



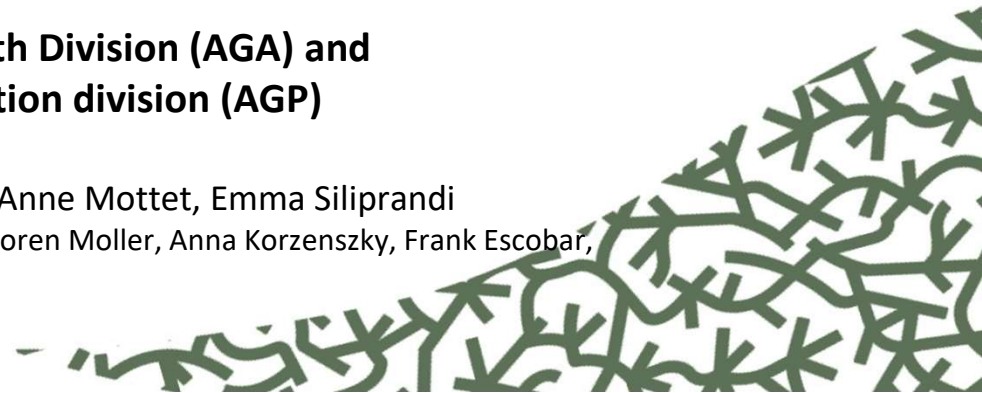
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Cambodia National Workshop on the Application of TAPE: a Tool for Agroecology Performance Evaluation February 5-7, 2020

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

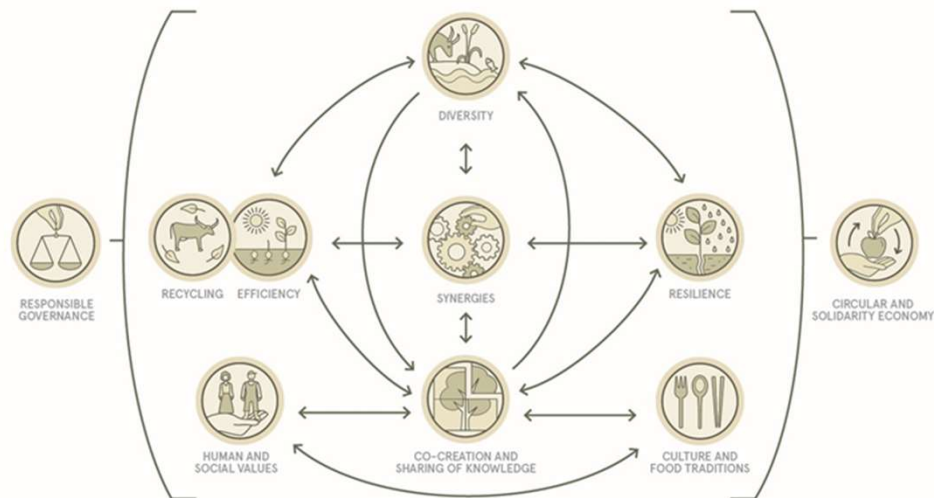
Abram Bicksler, Dario Lucantoni, Anne Mottet, Emma Siliprandi

With contributions from Rémi Cluset, Soren Moller, Anna Korzenszky, Frank Escobar,
Pablo Tiftonell and many others





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





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How do we assess performance in agriculture?



Yield/ha? \$/farm? Kcal/person?
Nitrogen leaching/ha? Number of healthy people?



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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)





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What is the objective of TAPE?

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

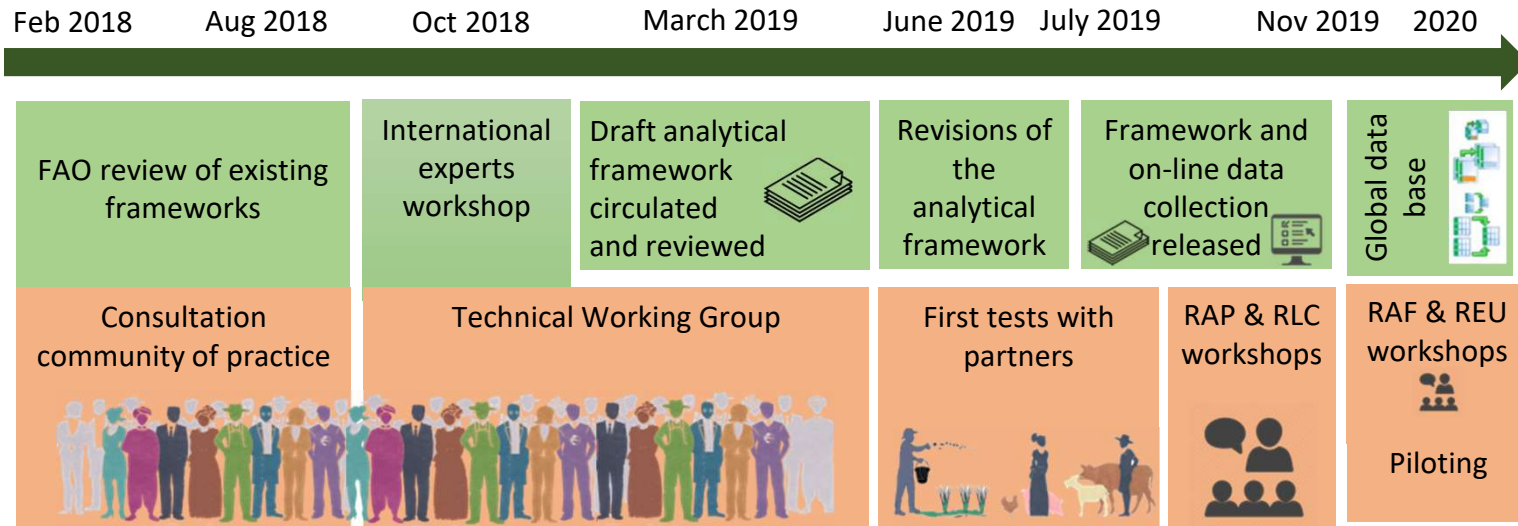


And more specifically

- **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.



Process and Timeline Up Till Now





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)

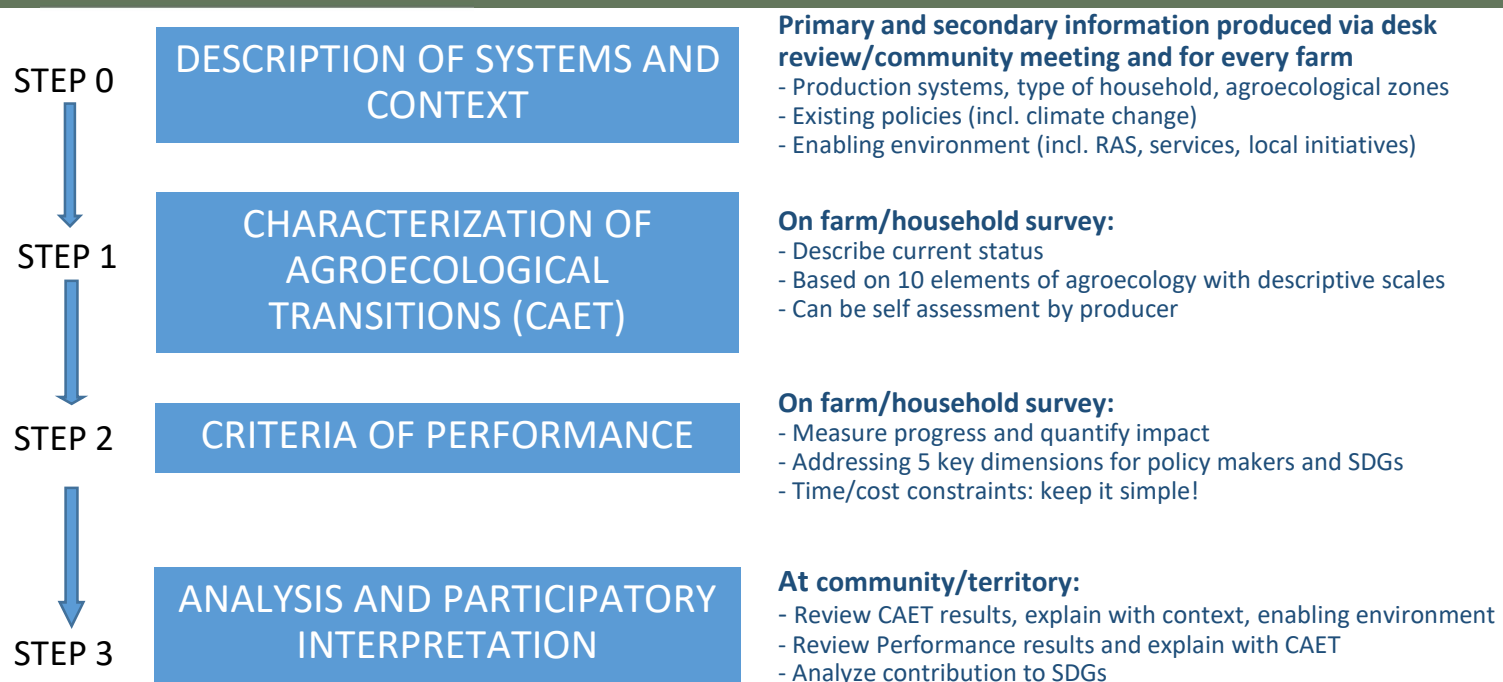
11. Address **integrated production systems** (crops-livestock-trees-fish)
12. Include a **limited number of core criteria** based on agreed dimensions
13. Use criteria for the **characterization** of agroecological transition and assess key **performance**
14. Include indicators to show the **contribution 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 Evaluación 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	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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)	<ul style="list-style-type: none"> • 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 Econômico-Ecológica de Agroecossistemas (AS-PTA & MAELA)	<ul style="list-style-type: none"> • 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)	<ul style="list-style-type: none"> • 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)	<ul style="list-style-type: none"> • 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)	<ul style="list-style-type: none"> • 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)	<ul style="list-style-type: none"> • Assessing systems in transition • Participatory and based on interviews 	Does not prescribe indicators
SAFA - Sustainability Assessment of Food and Agriculture systems (FAO)	<ul style="list-style-type: none"> • Includes 4 dimensions of sustainability (environment, social, economy and governance), which are 4 of our 5 dimensions • Aims to be universal/global 	<ul style="list-style-type: none"> • Time consuming (21 themes and 58 sub-themes, 118 indicators) • Targets enterprises



A Stepwise Approach





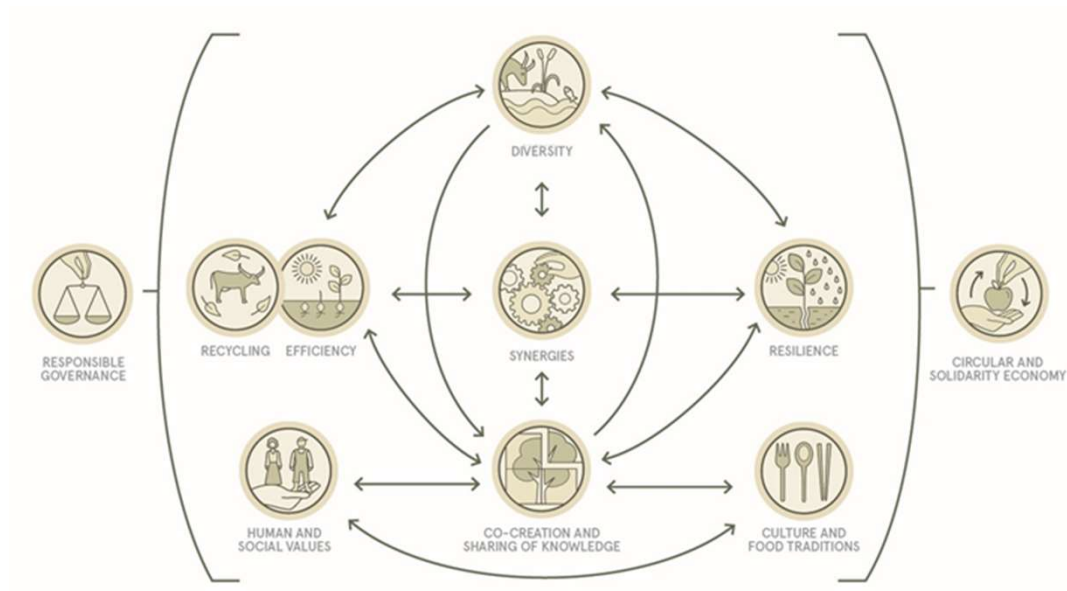
STEP 0 – Description of systems and context (can be a desk review or a community meeting) but should also be conducted for every farm

- Country , Location, Coordinates of the dwelling (if available), Type of production system
- How many people live/work in the system assessed?
- Productive activities, area in production (ha) and destination of agricultural production
- Description of natural context (e.g. type of agroecosystem, climate, elevation...) and environmental challenges (e.g. droughts, floods, pollution...)
- Description of public policy and market context (e.g. national or local regulations on agricultural production and trade, conservation areas, existence of label or mechanisms to recognize/protect the origin of the product, local markets/fairs, participatory guarantee systems, community supported agriculture...)
- Description of actors, groups/networks (e.g. RAS/extension services, cooperatives, knowledge platforms, producers' organization, participatory governance mechanisms ...)



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STEP 1 – CAET base on the 10 Elements of Agroecology





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 activities 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 activities linked to different products and services (crops, livestock, trees, selling, exchanging, ecotourism, little industry, etc.). Specific attention to enhance biodiversity.





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 exposed 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 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)

1-2 hour assessment for one farm

Elements of Agroecology	Evaluated Productive Systems																								
	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

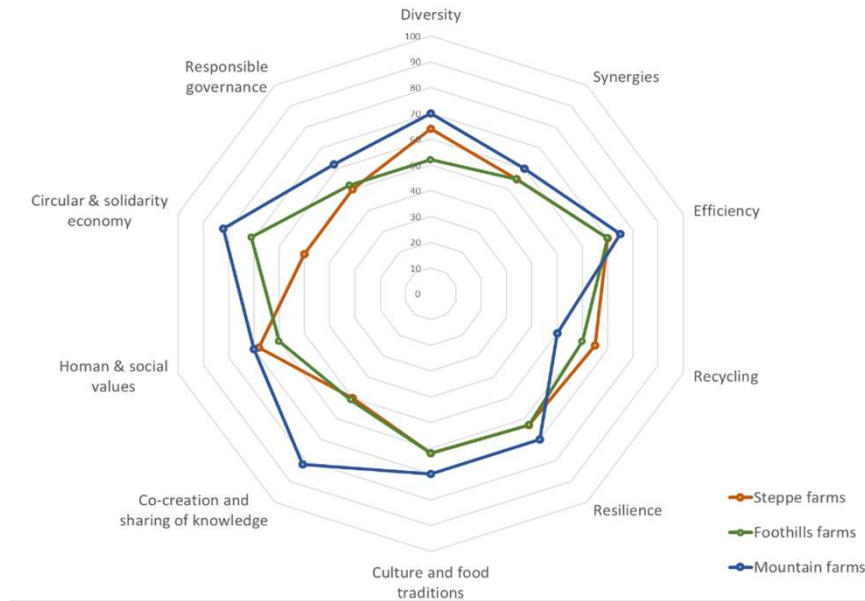
Source: Titonell *et al.*, 2019, unpublished



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

Systems classified within 3 types

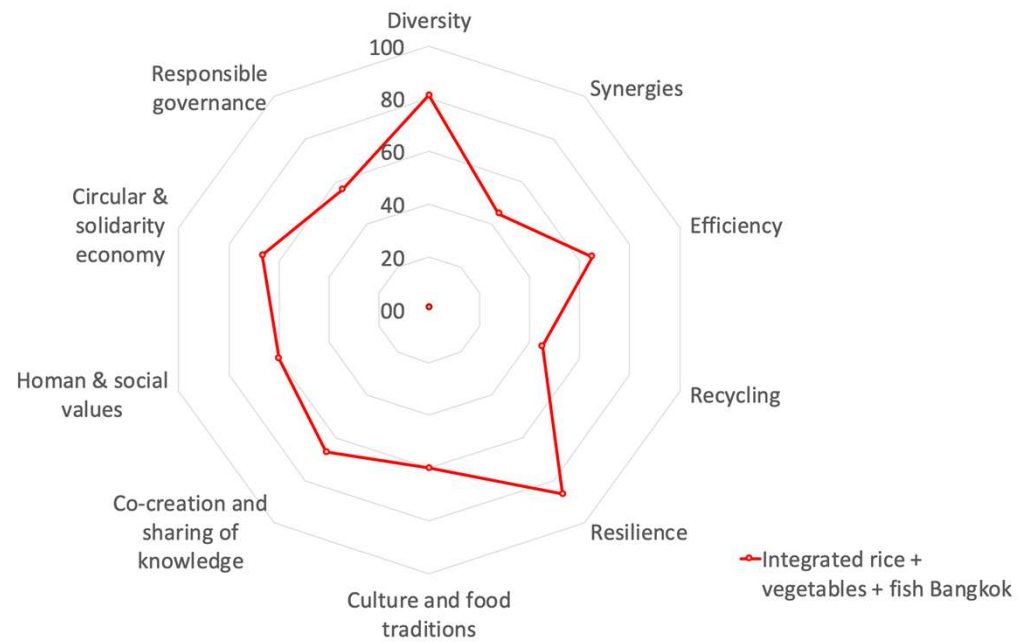


Source: Titonell *et al.*, 2019,
unpublished



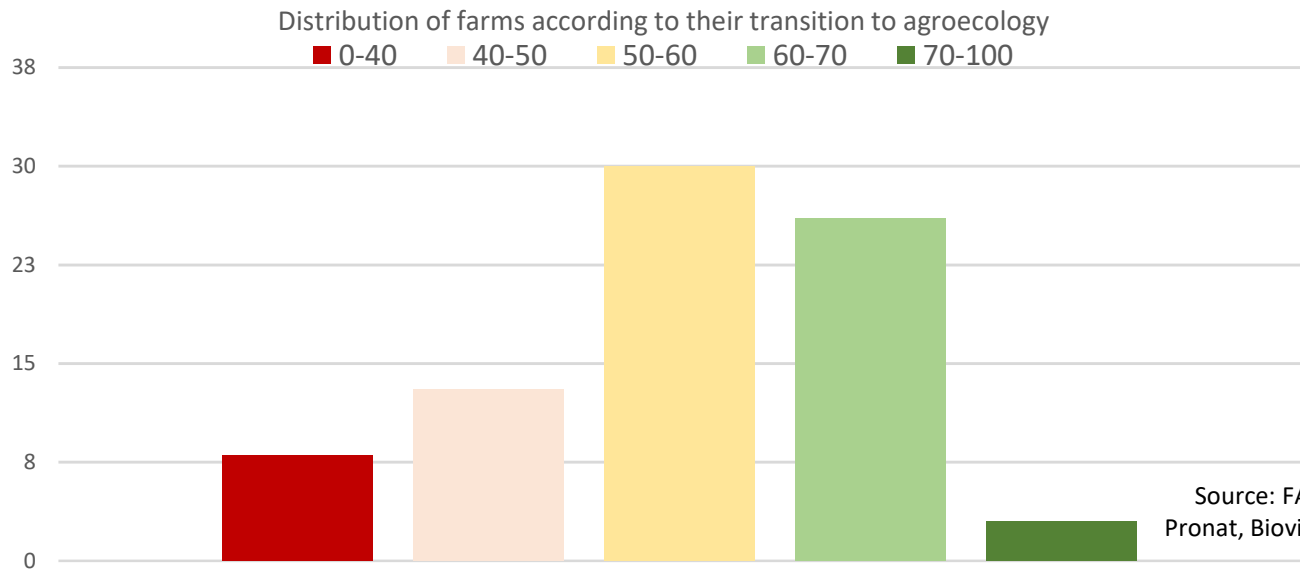
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STEP 1 CAET : Example of application in Thailand





Test CAET in Senegal





STEP 2: Core criteria of performance

Main dimension	#	Core criteria of performance	Proposed method of assessment in survey
Governance	1	Secure land tenure ^[1] (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) ^[1] Existence and use of pastoral agreements and mobility corridors
Economy	2	Productivity	Farm output value per hectare (SDG 2.4.1 sub-indicator 1) ^[1] Farm output value per person
	3	Income	Outputs - inputs - operating expenses – depreciation + other income (SDG 2.4.1 sub-indicator 2)
	4	Added value	Net income +rents +taxes +interest – subsidies
Health & nutrition	5	Exposure to pesticides	Quantity applied, area, toxicity and existence of risk mitigation equipment and practices
	6	Dietary diversity	Minimum Dietary Diversity for Women - FAO & FHI (2016)
Society & Culture	7	Women's empowerment	Abbreviated Women's Empowerment in Agriculture Index, A-WEAI (IFPRI, 2012)
	8	Youth employment	Access to jobs, training, education or migration (SDG 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)
	10	Soil health	SOCLA agroecological method to assess soil health, based on 10 indicators (Nicholls et al., 2004)



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Step 2 – Core Performance Criteria

- *Productivity*
- *Secure land tenure*
- *Income*
- *Added value*
- *Youth employment*
- *Women's empowerment*
- *Dietary diversity*
- *Exposure to pesticides*
- *Agricultural biodiversity*
- *Soil health*

• 10 criteria

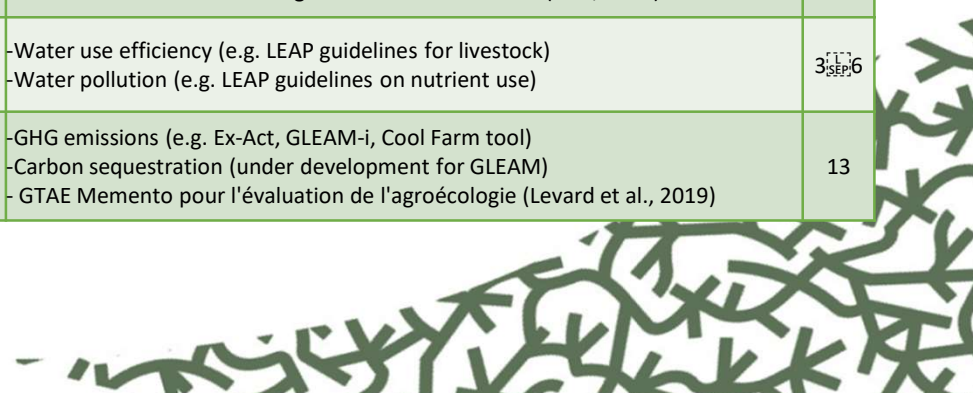
- *Green: desirable*
- *Yellow: acceptable*
- *Red: unsustainable*

• Traffic light
approach



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 ¹ _{SEP} 2 8 ¹ _{SEP} 8
Health & nutrition	Food security & nutrition	- Food self-sufficiency ratio: production x100/(production +purchases -sales) - Nutritional value of agricultural production	2 ¹ _{SEP} 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 ¹ _{SEP} 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





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Step 3: Participatory Validation

- **Bringing the results back to the community/territory to validate their accuracy/precision and representative value**
- Can be in the form of a community meeting, PRA session, etc.
- Designed to link to Step 0- Characterization of context
- Makes key connections between context features (enabling/disabling environment) and analysis of multi-dimensional performance



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Step 3: Participatory Validation

Interpretive Analysis Possibility

Core criteria of performance	Result
Secure land tenure	No document but perception of secure land
Productivity	USD 9,460/ha/year (Thailand 1,678) USD 10,915/FWU/year (Thailand 3204) FWU = 1 Daughter + 0.3 Father
Income	USD 9,567/FWU/year (Thailand ? same agroecosystem ?)
Added value	USD 10,376/FWU/year (Thailand 3204) With paid labor force for paddy
Exposure to pesticides	Pesticides of class II (Moderately) with less than 4 of the listed mitigation techniques
Dietary diversity	Minimum Dietary Diversity for Women = 8
Women's empowerment	A-WAEI 0.849 (but leadership 0.497)
Youth employment	NA
Agricultural biodiversity	Gini-simpson 54.7% 1.2 ha paddy and 0.3 ha fruits + vegetables + fish pond
Soil health	Data not collected



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Piloting

- **RAP:** LoA with Louvain Cooperation in Cambodia (245 farms) and with the CSA organization Shared Harvest in China (40 farms) + Regional TCPf (Vietnam and Lao PDR)
- **RLC:** Establishment of a supervision committee and expression of interest for piloting in Mexico (ECMIA), Bolivia, Argentina (Euroclim +), Nicaragua (INTA, Swissaid, ATC) Colombia (Cooperation project Brazil-Colombia-FAO), Perú (Eclosio, UNALM, IMPAC), Bolivia (Project Yapuchinis), Cuba (MAELA)...
- **REU:** LoA with Schola Campesina for regional WS in Italy (Europe), and Kyrgyzstan (Central Asia)
- **RAF:** pre-testing of CAET with FAO project (FiBL, Biovision, Enda Pronat); pending funding regional WS in Anglophone and Francophone Africa



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Next steps

- Publish TAPE test version guidelines on-line (December 2019)
- Continue with regional workshops (RAF and REU in 2020)
- Continue with identification of piloting opportunities
- Identify funding for TAPE development and piloting (possible interest from BMZ)
- Use and revise the on-line tool (ODK) for data collection and populate the global database
- Revise and validate TAPE in a second international workshop and discuss next steps/advanced analysis (2020)





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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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