The Agricultural Integrated Survey (AGRIS)
Agenda

Presentations

• Rationale, methodology, status
  – Q&A

• Data coverage
  – Q&A

• Sampling strategy
  – Q&A

Discussion
1. Rationale
Methodology
Status
Rationale

• SDG adds new pressure and widen data gaps
• Data collection still weak in many countries
• Need for more, better, cheaper and faster statistical data on the agricultural and rural sector, farm level
Rationale

• AGRIS data will inform policy design and implementation, improve market efficiency and support research
  
  – Contribution to SDGs monitoring (5 direct, 16 partial)
  
  – Global Strategy Minimum Set of Core Data: AGRIS collects large share of the MSCD

• AGRIS lays the foundations for the creation of an efficient agricultural statistical system

• AGRIS is affordable and manageable
## Methodology

### Modular Structure

<table>
<thead>
<tr>
<th>Synchronized with the Agricultural Census and operates over a 10-year cycle.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core Module: yearly data collection on current agricultural production (crop and livestock) integrated with key economic, technical and socio-demographic statistics</td>
</tr>
<tr>
<td>Rotating Modules: thematic data to be collected with lower frequency (2-5 years): economy, labour, machinery-equipment-assets-decisions, production methods &amp; environment.</td>
</tr>
</tbody>
</table>

### Statistical Units

<table>
<thead>
<tr>
<th>All agricultural holdings</th>
</tr>
</thead>
<tbody>
<tr>
<td>• household sector (INCL. SMALL HOLDERS)</td>
</tr>
<tr>
<td>• non-household sector</td>
</tr>
</tbody>
</table>

### Sample design

<table>
<thead>
<tr>
<th>Versatile sampling strategy, able to meet the different country situations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multiple waves for data collection possible (labour, economy)</td>
</tr>
</tbody>
</table>

### Data collection process

<table>
<thead>
<tr>
<th>Face-to-face interviews</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rely on Global Strategy data collection methods – including GPS, CAPI, etc.</td>
</tr>
</tbody>
</table>
## Methodology

### Recommended flow of modules

<table>
<thead>
<tr>
<th>Core Module</th>
<th>Years</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural Census (●) + Inter-census survey (0)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0</td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>AH Roster</td>
<td></td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>Crop + livestock production</td>
<td></td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>Other key variables</td>
<td></td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
<td>●</td>
</tr>
</tbody>
</table>

| Rot. Module 1 | Economy |       |   |   | ● | ● | ● |   |   |   |   | ●  |
| Rot. Module 2 | Labour   |       |   |   |   | ● |   |   |   |   |   | ●  |
| Rot. Module 3 | Machinery, Equipment, Assets and Decisions |       |   |   |   |   |   |   |   | ● |   | ●  |
| Rot. Module 4 | Production Methods and Environment |       |   | ● |   |   |   |   |   |   | ● | ●  |
Methodology

Topics covered and data items

• AGRIS complements the census of agriculture
• AGRIS covers technical, economic, environmental and social dimensions of agricultural holdings
• AGRIS collects sex-disaggregated data on key topics:
  — to identify male / female headed holdings
  — to assess women's contribution to agriculture:
    • labour
    • access to and control of productive assets, resources and services
    • decision making
Methodology

• **AGRIS toolkit**: methodological resources, guidelines and software/code:
  - Planning and design
  - Data collection
  - Data processing, analysis, archiving
  - Data dissemination
Ghana is the first country to test and adopt the AGRIS methodology. Ongoing collaboration between Global Strategy, GSS and MoFA aims to:

- Finalize AGRIS generic methodology (generic questionnaires) - Oct 2016 - May 2017
- Develop and test AGRIS-Ghana (customized questionnaires) - May - Oct 2017
- Set up a sustainable long-term funding mechanism for AGRIS - Jan – Oct 2017
PRE-TESTS = COGNITIVE TESTS

Objectives

• Probe difficult questions/sections.
• Check that respondents:
  – Understand questions, concepts or tasks in a consistent way and as intended
  – Feel able and willing to answer
  – Provide pertinent and reliable answers

Approach

• 5 AGRIS questionnaires tested through in-depth cognitive interviews on a small group of respondents (approx. 20 individuals per questionnaire)

Results: expected by early Dec 2016
FULL QUESTIONNAIRES TESTING

Objectives

• Assess the overall efficiency of the questionnaires and their feasibility:
  – Length and flow
  – CAPI
  – Integration of core and rotating modules

Approach

• Core & one rotating module tested on a small sample of farms
• Total of 200 holdings interviewed

Planned: April-May 2016
Methodological developments

• Lead: GS / FAO + external expertise

• AGRIS Toolkit: on-going development, testing and peer review (WB LSMS-ISA+ others)
  – 1st Priority
    • Questionnaires and associated manuals
    • Sampling guidelines
  – 2nd Priority
    • Operational guidelines
    • Training materials
Status: field tests

- Experiment Post Harvest Losses & Comparison declaration vs measurements
- Cognitive pre test / generic AGRIS questionnaires
- Experiment on measuring labour input & Own-consumption work
- Field test generic AGRIS questionnaires
Implementation at global level

- **Global Strategy**
  - 2mUSD, 2015-2017
  - Focus: methodology

- **FAO / USAID project**
  - 15mUSD, 5 years (= phase 1)
  - Focus: AGRIS undertaking in 4 countries to be identified
    - Limited normative work

- **FAO / BMGF project (pipeline)**
  - 3mUSD, 4 years
  - Focus: methodology + governance + preparatory work with countries
    - Ad-hoc support to 15 countries, leverage local funding

Status: roll-out
Implementation at country level

- Big demand: 20 countries
- Just starting (USAID)
  - No blank sheet – rather consolidation of existing survey system
  - Build on current national capacities
- National implementation and alignment with national priorities: NSDS – SPARS
  - Customization of generic questionnaires + flows, sampling, etc.
- Toolkit available for everyone to get free inspiration for free implementation

Status: roll-out
Implementation at global level: GRAInS Partnership

- FAO & WB + technical partners + key donors + countries
- Steering Committee + light Secretariat
- Activities:
  - Advocate and raise funding for more and better surveys.
  - Implement integrated household surveys and agricultural surveys, and provide TA and financial support.
  - Conduct methodological research on integrated household surveys and agricultural surveys.
  - Increase the usability and relevance of surveys with other data sources.
2. Data coverage
Basic Principles

• Satisfy a variety of needs through:
  i) comprehensive questionnaires with a modular structure;
  ii) questionnaires for a multi-wave approach and for 1 wave approach for some of the modules
  iii) short questionnaires with “priority questions”

• Consistency with international standards

• Build on current practices and capacities

• Policy relevant (SGDs, other emerging needs)

• Work in partnership –World Bank, ILO, Eurostat
CORE MODULE

• Objectives:
  – to monitor a set of key indicators on an annual basis, thus enabling the identification of trends and changes in a timely manner;
  – to make some forecasts on future scenarios and farmers’ expectations.

• Content:
  – crop and livestock production and their seasonality, farm productivity, shocks and coping mechanisms, and access to markets and information;
  – essential structural data on holdings and households;
  – key data on inputs, production methods, labour and the overall income sources.
# Core module - structure

<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Identification and general characteristics of the holding</td>
</tr>
<tr>
<td>2.</td>
<td>Demographics and social characteristics [HS-AH only]</td>
</tr>
<tr>
<td>3.</td>
<td>Agricultural Productions</td>
</tr>
<tr>
<td></td>
<td>Crops: temporary crops</td>
</tr>
<tr>
<td></td>
<td>Crops: temporary crops, next campaign</td>
</tr>
<tr>
<td></td>
<td>Crops: permanent crops</td>
</tr>
<tr>
<td></td>
<td>Livestock</td>
</tr>
<tr>
<td></td>
<td>Milk, meat, eggs and other animal products</td>
</tr>
<tr>
<td></td>
<td>Aquaculture and fisheries</td>
</tr>
<tr>
<td>4.</td>
<td>Production methods, shocks and coping mechanisms</td>
</tr>
<tr>
<td>5.</td>
<td>Labour</td>
</tr>
<tr>
<td></td>
<td>Labour input on the holding</td>
</tr>
<tr>
<td>6.</td>
<td>Economy</td>
</tr>
<tr>
<td></td>
<td>Access to finance</td>
</tr>
<tr>
<td></td>
<td>Access to information</td>
</tr>
</tbody>
</table>
ROTATING MODULE ECONOMY

• Objectives:
  – to gather information on agricultural holding’s income through an inquiry upon its revenues and expenses;
  – to provide the necessary data to measure production costs and profitability for different production systems and farm types;
  – to provide the necessary data that, used in combination with other questionnaires, will allow an estimation of agricultural productivity
  – to allow for an estimation of own-consumption work and services for the households.

• Content:
  – Data on farm revenues and costs to compile policy-relevant indicators, such as farmers’ margins and input productivity;
  – Commodity transformation on the farm, revenues and costs linked to it;
  – Wages earned by household members outside the holding;
  – Farmers’ selling practices;
  – Share of total production sold;
  – Ability to delay selling to wait for better market conditions.
## Rotating module Economy – structure

<table>
<thead>
<tr>
<th>1. Means of production (no labour)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land tenure</td>
</tr>
<tr>
<td>Property of livestock</td>
</tr>
<tr>
<td>Storage capacity</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2. Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total income</td>
</tr>
<tr>
<td>Income from agricultural activities</td>
</tr>
<tr>
<td>Income from other gainful activities</td>
</tr>
<tr>
<td>Subsidies/transfers received</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3. Expenditure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linked to crop production</td>
</tr>
<tr>
<td>Linked to livestock production</td>
</tr>
<tr>
<td>Salaries</td>
</tr>
<tr>
<td>Insurance</td>
</tr>
<tr>
<td>Linked to other gainful activities</td>
</tr>
</tbody>
</table>

| 4. Main commercial networks for the production |

| 5. Credit, access to financing and investments |
Implementation

- **Holding from the non-household sector:**
  - 1 visit = 1 wave of data collection

- **Holding from the household (HH) sector:**
  - Option A: 1 visit = 1 wave of data collection
  - Option B: 2+2 visits = 4 waves of data collection

<table>
<thead>
<tr>
<th>Visit</th>
<th>Data collection</th>
<th>Reference period</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1st visit</strong> (long), month M</td>
<td>Core module</td>
<td>Last agricultural campaign</td>
</tr>
<tr>
<td>After agricultural campaign (after harvesting)</td>
<td>Part of eco module</td>
<td>Current situation referring to the previous campaign</td>
</tr>
<tr>
<td></td>
<td>Diary left and explained</td>
<td>Next 4 months</td>
</tr>
<tr>
<td><strong>2nd visit</strong> (short), month M+4</td>
<td>Diary checking</td>
<td>Last 4 months</td>
</tr>
<tr>
<td></td>
<td>Diary left and explained</td>
<td>Next 4 months</td>
</tr>
<tr>
<td><strong>3rd visit</strong> (short), month M+8</td>
<td>Diary checking</td>
<td>Last 4 months</td>
</tr>
<tr>
<td></td>
<td>Diary left and explained</td>
<td>Next 4 months</td>
</tr>
<tr>
<td><strong>4th visit</strong> (long), month M+12</td>
<td>Core module</td>
<td>Last agricultural campaign</td>
</tr>
<tr>
<td></td>
<td>Part of eco module data</td>
<td>Last agricultural campaign - update</td>
</tr>
<tr>
<td></td>
<td>Diaries checking - totals</td>
<td>Last agricultural campaign (last 12 months)</td>
</tr>
</tbody>
</table>
ROTATING MODULE LABOUR

• Objectives:
  – to assess the volume of labour input in agricultural holdings;
  – to collect information on the organization of labour on holdings, incl. identification of age/sex of workers (family and non-family) and specific roles;
  – to gather information on household members’ participation into all forms of work (on and off the holding), based on the 19th Int. Conference Labour Statistics (ICLS) Resolution.

• Content:
  – Holding labour questionnaire
    • Time worked on the holding;
    • Seasonal calendar of activities;
    • Payments and Benefits (if any), and Payment modalities.
  – HH member questionnaire
    • Time worked on the holding;
    • Own consumption work ↔ employment;
    • 2 main jobs;
    • Unpaid services to the household.
### Rotating module Labour – structure

<table>
<thead>
<tr>
<th>1. Household members’ contribution to the agricultural holding (HH sector only)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participation into agricultural activities of the holding (incl. own-use production work vs employment, wages, time worked)</td>
</tr>
<tr>
<td>Participation into diversification activities of the holding (incl. wages, time worked)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2. Household members’ other working activities - diversification (HH sector only)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other work activities and main jobs</td>
</tr>
<tr>
<td>Unpaid services and domestic activities</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3. External labour of the agricultural holding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participation in agricultural activities (time worked)</td>
</tr>
<tr>
<td>Participation in diversification activities of the holding (time worked)</td>
</tr>
<tr>
<td>Characteristics of work activities</td>
</tr>
<tr>
<td>Wages / salaries and forms of payment</td>
</tr>
<tr>
<td>Work conditions (incl. decent work, informality, etc.)</td>
</tr>
</tbody>
</table>
Objectives:

- provides information on different structural characteristics of holdings as well as improving knowledge on responsibilities and roles within the holding.

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. Assets

3. Distribution of managerial decisions in the holding
ROTATING MODULE
Production Methods and Environment

• Objectives:
  – to collect data needed as an input in the compilation of indicators to assess the impact of agricultural activities on the environmental, social and economic sustainability of farming, GHG emissions, etc.
  – To enable, together with the Economy Module, an analysis of the cost of production for different types of agricultural production methods and calculation of the costs and benefits of switching from one production method to another, with the ultimate objective of improving farm productivity.

• Content:
  – Main categories of land use, tillage practices, soil management and irrigation;
  – Energy resources used with a focus on renewable energy sources;
  – Characteristics of Crop production systems, use of fertilisers and PPPs;
  – Livestock production systems and use of pastures, manure management;
  – Organic farming;
  – Measures to mitigate and adapt to climate change;
  – Waste management.
# ROTATING MODULE

## Production methods and Environment

<table>
<thead>
<tr>
<th>Section</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Use of Natural Resources</td>
<td>Land use, Energy sources, Soil management, Irrigation and drainage</td>
</tr>
<tr>
<td>2. Crops production systems and resources</td>
<td>Fertilizers, Plant protection products, Crops and seeds varieties and resources, Rice cultivation, specificities, Type of non-residential buildings</td>
</tr>
<tr>
<td>3. Livestock production systems and resources</td>
<td>Type of livestock production system, 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</td>
</tr>
<tr>
<td>4. On farm processing of agricultural products and by-products</td>
<td></td>
</tr>
<tr>
<td>5. Organic farming (certified or in conversion to organic)</td>
<td></td>
</tr>
<tr>
<td>6. Agro forestry</td>
<td></td>
</tr>
<tr>
<td>7. Access to and use of services, infrastructure and natural resources</td>
<td>Agricultural extension services (incl. veterinary), Infrastructure (incl. IT, communications, access to market), Access to natural and common property resources</td>
</tr>
<tr>
<td>8. Greenhouse gas and environment</td>
<td></td>
</tr>
<tr>
<td>9. Adaptation to climate change and mitigation strategies</td>
<td></td>
</tr>
<tr>
<td>10. Waste Management</td>
<td></td>
</tr>
</tbody>
</table>
Complementary modules

• Farm productivity
  – Land productivity is measured in the Core which enable longitudinal analysis
  – Labour productivity is measured with data coming from 2 modules:
    • Core module : production volumes
    • Labour module : labour input (in time worked or in monetary units for wages/salaries)
    • Eco module: values

• GHG /ammonia emissions coming from the manure
  – Core module: data on Number of livestock by type, sex, age group
  – Production methods and environment module:
    • Major feeding practises used by type of livestock; type of feeds;
    • Use of pastures (number of months) and more specifically, the manure left on pastures
    • Use of the manure produced by the holding : for fuel, for heating, for construction, etc.
    • Type of manure management – a hole, a pile, specialised modern system – covered /open
3. Sampling
Countries current practices

Source: 2016, desk review of practices in 32 countries
- Africa 20
- Asia 12

Sampling design in Agricultural surveys

<table>
<thead>
<tr>
<th>Area sampling</th>
<th>Multistage stratified</th>
<th>Multistage stratified</th>
<th>NA</th>
<th>One-stage sampling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa</td>
<td>10%</td>
<td>90%</td>
<td>58%</td>
<td>33%</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>18</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>Asia</td>
<td>1</td>
<td>8%</td>
<td>4</td>
<td>1</td>
</tr>
</tbody>
</table>

AGRIS, 2016
## Basic principles

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
</table>
| Efficiency             | - Based on the major recent publications  
                         - Reliable coverage of the AGRIS data need                               |
| Practicability         | - feasibility  
                         - Taking into account countries current practices                          |
| Cost effectiveness     | - Cost effective methods for economical sustainability                       |
| Gold standard          | - Propose a “gold” standard (most suitable approach) and other “silver” standard to accommodate different practices |
Frame development and update
Gold standard: frame component

Master Sampling Frame
- broad scope of items: 1 core permanent module + 4 rotating modules

Area frame
- Area units (ideally EA) with georeferenced boundaries
- Information on land cover and use: integration of agricultural surveys with environmental issues

List frame
- Complete list of holdings in each area unit including suitable frame items as provided in WCA 2020
Gold standard: frame stratification

Main stratification
- Rural
- Peri urban

Land cover strata
- A
- B
- C
- D

Holding based strata
1
2
3
4
Gold standard: example

• A good planning and coordination with population census (PHC) and Agricultural census (AgC) can make it possible to build a gold standard frame to launch AGRIS:

  – During the preparation phase of the population census, collect information on the georeferences of EA and other data on land cover and land use data for EA stratification.

  – Develop an agricultural module to be collected during the population census and taking into account basic information for holdings stratification.

  – From the database obtained from steps 1 and 2, extract a sub-database containing only the EA of peri-urban and rural areas to be used as a master sampling frame for AGRIS.
Frame building options

In case AGRIS needs to be started without synchronization with PHC and AgC:

- An MSF may be built using the available frame (PHC and AgC) or administrative data but with serious limitations.
- If there is no frame, a large listing can be performed to build a frame for AGRIS.
A plan for maintenance and update of the frame should be established

Lists update depends on the sampling scheme with renewal of a fraction of samples (rotation scheme), without renewal (panel scheme), financial constraints and sampling design

Example for a panel scheme and two-stages sampling

- **Update of the list of PSU**
  - Cost will depend on the type of PSU (permanent or artificial EA?)
  - Structural data at a PSU level should be collected for sampling purposes

- **Selection of a new sample of PSU**
  - The updated information on PSU size and/or stratification variables may be used

- **Complete enumeration of SSU in each selected PSU**
  - Cost will depend on the type of PSU and sampling design
  - Necessary for new sample selection
Sampling design
Gold standard

Frame: Gold standard frame

Populations (WCA 2020):

• holdings in the household sector (operated by household members)

• holdings in the non-household sector, such as corporations and government institutions
Gold standard

Units
- H-HS
- H-NHS

Design
- Stratified 2-stages
  - PSU=EA
- Stratified 1-stage

Selection
- PSU=PPS
- SSU=SRSWR
- SRSWR

Rotation
- 1/5 sample rotation (PRN)
- 1/5 sample rotation (PRN)
Main advantages

• Cost effective field operation
• Cost effective sample update
• Efficiency
  – Lower inter PSU variability
  – Sample variance relatively easy to calculate
Specific cases

• **Use of a single list frame:**
  – Use of other PSU (village, county…):
    • Size based stratification
    • Clear boundaries issues
  – Environment based stratification (GIS, admin data)

• **Use of a single area frame:**
  – Include Holding based strata
  – If sampling units are segments, take into account holding’s weight estimation issues (e.g. indirect sampling and GWSM)
Thank You

François Fonteneau
Dramane Bako
Chiara Brunelli
Franck Cachia
Neli Georgieva

Food and Agriculture Organization of the UN (FAO), Statistics Division