



## AFRICAN COMMISSION ON AGRICULTURAL STATISTICS

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### AGRIS STATISTICAL INFRASTRUCTURE NEEDED FOR SDG MONITORING

#### Summary

The Agricultural Integrated Survey (AGRIS), which was developed by FAO in the context of the Global Strategy to Improve Agricultural and Rural Statistics, is a farm-based modular multi-year survey program. It has been designed as a tool to accelerate the production of disaggregated data on agricultural production as well as on the technical, economic, environmental and social dimensions of farms, including smallholder farms. AGRIS was designed to be particularly relevant for developing countries.

National agencies that are willing to design and implement a customized AGRIS will find that AGRIS provides the necessary resources in terms of (1) technical methodology, (2) specialized survey tools and instruments that use the latest knowledge and technology and cover the full range of survey steps, and (3) budget and institutional framework guidelines. Currently, FAO and its partners are scaling up a network of expertise, especially at regional level, to provide the necessary training, technical assistance and funding opportunities.

#### I. Introduction

AGRIS was designed as a cost-effective way to strengthen agricultural data collection and help build sustainable and comprehensive rural information systems in developing countries. The data generated is meant to inform policy design and implementation, as well as improve market efficiency and support research. AGRIS constitutes an invaluable data source and provides the framework for designing, monitoring and evaluating any agricultural and rural policy or investment.

AGRIS can complement ongoing agricultural data collection, whether it is an agricultural census, a versatile agricultural market information system, or the use of remote sensing and administrative data, AGRIS is a cornerstone for the establishment of a comprehensive rural information system.

Major international initiatives, such as the Sustainable Development Goals (SDGs), define frameworks for mutual accountability and associated targets and indicators. This emphasizes the importance of strong national statistical systems, capable of generating the data required to monitor progress towards these targets. At present, however, the SDG data requirements far exceed the current capacities of national systems.

AGRIS provides the basic data for monitoring Goal 2 indicators:

<b>SDG 2.3.1</b>	Volume of production per labor unit by classes of farming / pastoral / forestry enterprise size
<b>SDG 2.3.2</b>	Average income of small scale food producers, by sex and indigenous status

In addition, AGRIS offers the possibility to monitor:

<b>SDG 2.4.1</b>	Proportion of agricultural area under productive and sustainable development
<b>SDG 5.a.1</b>	(a) proportion of total agricultural population with ownership or secure rights over agricultural land, by sex (b) share of women among owners or rights-bearers over agricultural land, by tenure type

The proposed generic set of AGRIS questionnaires will also contribute to generate 65% of the Minimum Set of Core Data requirements. It is clear that AGRIS offers many benefits. Without it, existing data gaps can only be filled by ad-hoc suboptimal mechanisms with high transaction costs. This would further increase the burden on people, agricultural holdings and data systems, and would not guarantee the data quality required by users. Ultimately, this would prevent any monitoring of these policy frameworks and would constitute an obstacle to the accountability and transparency required by functioning markets.

## II. Methodology

The AGRIS methodology has been developed by FAO in the context of the Global Strategy. Some activities involve partner agencies, for example the World Bank, ILO and Experts from lead statistical agencies worldwide. Research and testing has also been conducted with national agencies on an ad-hoc basis, in particular in Ghana. The first country to benefit from support for a full implementation is Senegal.

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## Overall data collection strategy

AGRIS is synchronized with the Agricultural Census and operates over a 10-year cycle. AGRIS proposes 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 in 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 which in addition focuses on a range of different themes that remain largely the same in each survey round. The rotating section (‘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 modules flow for the four recommended modules: ‘economy’, ‘labour’, ‘machinery, equipment, assets’, and ‘production methods and environment’. The financial and human resources input required to sustain and implement such a set-up is relatively stable over the 10 year cycle, making it a viable set-up for a data producing agency. The targeted annualized budget for an IDA country for such a set-up is within the USD1m – 1.5m range. 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.

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

**Figure 1:** Recommended AGRIS modules flow

In order to 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 in their years of implementation. Sub-sampling 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.

### **Data collection model**

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 professionals enumerators remain the best means of quality data collection. When required, data collection could include the use of self-reported log-books (or SMS log-books), for example in the case of multiple harvest seasons or livestock data (Core Module), or cost of production (Rotating Module 1). The use of 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.). Mixed-mode data collection will be piloted to ascertain the benefits of surveying a panel of household holdings by phone and a panel of non-household holdings by means of web questionnaires. The systematic use of the GPS coordinates of the location of holdings and plots is recommended, to accelerate the ground-truthing of complementary remote sensing information systems.

### **Sampling**

The AGRIS sample techniques and sample size will be decided by the implementing national agencies, based on the sample frames available, the capacities to design and implement complex sampling techniques and corresponding field work, the budget available and the ultimate data accuracy and disaggregation required. Specific and detailed sampling guidelines and tools are provided in the AGRIS Toolbox (see paragraph 27 below). These tools are based on the advanced research conducted by the Global Strategy on Multiple Frame Sampling and on the Integrated Survey Framework.

Different theoretical and practical issues relating to frames exist, and, in many countries, still limit surveying options and eventually reduce data quality and usability. These issues range from generic issues, such as frame coverage (for list frames in particular) to more specific issues, such as the poor accuracy of livestock statistics based on area frames. Guidance upon these matters will be provided in the AGRIS Toolkit.

The AGRIS sampling strategy is versatile, to be able to meet the different 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
- Subsampling for rotating modules

Seasonality is a key dimension in agriculture. Right timing of data collection is of critical importance. The appropriate use of sub-samples and panels will allow AGRIS to capture some of the seasonality factors. Methodological options to administer data collection only once or several times a year are provided - both for the core and the rotating modules.

## Topics covered and data items

AGRIS covers different technical, economic, environmental and social dimensions of agricultural holdings through its core module and its 4 rotating modules: 'economy', 'labour', 'machinery, equipment, assets', and 'production methods and environment'. The following tables list the proposed data items for each module. The AGRIS Toolkit further details these data items and proposes corresponding 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.

The core module will collect data on the following topics:

### **CORE MODULE**

#### **1. Identification and general characteristics of the holding**

Location, holder, manager, respondent, main activity, main destination

#### **2. Agricultural productions**

Crops: last 12 months

Crops: next 12 months

Livestock

Meat, milk, eggs and other animal productions

Aquaculture and fisheries

#### **3. Economy**

Income

Expenditures

Credits and access to finance

Access to information

#### **4. Production shocks and coping mechanisms**

#### **5. Demographics [HS-AH only]**

#### **6. Labour**

Labour input on the holding

#### **7. Holding housing dwelling and assets [HS-AH only]**

2.1 The four AGRIS rotating modules will collect data on the following topics:

## **ROTATING MODULE : ECONOMY**

### **1. Main characteristics of the holding**

Identification, land ownership and use, livestock ownership

### **2. Income from agricultural production**

**Quantity produced**, by commodity (from Core)

**Quantity sold**, by commodity

**Total value of sales** or average **price received**, by commodity

### **3. Other sources of income of the holding**

**Aquaculture and fisheries** (sales)

**Forestry products** (own-use and sales)

**On-farm processing of agricultural commodities** (total quantities produced, sold and expenses)

**Energy/electricity generation** (amount produced, sold and value)

**Diversification activities** (income and expenses)

**Other sources of income related to agriculture** (income)

### **4. Subsidies and transfers related to agricultural production**

Direct and indirect subsidies; transfers

### **5. Other sources of income of household members**

Salaries, rentals (other than renting of ag land of the holding), investments, etc.

### **6. Inputs and production costs**

**For crop production**

**For livestock production**

**Labour** (total salaries/wages in cash or in-kind)

### **7. Taxes and licenses related to the holding**

**Taxes paid** (value) - land, property, etc.

**Licenses** (value) - water, access rights, etc.

### **8. Investments and financing**

**Purchase of capital/fixed assets** (value)

**Loans** (provider, type, value and use on the holding)

### **9. Insurance schemes**

Type, coverage, premium values and repayments

### **10. Storage facilities**

By type and commodity

### **11. Marketing**

% produce sold, market type and characteristics

## **ROTATING MODULE: LABOUR**

<b>1. Overview of labour force on the holding</b>
<b>2. Peak and low months</b>
<b>3. Demographic characteristics of workers</b>
<b>4. Time worked by workers</b>
<b>5. Forms of contracts and payments</b>
<b>6. Contractors</b>

## **ROTATING MODULE : MACHINERY, EQUIPMENT, ASSETS**

### **1. Machinery and Equipment**

*(types & quantities in use, access & ownership)*

- Manually operated equipment
- Animal powered equipment
- Machines for general farm use
- Specialized agriculture machinery and equipment

### **2. Type of non-residential buildings**

### **3. Assets [HS-AH only]**

- Land, livestock owner, operator
- Household dwellings
- Drinking water
- Household assets

## **ROTATING MODULE : PRODUCTION METHODS & ENVIRONMENT**

*(Quantities, types and areas)*

### **1. Use of Natural Resources**

Land use  
Energy sources  
Soil management  
Irrigation and drainage

### **2. Crops production systems and resources**

Fertilizers  
Plant protection products  
Crops and seeds varieties and resources  
Rice cultivation, specificities

### **3. Livestock production systems and resources**

Livestock types and resources  
Animal breeding and reproduction  
Animal housing, manure management, equipment and transportation of animals  
Veterinary products and use of traditional medical methods  
Feed and use of pastures

### **4. Organic farming (certified or in conversion to organic)**

### **5. Agro forestry**

### **6. Access to and use of services, infrastructure and natural resources**

Agricultural extension services (incl. veterinary)  
Infrastructure (incl. IT, communications, access to market)  
Access to natural and common property resources

### **7. Greenhouse gas and environment**

### **8. Adaptation to climate change and mitigation strategies**

### **9. Waste Management**

The AGRIS Toolkit provides additional resources to guide in the design and customization of the questionnaires. Specific guidelines will synthesize costs/benefits dimensions of different options for the sequencing of the rotating modules, for different farming systems.

### **Data access**

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

FAO will maintain a DDI-compliant<sup>1</sup> AGRIS Central Catalog, in line with the practices of and tools made available by the International Household Survey Network<sup>2</sup>. In addition to all relevant metadata, questionnaires and survey outputs, the AGRIS Central Catalog will provide easy and safe access to anonymized microdata, for research purposes. The exact access terms for each survey dataset will be agreed between national agencies and FAO, and will fall under either of two categories: “public use file” and “licensed file”. When anonymized micro datasets cannot be made available, the catalog will still provide detailed metadata at the variable level. The AGRIS Central Catalog will be connected to the national catalogs and to relevant international catalogs such as the World Bank Microdata

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<sup>1</sup> [www.ddialliance.org/](http://www.ddialliance.org/)

<sup>2</sup> [www.ihsn.org](http://www.ihsn.org)



Catalog or the IHSN Central Survey Catalog, for automatic harvesting and data exchanges. National agencies will have access to detailed usage statistics on their own products.

The AGRIS Central Catalog will be critical for ensuring long-term preservation of and access to AGRIS resources.

Partnerships with local universities will be recommended, to build the long-term capacity to understand and use complex micro datasets and the associated econometrics techniques. This is expected to increase statistical literacy, fuel research and inform civil society on policy choices.

### **III. Conclusion**

The implementation of the AGRIS methodology is in the early stages, but is well positioned to make a strong impact in the development of sound agricultural statistics system. It is can strengthen agricultural data collection and help build sustainable and comprehensive rural information systems. As such it can be a useful tool for monitoring of a number of SDG indicators under Objective 2 of the 2030 Sustainable Development Agenda. Strengthening national agricultural statistical systems through the provision of capacity development in the implementation of innovative methodologies and tools will set the foundation for reliable statistics to be produced for the long term.

Agriculture data collection is a valuable process that informs a number of targets across the sector. AGRIS has responded to that need, which requires timely national data of high-quality that can shape policy, encourage investment, and allow for progress to be effectively measured.