1. Повышение эффективности использования ресурсов играет важнейшую роль в обеспечении устойчивости сельского хозяйства
2. Для обеспечения устойчивости необходимы решительные действия по сохранению, защите и улучшению природных ресурсов
3. Сельское хозяйство, которое не обеспечивает защиту и укрепление источников средств к существованию и социального благополучия жителей сельских районов, устойчивым не является
4. Повышение устойчивости людей, общин и экосистем к внешним воздействиям - ключевой фактор обеспечения устойчивости сельского хозяйства
5. Для устойчивого производства продовольствия и ведения сельского хозяйства необходимы механизмы ответственного и эффективного управления

Устойчивое производство продовольствия и ведение сельского хозяйства

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SUSTAINABLE DEVELOPMENT GOALS

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

2.4 К 2030 году обеспечить создание устойчивых систем производства продуктов питания и внедрить методы ведения сельского хозяйства, которые позволяют повысить жизнестойкость и продуктивность и увеличить объемы производства, способствуют сохранению экосистем, укрепляют способность адаптироваться к изменению климата, экстремальным погодным явлениям, засухам, наводнениям и другим бедствиям и постепенно улучшают качество земель и почв.

- SDG indicator 2.4.1: Площадь сельскохозяйственных угодий, обрабатываемых с помощью производительных и устойчивых методов ведения сельского хозяйства

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Milestones

Year	Month	SDG process for Indicator 2.4.1
2015	October	2nd meeting of IAEG-SDG: Various interpretations on the definition of sustainable agriculture and how to measure it
2016	March	47th UN-SC endorses SDG 2.4.1 as: 'Proportion of agricultural area under productive and sustainable agriculture' (Tier III)
	March-Dec	Literature review: building on exiting frameworks
	December	Technical expert meeting (FAO) – First draft methodology
2017	February	First proposal submitted to GS-SAC - Refining the methodology
	April	Multi-stakeholder Expert Group Meeting at FAO: Drafting detailed methodology
	Oct-Jan	Desk piloting in selected countries
	November	6th meeting of IAEG-SDG. Request finalizing country pilot
2018	Jan-May	Preparation of revised methodology
	April	Workshop – learning from country pilots
	May	Webinar with IAEG-SDG members. Second online consultation
	May-October	Country testing for methodology and farm survey questionnaire
	October	Presented to FAO Committee on Agriculture as metrics to measure progress towards achieving the SDGs in agriculture
	November	**Reclassified as Tier II at the 8th meeting of IAEG-SDG**

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Potential Data Provider of 2.4.1

Responsible Institution: Ministry of Food, Agriculture and Livestock

Related Institution: ?

Steps to develop the indicator

1. Determining the scope
2. Determining the dimensions to be covered (sustainability)
3. Choosing the scale
4. Selecting the data collection instrument(s).
5. Selecting the themes to be covered, choosing a sub-indicator for each theme.
6. Developing the criteria to assess sustainability performance for each sub-indicator
7. Deciding the periodicity of monitoring the indicator
8. Developing modality of reporting the indicator

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Characteristics of Indicator 2.4.1

Indicator 2.4.1 is defined as the "Proportion of agricultural area under productive and sustainable agriculture", which is expressed by the following formula:

$$SDG2.4.1 = \frac{Area\ under\ productive\ and\ sustainable\ agriculture}{Agricultural\ land\ area}$$

- It reflects the multiple dimensions of sustainability
- It captures the main issues as they are expressed in the SDG target 2.4: resilience, productivity, ecosystem maintenance, adaptation to climate change and extreme events, and soils
- It is measured at farm level
- It allows measurement of progress towards more productive and sustainable agriculture

Scope

Included within the scope

- Crop and livestock production systems
  - Non-food crops and livestock (example crops such as tobacco, cotton, and livestock raised for non-food products like sheep for wool).
  - Crops grown for fodder or for energy purposes.
- Agro-forestry (trees on the farm).
- Aquaculture, to the extent that it takes place within the agricultural area. For example, rice-fish and similar systems.
- Both intensive and extensive production systems (including subsistence agriculture).

Excluded from the scope

- State and common land used commonly by several agriculture holdings.
- Production from gardens and backyards.
- Production from hobby farms.
- Land used exclusively for aquaculture.
- Forest and other wooded lands.
- Food harvested from the wild.

Criteria for the choice of themes and sub-indicators

- *Policy relevance*
- *Universality*
- *International comparability*
- *Measurability*
- *Cost effectiveness*
- *Minimum cross-correlation*

Sub-indicators

- **Impact/outcome** indicators that record what the state or change in state of factors and associated flows of benefits or costs.
- **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.
- **Practice** indicators that record the type of agricultural practices and processes that a farm is undertaking.
- **Perception** indicators that record views of various stakeholders about different aspects of sustainability.

Sub-indicators

No.	Theme	Sub-indicators
1	Land productivity	Farm output value per hectare
2	Profitability	Net farm income
3	Resilience	Risk mitigation mechanisms
4	Soil health	Prevalence of soil degradation
5	Water use	Variation in water availability
6	Fertilizer risk	Management of fertilizers
7	Pesticide risk	Management of pesticides
8	Biodiversity	Use of biodiversity-friendly practices
9	Decent employment	Wage rate in agriculture
10	Food security	Food insecurity experience scale (FIES)
11	Land tenure	Secure tenure rights to land

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11 sub-indicators to reflect the multi-dimensional nature of the indicator

	Theme	Sub-indicators	Type
Economic	Land productivity	Farm output value per hectare	Outcome
	Profitability	Net farm income	Outcome
	Resilience	Risk mitigation mechanisms	Mix
Environmental	Soil health	Prevalence of soil degradation	Outcome
	Water use	Variation in water availability	Mix
	Fertilizer pollution risk	Management of fertilizers	Practice
	Pesticide risk	Management of pesticides	Practice
	Biodiversity	Use of biodiversity-supportive practices	Practice
Social	Decent employment	Wage rate in agriculture	Outcome
	Food security	Food insecurity experience scale (FIES)	Outcome
	Land tenure	Secure tenure rights to land	Outcome

Assessing sustainability levels

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

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Steps to calculate the 11 sub-indicators

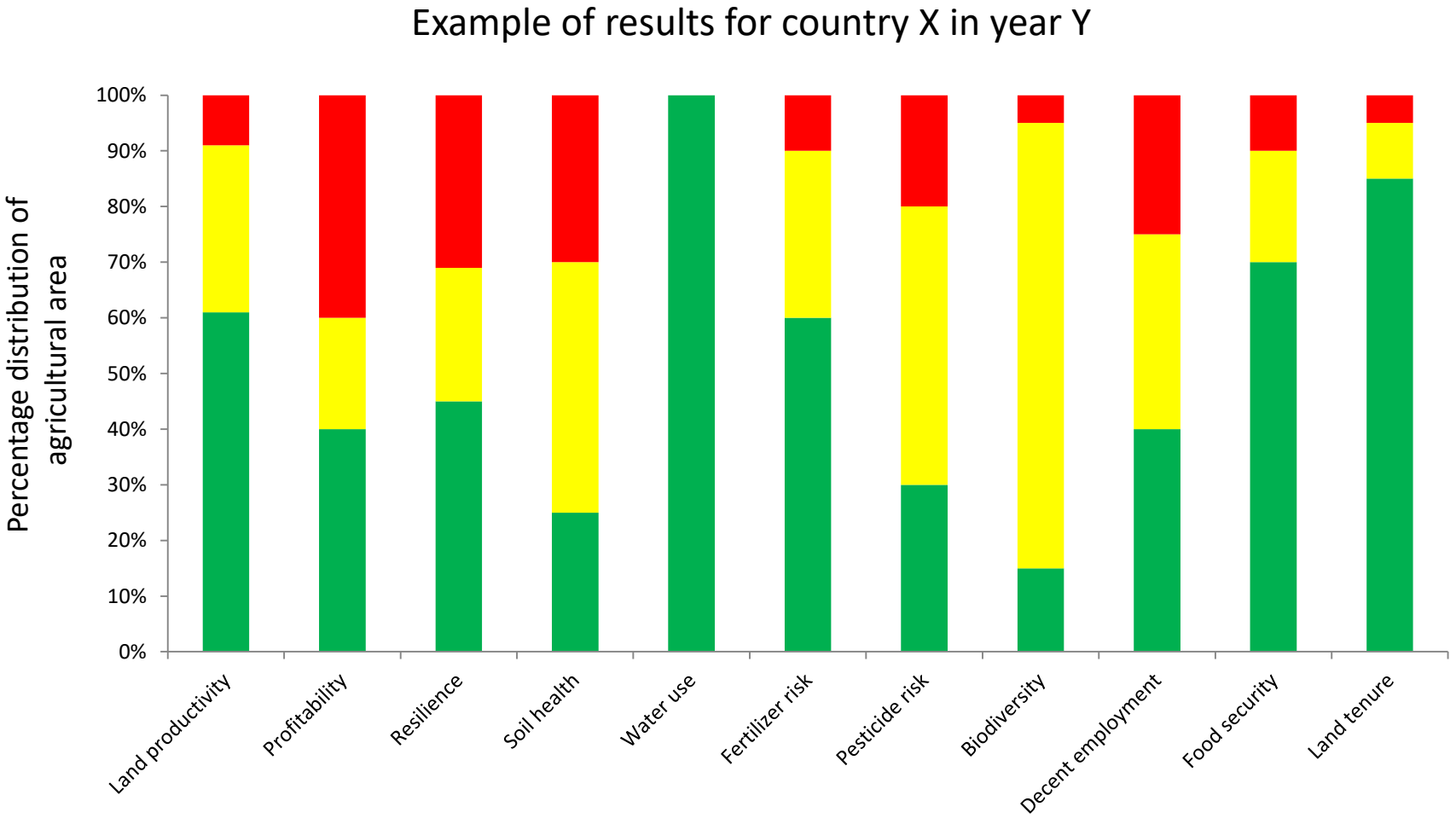
Dashboard approach

1. Classify the sustainable (not sustainable) farms and its associated agricultural area, as per established criteria for each sub-indicator.

2. Once farms and its agricultural area have been classified for a given sub-indicator, calculate the total agricultural area according to its sustainability status.

3. Each sub-indicator is finally derived by calculating the proportion of agricultural area by sustainability status (i.e. desirable, acceptable and unsustainable) in total agricultural area.

Reporting through a dashboard



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

Pros & Cons of Dashboard

Pros	Cons
• Improve focus - allows quick evaluation of the results across selected themes/sub-indicators • Policy relevant – provide actionable information and clarity about the main issues of unsustainability of the country • Flexible – present the possibility to combine data from different sources	• Lack of simplicity – no single number to express sustainability • Progress over time for a country, comparison across countries and its ranking will be challenging unless done at the theme/sub-indicator level • Demand careful readability to understand the sustainability status

Aggregate indicator (at national or other levels)

$$SDG241_d = \min_{n:1-11} (SI_{d\,n})$$

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

$$SDG241_u = \max_{n:1-11} (SI_{u\,n}) = 1 - SDG241_{a+d}$$

- $SDG241_d$ = 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'

Preferred instrument for data collection

- Preferred instrument for data collection is a farm survey
- Aligned with efforts supported by FAO to develop farm surveys as the most relevant instrument for agricultural data (see AGRIS)
- Questionnaire designed as a module that contains the minimum set of questions needed to assess 2.4.1
- These questions can be integrated into existing farm surveys
- Can be complemented with contextual information from other data sources (especially for environmental indicators)
- Suggested periodicity: 3 years

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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	
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
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
10	Food insecurity experience scale (FIES)						X	X
11	Secure tenure rights to land	X					X	

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

Conditions for using alternative data sources

- Respects the stratification (farm type, agricultural areas, etc.)
- Captures the same phenomenon as the proposed farm survey
- At least same quality as the farm survey
- Compliant with international/national standards and classifications systems internationally comparable
- Data available at the same level of territorial disaggregation as the farm survey
- Reference year and periodicity homogenous across the sub-indicators

Sub-indicator sheets

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1. Farm output value per hectare

Theme: Land Productivity

Coverage: All farm types

Description: The sub-indicator is described as farm output value per hectare (crops and livestock).

$$Farm\ output\ value\ per\ hectare = \frac{Volume\ of\ agricultural\ output\ x\ relative\ prices}{Farm\ agricultural\ \ land\ area\ (hectare)}$$

Sustainability criteria:

- Green (desirable): Sub-indicator value is ≥ 2/3 of the corresponding 90th percentile of the distribution
- Yellow (acceptable): Sub-indicator value is ≥ 1/3 and < 2/3 of the corresponding 90^{th} percentile
- Red (unsustainable): Sub-indicator value is < 1/3 of the corresponding 90th percentile

2. Net Farm Income

Dimension: Economic

Theme: Profitability

Coverage: All farms types

Description: The sub-indicator measures if the farm is consistently profitable over a 3-year period.

Sustainability criteria:

- Green (desirable): above zero for past 3 consecutive years
- Yellow (acceptable): above zero for at least 1 of the past 3 consecutive years
- Red (unsustainable): below zero for all of the past consecutive years

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3. Risk mitigation mechanisms

Dimension: Economic; **Theme:** Resilience; **Coverage:** All farms types

Description: This sub-indicator measures the incidence of the following mitigation mechanisms:

1. Access to credit;
2. Access to insurance;
3. On farm diversification

Sustainability criteria:

- Green (desirable): Adoption of at least two of the above-listed mitigation mechanisms.
- Yellow (acceptable): Adoption of at least one of the above-listed mitigation mechanisms.
- Red (unsustainable): Absence of all of the above listed mitigation mechanisms.

4. Prevalence of soil degradation

Dimension: Environmental; **Theme:** Soil health ; **Coverage:** All farms types

Description: The sub-indicator measures the extent to which agriculture activities affects soil health and therefore represents a sustainability issue.

The following soil threats are identified

1. Soil erosion
2. Reduction in soil fertility
3. Salinization of irrigated land
4. Waterlogging

Sustainability criteria:

- Green (desirable): The combined area affected by any of the four selected threats to soil health is negligible (less than 10% of the total agriculture area of the farm).
- Yellow (acceptable): The combined area affected by any of the four selected threats to soil health is between 10% and 50% of the total agriculture area of the farm.
- Red (unsustainable): The combined area affected by any of the four selected threats to soil health is above 50% of the total agriculture area of the farm.

5. Variation in water availability

Dimension: Environmental

Theme: Water use

Coverage: All farm types

Description: The sub-indicator captures the extent to which agriculture contributes to unsustainable patterns of water use.

Sustainability criteria:

- Green (desirable): does not use water for irrigating crops on more than 10% of the agriculture area of the farm, or water availability remains stable over the years
- Yellow (acceptable): uses water to irrigate crops on at least 10% of the agriculture area of the farm, does not know whether water availability remains stable over the years, or experiences reduction on water availability over the years, but there is an organisation that effectively allocates water among users.
- Red (unsustainable): in all other cases.

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6. Management of fertilizers

Dimension: Environmental**; Theme:** Fertilizer risk; **Coverage:** All farm types

Description: The proposed approach is based on questions to farmers about their use of fertilizer

The following environmental risks are identified

Sustainability criteria:

- Green (desirable): The farm has organic certification (does not use synthetic or mineral fertilizers) or uses synthetic or mineral fertilizers and takes specific measures to mitigate environmental risks (more than four from the list in the next slide)
- Yellow (acceptable): farmer uses synthetic or mineral fertilizers and takes at least one measure from the list to mitigate environmental risks
- Red (unsustainable): farmer uses synthetic or mineral fertilizer and does not take any of the measures from the list to mitigate environmental risks associated with their use.

6. Management of fertilizers (continued)

The following environmental risks are identified

1. Follow protocols as per extension service or retail outlet recommendations or local regulations, not exceeding recommended doses
2. Use synthetic and mineral fertilizers in combination with organic sources of nutrients (including manure)
3. Use legumes as a cover crop, or component of a multi/crop system to reduce fertilizer inputs
4. Recycle nutrients where possible, such as composting residues, manures or other organic materials to use as fertilizers
5. Distribute fertilizer application over the growing period
6. Consider soil type and climate in deciding fertilizer application doses and frequencies
7. Perform regular nutrient budget calculations based on soil sampling
8. Perform site-specific nutrient management or precision farming (Precision farming is a farming management concept based on observing, measuring and responding to inter and intra-field variability in crops)

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7. Management of pesticides

Dimension: Environmental

Theme: Pesticides

Coverage: All farm types

Description: The proposed sub-indicator is based on information on the use of pesticides on the farms

Sustainability criteria:

- Green (desirable): The farm has organic certification or does not use pesticides, uses only low risk pesticides, and adheres to all three health-related measures and at least three of the environment-related measures listed in the next slide (including adherence to label recommendation)
- Yellow (acceptable): farmer uses only low-risk pesticides and takes some measures to mitigate environmental and health risks (at least two from each of the lists in the next slide, including adherence to label recommendations)
- Red (unsustainable): farmer uses highly hazardous pesticides or uses low-risk pesticides but does not take specific measures to mitigate environmental or health risks associated with their use.

7. Management of pesticides (continued)

- **Health measures**

1. Adherence to label recommendations for pesticide use
2. Use of personal protection equipment
3. Safe disposal of waste (cartons, bottles and bags)

- **Environment measures**

1. Adjust planting time, or apply crop spacing, crop rotation, mixed cropping or inter-cropping for breaking the pest cycle
2. Perform biological pest control or use biopesticides
3. Adherence to label recommendations for pesticide use
4. Adopt pasture rotation to suppress livestock pest population
5. Use of pest resistant/tolerant cultivars and livestock breeds and standard/certified seed and planting material
6. Systematic removal of plant parts attacked by pests
7. Regular cleansing of machinery and equipment to reduce pest dissemination

8. Use of biodiversity-supportive practices

Dimension: Environmental;

Theme: Biodiversity

Coverage: All farm types

Description: This sub-indicator measures the level of adoption of biodiversity-supportive practices by the farm

Sustainability criteria:

- Green (desirable): The agricultural holding meets at least five of the criteria in the next slide
- Yellow (acceptable): The agricultural holding meets between two and four of the criteria in the next slide
- Red (unsustainable): The agricultural holding meets less than two of the criteria in the next slide

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8. Use of biodiversity-supportive practices (continued)

Biodiversity criteria

1. Leaves at least 10% of the holding area for natural or diverse vegetation. This can include natural pasture/grassland, maintaining wildflower strips, stone and wood heaps, trees or hedgerows, natural ponds or wetlands.
2. Does not use synthetic pesticides, does not purchase more than 50% of the feed for livestock and does not use antimicrobials as growth promoters.
3. At least two of the following contribute to the farm production, each of them representing at least 10% of the value of the holding's production: 1) crop/pasture; 2) trees or tree products; 3) livestock or animal products; 4) fish.
4. Practices crop or crop/pasture rotation involving at least 3 crops on at least 80% of the farm area.
5. The area under a single continuous commodity is not larger than 2 hectares (excluding pasture).
6. Areas larger than 2 hectares under a single commodity use at least two different varieties
7. At least 50% of each animal species' population consists of locally adapted breeds or breeds at risk of extinction Natural pastures or grassland implies no use of mineral or chemical fertilizer and no pesticides
8. Locally adapted breeds: "which have been in the country for a sufficient time to be genetically adapted to one or more of traditional production systems or environments in the country." 15 FAO. 2000. Guidelines for the development of country reports (available at http://www.fao.org/docrep/meeting/021/am228e.pdf).

9. Wage rate in agriculture

Dimension: Social

Theme: Decent employment

Coverage: Not applicable to farms that employ only family labour.

Description: The sub-indicator measures the farm unskilled labour daily wage rate in Local Currency Units (LCU).

Sustainability criteria:

- Green (desirable): if the holding has fair labour certification or if the wage rate paid to unskilled labour is above the minimum national wage rate or minimum agricultural sector wage rate (if available).
- Yellow (acceptable): if the wage rate paid to unskilled labour is equals to the minimum national wage rate or minimum agricultural sector wage rate (if available).
- Red (unsustainable): if the wage rate paid to unskilled labour is below the minimum national wage rate or minimum agricultural sector wage rate (if available).

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10. Food Insecurity Experience Scale (FIES)

Dimension: Social

Theme: Food security

Coverage: Only household farms

Description: The Food Insecurity Experience Scale (FIES) produces a measure of the severity of food insecurity experienced by individuals or households, based on direct interviews.

Sustainability criteria: Level on FIES scale

- Green (desirable): Mild food insecurity
- Yellow (acceptable): Moderate food insecurity
- Red (unsustainable): Severe food insecurity

11. Secure tenure rights to land

Dimension: Social

Theme: Land tenure

Coverage: All farms types

Description: The sub-indicator measures the ownership or secure rights over use of agricultural land areas using a series of criteria.

Sustainability criteria: Level of security of access to land.

- Green (desirable): has a formal document with the name of the holder/holding on it, or has the right to sell any of the parcel of the holding, or has the right to bequeath any of the parcel of the holding
- Yellow (acceptable): has a formal document even if the name of the holder/holding is not on it
- Red (unsustainable): no positive responses to any of the 4 questions above

THANK YOU

For more detailed information please see:

- http://www.fao.org/sustainable-development-goals/indicators/241/en/