



Food and Agriculture Organization  
of the United Nations

# SDG Indicator 2.4.1 – Measuring and Monitoring Sustainable Agriculture

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# CONTENT

- **Introduction**

- Process for development of methodology
- Methodology: scope, coverage, themes
- Reporting the indicator
- Data collection instruments
- FAO data collection and reporting strategy

# GOAL 2: END HUNGER, ACHIEVE FOOD SECURITY AND IMPROVED NUTRITION AND PROMOTE SUSTAINABLE AGRICULTURE



**Target 2.4:** By 2030, ensure *sustainable* food production systems and implement *resilient* agricultural practices that increase *productivity* and *production*, that help maintain *ecosystems*, that strengthen *capacity for adaptation to climate change, extreme weather, drought, flooding* and other disasters and that progressively improve *land and soil* quality

**Indicator 2.4.1 (Tier II):** Proportion of agricultural area under productive and sustainable agriculture

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# MILESTONES

Year	Month	SDG process for Indicator 2.4.1
<u>2015</u>	October	2nd meeting of IAEG-SDG: definition of sustainable agriculture and ways to measure it
<u>2016</u>	<b>March</b>	<b>47<sup>th</sup> UN-SC endorsed SDG 2.4.1 as: ‘Proportion of agricultural area under productive and sustainable agriculture’ (Tier III)</b>
	March-Dec	Literature review: building on exiting frameworks
	December	Technical expert meeting (FAO) – First draft methodology
<u>2017</u>	<b>February</b>	<b>First proposal submitted to GS-SAC – refinement the methodology</b>
	April	Multi-stakeholder Expert Group Meeting at FAO: Drafting detailed methodology
	September	<b>First Global consultation</b> (online) with NSOs
	Oct-Dec	Desk tests (Kyrgyz Republic, Bangladesh, Rwanda, Ecuador, Belgium)
	<b>November</b>	<b>6th meeting of IAEG-SDG. Requested finalizing country pilot</b>

# MILESTONES

Year	Month	SDG process for Indicator 2.4.1
<u>2018</u>	Jan- Nov	<b>Preparation of revised methodology</b>
	April	Technical workshop on learning from country desk tests
	May	<b>Second online consultation</b> - Webinar with IAEG-SDG members.
	May-October	Country cognitive tests in Mexico, Kenya and Bangladesh
	October	Presented to FAO Committee on Agriculture
	<b>November</b>	<b>8th meeting of IAEG-SDG – Upgraded as Tier II</b>
<u>2019</u>	Jan-June	<b>Data collection strategy and capacity development plan submitted to UNSD</b>
	Jan-Sept	Extended pilot tests completed in Bangladesh Toolkit for 2.4.1 (survey questionnaire, enumerator manual, data entry manual and scripts, calculation procedure, sampling design, e-learning etc.)
	Jan-Oct	Refinements in bio-diversity sub-indicator carried out with informal group of countries – Revised proposal submitted to IAEG-SDG in Oct for endorsement, where it was accepted
	December	FAO Data collection questionnaire will be sent to countries
<u>2020</u>	Jan- Feb	Countries send back the filled in questionnaire
	Mar-July	Data is validated and then reported at the global level
<u>2020-2030</u>		<b>Repeat annual data collection, analysis and dissemination cycle</b>

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# INDICATOR'S FORMULA

Formula:

$$SDG\ 2.4.1 = \frac{\textit{Area under productive and sustainable agriculture}}{\textit{Agricultural land area}}$$

Where:

- The **denominator** *agricultural area* arable land + permanent crops + permanent meadows and pastures.
- The **numerator** captures the three dimensions of sustainable production: economic social and environmental

<http://www.fao.org/faostat/en/#data/RL>

# STEPS TO DEVELOP THE INDICATOR

- 1) Choosing the scale: **Agriculture holding level**
- 2) Determining the scope: **Crops and livestock**
- 3) Dimensions to be covered: **Economic, social and environmental**
- 4) Selecting the themes to be covered: **Specific areas/aspects within a dimension (e.g. land productivity, biodiversity, decent employment). Total 11 themes**
- 5) Choosing a sub-indicator **to measure performance of the farm in a given theme. 11 sub-indicator (3 Economic, 3 social and 5 environment)**
- 6) Developing the criteria to assess sustainability performance of farms on each sub-indicator to **classify the them green, yellow and red**
- 7) Developing modality of reporting the indicator: **Dashboard and aggregate indicator**
- 8) Selecting the data collection instrument(s): **Farm survey**
- 9) Deciding the periodicity of monitoring the indicator: **3 Years**

# METHODOLOGICAL PRINCIPALS

Key principles applied in developing the indicator:

- Policy relevance and “action-ability”
- Universality
- Comparability
- Measurability and cost effectiveness
- Minimum cross correlation

Impacts upon:

- Choice of sub-indicators for different dimensions
- Choice of sustainability criteria for each sub-indicator
- Level of sophistication in data collection

# SCOPE

## Within scope:

- Intensive and extensive crop and livestock production systems
- Subsistence agriculture
- Food and non-food crops and livestock products (e.g., tobacco, cotton, sheep wool). Crops grown for fodder or for energy purposes
- Aquaculture, to the extent if it takes place within the agricultural area as a secondary activity e.g. rice-fish and similar systems
- Agro-forestry i.e. trees on the agricultural land area of the farm
- Common land when exclusively used and managed by the farm holding

## Out of scope:

- Common land not exclusively used by agriculture holding
- Nomadic pastoralism
- Production from gardens, backyards and hobby farms
- Holding focused exclusively on aquaculture and/or agro-forestry
- Food harvested from the wild
- Forest and other wooded lands

# INDICATOR'S FRAMEWORK

Dimension	Theme	Sub-indicator	Farm type	Reference period
Economic	1. Land productivity	Farm output value per hectare	All types	Last calendar yr.
	2. Profitability	Net farm income	All types	Last 3 calendar yrs.
	3. Resilience	Risk mitigation mechanisms	All types	Last calendar yr.
Environmental	4. Soil health	Prevalence of soil degradation	All types	Last 3 calendar yrs.
	5. Water use	Variation in water availability	All types	Last 3 calendar yrs.
	6. Fertilizer risk	Management of fertilizers	All types	Last calendar yr.
	7. Pesticide risk	Management of pesticides	All types	Last calendar yr.
	8. Biodiversity	Use of agro-biodiversity supportive practices	All types	Last calendar yr.
Social	9. Decent employment	Wage rate in agriculture	Farms hiring unskilled labour	Last calendar yr.
	10. Food security	Food Insecurity Experience Scale (FIES)	Household farms	Last 12 months
	11. Land tenure	Secure tenure rights to land	All types	Last calendar yr.

# ASSESSING SUSTAINABILITY LEVELS

**Thresholds:** A cutoff point, reference, benchmark, target or baseline value or range of values for each sub-indicators.

- Criteria for each of the 11 sub-indicators were established by thematic experts, and have been fine tuned in light of results of the tests conducted in selected countries
- Two thresholds were established for each sub-indicator

**Traffic light approach:**

1. **Green:** 'desirable'
2. **Yellow:** 'acceptable'
3. **Red:** 'unsustainable'

# SUMMARY OF STEPS FOR ESTIMATION OF AREAS BY SUSTAINABILITY STATUS

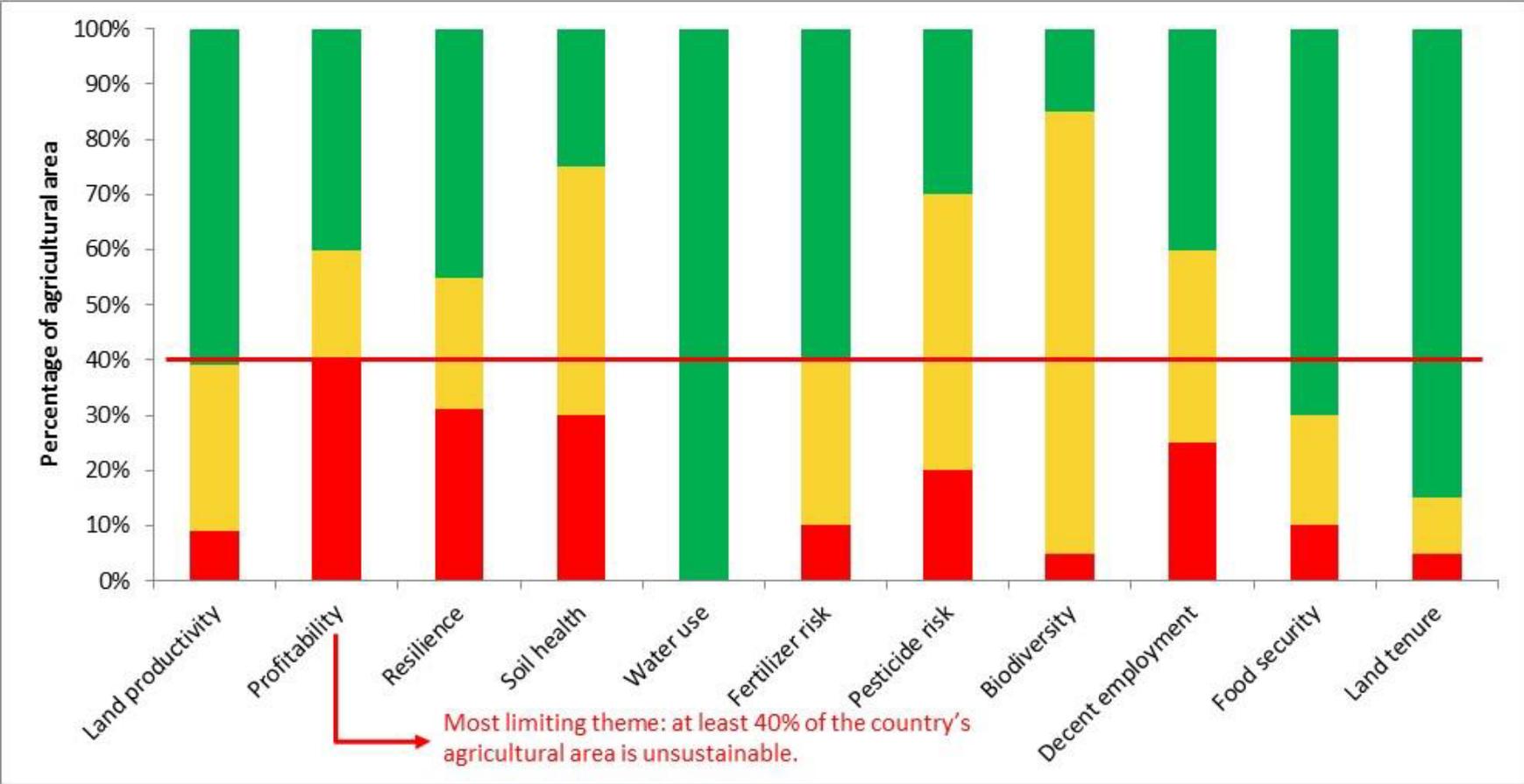
1. Estimate the sub-indicator value at the farm level
2. Classification of the farm and agricultural area it manages as sustainable (green), acceptable (yellow) and unsustainable (red) for each sub-indicator using the respective sustainability criteria.
3. At the national or sub-national level, add up the agricultural areas of the farms by sustainability status.
4. For each sub-indicator, calculate the proportion of agricultural area as a percentage of total agricultural area by sustainability status at the national or sub-national level and present as a dashboard.

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# REPORTING: DASHBOARD

Example of results for country X in year Y



Note: This dashboard is only a simulation and is not from real data

# AGGREGATE INDICATOR (AT NATIONAL OR OTHER LEVELS)

$$SDG241_d = \min_{n:1-11} (SI_d n)$$

$$SDG241_{a+d} = \min_{n:1-11} (SI_d + SI_a)_n$$

$$SDG241_u = \max_{n:1-11} (SI_u n)$$

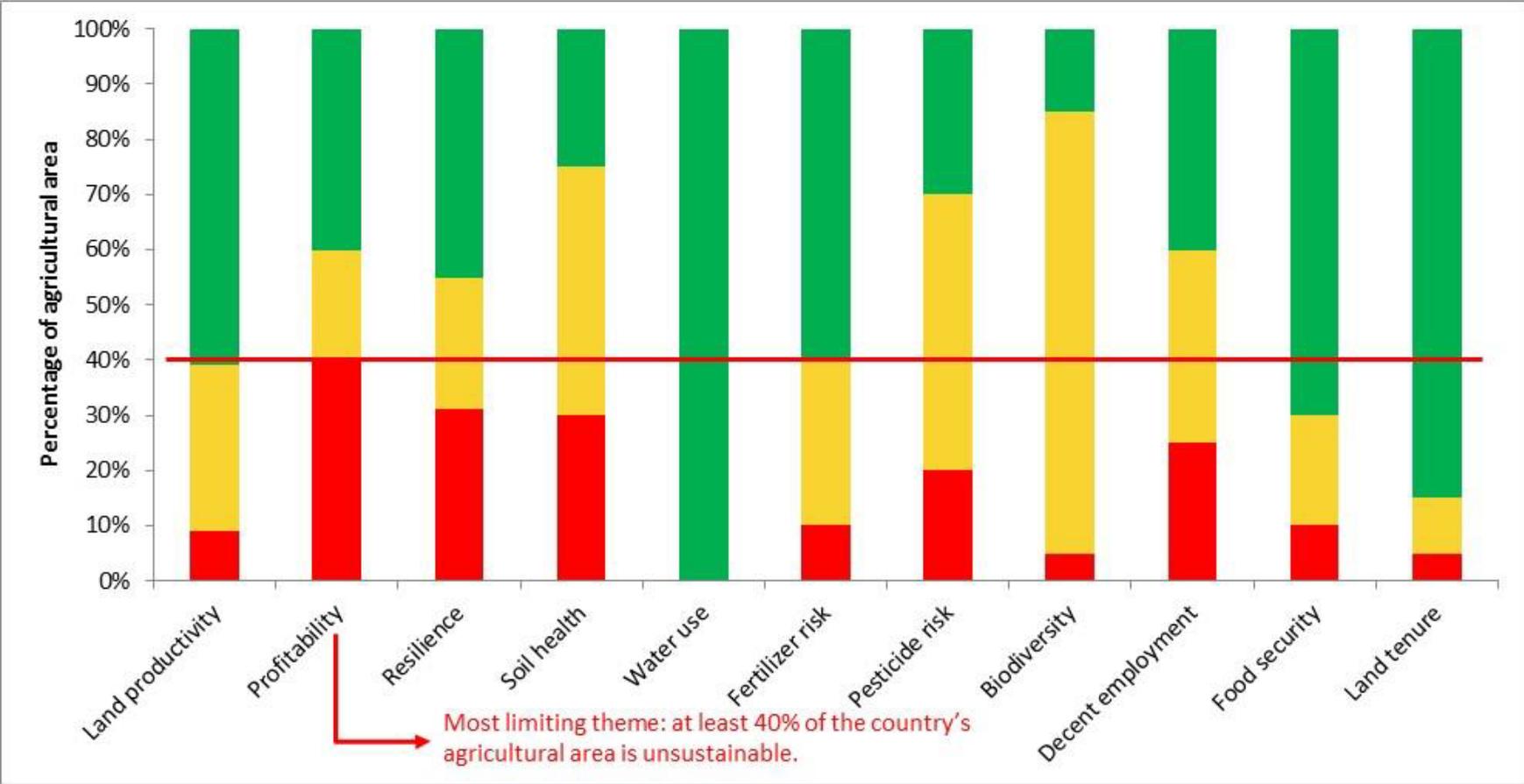
$SDG241_d$  = proportion of agricultural land area that have achieved the 'desirable' level

$SDG241_{a+d}$  = proportion of agricultural land area that have achieved at least the 'acceptable' level

$SDG241_u$  = proportion of agricultural area that is 'unsustainable'

# REPORTING: AGGREGATE INDICATOR

Example of results for country X in year Y



Note: This dashboard is only a simulation and is not from real data

# DISSAGREGATION

The dashboard offers a response in terms of measuring sustainability at farm level and aggregating and reporting it by:

- National/sub-national level
  
- Different holdings types:
  - Household/non-household
  - Crops/livestock/mixed
  - Irrigate/non-irrigated

# PERIODICITY

- Recommended periodicity of reporting is every 3-years
  - For many sub-indicators, it is unlikely that its value will change from one year to another
  - The 3-year periodicity will enable countries to have three data points on the indicator before 2030, assuming that they begin reporting in the early 2021

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# DATA COLLECTION INSTRUMENTS

1. Farm survey questionnaire
2. AGRISurvey programme and 50x2030 initiative
3. Alternative or existing data sources

## OPTION 1: STANDALONE SURVEY QUESTIONNAIRE

- Standalone survey questionnaire designed as a module that contain the minimum set of questions needed to assess 2.4.1.
- It can be administered in various ways; i) independently; ii) attached as a separate module; iii) integrated at appropriate places within existing farm surveys.
- FAO has developed Statistical Toolkit to accompany the survey questionnaire which is comprised of guidelines on:
  - Sampling design for 2.4.1
  - Enumerator's manual
  - Data entry operations
  - Data analysis "From raw data to computation of the indicator"
  - Code book, tabulation plan, and STATA scripts to support data analysis and reporting

# OPTION 1: STANDALONE SURVEY QUESTIONNAIRE

<p><b>Survey Module</b>  <b>SDG Indicator 2.4.1</b>  <b>Proportion of Agricultural Area under Productive and Sustainable Agriculture</b>                  Revision 6: 07 August 2019</p>
<p><b>QUESTIONNAIRE</b></p>

**SURVEY INFORMATION**

Surveyor first name:  Surname:  Surveyor number:

Start time of the survey:  hour  minutes Date:

Holding Identification Number:

**Section I: INTRODUCTION TO THE SURVEY MODULE AND IDENTIFICATION OF THE HOLDING AND HOLDER**

**TEXT TO READ:**  
 Hello, my name is -----, I work for the -----, We collect data that the Government and other stakeholders use for planning purposes. I am vising you to collect data on your farm. This is part of a worldwide exercise to measure progress in agriculture organised together with the Food and Agriculture Organization of the United Nations. The information you provide will be treated confidentially. It will only be used for statistical purposes and will be put together with responses from other farmers for use in the formulation of programmes and policies to promote more productive and sustainable agriculture. This interview should take approximately one hour. We appreciate your participation in answering these questions.

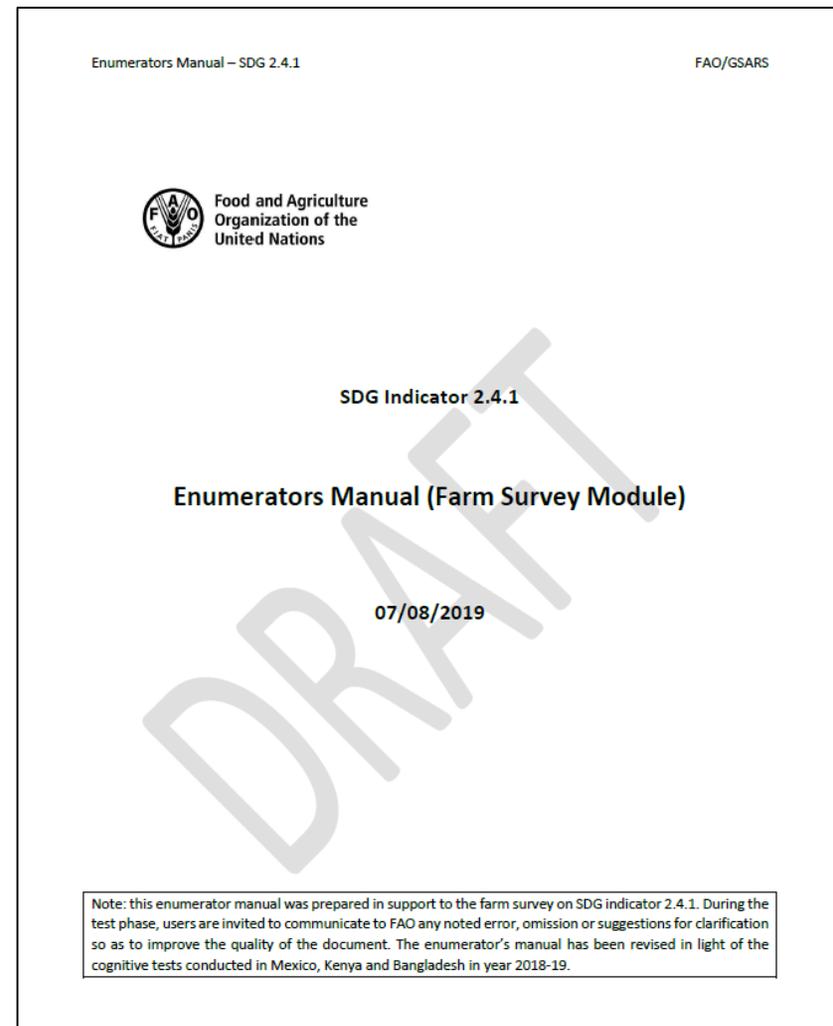
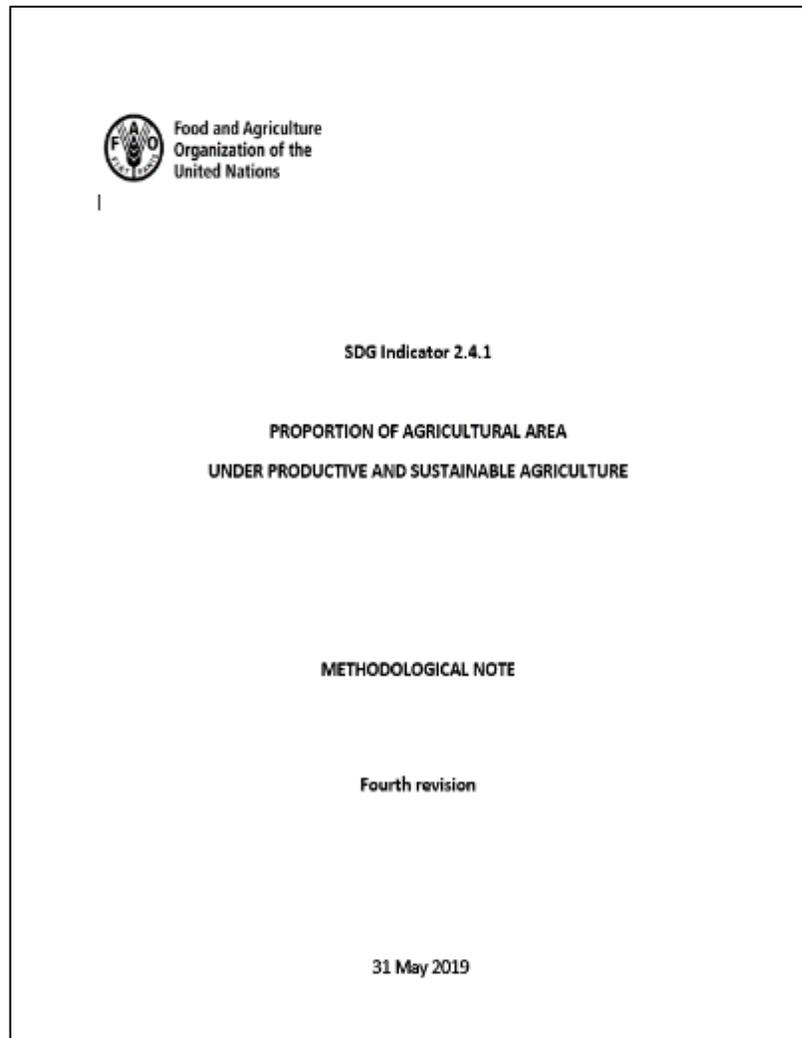
If you have any questions regarding this survey, you are welcome to telephone the number indicated on the visiting card of our organization that I leave for you here. I express my gratitude for your participation in this survey in advance.

I.1 Record the following information about the respondent

I.1.1 First name

I.1.2 Surname

# OPTION 1: SUPPORTING DOCUMENTS



# OPTION 1: SUPPORTING DOCUMENTS



Food and Agriculture  
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SDG Indicator 2.4.1

**Guidelines for  
Data Entry Operations and Data Analysis**

10/09/2019



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SDG Indicator 2.4.1

**Sampling guidance**

11/06/2019

1



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Indicator 2.4.1

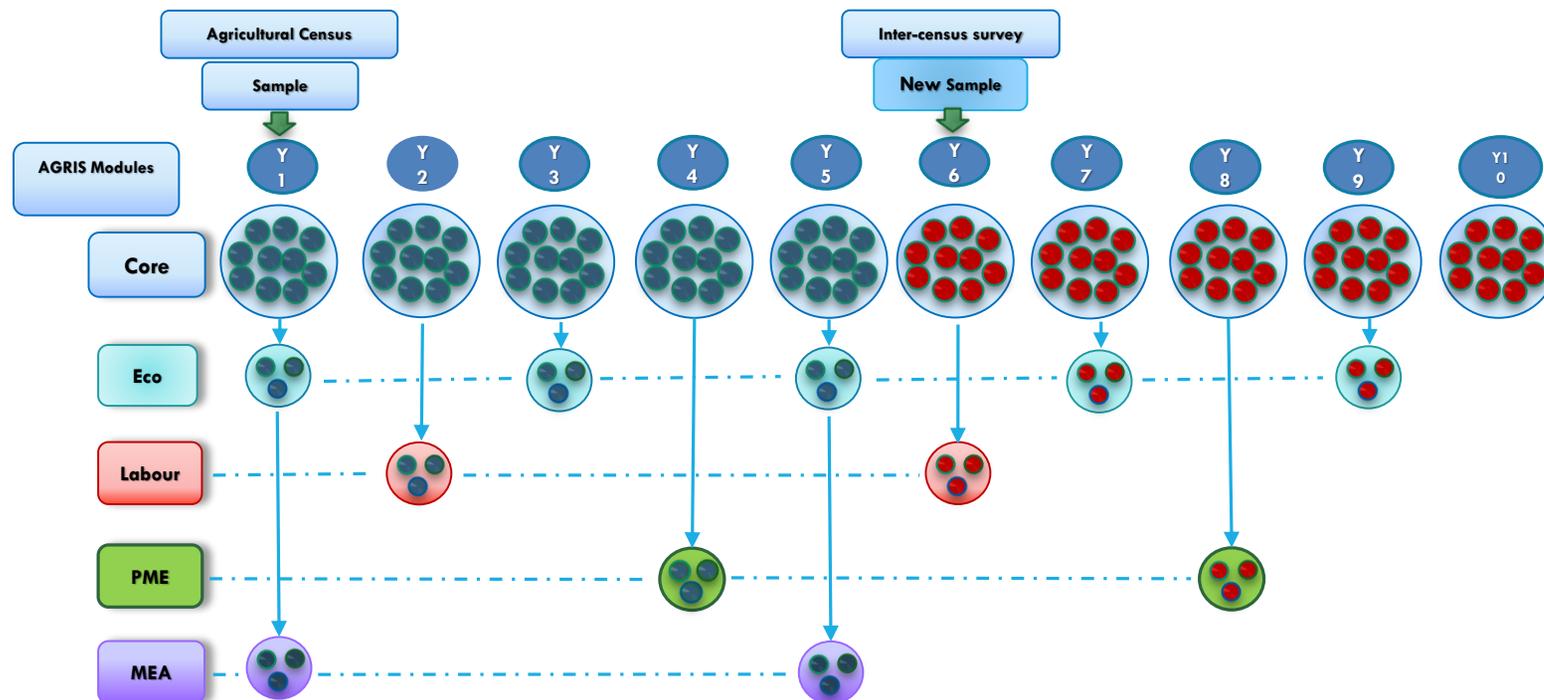
**From Raw Data to computation of the Indicator**

10/09/2019

# OPTION 2: AGRISURVEY PROGRAMME

Leverage and capitalize on the AGRISurvey programme which is farm based, high-quality and cost-efficient modular survey over a ten years cycle to generate the data on farms for policy making and cover several SDGs and the MSCD:

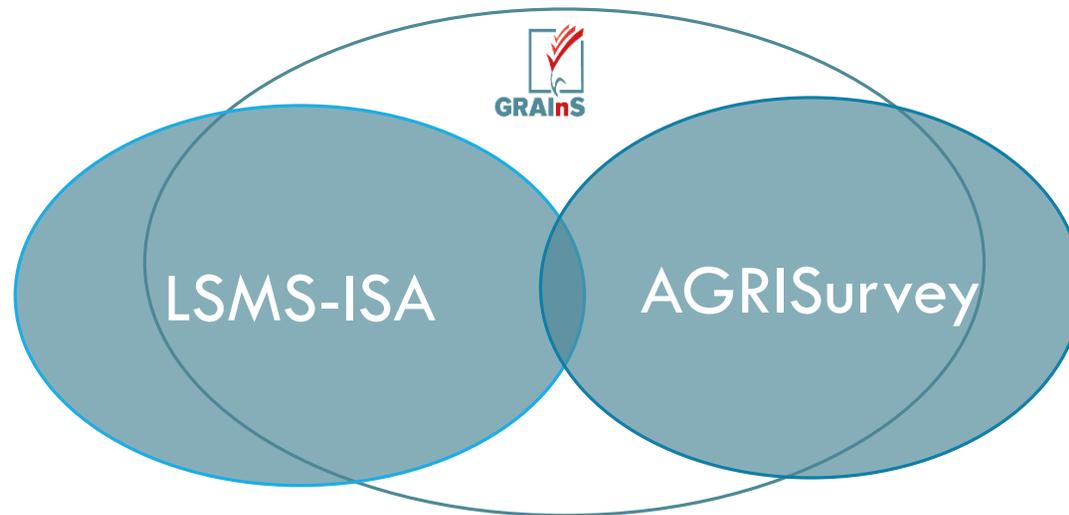
**AGRIS survey system:**



# OPTION 2: 50X2030 INITIATIVE

AGRISurvey programme will soon be scaled up into the 50X2030 initiative that aims to support 50 L/LMICs with a survey program by 2030 under the GRAInS partnership.

## 50X2030 initiative:



### The Partners



# OPTION 2: EFFORTS TO ENHANCE NATIONAL DATA PRODUCTION

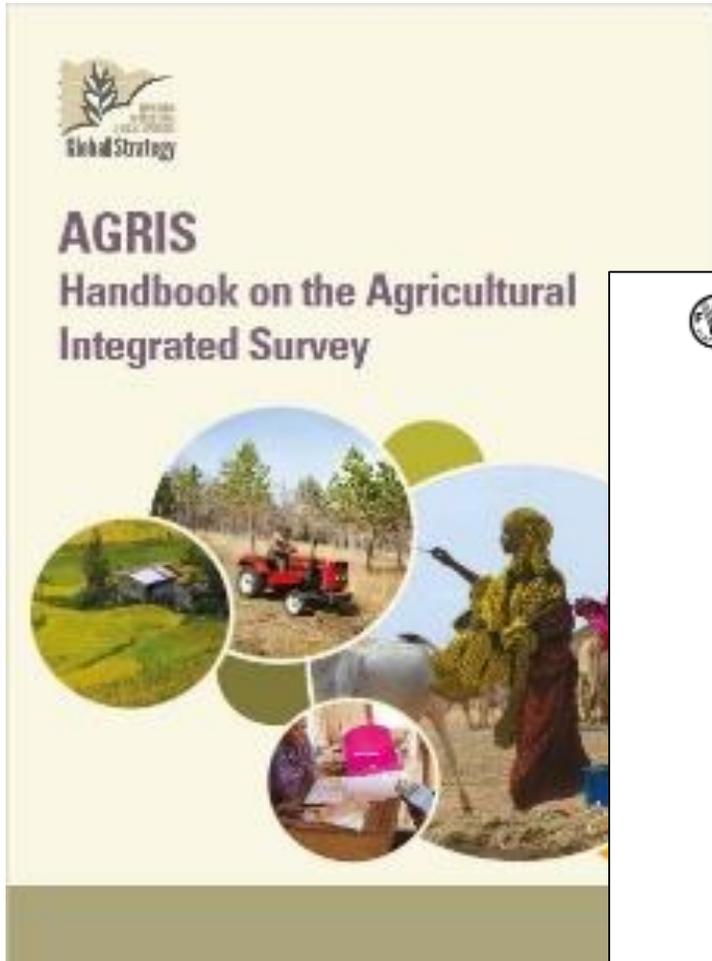
## 2.4.1 integration with the AGRISurvey programme:

- **Core module** : Allowing for 2.4.1 data collection in one single year.
- **Economy & PME modules**: Allowing for 2.4.1 data collection in two consecutive years. Questions for sub-indicators in the social and economic dimensions are integrated in the core module, while questions on environmental sub-indicators are integrated with the Production Methods and Environment Module (PME).

## 2.4.1 integration with the 50X2030 initiative:

- **PME module with 2.4.1. questions**: Allowing for 2.4.1 data collection in one single year.

# OPTION 2: SUPPORTING DOCUMENTS





## AGRIS

### The Agricultural Integrated Survey

Producing cost-efficient data on farms for policymaking



### What is AGRIS?

new modular 10-year survey programme to generate better and less costly data on farms proposed to countries for further customization and national implementation forms national policies and responds to SDG requirements

CORE MODULE	ECONOMY MODULE	LABOUR MODULE	PRODUCTION METHODS & ENVIRONMENT MODULE	MACHINERY, EQUIPMENT, ASSETS AND DECISIONS MODULE
<ul style="list-style-type: none"> <li>• Crop and livestock production and seasonality</li> <li>• Land use</li> </ul>	<ul style="list-style-type: none"> <li>• Farm budgets, revenues, and expenses</li> <li>• Crop and livestock production systems</li> </ul>	<ul style="list-style-type: none"> <li>• Volume of labour input</li> <li>• Organization of labour on the farm</li> <li>• Age- and sex-specific profiles and related roles</li> <li>• Household members' participation in all forms of work</li> </ul>	<ul style="list-style-type: none"> <li>• Soil and manure management</li> <li>• Energy</li> <li>• Irrigation</li> <li>• Organic farming</li> <li>• Biodiversity</li> <li>• Climate change</li> </ul>	<ul style="list-style-type: none"> <li>• Quantity, type and ownership of equipment and machinery</li> <li>• Assets</li> <li>• Decision making, with a special focus on gender</li> </ul>

**REGULAR FLOW OF TIMELY AND INTEGRATED DATA:**

- Policy relevant
- Sex-disaggregated
- Identify challenges in production, productivity and resilience
- Homogenized microdata available



for  
**DATA USERS**



for  
**DATA PRODUCERS**

**INNOVATION, GUIDELINES AND SUPPORT:**

- Methodological innovations
- Standard definitions, concepts and classifications
- CAPI technology
- Technical assistance to build capacity
- Financial support

## WHAT IS NEW?



Food and Agriculture Organization of the United Nations

### Draft Technical Note

### Mainstreaming

### SDG Indicator 2.4.1 in AGRIS & 50x2030

Version 0.1

25 April 2019

30

# OPTION 3: USE OF ALTERNATIVE DATA SOURCES

No.	Sub-indicators	Admin data	Ag/livestock census	Ag surveys	Env. monitoring systems	GIS/remote sensing	Household surveys	Other
1	Farm output value per hectare		X	X		X	X	X
2	Net farm income		X	X			X	
3	Risk mitigation mechanisms	X					X	X
4	Prevalence of soil degradation				X	X		
5	Variation in water availability	X		X	X	X		X
6	Management of fertilizers	X		X	X	X		
7	Management of pesticides	X		X	X			X
8	Use of biodiversity-supportive practices				X	X		
9	Wage rate in agriculture	X		X			X	X
10	Food insecurity experience scale (FIES)						X	X
11	Secure tenure rights to land	X		X			X	

Note: Environmental monitoring systems include soil sampling, river flows records, and groundwater abstraction records. GIS/RS includes models,

# OPTION 3: CONDITIONS FOR USING ALTERNATIVE DATA SOURCES

- Can be reflected in or attributed to agricultural land area in the country and is nationally representative;
- Can be associated with the country's agricultural productions systems, particularly crops, livestock and the combinations in between; Captures the same phenomenon and should give the same result as proposed by the farm survey for international comparability;
- Data are available at the same level of territorial disaggregation as the farm survey and respects the recommended stratification (farm type i.e. sector, production system, etc.);
- Compliant with international/national standards and classifications systems to be internationally comparable;
- Reference year and periodicity is homogenous with farm survey across the sub-indicators.

# COMPLEMENTING FARM SURVEY DATA

- Replace farm survey questions, when alternative sources of information are available and respond to the criteria.
- Complement farm survey questions, by providing additional contextual information helpful to interpret the results.
  - This can be done ex-ante or during the data collection by providing contextual information to the enumerators before going to the field.
- Crosschecking the farm survey results to identify any inconsistencies and to ensure its robustness
  - Ex-post information to triangulate and validate survey data after the data collection and analysis has been completed.

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# DATA COLLECTION AND REPORTING

- Short-term: FAO to collect available national data by sub-indicator through a FAOSTAT-style questionnaire
  - Nov 2019 – Jan 2020: Questionnaire sent to countries' focal points and data collected
  - Jan-Feb 2020: data analysis, gap filling, QA/QC processes
  - Feb 2020: Data is validated and if possible, reported at the global level
  - 2020-2030: Repeat annual data collection, analysis and dissemination cycle
- Medium-Long Term:
  - 2020-2030: Implementation of farm-based surveys in countries supported by capacity development activities, including dedicated projects (e.g., AGRISurvey Programme, 50X2030 Initiative).

# INDICATOR REPORTING: FAO DATA COLLECTION QUESTIONNAIRE



## 2.4.1 - PROPORTION OF AGRICULTURE AREA UNDER PRODUCTIVE AND SUSTAINABLE AGRICULTURE - INSTRUCTIONS

### General Instructions

<b>International standards and classifications</b>	This questionnaire reflects SDG Indicator 2.4.1 Methodology ( <a href="http://www.fao.org/sustainable-development-goals/indicators/241/en/">http://www.fao.org/sustainable-development-goals/indicators/241/en/</a> ). Definitions and classifications are aligned with the System of Environmental-Economic Accounting (SEEA) ( <a href="https://unstats.un.org/unsd/envaccounting/seearev/">https://unstats.un.org/unsd/envaccounting/seearev/</a> ) and also uses some definitions of the World Census of Agriculture 2020, Volume 1 (WCA) ( <a href="http://www.fao.org/world-census-agriculture">http://www.fao.org/world-census-agriculture</a> ). Kindly refer, where possible, to the classification of temporary and permanent crops provided by these classifications.
<b>Calendar year</b>	Kindly report your data with reference to the <b>calendar year</b> (January to December) indicated by column. If data are available for year(s) different from those specified, enter data but include an explanation under the "Notes" Column.
<b>Units</b>	Data are to be expressed in hectares. If data are reported in a different unit of measurement, please indicate it in the 'NOTES' column.  Please report 0 (zero) for categories <b>not occurring</b> but potentially applicable (e.g. no data on this particular (name) sub-indicator). If no value can be reported, please use the following notation keys to kindly specify the reason:
<b>Notation keys</b>	<p><b>C</b> Confidential information.</p> <p><b>IE</b> Included elsewhere. Please specify in 'notes' under which category or cell these data are included.</p> <p><b>NA</b> No data available.</p> <p><b>:</b> Non-applicable. Data category cannot exist in your country (e.g. name sub-indicator)</p>
<b>Comments and additional information</b>	Please include any relevant information in the notes column available in each section. Relevant information may refer to differences in, among others: land use classification, definitions and methodologies, reference year, units used for data collection, status of reported data (e.g., preliminary, forecast), etc.
<b>Electronic version</b>	This questionnaire is provided in .xlsx format. The preferred option is to have it completed in this electronic version and returned by email.

### Structure of the questionnaire

<b>Cover</b>	Collects the contact details of the national focal point responsible for SDGs and provides the FAO contact details for sending the completed questionnaire or requesting information.
<b>Instructions</b>	Provides general instructions on how to complete the questionnaire as well as an overview of its structure (this page). Users are kindly asked to read these instructions before filling in the questionnaire.
<b>Definitions</b>	Provides definitions of the categories used in the questionnaire and their correspondence with other international standards.
<b>1. Economic Dimension</b>	Collects data on 3 sub-indicators in the economic dimension (Farm output value per hectare, Net Farm Income, and Risk mitigation mechanisms).
<b>2. Environmental Dimension</b>	Collects data on 5 sub-indicators in the environmental dimension (Prevalence of soil degradation, Variation in water availability, Management of fertilizers, Use of biodiversity-supportive practices)
<b>3. Social Dimension</b>	Collects data on 3 sub-indicators in the social dimension (Wage rate in agriculture, Food Insecurity Experience Scale, Secure tenure rights to land)
<b>4. Metadata</b>	Collects metadata on completeness (country coverage), source of the data, original unit of measurement, frequency of data collection and dissemination media

←	▶	...	<b>Instructions</b>	Definitions	1. Economic Dimension	2. Environmental Dimension	3. Social Dimension	4. Metadata	5. Feedback	+	⋮	←	
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# THANK YOU

**Contact us:**

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# IMPORTANCE OF AGRICULTURE!

**Over the coming 35 years, agriculture will face an unprecedented confluence of pressures:**

- Including a 30 percent increase in the global population - projected to grow from 7.2 billion to reach 9.3 billion in 2050 (United Nations, 2013a).
- Support changing dietary patterns, estimates are that food production will need to increase from the current 8.4 billion tonnes to almost 13.5 billion tonnes a year. (Agriculture will need to produce 60 percent more food globally, and 100 percent more in developing countries, if it is to meet demand at current levels of consumption).
- Achieving that level of production from an already seriously depleted natural resource base will be impossible without profound changes in our food and agriculture systems.

**As a result:**

- A holistic approach is required to expand and accelerate the transition to sustainable food and agriculture which ensures world food security, provides economic and social opportunities, and protects the ecosystem services on which agriculture depends.

# WHAT IS SUSTAINABLE AGRICULTURE?

- Unlike a traditional approach where the economic consideration is the single major factor; Agriculture sustainability also involves social and environmental factors.
- In fact it is defined by 3 integral aspects which are: agriculture needs to be economically viable, environmentally friendly/non degrading and socially responsible/acceptable. The integrated economic, environmental, and social principles are incorporated into a “triple bottom line” (TBL); profit, people and the planet.
- Sustainability in the context of 2.4.1. strive to capture 3 dimensions by focusing on practices of a farmer on the farm, rather than on a specific agricultural product or activity.

# TYPE OF SUB-INDICATORS SELECTED

- **Impact/outcome** indicators that record what the state or change in state of factors and associated flows of benefits or costs.
- **Practice** indicators that record the type of agricultural practices and processes that a farm is undertaking.
- **Awareness** indicators record the level of awareness and knowledge in relation with a give sustainability issue.
- **Behavior** indicators capture the attitude of a given stakeholder in relation with a given sustainability issue.
- **Perception** indicators that record views of various stakeholders about different aspects of sustainability