Food and Agriculture Organization of the United Nations

TAPE
a Tool for Agroecology Performance Evaluation

Animal Production and Health Division (AGA) and Plant Production and Protection division (AGP)

Abram Bicksler, Dario Lucantoni, Anne Mottet, Emma Siliprandi
With contributions from Rémi Cluset, Soren Moller, Anna Korzenszky, Pablo Tittonell and many others

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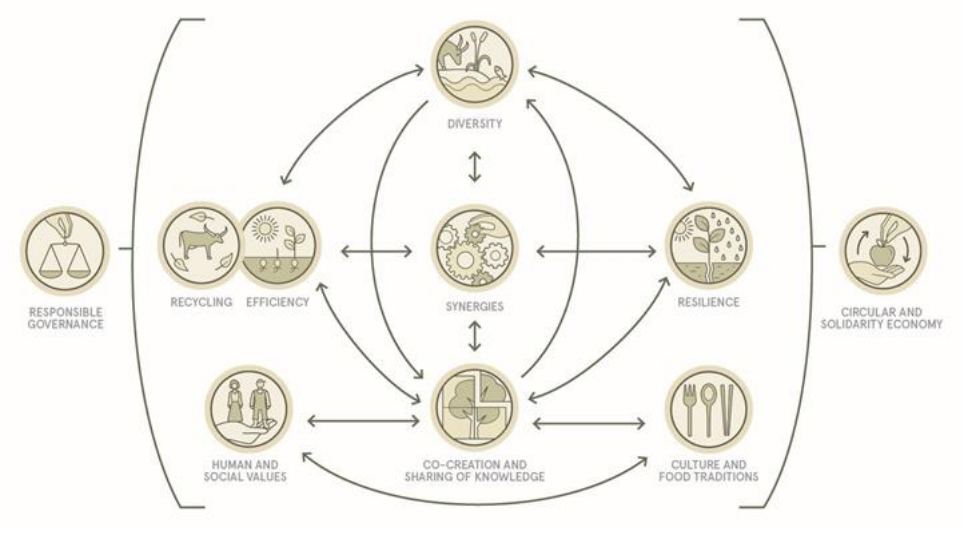
The 10 Elements of Agroecology:
Guiding Transition To Sustainable Food and Agricultural Systems



How do we assess performance in agriculture?



Yield/ha? $/farm? Kcal/person?

Nitrogen leaching/ha? Number of healthy people?

COAG 26 (2018) request to FAO:

"to assist countries and regions to engage more effectively in the transition processes towards sustainable agriculture and food systems by strengthening normative, science and evidence-based work on agroecology, developing metrics, tools and protocols to evaluate the contribution of agroecology and other approaches to the transformation of sustainable agriculture and food systems." (C 2019/21 Rev.1 , Para. 15 a)

What is the objective of this framework?

To produce global and harmonized evidence (information and data) on the multi-dimensional performance of agroecological systems in order to inform policy-making and to support the process of transition to agroecology

The tool can be used by governments but also farmers, scientists and extension workers

And more specifically

- **Build knowledge and empower producers** through the collective process of producing data and evidence on their own practices;
- **Support agroecological transitions** at different scales and in different locations by proposing a diagnostic of performances over time and by identifying areas of strengths/weaknesses and enabling/disabling environment;
- **Inform policy makers and development institutions** by creating references on the multi- dimensional performance of agroecology and its potential to contribute to the SDGs.

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Process and timeline up to now

March 2018 | Aug 2018 | Oct 2018 | March 2019 | June 2019 | July 2019 | Sept 2019

FAO review of existing frameworks

International experts' workshop

Draft analytical framework circulated and reviewed

Revisions of the analytical framework

Framework and on-line data collection released

Global data base

Consultation community of practice

Technical Working Group

Testing and piloting

Regional workshops

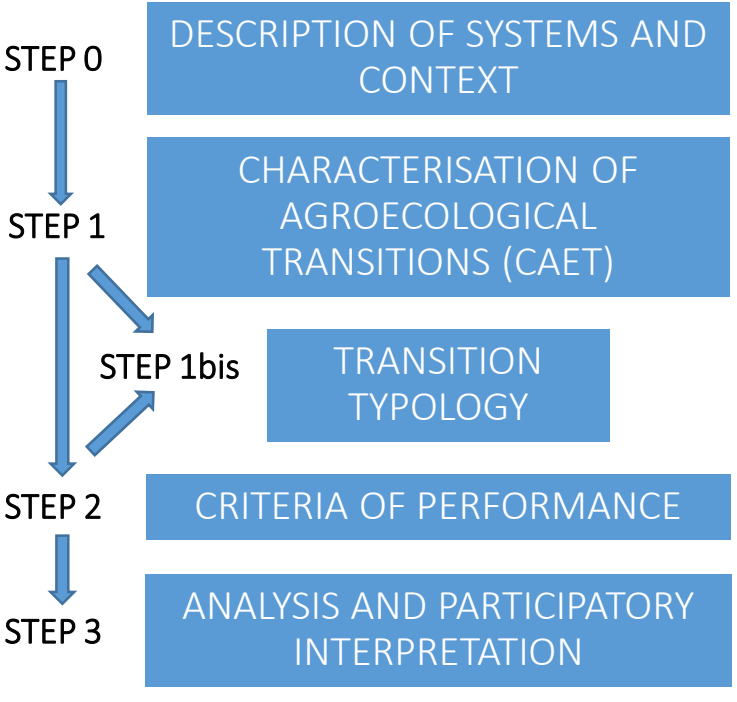
Founding principles agreed upon (1/2)

1. Build on **existing frameworks**, tools, methodologies and data
2. Be **widely applicable**, balancing holistic nature and context specificity
3. Be **theoretically robust but operationally flexible**
4. Measure key data, **minimizing the cost** of data collection
5. Be **tested** by relevant partners for review and validation
6. Be developed and applied in a **participatory manner**
7. Generate evidence at **local, national and global levels.** Results should also be useful at **the territorial level**
8. Collect data that focus on the **farm/household and community/territorial** levels
9. Build a **long-term partnership for data-collection**
10. Draw on and combine **different sources of knowledge**

Founding principles agreed upon (2/2)

11. Address **integrated production systems** (crops-livestock-trees-fish)
12. Include a **limited number of core criteria** based on agreed dimensions
13. Use criteria for the **characterization** of agroecological transition and assess key **performance**
14. Include indicators to show the **contribution of agroecology to the SDGs** to engage policymakers
15. Ensure that the characterization of agroecological systems is **based on the 10 Elements**
16. **Disaggregate data** by age, sex and diversity of producers when possible
17. Simplify the indicators as much as possible and **involve producers in data collection**
18. **Address global challenges and trends**, especially food security and nutrition, climate change adaptation and mitigation, biodiversity, and land degradation
19. **Include key enabling/disabling factors** to the agroecological transition
20. Analyze **trade-offs and synergies** between the 10 Elements and also between SDGs

Framework	Key attributes retained	Differences
MESMIS – Marco para la Evaluacíon de Sistemas de Manejo de recursos naturales incorporando Indicadores de Sostenibilidad (GIRA-UNAM)	Participatory, Step-wise, Hierarchical, Flexible, Starts with contextualization	Indicators can be quantified by different method vs protocol provided in this framework
GTAE – Groupe de Travail sur les Transitions Agroécologiques (CIRAD-IRD-AgroParistech) – Memento pour l'évaluation de l'agroécologie	• Simple and reasonably time consuming • Allows integration in broader systems of M&E • Almost all criteria are common	Initial step of complete agrarian diagnostic not included in this framework Some criteria proposed as advanced
SOCLA – Sociedad Científica Latinoamericana de Agroecología, Method to assess sustainability and resilience in farming	• Soil health assessment used as core criteria • Almost all other criteria common • Participatory and simple	In depth crop health assessment not included in this framework
Sustainable Intensification Assessment Framework (Michigan State University)	• Not focused on particular practices • Addresses different scales (field/animal, farm/household, community/territory) • All 6 domains are common	Some of the criteria/indicators are included as advanced and not core in this framework
LUME - Método de Análise Econômino-Ecológica de Agroecossistemas (AS-PTA & MAELA)	• Based on MESMIS method • Almost all criteria/indicators are common • Valuing the invisible non-monetary economy	Centrality of the principle of autonomy vs one of the aspects to assess in this framework
Measuring the impact of the Zero Budget Natural Farming (State Dept of Ag., Andhra Pradesh & Amrita Bhoomi Center)	• Participatory and possible self-assessment • Large number of common indicators /impact	Method largely left to implementer to define
The Economics of Ecosystems and biodiversity - TEEB (ICRAF)	• Separates 2 steps: description of the system/analysis of impacts • 4 dimensions of impacts are included	Economic assessment so based on 4 capitals, which is not our entry point
Sustainable Rural Livelihoods approach (CIRAD)	• Includes an analysis of the context • Could be adapted for this framework by integrating the 10 elements in the qualification of assets	Not participatory
Participatory methodologies from Malawi and Tanzania (Cornell University)	• Assessing systems in transition • Participatory and based on interviews	Does not prescribe indicators
SAFA - Sustainability Assessment of Food and Agriculture systems (FAO)	• Includes 4 dimensions of sustainability (environment, social, economy and governance), which are 4 of our 5 dimensions • Aims to be universal/global	• Time consuming (21 themes and 58 sub-themes, 118 indicators) • Targets enterprises



Primary and secondary information:
- Production systems, type of household, agroecological zones
- Existing policies (incl. climate change)
- Enabling environment

On farm/household/territory survey:
- Describe current status
- Based on 10 elements of agroecology with descriptive scales
- Can be self assessment by producer

Statistical and/or participatory clustering to reduce sample size if large number of observations in CAET

On farm/household/community survey:
- Measure progress and quantify impact
- Addressing 5 key dimensions for policy makers and SDGs
- Time/cost constraints: keep it simple!

On farm/household/community :
- Review CAET results, explain with context, enabling environment
- Review Performance results and explain with CAET
- Analyze contribution to SDGs

STEP 0 – Description of systems and context

- Type of system assessed, Country , Location (municipality, province), Coordinates of the dwelling (if available), Name of the system assessed
- How many people live in the system assessed? How many work in agricultural production?
- Productive activities
- Total area in production (ha) and destination of agricultural production
- Existence of public policies/laws FAVOURABLE to the agroecological transition
- Existence of public policies/laws UNFAVOURABLE to the agroecological transition

STEP 1: CAET - Diversity

Index	0	1	2	3	4
Crops	Monoculture (or no crops cultivated)	One crop covering more than 80% of cultivated area	Diversified number of crops	Diversified and balanced number of crops adapted to local and changing climatic conditions	High number of crops varieties and species well adapted to local and changing climatic conditions. Spatially diversified farm by multi-, poly- or inter-cropping functional to other productive activities within the agroecosystem
Animals (including aquaculture)	No animals raised within the agroecosystem	One species only or covering more than 80% of the animals in the farm (or good number of species but low in number or not well adapted to local conditions)	Good number of animals of more than one species	Good number of animals of different breeds and species adapted to the local and changing climatic conditions and functional to other productive activities within the agroecosystem	High number of animals of several breeds and species (including domesticated pollinators and aquaculture) well adapted to local and changing climatic conditions and functional to other productive activities within the agroecosystem
Trees (and other perennials)	No trees (nor other perennials) in the agroecosystem	Few trees (and/or other perennials) in the agroecosystem (or good number of trees of one species only)	Good number of trees (and/or other perennials) of more than one species	Good number of trees (and/or other perennials) of different species functional to other productive activities within the agroecosystem	High number of trees (and/or other perennials) of several different species integrated and functional to other productive activites within the agroecosystem
Diversity of activities and products enhancing resilience of rural livelihoods	One productive activity only (e.g. selling one crop only)	Few productive activities linked to a very small number of crops/animals	Diversified number of productive activities linked to more than one crop/animal	Diversified number of productive activities and services linked to a high number of products	Many productive activites linked to different products and services (crops, livestock, trees, selling, exchanging, ecotourism, little industry, etc.). Specific attention to enhance biodiversity.

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STEP 1: CAET - Human and Social values

Index	0	1	2	3	4
Women's empowerment	Women do not normally have voice in decision making, nor in family nor in the community. No organization for women empowerment exists.	Women may have voice in their household but not in the community. Some kind of women associations exist but are not very functional.	Women influence decision making but are not protagonist. Some kind of women associations exist with average functionality.	Women are considered equal to men but still suffer some kind of restriction. Women organizations exist and are useful.	Women are completely empowered, their role respected and their work recognised. Women organizations exist, are functional and respected.
Labour (working conditions and social inequalities)	Agriculture production is capital intensive and managed by agribusiness. Social and economic distance between landowners and employees, that have undecent working conditions, low wages and high exposure to risks.	Working conditions are hard, workers have average wages and may be esposed to risks.	Agricultural production is mostly managed by family farmers. Workers have the minimum decent labour conditions.	Agricultural production managed by family farmers. Workers have decent labour conditions.	Agricultural production is labour intensive and managed by family farmers. Social and economic proximity between farmers and employees. Agroecological techniques generate meaningful and dignified labour conditions with good remuneration.
Youth empowerment and emigration	Young people see no future in agricultural activity and are eager to to emigrate if they had the chance	The majority of young people thinks that agricultural activity is too hard and many would emigrate if they had the chance	Even if working conditions are hard, the majority of young people does not want to emigrate and would like to improve their livelihoods and the living conditions of their community	The majority of young people is satisfied with the agricultural work and does not want to emigrate even if they had the chance	Young people (both boys and girls) see their future in agricultural activities and are eager to continue and improve the activity of their parents. They are included in the decision making and involucrated in the co-creation and sharing of knowledge.
Animal welfare [if applicable]	Animals live a miserable life, suffer stress and are slaughtered without avoiding unnecessary pain	Animals suffer stress and may be prone to diseases	Animals health is generally good but they may suffer some kind of stress	Animals health is generally good	Animals live a healthy life without stress, are treated with dignity, and slaughtered avoiding unnecessary pain

STEP 1: CAET – Other elements

Element of Agroecology	Index
Efficiency	Use of external inputs
	Ecological management of fertility
	Ecological management of pests & diseases
	Productivity (of land and animals)

Element of Agroecology	Index
Recycling	Recycling of biomass and nutrients
	Management of seeds and breeds
	Renewable energy (use & production)
	Water conservation and saving

Element of Agroecology	Index
Culture & food tradition	Appropriate diet and nutrition awareness
	Use of traditional (peasant & indigenous) knowledge and abilities
	Use of local varieties/breeds in production and cooking

STEP 1 CAET : Example of application in Patagonia (1/2)

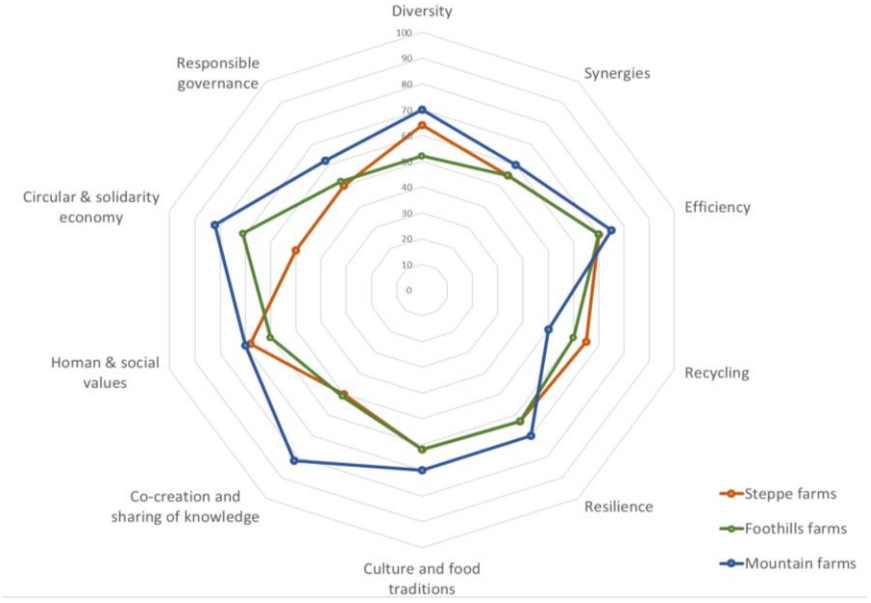
Half a day assessment for one farm

	Evaluated Productive Systems																								
Elements of Agroecology	HC	TA	CE	FA	MM	Va	DH	RC	OG	CC	LL	FL	AH	ND	MV	S/N	SC	AS	BT	LS	SR	T	NP	DM	DC
Recycling	55	65	40	5	50	25	40	50	50	55	75	55	50	30	25	50	60	65	50	60	70	65	65	85	75
Responsible Governance	63	44	63	38	63	81	88	31	63	31	56	63	63	44	50	56	50	50	69	31	56	63	50	56	56
Synergies	40	45	45	50	50	35	40	75	65	75	75	75	60	30	60	65	55	55	55	65	65	70	40	60	55
Diversity	56	69	56	44	44	44	44	75	75	81	75	81	69	81	94	75	63	31	44	56	50	50	56	63	31
Co-creation & sharing of knowledge	58	50	100	67	50	83	100	50	67	50	92	83	100	33	50	33	58	50	50	33	50	67	67	33	42
Resilience	44	38	69	50	69	69	69	63	63	56	88	88	88	81	81	56	50	69	25	50	69	75	38	63	63
Human & social values	58	38	67	46	71	79	63	71	88	75	71	92	46	67	58	67	67	58	58	50	58	46	63	71	71
Culture & food tradition	13	13	88	63	81	63	75	81	69	69	69	69	75	81	56	75	25	63	56	63	56	50	63	81	69
Efficiency	75	55	80	70	90	75	85	70	65	80	50	80	70	75	70	55	65	60	75	65	60	70	65	70	70
Circular & Solidarity Economy	58	58	83	50	83	100	83	75	83	92	83	83	75	83	75	58	50	42	75	75	83	75	42	42	67

Source: Titonell *et al.*, 2019, unpublished

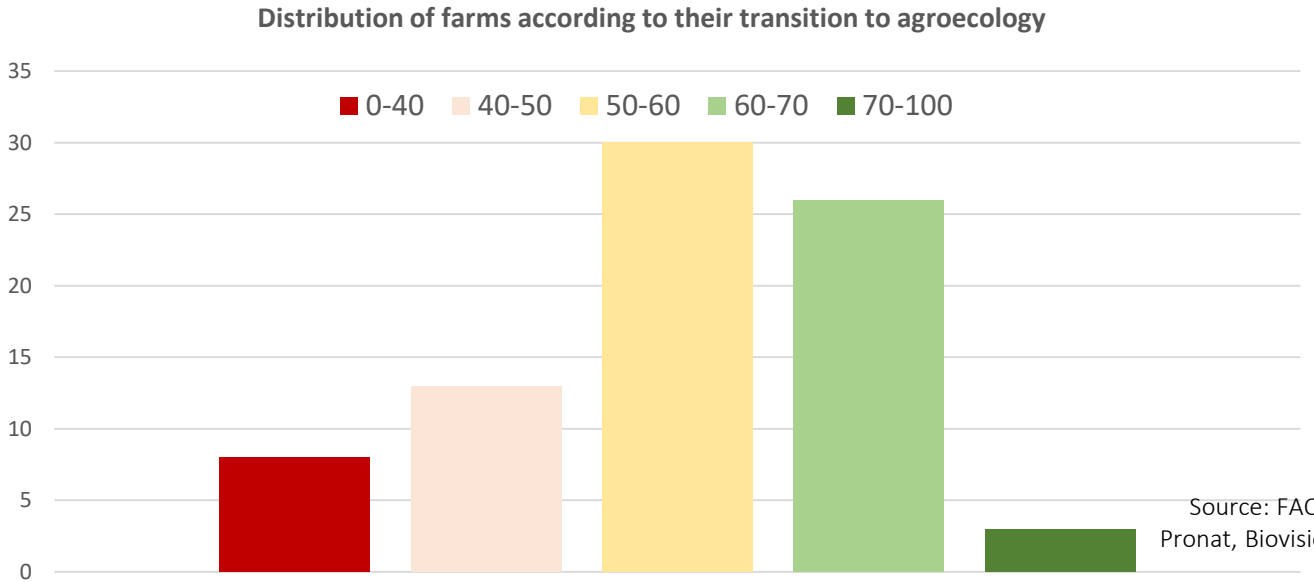
STEP 1 CAET : Example of application in Patagonia (2/2)

Systems classified within 3 types



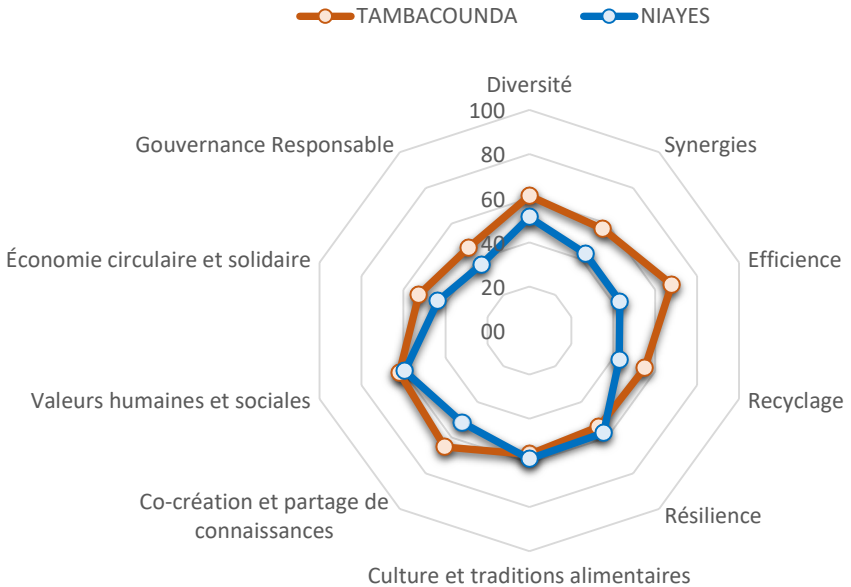
Source: Titonell *et al.*, 2019, unpublished

Test CAET in Senegal



Source: FAO, Enda Pronat, Biovision and FiBL

Test CAET in Senegal



Source: FAO, Enda Pronat, Biovision and FiBL

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STEP 2: Core criteria of performance

Main dimension	#	Core criteria of performance	Proposed method of assessment in survey	SDG	SDG indicators
Governance	1	Secure land tenure (mobility for pastoralists)	Type of tenure over land: property, lease + duration, verbal, not explicit (SDG 1.4.2, 5.a.1 and 2.4.1 sub-indicator 11) Existence and use of pastoral agreements and mobility corridors	1 2 5	1.4.2 2.4.1 5.a.1
Economy	2	Productivity	Farm output value per hectare (SDG 2.4.1 sub-indicator 1) Farm output value per person	2	2.3.1 2.4.1
	3	Income	Outputs - inputs - operating expenses – depreciation + other income (SDG 2.4.1 sub-indicator 2)	1 2 10	1.1.1, 1.2.1 and 1.2.2 2.3.2, 2.4.1 10.2.1
	4	Added value	Net income +rents +taxes +interests – subsidies	10	10.1.1 10.2.1
Health & nutrition	5	Exposure to pesticides	Quantity applied, area, toxicity and existence of risk mitigation equipment and practices	3	3.9.1 3.9.2 3.9.3
	6	Dietary diversity	Minimum Dietary Diversity for Women - FAO & FHI (2016)	2	2.1.1, 2.1.2, 2.2.1, 2.2.2, 2.4.1
Society & Culture	7	Women's empowerment	Abbreviated Women's Empowerment in Agriculture Index, A-WEAI (IFPRI, 2012)	2 5	2.4.1 5.a.1 5.a.2
	8	Youth employment	Access to jobs, training, education or migration (SDG 8.6.1)	8	8.6.1
Environment	9	Agricultural biodiversity	Relative importance of crops varieties, livestock breeds, trees and semi-natural environments on farm (SDG 2.4.1 sub-indicator 8.1, 8.6 and 8.7)	2 15	2.4.1 2.5.1
	10	Soil health	SOCLA agroecological method to assess soil health, based on 10 indicators (Nicholls et al., 2004)	2 15	2.4.1 15.3.1

Analysis of criteria of performance

E.g. Land tenure

• Green (desirable):

Has a formal document with the name of the holder on it
AND has perception of secure access to land
AND has at least one right to sell/bequeath/inherit any of the parcel of the holding;

• Yellow (acceptable):

Has a formal document even if the name of the holder is not on it
OR has no document but his perception of secure land possession is positive
AND has at least one right to sell/bequeath/inherit the land;

• Red (unsustainable):

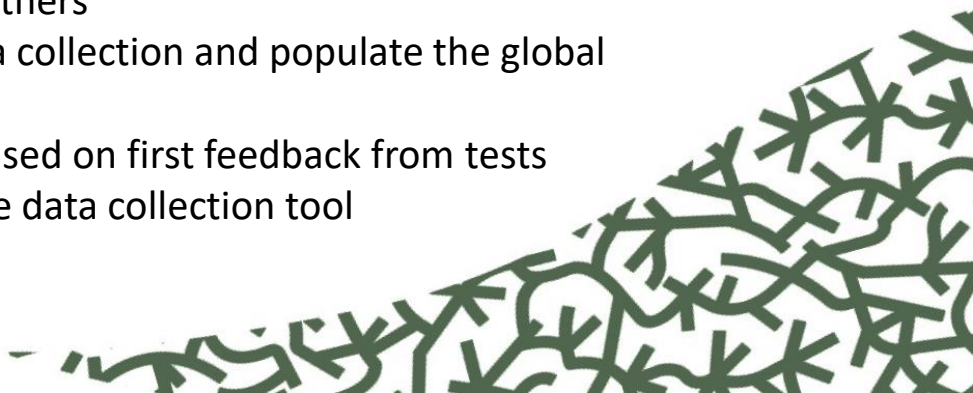
No document possessed
AND no positive perception of secure access to land.

Non exhaustive list of advance criteria

Main dimension	Advanced criteria	Possible methodologies for assessment	SDG
Economy	Resilience	Self-evaluation and Holistic Assessment of climate Resilience of farmers and Pastoralists (SHARP)	1 2 8
Health & nutrition	Food security & nutrition	- Food self-sufficiency ratio: production x100/(production +purchases -sales) - Nutritional value of agricultural production	2 3
Society & Culture	Decent work	Decent Work Indicators for agriculture and rural areas (FAO, 2015)	8
Environment	Water	-Water use efficiency (e.g. LEAP guidelines for livestock) -Water pollution (e.g. LEAP guidelines on nutrient use)	3 6
	Climate change mitigation	-GHG emissions (e.g. Ex-Act, GLEAM-i, Cool Farm tool) -Carbon sequestration (under development for GLEAM) - GTAE Memento pour l'évaluation de l'agroécologie (Levard et al., 2019)	13

Next steps

- Disseminate TAPE to FAO decentralized offices and partners, and provide training
- Test TAPE with FAO decentralized offices (RLC and RAP) and within projects with partners
- Use on-line tool for data collection and populate the global database
- Validate/ revise TAPE based on first feedback from tests
- Publish TAPE and on-line data collection tool



Thank you

Members of the Technical Working Group, in alphabetical order: Rachel Bezner-Kerr (Cornell University), Jean-Luc Chotte (Institut de Recherche pour le Développement), Martín Drago (Friends of the Earth International), Barbara Gemmill-Herren (ICRAF-World Agroforestry Center), Allison Loconto (Harvard University/ Institut National de la Recherche Agronomique), Santiago López-Ridaura (CIMMYT/International Maize and Wheat Improvement Center), Bertrand Mathieu (Agronomes et Vétérinaires Sans Frontières), Delphine Ortega (La Vía Campesina), Paulo Petersen and María Noel Salgado (MAELA- Movimento Agroecológico da América Latina e Caribe), Éric Scopel and Jean-Michel Sourisseau (Centre de Coopération Internationale en Recherche Agronomique pour le Développement)

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Other contributors: Valeria Alvarez, Sofia Hara and Juan de Pascuale Bovi (INTA, Argentina), Betrand Mathieu (AVSF), Laurent Levard (GRET) and Patrice Burger (CARI), France