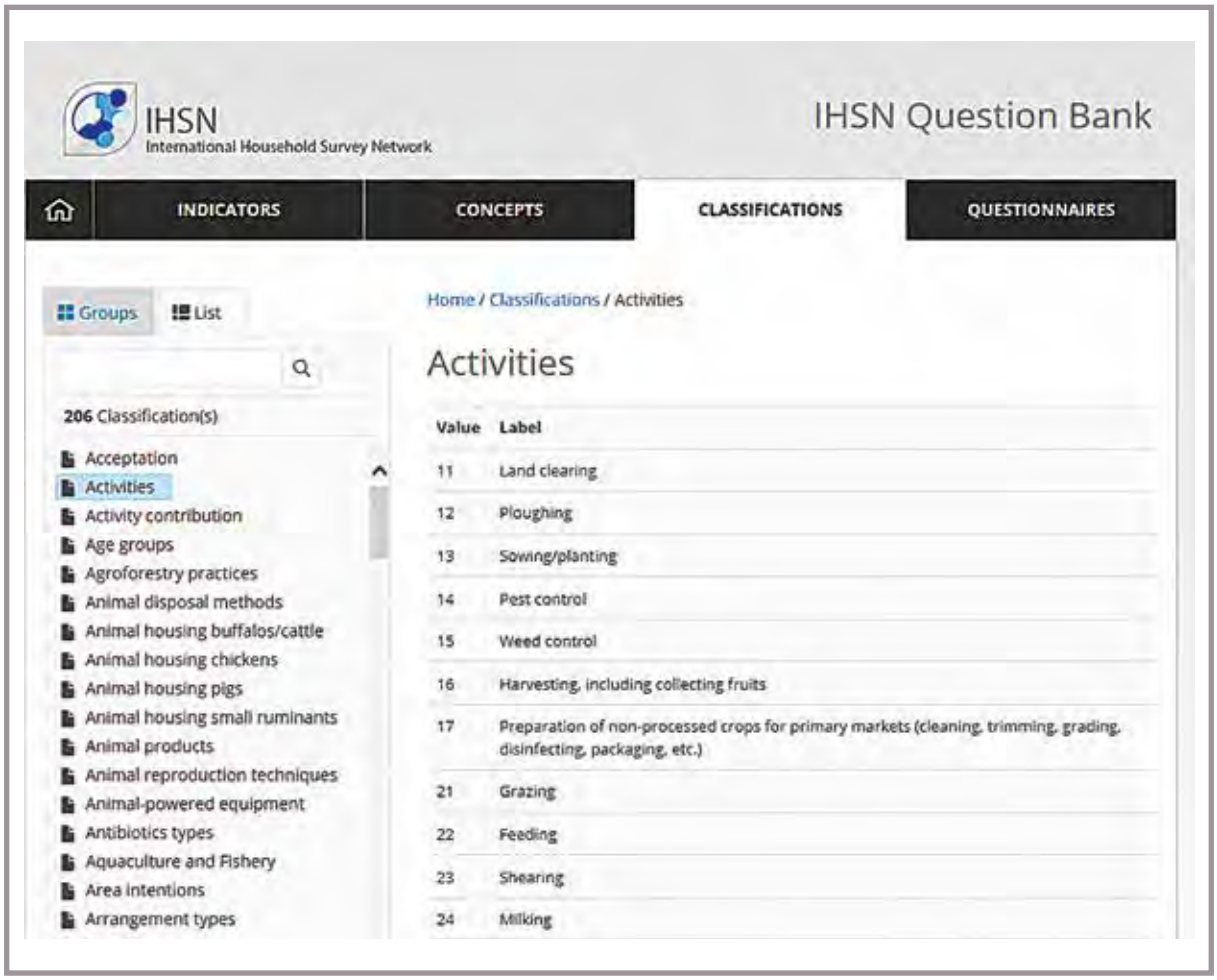
FIGURE 3. VALUE OF OUTPUT INDICATOR.



Classifications

The classifications domain contains the response options and codes for all single or multiselect questions.

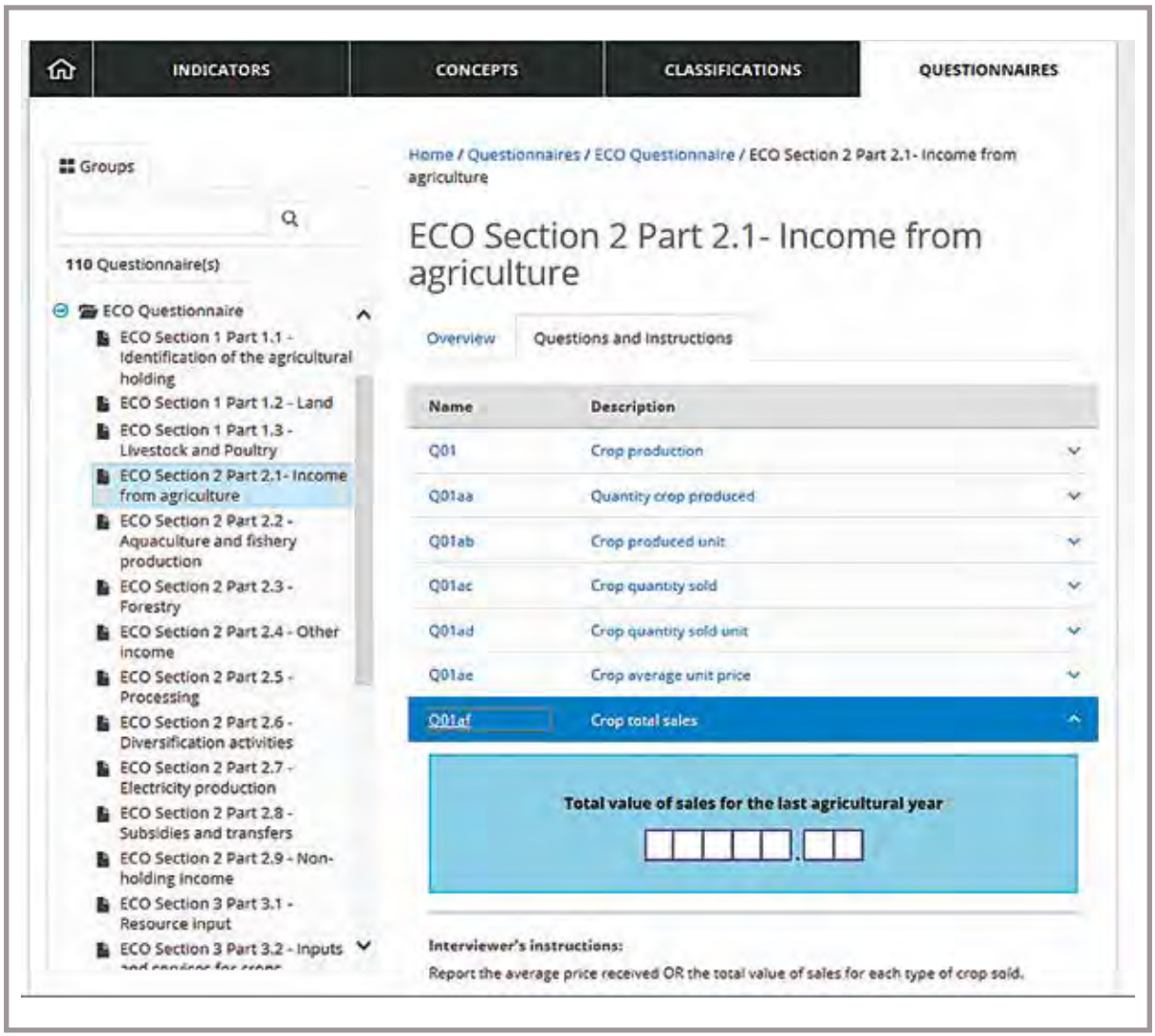
FIGURE 4. AGRIS CLASSIFICATION OF HOLDING'S ACTIVITIES PRESENTS THE AGRIS CLASSIFICATION OF HOLDING'S ACTIVITIES, IN COMPLIANCE WITH THE ISIC REV.4 CLASSIFICATION.



Questionnaires

Each section of the questionnaires is presented as a stand-alone entity. Moreover, for each question, all related classifications, skip patterns and instructions for interviewers may be visualized, both on the platform and using a supporting PDF document of the paper version of the questionnaires. Part 2.1 of the Economy Module is used to collect information on income related to agricultural activities (following AGRIS classification of holding's activities), with questions on quantity produced and value of output (figure 5).

FIGURE 5. QUESTION ON VALUE OF SALES FOR CROPS (ECO QUESTIONNAIRE).



Finally, it has to be acknowledged that the use of the Question Bank will be particularly relevant during the countries' customization phase, as it will be used to understand the features of each module in depth before adapting it to different local contexts. Therefore, implementing this tool is also crucial to better communicate the purpose and scope of the entire AGRIS project to experts and countries.

Annex 7

Recommended R packages for AGRIS sampling

STRATIFICATION OF SAMPLING FRAME, DECISIONS CONCERNING SAMPLE SIZE

R package: "Stratification"

Enables stratification of the sampling frame by categorizing a continuous variable X (the auxiliary variable) that is known for all units in the sampling frame (this is useful in design one-stage stratified design). In particular, it:

- Includes various algorithms (cum square root, Lavallée-Hidiroglou, etc.);
- Allows identification of take-all and take-none strata given the target CV;
- Performs the allocation of sample units according to a Neyman or power allocation; and
- Permits consideration of a model for predicting the unknown target variable Y, given X.

R package: "SamplingStrata"

Enables stratifying the sampling frame by categorizing a set of continuous variables X known for all units in the sampling frame. It:

- Jointly performs stratification and sample allocation by considering the Bethel algorithm;
- Includes a function to perform Bethel's multivariate optimal allocation given a stratification and target CVs at both population and domain levels;
- Includes a function to select the simple random sampling (SRS) of units from the stratified sampling frame

SAMPLE SELECTION

R package: "pps"

Permits to select a PPS sample. This package includes:

- facilities to select a stratified PPS sample; and
- facilities to select a stratified SRS sample.

R package: "sampling"

Includes several functions for sample selection, among which the following functions:

- Performance of multi-stage selection with equal and unequal probabilities; and
- Performance of stratified random sampling with equal and unequal probabilities.

ESTIMATION IN COMPLEX SAMPLE SURVEYS

R package: "survey′"

This package enables estimations from survey data, including estimation of sampling error. In particular, it:

- Contains facilities to perform the post-stratification of the calibration of survey weights;
- Enables estimation of the total means, quantiles etc. for the entire population or for domains of study; and
- Provides an estimate of sampling variance.

R package "ReGenesees"

(Available on request from the Italian National Institute of Statistics – Istat)

This software is used for the design-based and model-assisted analysis of complex sample surveys. It:

- Contains facilities to perform calibration of survey weights;
- Enables the estimation of total means, quantiles etc. for the entire population or for domains of study; and
- Enables estimation of sampling variance.

R package "sampling"

This includes functions to:

- Perform calibration of survey weights; and
- Estimate the sampling variance.

Many additional R packages for use in other survey phases (such as editing and imputation, and indicators) are listed in the CRAN 'Official Statistics' task view, available at: https://cloud.r-project.org/web/views/OfficialStatistics.html.

Many R packages are available to treat spatial data at: https://cloud.r-project.org/web/views/Spatial.html.

ESTIMATION IN DUAL FRAME SURVEYS

R package "Frames2"

This package can be used to compute the main dual frame estimators.

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- Laura Monopoli

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