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## AFRICAN COMMISSION ON AGRICULTURAL STATISTICS

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### Overview on SDG 2.4.1 proxy indicator methodology

#### Executive summary

Significant data collection gaps continue to hinder reporting on SDG indicator 2.4.1 related productive and sustainable agriculture, which relies on farm-level surveys. Many countries struggle with low survey frequency, financial and technical constraints, and a lack of alternative data sources, delaying comprehensive reporting on agricultural sustainability.

To address this issue, FAO developed a proxy approach using seven national-level sub-indicators that approximate the key dimensions of sustainability and productivity in agriculture. These sub-indicators are assessed based on trend analysis and current status, allowing FAO to generate country and regional aggregate scores despite the absence of direct farm-level data.

This interim solution does not replace SDG 2.4.1 but provides a stopgap measure to track progress until countries can fully implement farm-based data collection. By leveraging existing national statistics, the proxy ensures continued monitoring and supports policy decisions aligned with the 2030 Agenda for Sustainable Development.

#### Suggested actions by AFCAS

The Commission is invited to provide guidance on the following recommended actions:

- Take note of the SDG 2.4.1 **proxy indicator** as a stopgap measure while countries transition to full **farm-level survey approach implementation**, ensuring continued monitoring of productive and sustainable agriculture.
- Urge governments and development partners to **allocate the necessary financial and technical resources** into the tools and systems needed to produce SDG indicator 2.4.1.
- Advise countries to work towards **increasing the regularity of agricultural surveys** and integrating the **2.4.1 questionnaire module** into existing survey tools to close data gaps.

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## I. Introduction

1. In 2022, FAO provided a comprehensive update on the status of SDG indicator 2.4.1 to the Interagency and Expert Group on SDG indicators (IAEG-SDG), the UN Statistical Commission’s working group on SDG indicators. This update outlined FAO’s capacity development efforts and data collection initiatives while acknowledging persistent challenges in country-level reporting. Despite initial plans set in 2019, low response rates prevented the reporting of this indicator before 2023. Several factors contributed to this delay, including the infrequent implementation of agricultural surveys—further disrupted by the COVID-19 pandemic—the limited technical and financial capacity of countries to incorporate the 2.4.1 module into new surveys, and the lack of alternative data sources.

2. The scarcity of data on SDG indicator 2.4.1 created a critical gap in SDG reporting. Monitoring agricultural sustainability is essential to the 2030 Agenda and closely related initiatives such as the Food Systems Summit and the Climate Convention. Given the slow progress in direct data collection at the national level and thereby reporting, FAO developed a provisional proxy indicator to measure countries' progress toward sustainable and productive agriculture. While this proxy is not intended to replace [SDG indicator 2.4.1](#), it serves as a temporary solution until comprehensive national reporting on [farm-survey based approach](#) becomes feasible for implementation and monitoring.

3. An initial set of proxy metrics was presented to the IAEG-SDG in August 2022. This was followed by an informal country consultation process to refine the approach based on national feedback. The consultation, which concluded on 3 October 2023, resulted in the IAEG-SDG’s and UNSC’s final approval<sup>1</sup> of seven sub-indicators that form the basis for computing the SDG 2.4.1 proxy. This paper presents the selected sub-indicators and the approved methodology to compute the aggregate SDG 2.4.1 proxy measure.

## II. Principal Aspects of the Proxy for SDG 2.4.1

4. The proxy indicator is built around seven established sub-indicators that measure sustainability and productivity in agriculture. These sub-indicators are derived from widely available national statistics and align with FAO’s existing statistical reporting processes, including some indicators linked to other SDG targets (see table 1).

5. Table 1: Coverage of farm-level and proxy subindicators (as of 2024)

Farm-level subindicator	Coverage	Proxy subindicator	Coverage
Farm output value per hectare	18%	Gross production value per hectare	81%
Food Insecurity Experience Scale	12%	Gross output diversification	81%
Management of fertilizers	15%	Agricultural value added per worker	73%
Management of pesticides	13%	Cropland nitrogen use efficiency	78%
Net farm income	14%	Agriculture component of water stress	72%
Prevalence of soil degradation	9%	Greenhouse gas emissions intensity in agriculture	81%

<sup>1</sup> See resolution 55/103 (c) in UNSC 55 report ([E/2024/24-E/CN.3/2024/36](#)): The Statistical Commission “Took note of the proxy indicator proposal for Goal indicator 2.4.1 as a practical interim solution, [...] and encouraged the custodian agency to work with countries to strengthen capacity-building activities for the official indicator”

Risk mitigation mechanisms	16%	Informal employment in agriculture	55%
Secure tenure rights to land	21%	<b>Single country score</b>	<b>79%</b>
Variation in water availability	13%		
Wage rate in agriculture	16%		
<b>Sustainable Development Goal Indicator 2.4.1 aggregate</b>	<b>4%</b>	Based on 249 countries and territories used for Sustainable Development Goal reporting	

6. While the measures selected do not mirror all 11 sub-indicators of SDG 2.4.1, they provide a balanced representation of the socio-economic and environmental dimensions that underpin sustainable development. This selection is informed, in part, by FAO’s independent analytical work, culminating in the [Progress towards Sustainable Agriculture \(PROSA\)](#) framework (Tubiello et al., 2021).

7. Unlike SDG indicator 2.4.1, which relies on farm-level data collection, the proxy sub-indicators are derived directly from national-level data. Additionally, whereas the original 2.4.1 methodology assesses each of its 11 sub-indicators against predefined sustainability thresholds, the proxy framework evaluates the seven selected sub-indicators based on both **trend direction and consistency** as well as their **current status**. This approach aligns with the **system-wide methodology used in the [global SDG Progress Chart](#)** and FAO’s own [SDG Progress Report](#).

8. The four main progress assessment methods, considering both trend and current status for indicators with and without numerical targets, follow this framework.

Trend assessment for indicators with a numerical target: <u>Ratio actual vs. required (CR)</u>	Trend assessment for indicators without a numerical target: <u>actual growth (CAGR) compared to baseline</u>
Status assessment for indicator with a numerical target: <u>distance to the target</u>	Status assessment for indicators without a numerical target: <u>quintile distribution</u>

The compound annual growth rate (CAGR) for is calculated as:

$$CAGR_a = \left( \frac{x_t}{x_{t_0}} \right)^{\frac{1}{t-t_0}} - 1$$

where  $t_0$  (2015) is the beginning of the assessment period. The ratio of actual vs. target growth rate (CR) is calculated as:

$$CR = \frac{CAGR_a}{CAGR_r} = \frac{\left( \frac{x_t}{x_{t_0}} \right)^{\frac{1}{t-t_0}} - 1}{\left( \frac{x^*}{x_{t_0}} \right)^{\frac{1}{2030-t_0}} - 1}$$

Among the seven proxy sub-indicators, only two have clearly defined numerical targets (see table 2).

Dimension	2.4.1 sub-indicator theme	Proposed Proxy measure	Numerical target
Economic	Land productivity	Gross production value per hectare	No
Economic	Resilience	Gross output diversification	No
Economic	[No equivalent theme]	Agricultural value added per worker (link to 2.3.2)	No
Environment	Soil quality	Nitrogen use efficiency	Yes
Environment	Water availability	Agriculture component of water stress (6.4.2 disaggregation)	Yes
Environment	[No equivalent theme]	GHG emissions intensity	No
Social	Decent employment	Proportion of informal employment in agriculture	No

Table 1: Sub-indicators having or not a numerical target.

A methodological note for each of the proxy seven sub-indicators and the two different assessment approaches can be found in [Annex 1](#)

### III. Translation of Progress Assessment into a Country Score

9. Country-level results are presented through multiple complementary formats:

- **Aggregate score:** A single value summarizing overall progress.
- **Dashboard with traffic-light colors:** A visual representation of progress.
- **Full dataset:** Absolute values for each of the seven sub-indicators.

10. **Aggregate Single-Country Score:** Each country's score will be derived by averaging the scores assigned to its sub-indicators, following the methodology detailed in [Annexes 1, 2 and 3](#). Based on this average, countries will be classified into one of five bands reflecting both their **trend** toward productive and sustainable agriculture and their **current status as follows:**

Score	Trend towards productive and sustainable agriculture
<b>1 ≤ 1.5</b>	Band 1: Deterioration away from productive and sustainable agriculture
<b>1.5 ≤ 2.5</b>	Band 2: Slight deterioration from productive and sustainable agriculture
<b>2.5 ≤ 3.5</b>	Band 3: No improvement towards productive and sustainable agriculture
<b>3.5 ≤ 4.5</b>	Band 4: Slight improvement towards productive and sustainable agriculture
<b>4.5 ≤ 5</b>	Band 5: Improvement towards productive and sustainable agriculture

Score	Current status with respect to productive and sustainable agriculture
<b>1 ≤ 1.5</b>	Band 1: Very far from achieving productive and sustainable agriculture
<b>1.5 ≤ 2.5</b>	Band 2: Far from achieving productive and sustainable agriculture
<b>2.5 ≤ 3.5</b>	Band 3: At a moderate distance to achieving productive and sustainable agriculture

<b>3.5 ≤ 4.5</b>	Band 4: Close to achieving productive and sustainable agriculture
<b>4.5 ≤ 5</b>	Band 5: Productive and sustainable agriculture already achieved

11. This aggregation method aligns with the approach already approved by the **IAEG-SDG** for SDG indicators **5.a.2, 14.6.1, and 14.b.1**.

12. **Conditions for Calculation:** A country score will only be computed if the following two conditions are met:

- At least **four out of seven sub-indicators** must be available.
- **At least one** subindicator for social and economic dimension, and **at least two** subindicators for the environmental dimension.

13. **Single-Country Dashboard:** To provide deeper insight into a country's progress, a **dashboard** can be used to display both **trend** and **current status** in relation to productive and sustainable agriculture. For example, a country may show **slight or good progress** on several proxy indicators while still being **far or very far** from the target for most indicators.

Using the **scoring system**, the fictive country with the scorecard below (table 3) would be classified as:

- **Band 3** for **trend**, indicating **slight improvement toward productive and sustainable agriculture**.
- **Band 2** for **current status**, meaning it remains **far from achieving productive and sustainable agriculture**.

This dual assessment provides a nuanced view of progress, helping policymakers identify areas requiring further intervention. By applying the scoring system, the country will be categorized into Band 3 with respect to trend and into Band 2 with respect to Current Status. Therefore, the country is making “slight improvement towards productive and sustainable agriculture”, even though it is still “far from achieving productive and sustainable agriculture”.

<b>Proposed Proxy measure</b>	<b>Trend</b>	<b>Current status</b>
Gross production value per hectare	5	2
Gross output diversification	5	2
Agricultural value added per worker	4	4
Nitrogen use efficiency	4	3
Agriculture component of water stress	1	1
GHG emissions intensity in agriculture	3	2
Informal employment in agriculture	1	1
Average score	3.3	2.1

Table3: *Fictive country scorecard*

14. **Aggregate Regional Score:** Regional scores will be computed as a **weighted mean** of country scores for **trend** and **current status**, classifying regions into the same **five bands** as individual countries. To emphasize **global impact**, scores will be weighted by **agricultural land area** rather than treating all countries equally. This approach ensures that countries with **larger agricultural land areas**—which have a proportionately greater influence on sustainable agriculture at a planetary scale—carry more weight in regional calculations. Consequently, **smaller countries will contribute less** to the regional aggregate. Missing countries or those that do not meet the assessment criteria are not included in the aggregates, and the implicit assumption is that these countries perform the same as the neighbouring countries in the region.

15. **Data providers and collection method:** Data are provided by various governmental sources serving as official focal points. The institutions responsible for data collection at national level vary according to countries, including Ministry of Agriculture, Ministry of Water, Ministry of Environment, other relevant line Ministries and the National Statistics Office (NSO).

16. **Data for the 7 sub-indicators measures** are collected and analyzed directly at national level. FAO Questionnaires on Land Use, Irrigation and Agricultural Practices and AQUASTAT, are dispatched annually to relevant national entities. The measure based on SDG 8.3.1 is prepared by the International Labour Organization (ILO) in close consultation with national governments.

Relevant FAO questionnaires are:

- **Land Use, Irrigation and Agricultural Practices:** Data on land use (primarily focusing on agriculture, forestry, aquaculture and fisheries), irrigation and agricultural practices.
- **Crop and Livestock Production and Utilization:** Data on primary crop production data, primary crop utilization data, area harvested, live animals number data, primary livestock production and loss data, oils utilization data, selected derived agricultural commodities production data.
- **Fertilizers:** Data on production, agricultural use and other uses of fertilizers (both chemical and organic)
- **AQUASTAT:** Data on water withdrawals by sectors and by sources, wastewater and irrigated areas.
- **Prices Received by Farmers: Primary Crop and Livestock Products:** Data on agricultural producer

17. **Validation:** Of the 7 sub-indicators, two are components of SDG indicators (8.3.1 and 6.4.2) and are considered official data. The other five sub-indicators are based on either official data provided by the country to FAO or estimated by FAO as part of its mandate on food and agriculture statistics. The entire set of country values pertaining to the five metrics based on FAO estimates are shared with National Statistical Offices by the FAO Chief Statistician, and considered validated unless the country objects to their publication.

18. **Treatment of missing values:** Imputation methods of the sub-indicators are domain-specific and are applied at country level. Estimates by FAO are produced by a variety of methods, such as imputation, interpolation, modelling, etc. For reporting of the sub-indicators within SDG 2.4.1, carry-forward, linear interpolation, and carry-backwards routines are applied to the underlying input data.

19. **Internal FAO reporting:** SDG 2.4.1 proxy data are disseminated on the [FAOSTAT webpage dedicated to the SDG indicators](#). Additionally, an [SDG 2.4.1 Proxy](#) Shinyapp has been developed to

present detailed country-level results, including current status, trends, and visualizations by sub-indicator.

20. Globally, results for SDG 2.4.1 Proxy are as follows in terms of current status assessment: the world was at a moderate distance to achieving productive and sustainable agriculture (score 3.3 out of 5), while also having registered slight improvement in the trend towards achieving productive and sustainable agriculture (score 4.0 out of 5) since 2015.

21. At the regional level, Northern America and Europe (4.1), Eastern Asia and South-Eastern Asia (3.7), Oceania (3.7), and Latin America and the Caribbean (3.6), are **close** to achieving productive and sustainable agriculture. Central Asia and Southern Asia (2.8), Western Asia and Northern Africa (2.7), and Sub-Saharan Africa (2.7) are **at a moderate distance** to achieving productive and sustainable agriculture. LDCs and LLDCs are likewise **at a moderate distance** to achieving productive and sustainable agriculture lowest scores (2.5 and 2.6 out of 5, respectively). Over the period 2015-2022, Oceania showed **improvement** (4.8 out of 5) towards productive and sustainable agriculture. All other regions achieved a **slight improvement** towards productive and sustainable agriculture, with scores ranging from 3.5 to 4.3. Similarly, SIDS (3.5), LDCs (3.9) and LLDCs (3.7) showed **slight improvement**.

22. For the African region, current status scores for all sub-indicators in 2022 ranged from far from being very far from achieving productive and sustainable agriculture (for the sub-indicator gross production value per hectare score 1.40) to being close to achieving productive and sustainable agriculture (for the sub-indicators cropland nitrogen use efficiency score 3.62 and agriculture component of water stress score 4.03). Sub-indicators Agriculture value added per worker (score 1.91), GHG emissions intensity in agriculture (score 2.24), and informal employment in agriculture (score 1.90) were far from achieving productive and sustainable agriculture. The sub-indicator gross output diversification (score 3.46) was at a moderate distance to achieving productive and sustainable agriculture. The trend within the Africa region showed improvement towards sustainable agriculture for sub-indicator gross production value per hectare (score 4.59) and no improvement for informal employment in agriculture (score 2.95). The majority of the sub-indicators showed slight improvement – gross output diversification (score 3.64), agricultural value added per worker (score 3.68), cropland nitrogen use efficiency (score 3.68), agriculture component of water stress (score 3.79), and GHG emissions intensity in agriculture (score 3.92). The results indicate that the region is performing poorly in most of the environmental and social dimensions of sustainable agriculture with mixed results in the environmental dimension, but it is heading in the right direction, with the exception of the social dimension.

Within the African region, some subregions have performed differently from the rest of Africa. While most of the subregions are at a moderate distance to achieving productive and sustainable agriculture (overall scores ranging from 2.55 for Eastern Africa to 2.79 for Southern Africa), Middle Africa is far from it (overall score 2.42). For gross production value per hectare, Western Africa far from achieving productive and sustainable agriculture (score 1.79), while the other subregions are very far (scores ranging from 1 to 1.40). Middle Africa is performing most poorly among the subregions for the sub-indicator informal employment in agriculture (score 1.07). Regarding the trend, while most subregions are showing slight improvement towards productive and sustainable agriculture for most sub-indicators, Southern Africa is showing slight deterioration for informal employment agriculture (trend score 2.43).

Figure: Africa and sub-regions current status overall score and by sub-indicator for 2022

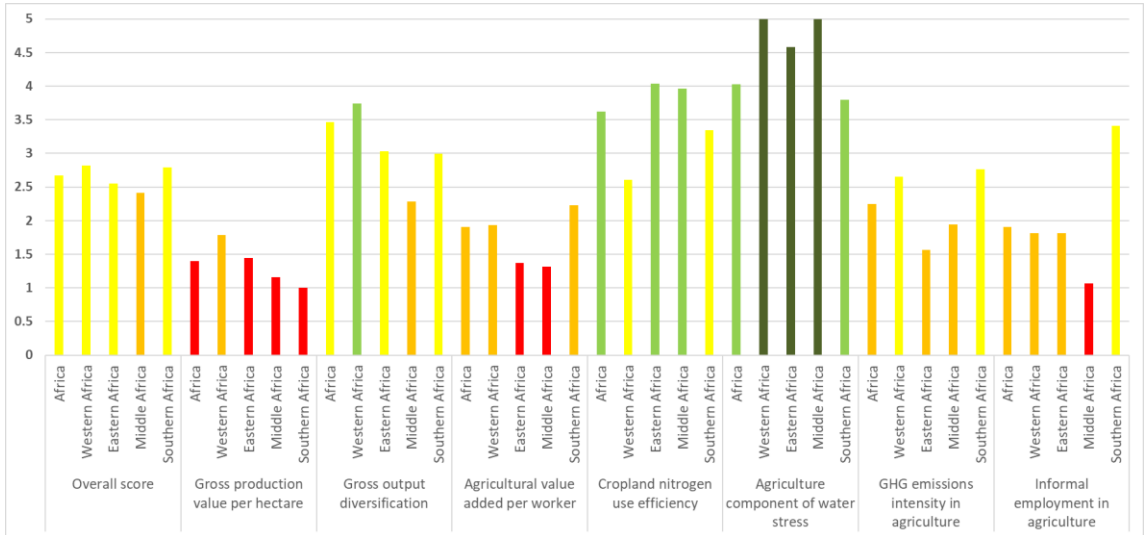
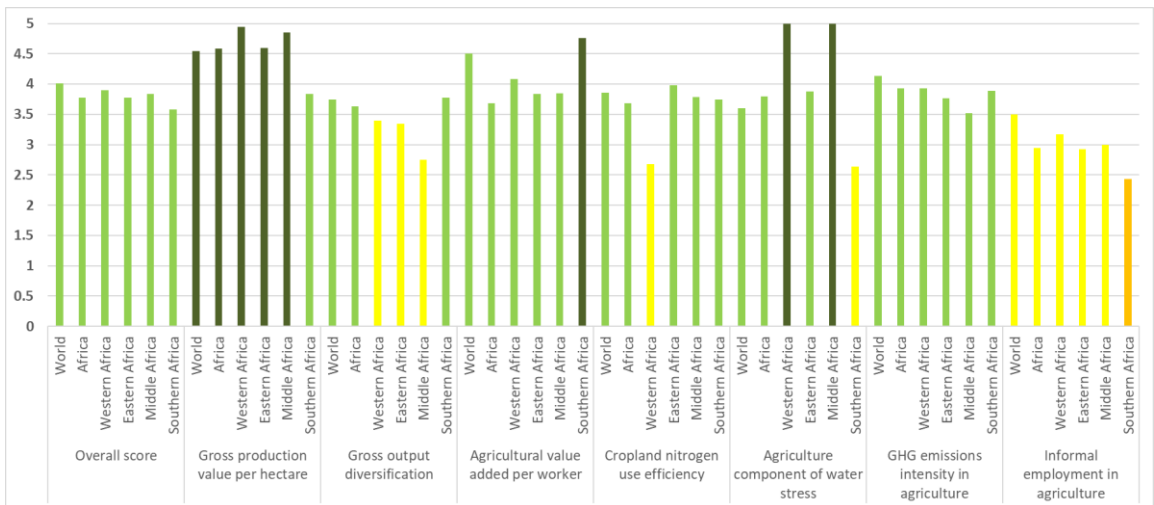
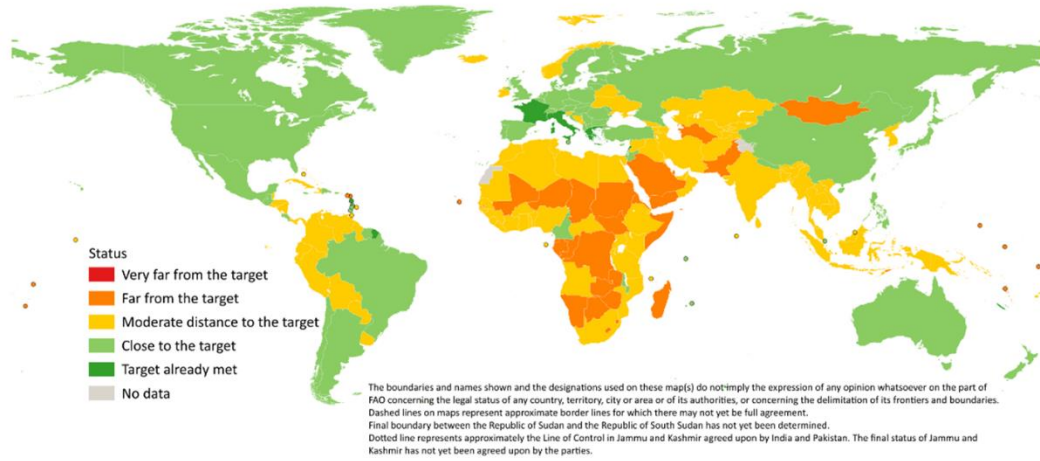


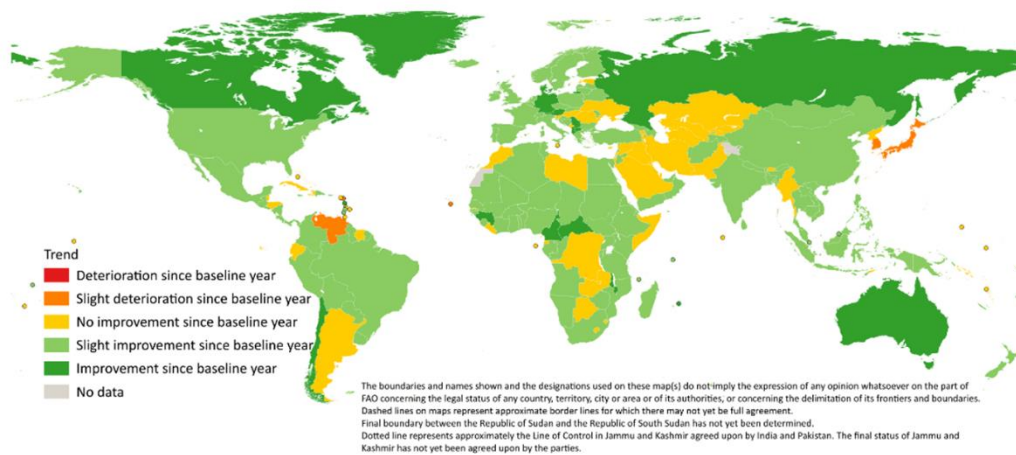
Figure: Africa and sub-regions trend assessment overall score and by sub-indicator for 2022



Map: Current status proxy map 2022



Map: Trend assessment proxy map 2022



## **IV. Conclusions and recommendations**

### **Conclusion**

- The lack of regular farm-level agricultural surveys has hindered reporting on SDG indicator 2.4.1. The proxy approach serves as a temporary solution to track progress while countries build capacity for implementation of the farm survey based approach.
- Monitoring sustainable agriculture requires enhanced technical capacity, increased survey frequency, and financial support. Without these improvements, long-term data availability will remain limited.

### **Recommendations**

- Countries are advised to take note of the proxy approach as an interim solution while transitioning towards farm-level survey-based reporting.
- National institutions are recommended to integrate the modules necessary to collect the original SDG indicator 2.4.1 into national surveys, improve survey frequency, and explore alternative data sources to improve reporting.
- National counterpart and development partners should allocate financial and technical resources to support comprehensive data collection and reporting on productive and sustainable agriculture.

## Annex 1: Description of the sub-indicators

### 1. Gross production value per hectare

Formula:

$$\text{Gross production value per hectare} = \frac{\text{Gross Production Value Agriculture}}{\text{Agricultural Land}}$$

*Numerator (Gross Production Value Agriculture):* Value of gross production has been compiled by multiplying gross production in physical terms by output prices at farm gate. Thus, value of production measures production in monetary terms at the farm gate level. Since intermediate uses within the agricultural sector (seed and feed) have not been subtracted from production data, this value of production aggregate refers to the notion of "gross production".

*Denominator (Agriculture Land):* Land used for cultivation of crops and animal husbandry. The total of area under "Cropland" and "Permanent meadows and pastures."

$$\text{Unit of measure: } \frac{\text{Constant 2014–2016 I \$}}{1000 \text{ hectares}}$$

*Data sources:*

Numerator: FAOSTAT Value of Agricultural Production Domain

<https://www.fao.org/faostat/en/#data/QV>

Denominator: FAOSTAT Land Use Domain

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

## 2. Gross output diversification

Formula:

$$\text{Gross output diversification} = 1 - \sum \left( \frac{\text{Gross Production Value}_{cit}}{\text{Gross Production Value}_{it}} \right)^2$$

C= crop

I = country

t = year

*Unit of measure:* unitless

*Data source:*

FAOSTAT Value of Agricultural Production Domain

<https://www.fao.org/faostat/en/#data/QV>

### 3. Agricultural value added per worker

Formula:

$$\text{Agricultural value added per worker} = \frac{\text{Value added in agriculture, forestry and fisheries}}{\text{Number of people employed in agriculture}}$$

This indicator provides information on the output of the agricultural sector by worker engaged. It is a measure of agricultural productivity. The data on the value added in agriculture, forestry and fisheries is extracted from FAOSTAT and then divided by the number of people employed in agriculture (in broad sense) extracted from ILOSTAT for a given year in a given country.

*Unit of measure:* US\$ (2015 prices) per worker

*Data source:*

FAOSTAT Employment Indicators: Agriculture Domain

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

#### 4. Cropland nitrogen use efficiency

Formula: The nutrient budget (NB) is calculated as the sum of inputs: mineral fertilizers (MF) multiplied by the fraction of fertilizer applied to cropland (CF), manure applied to soils (MAS), nitrogen deposition (ND), and biological fixation (BF), and seed (SD) minus outputs: crop removal (CR).

Thus: the Nutrient Budget (NB) for country  $i$  for nutrient  $j$  for year  $y$  is calculated as:

$$NB_{i,j,y} = \text{sum}(MF_{i,j,y} \times CF_{i,j,y}, MAS_{i,j,y}, ND_{i,j,y}, BF_{i,j,y}, SD_{i,j,y}) - CR_{i,j,y}$$

The Nutrient Use Efficiency (NUE) for country  $i$  for nutrient  $j$  for year  $y$  is calculated as:

$$NUE_{i,j,y} = CR_{i,j,y} / \text{sum}(MF_{i,j,y} \times CF_{i,j,y}, MAS_{i,j,y}, ND_{i,j,y}, BF_{i,j,y}, SD_{i,j,y})$$

*Unit of measure: %*

“A global reference database in FAOSTAT of cropland nutrient budgets and nutrient use efficiency: nitrogen, phosphorus and potassium, 1961–2020”

*Data sources:*

Mineral fertilizers:

Data: “Fertilizers by Nutrient” domain in FAOSTAT

<https://www.fao.org/faostat/en/#data/RFN> Coefficients: The cropland fraction estimates were derived from 4 existing datasets

Zou, T., et. al. Global trends of cropland phosphorus use and sustainability challenges. Nature (2022).

Manure applied to soils

Data: “Manure applied to Soils” (FAOSTAT)

<https://www.fao.org/faostat/en/#data/ESB> Coefficients: OECD Secretariat 1997, USA (Midwest Plan Service 1985) and Europe (Levington Agriculture 1997) and from Sheldrick et al (2003). Statistics Netherlands (2012).

Atmospheric Deposition:

Data: Vishwakarma, Srishti et al. (2022), Quantifying nitrogen deposition inputs to cropland: A national scale dataset from 1961 to 2020, Dryad, Dataset.

Crop Removal:

Data: Primary Crops under the domain “Crops and livestock products”

<https://www.fao.org/faostat/en/#data/QCL>

Coefficients: Ludemann et al (2022) Global data on crop nutrient concentration and harvest indices

<https://doi.org/10.5061/dryad.n2z34tn0x>

Biological Fixation :

Data : Primary Crops under the domain “Crops and livestock products”

<https://www.fao.org/faostat/en/#data/QCL>

Methods: Peoples et al. (2021) and Herridge et al. (2022).

## 5. Agriculture component of water stress

Formula:

$$\text{Agriculture component of water stress} = \frac{\text{TFWW}}{(\text{TRWR} - \text{EFR})} * 100\%$$

TFWW: the total freshwater withdrawn (km<sup>3</sup> /year (109 m<sup>3</sup> /year))

TRWR: the difference between the total renewable freshwater resources km<sup>3</sup> /year (109 m<sup>3</sup> /year))

EFR: the environmental flow requirements (km<sup>3</sup> /year (109 m<sup>3</sup> /year))

While for the overall SDG indicator 6.4.2., values below 25% are considered safe (no stress), whereas values over 25% are classified into four different levels of severity, for the agriculture component of the indicator, adjusted thresholds have been determined at 70 percent of these conventional thresholds at aggregate national level, considering that globally, agriculture is responsible for 70 percent of all water withdrawals. Therefore, a water stress level for the agriculture component of below 17.5% is considered safe, a level of between 17.5% and 35% is considered to be low stress, and so on.

*Unit of measure:* Percentage

*Data source:* [6.4.2 Water stress | SDG Indicators Data Portal | Food and Agriculture Organization of the United Nations](#)

<https://unstats.un.org/sdgs/dataportal>

## 6. GHG emissions intensity in agriculture

Formula:

$$\text{Green House Gas Emissions Intensity} = \frac{\text{Emissions (Farm gate)}}{\text{Value of Agricultural Production}} * 100\%$$

*Numerator* (Farm gate emissions): Emissions from drained organic soils, cultivation of histosols, inorganic N fertilizers, crop residues, manure deposited on pasture, range and paddock, manure applied to soils, manure management, enteric fermentation, prescribed burning of savanna, burning crop residues, rice cultivation, and on-farm energy use.

*Denominator* (Value of Agricultural Production): Value of gross production has been compiled by multiplying gross production in physical terms by output prices at farm gate.

*Unit of measure:* kg CO<sub>2</sub> equivalent per constant 2014-2016 USD

*Data source:*

FAOSTAT Climate Change: Agrifood system emissions totals domain

<https://www.fao.org/faostat/en/#data/GT>

FAOSTAT Value of Agricultural Production Domain

<https://www.fao.org/faostat/en/#data/QV>

## 7. Informal employment in agriculture

[SDG Indicator 8.3.1](#) Proportion of informal employment in total employment, disaggregated by the agricultural sector

Informal employment comprises persons who in their main or secondary jobs were in one of the following categories: - Own-account workers, employers and members of producers' cooperatives employed in their own informal sector enterprises (the characteristics of the enterprise determine the informal nature of their jobs) - Own-account workers engaged in the production of goods exclusively for own final use by their household (e.g. subsistence farming) - Contributing family workers, regardless of whether they work in formal or informal sector enterprises (they usually do not have explicit, written contracts of employment, and are not subject to labour legislation, social security regulations, collective agreements, etc., which determines the informal nature of their jobs) - Employees holding informal jobs, whether employed by formal sector enterprises, informal sector enterprises, or as paid domestic workers by households (employees are considered to have informal jobs if their employment relationship is, in law or in practice, not subject to national labour legislation, income taxation, social protection or entitlement to certain employment benefits) For the purpose of classifying persons into formal or informal employment for this indicator, only the characteristics of the main job are considered.

*Unit of measure:* Percentage

*Data sources:* ILO Stat

<https://ilostat.ilo.org/topics/informality/>

## Annex 2: Methods for assessing the current status

Dimension	2.4.1 sub-indicator theme	Proposed Proxy measure	Numerical target
Economic	Land productivity	Gross production value per hectare	No
Economic	Resilience	Gross output diversification	No
Economic		Agricultural value added per worker (link to 2.3.2)	No
Environment	Soil quality	Nitrogen use efficiency	Yes
Environment	Water availability	Agriculture component of water stress (6.4.2 disaggregation)	Yes
Environment	[No equivalent theme]	GHG emissions intensity	No
Social	Decent employment	Proportion of informal employment in agriculture	No

### 1.1 Indicators with a numerical target

The current distance to the target is calculated only when a numerical target exists, as follows:

$$d_{it} = \begin{cases} x^* - x_{it}, & \text{when the desired direction is an increase over time} \\ x_{it} - x^*, & \text{when the desired direction is a decrease over time} \end{cases}$$

Here  $x_{it}$  denotes the numerical value of the generic indicator for country  $i$  in year  $t$ ; while  $x^*$  is the target value of the generic indicator (to be reached by 2030). This distance measure is 0 for indicators having already reached the target at the time of the assessment.

#### a) SDG indicator 6.4.2, agriculture component

For this indicator, thresholds have been determined that are set at 70 percent, the conventional thresholds for the severity levels of water stress at aggregate national level (as per metadata of SDG indicator 6.4.2), considering that globally, agriculture is responsible for 70 percent of all water withdrawals. The current distance to the target for the agriculture component of SDG indicator 6.4.2 is therefore calculated as follows: *Where*  $x$  is the level of water stress attributable to agriculture

Bounds	Color	Meaning	Score
$x \leq 17.5$ percent	Dark green	Target already met	5
$17.5 < x \leq 35$ percent	Light green	Close to the target	4
$35$ percent $< x \leq 52.5$ percent	Yellow	Moderate distance to the target	3
$52.5$ percent $< x \leq 70$ percent	Orange	Far from the target	2
$x > 70$ percent	Red	Very far from the target	1
None	Grey	Missing data	1

### b) Nitrogen Use Efficiency

For the cropland nitrogen use efficiency (NUE), the desired range is between 50% to 90%, based on a scientifically determined optimal target between 65% and 80%<sup>2</sup>. The assessment of the current status (last available data) will be conducted by calculating the distance to the target as shown below. The cropland NUE value  $x$  for country  $i$  in year  $t$  will be assessed as follows:

Bounds	Color	Meaning	Score
$50\% \leq x_{i,t} \leq 90\%$	Dark green	Target already met	5
$45\% \leq x_{i,t} < 50\%$ $90\% < x_{i,t} \leq 95\%$	Light green	Close to the target	4
$40\% \leq x_{i,t} < 45\%$ $95\% < x_{i,t} \leq 100\%$	Yellow	Moderate distance to the target	3
$35\% \leq x_{i,t} < 40\%$ $100\% < x_{i,t} \leq 105\%$	Orange	Far from target	2
$x_{i,t} < 35\%$ $x_{i,t} > 105\%$	Red	Very far from target	1
None	Grey	Missing data	1

### 1.2 Indicators without a numerical target

All the other six proxy measures will be treated as indicators without a numerical target, for which the distance to the target cannot be calculated. For analytical purposes, it is useful however to provide a summary picture that describes the current worldwide distribution of the indicator. For this reason, each country will be associated to the corresponding quintile. The quintiles divide the entire distribution of countries into five equal groups, according to their indicator value: the first quintile contains the bottom fifth of the countries on the indicators scale (i.e. the 20 % of the countries with

<sup>2</sup>Ludemann *et al.*, 2023, in press <https://essd.copernicus.org/preprints/essd-2023-206/essd-2023-206.pdf>

the lowest value), the second quintile represents the second fifth (from 20 % to 40 %) and so on; finally the fifth quintile represents the top 20 % countries, i.e. those with the highest values for the indicator. A country's quintile categorization will earn it a corresponding score for the purposes of calculating its overall progress towards productive and sustainable agriculture, depending on the normative direction:

**With an increasing normative direction**

Quintile	Color	Meaning	Score
$q_{80\%} < x_{it} \leq q_{100\%}$	Dark green	Best performers	5
$q_{60\%} < x_{it} \leq q_{80\%}$	Light green	Above median performers	4
$q_{40\%} < x_{it} \leq q_{60\%}$	Yellow	Median performers	3
$q_{20\%} < x_{it} \leq q_{40\%}$	Orange	Below median performers	2
$q_{0\%} \leq x_{it} \leq q_{20\%}$	Red	Worst performers	1
None	Grey	Missing data	1

**With a decreasing normative direction**

Quintile	Color	Meaning	Score
$q_{0\%} \leq x_{it} \leq q_{20\%}$	Dark green	Best performers	5
$q_{20\%} < x_{it} \leq q_{40\%}$	Light green	Above median performers	4
$q_{40\%} < x_{it} \leq q_{60\%}$	Yellow	Median performers	3
$q_{60\%} < x_{it} \leq q_{80\%}$	Orange	Below median performers	2
$q_{80\%} < x_{it} \leq q_{100\%}$	Red	Worst performers	1
None	Grey	Missing data	1

### Annex 3: Method for assessing trend

The method to assess the trend distinguishes between indicators underpinning targets with and without a numerical yardstick.

#### 2.1 Indicators with a numerical target

For indicators with a fixed numerical target, the trend is assessed by comparing the actual growth since the baseline year, with the growth required to achieve the target. Assuming a geometrical growth over time, the trend is assessed with the following mathematical expression<sup>3</sup>

$$CR = \frac{CAGR_a}{CAGR_r} = \frac{\left(\frac{x_t}{x_{t_0}}\right)^{\frac{1}{t-t_0}} - 1}{\left(\frac{x^*}{x_{t_0}}\right)^{\frac{1}{2030-t_0}} - 1}$$

Against the following thresholds and categories as included in the technical annex of the global SDG Progress Chart:

Level or ratio CR	Color	Assessment category	Score
$x \leq x^*$	Dark green	Target already met	5
$CR \geq 0.95$	Light green	On-track to achieve the target	4
$0.5 < CR < 0.95$	Yellow	On-path, but too slow to achieve the target	3
$-0.10 \leq CR \leq 0.5$	Orange	No improvement (stagnation) since baseline	2
$CR < -0.10$	Red	Deterioration/movement away from the target (<<)	1
Missing data	Grey	None	1

#### 2.2 Indicators without a numerical target (applies to all the other indicators)

For indicators without a set numerical target, which is the case for most of the suggested indicators in this proposal, it is only possible to assess the actual growth ( $CAGR_a$  in the expression above) against two sets of thresholds and categories, which depend on the normative direction of the indicator.

Therefore,

$$CAGR_a = \left(\frac{x_t}{x_{t_0}}\right)^{\frac{1}{t-t_0}} - 1$$

Different criteria can be used to assess the CAGR, depending on the sign of the normative direction and also on the fact that for some indicators a situation that remains unchanged over time (not increase or not decrease) can be judged positively.

<sup>3</sup>  $t_0$  denotes the baseline year, while  $t$  indicates the current or considered year for the assessment

**Thresholds and categories when a positive outcome corresponds to an increase of the indicator**

Levels of actual growth rate	Color	Assessment category	Score
$CAGR_a > 0.01$	Dark green	Improvement since baseline-year (>>)	5
$0.005 < CAGR_a \leq 0.01$	Light green	Slight improvement since baseline-year (>)	4
$-0.005 \leq CAGR_a \leq 0.005$	Yellow	No improvement since baseline-year (=)	3
$-0.01 \leq CAGR_a < -0.005$	Orange	Slight deterioration since baseline-year (<)	2
$CAGR_a < -0.01$	Red	Deterioration since baseline-year (<<)	1
Missing data	Grey	None	1

**Thresholds and categories when a positive outcome corresponds to a decrease of the indicator**

Levels of actual growth rate	Color	Assessment category	Score
$CAGR_a < -0.01$	Dark green	Improvement since baseline-year (>>)	5
$-0.01 \leq CAGR_a < -0.005$	Light green	Slight improvement since baseline-year (>)	4
$-0.005 \leq CAGR_a \leq 0.005$	Yellow	No improvement since baseline-year (=)	3
$0.005 < CAGR_a \leq 0.01$	Orange	Slight deterioration since baseline-year (<)	2
$CAGR_a > 0.01$	Red	Deterioration since baseline-year (<<)	1
Missing data	Grey	None	1

Countries that have already reached the maximum score for the current status assessment are assigned the maximum score for the trend assessment.