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TAPE - Tool for Agroecology Performance Evaluation

Animal Production and Health Division (AGA)
Plant Production and Protection division (AGP)
Strategic Program 2 (SP2)

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Agroecology: what are we talking about?

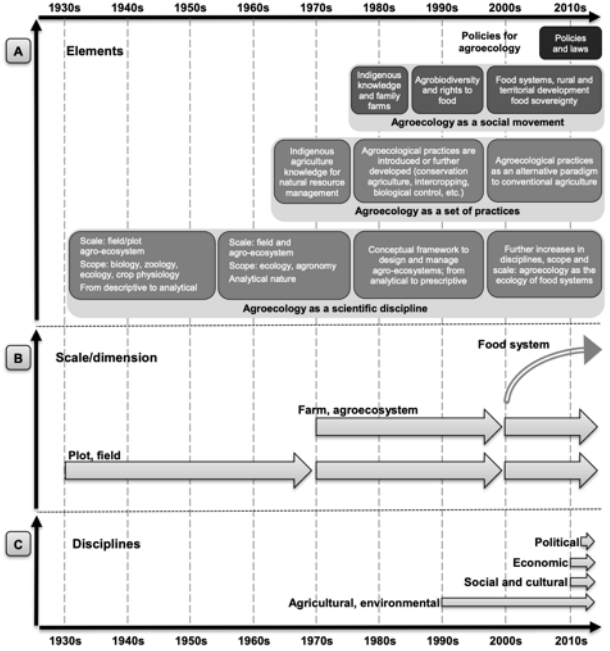
- 30's: agroecology as a science
- 70's: practices to protect environment, by promoting use of ecological theories
- 80-90's: + food sovereignty of local populations (LAC) and social, economic and political sciences, while partly spreading from field to food system
- 00's: + food security and climate

Not an agroecological zoning or a type of production systems

Latest definitions

- Ecology of the entire food system (Francis et al., 2003)
- A science, a movement and a practice (Wezel, 2009)
- Interactions between plants, animals, humans and the environment for food security and nutrition (HLPE, 2016)

Figure 2 Historical evolution of Agroecology



Sources: (A) adapted from Silici (2014), based on Wezel *et al.* (2009) and Wezel and Soldat (2009); (B) adapted from Wezel *et al.* (2009).

FAO: International and Regional Multistakeholder meetings

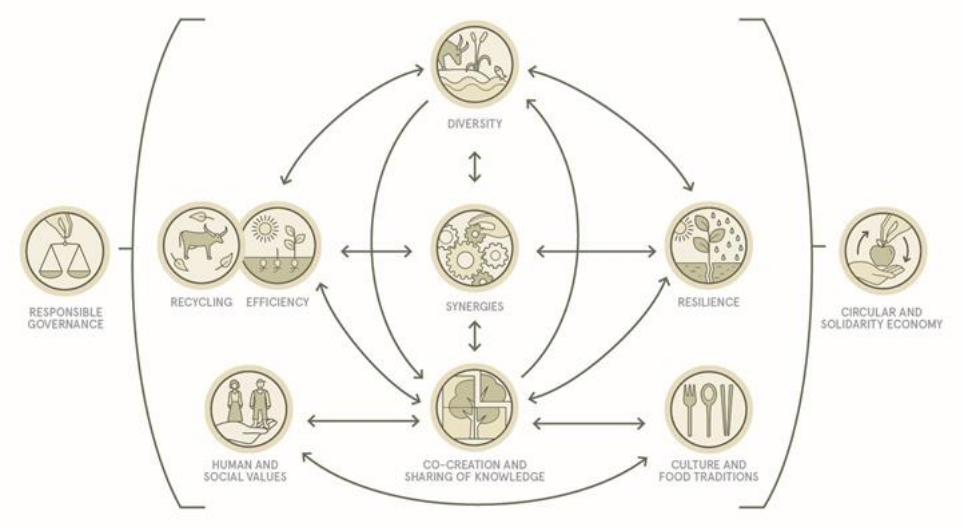
A total of 1350 participants from 162 countries

- 2014 : International Symposium « ***Agroecology for food security and nutrition*** » (Rome)
- 2015-2017 : A series of 7 regional seminars

LATIN AMERICA AND THE CARIBBEAN	SUB-SAHARAN AFRICA	ASIA AND THE PACIFIC	EUROPE AND CENTRAL ASIA	NEAR EAST AND NORTH AFRICA
Brasilia Brazil **June 2015**	Dakar Senegal **October 2015**	Bangkok Thailand **November 2015**	Budapest Hungary **November 2016**	Tunis Tunisia **November 2017**
La Paz Bolivia (Plurinational State of) **September 2016**		Kunming China **August 2016**		

- 2018: 2nd International Symposium « ***Scaling up Agroecology to achieve the SDGs*** » (Rome)

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



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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)

How do we assess performance in agriculture?



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

Nitrogen leaching/ha? Number of healthy people?

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What is the objective of TAPE ?

To produce global and harmonized evidence on the multi-dimensional performance of agroecological systems.

- **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.

TABLE 1 Key attributes retained from a number of existing frameworks reviewed and main differences

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 monitoring and evaluation » Almost all criteria are common	Initial step of complete agrarian diagnostic not included in this framework Some criteria are proposed as advanced as they require more time and resources.
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 ZBNF, the Zero Budget Natural Farming (State Dept of Agriculture, 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 and analysis of the impacts » 4 dimensions of impacts are included (and this framework adds a 5th)	Economic assessment so based on 4 capitals, which is not the entry point in this framework
Sustainable Rural Livelihoods approach (CIRAD)	» Includes an analysis of the context (institutions, household activities...) » 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 the 5 dimensions on this framework » Aims to be universal/global	Time consuming (21 themes and 58 sub-themes, 118 indicators) Targets enterprises (farms or companies)

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Process and timeline up to now

Feb 2018 | Aug 2018 | Oct 2018 | March 2019 | June 2019 | July 2019 | Nov 2019 | 2020

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

First tests with partners

Regional workshops

Piloting

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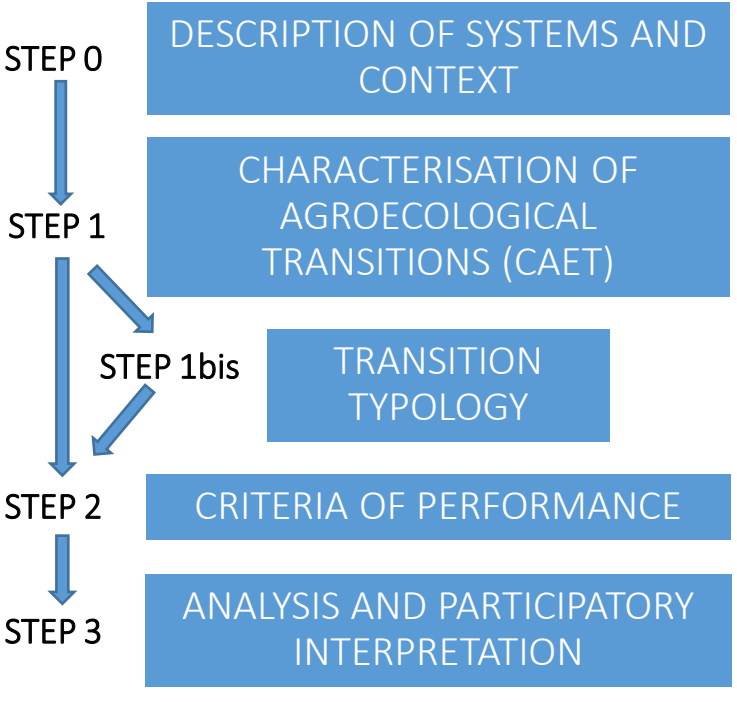
TAPE, step by step



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

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

At territory/community scale:
- Review CAET results, explain with context, enabling environment
- Review Performance results and explain with CAET
- Analyze contribution to SDGs

STEP 1: CAET - Diversity

	Index	0	1	2	3	4
DIVERSITY	**Crops**	Monoculture (or no crops cultivated)	One crop covering more than 80% of cultivated area	Two or three crops	More than 3 crops adapted to local and changing climatic conditions	More than 3 crops and varieties adapted to local conditions. Spatially diversified farm by multi-, poly- or inter-cropping
	Animals (including fish and insects)	No animals raised	One species only	Several species, with few animals	Several species with significant number of animals	High number of species with different breeds well adapted to local and changing climatic conditions
	Trees (and other perennials)	No trees (nor other perennials)	Few trees (and/or other perennials) of one species only	Some trees (and/or other perennials) of more than one species	Significant number of trees (and/or other perennials) of different species	High number of trees (and/or other perennials) of different species integrated within the farm land
	Diversity of activities, products and services	One productive activity only (e.g. selling only one crop)	Two or three productive activities (e.g. selling 2 crops, or one crop and one type of animals)	More than 3 productive activities	More than 3 productive activities and one service (e.g. processing products on the farm, ecotourism, transport of agricultural goods, training etc.)	More than 3 productive activities, and several services

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STEP 1: CAET - Human and Social values

	Index	0	1	2	3	4
HUMAN AND SOCIAL VALUES	**Women's empowerment**	Women do not normally have a voice in decision making, not in the household nor in the community. No organisation for women empowerment exists	Women may have a voice in their household but not in the community. And/or one form of women association exist but is not fully functional	Women can influence decision making, both at household and community level, but are not decision makers. They don't have access to resources. And/or some forms of women associations exist but are not fully functional	Women take fully part in decision making processes but still don't have full access to resources. And/or women organisations exist and are used	Women are completely empowered in terms of decision making and access to resources. And/or women organisations exist, are functional and operational
	Labour (productive conditions, social inequalities)	Agricultural supply chains are integrated and managed by agribusiness. Social and economic distance between landowners and workers. And/or workers don't have decent working conditions, make low wages and are highly exposed to risks	Most of agricultural production is Working conditions are hard, workers have average wages for the local context and may be exposed to risks	Agriculture is mostly based on family farming but producers have limited access to capital and decision-making processes. Workers have the minimum decent labour conditions	Agriculture is mostly based on family farming and producers have access to capital and decision-making processes. Workers have decent labour conditions	Agriculture is based on by family farmers or farmers have full access to capital and decision-making processes. Social and economic proximity between farmers and employees
	Youth empowerment and emigration	Young people see no future in agriculture and are eager to emigrate	Most young people think that agriculture is too hard and many wish to emigrate.	Most young people do not want to emigrate, despite hard working conditions, and wish to improve their livelihoods and living conditions within their community	Most young people (both boys and girls) are satisfied with working conditions and do not want to emigrate	Young people (both boys and girls) see their future in agriculture and are eager to continue and improve the activity of their parents
	Animal welfare [if applicable]	Animals suffer periodically/seasonally from hunger and thirst, stress or diseases, and are slaughtered without avoiding unnecessary pain	Animals suffer periodically/seasonally from hunger and thirst, stress or diseases, and are slaughtered without avoiding unnecessary pain	Animals do not suffer from hunger or thirst, but suffer from stress, may be prone to diseases and can suffer from pain at slaughter	Animals do not suffer from hunger, thirst or diseases but can experience stress, especially at slaughter	Animals do not suffer from stress, hunger, thirst, pain, or diseases, and are slaughtered in a way to avoid 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

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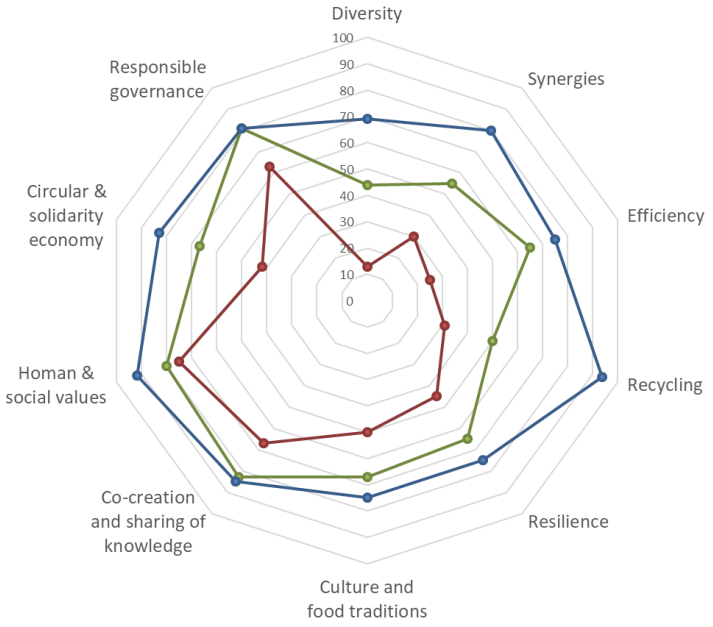
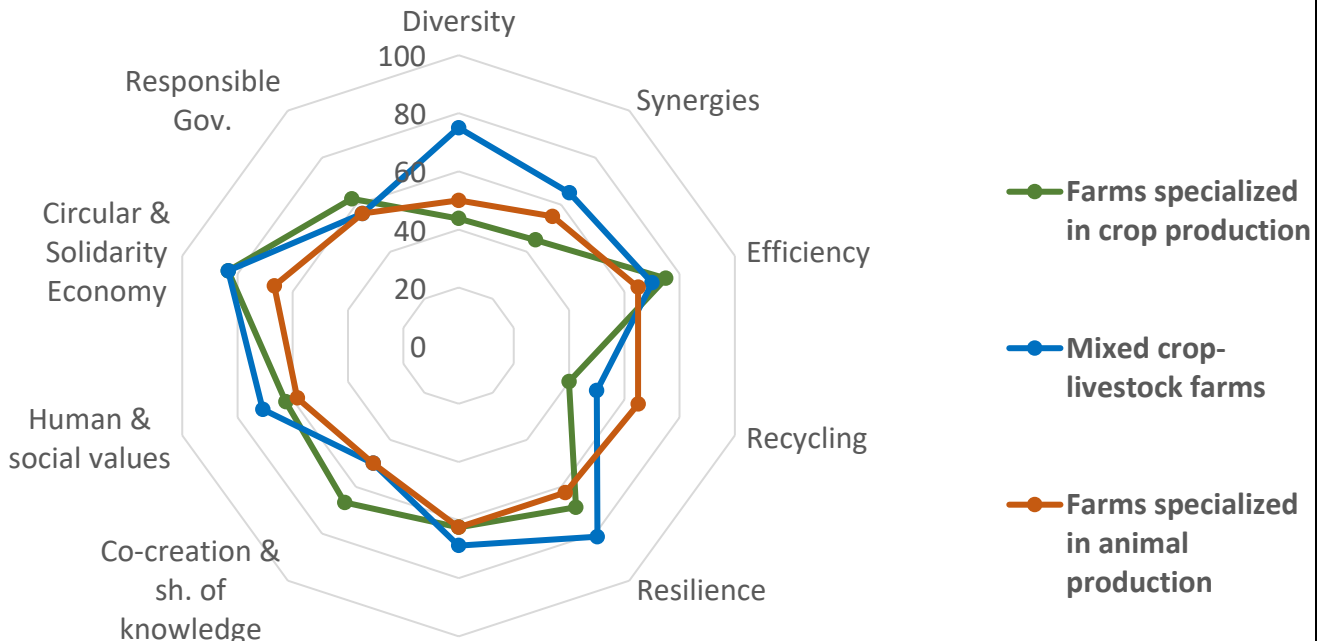
Step 1 CAET – results of 3 farms in Cuba



1) Conventional farm (tobacco monoculture) (CAET=44%)
2) Farm in transition to agroecology (CAET=66%)
3) Diversified agroecological farm (CAET=81%)

Lucantoni, 2020

STEP 1bis : transition typology for type of farms in Argentina



Álvarez et al. 2019

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STEP 2: Core criteria of performance

Main dimension	#	Core criteria of performance	Proposed method of assessment in survey
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
Economy	2	Productivity	Gross output value per hectare (SDG 2.4.1 sub-indicator 1) Gross output value per person
	3	Income	Income from crops +animals +other activities +subsidies –inputs –operating expenses –depreciation –taxes –interests (SDG 2.4.1 sub-indicator 2)
	4	Added value	Gross output value –depreciation –expenditures for inputs
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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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 Access to market	- Decent Work Indicators for agriculture and rural areas (FAO, 2015) - Territorial Markets (ESN)	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

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STEP 1 and 2 : Example from 2 farms in Cambodia

STEP 1 CAET

STEP 2: Criteria of Performance

Core criteria of performance	Takeo farm	Kampong Chhnang farm
Secure land tenure	Formal document of possession of land	Formal document of possession of land
Productivity	N/A	N/A
Income	12.223 USD	0 USD
Added value	12.330 USD	-1.000 USD
Exposure to pesticides		
Dietary diversity	9/10	5/10
Women's empowerment	93.9%	55.7%
Youth employment	N/A	N/A
Agricultural biodiversity	42%	33%
Soil health	3.2	3.5

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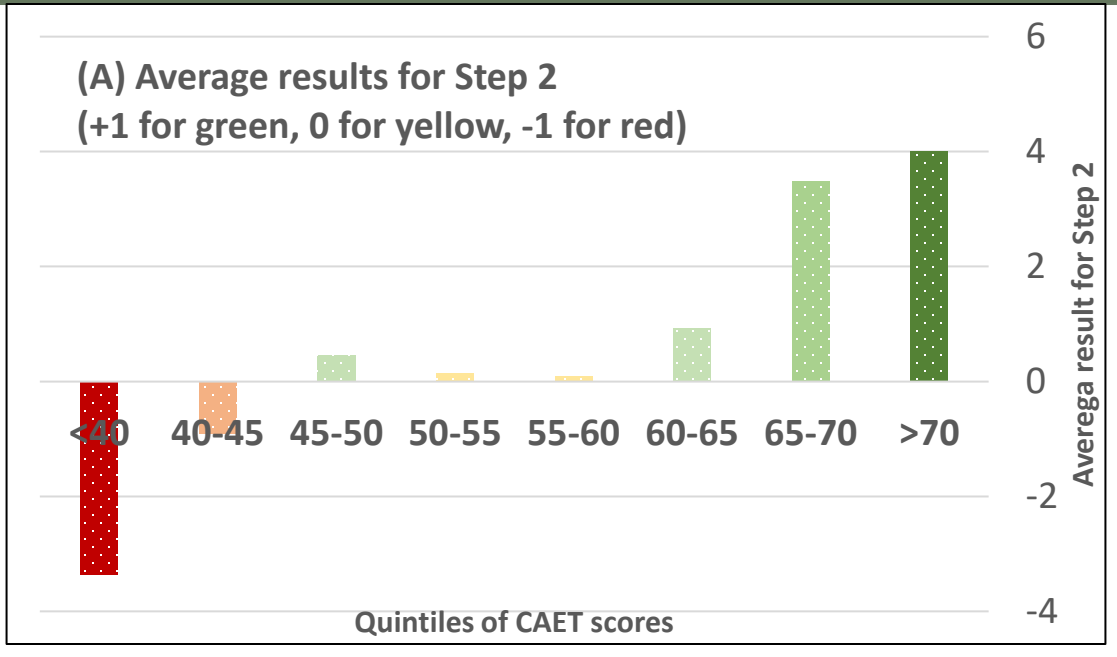
STEP 2 : aggregated results from 228 farms in Cambodia



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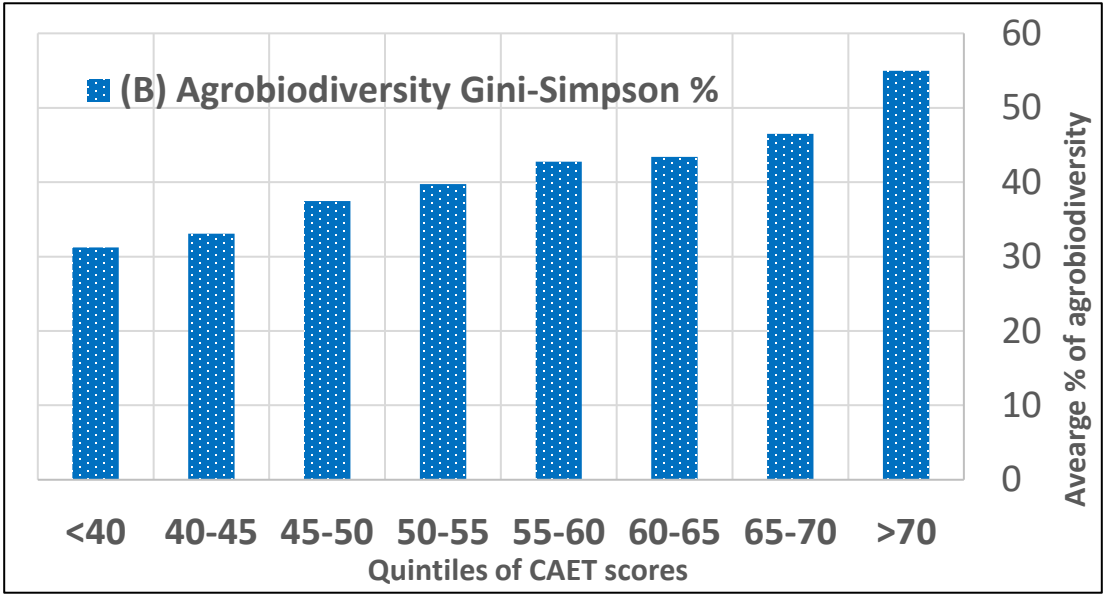

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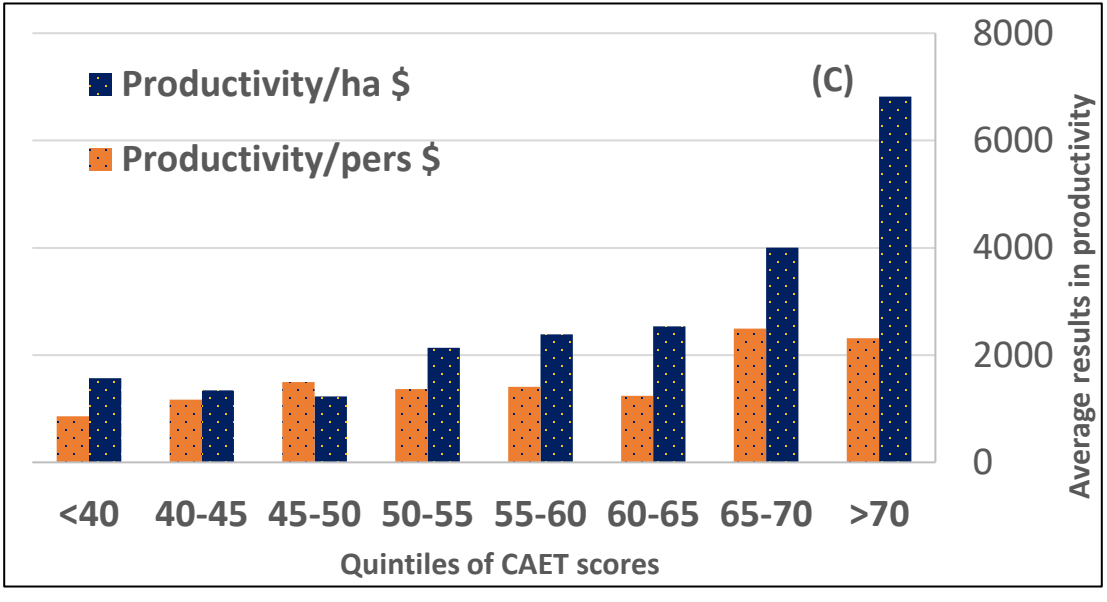

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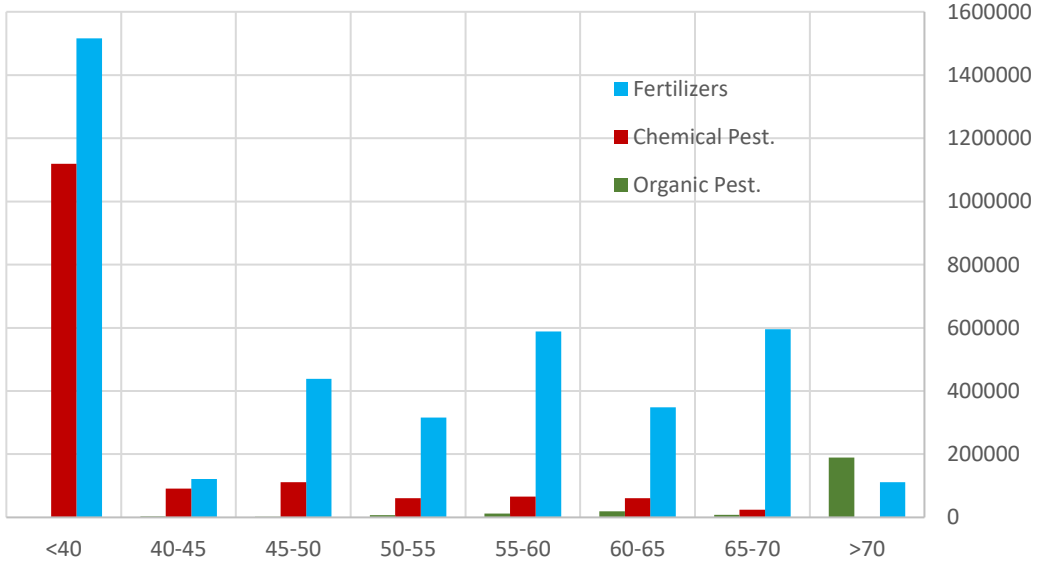
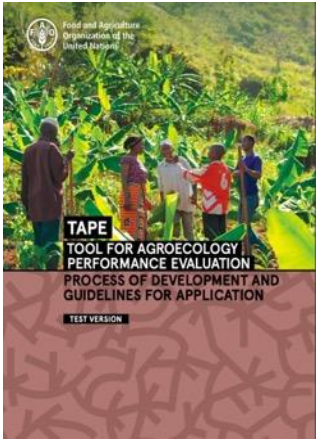


Achievements to date

- 2 regional workshops (RAP and RLC), 2 pilot LoAs (China and Cambodia), 1 regional pilot TCP (Laos and Viet Nam), 2 pilot candidates RLC, 2 in Caribbean
- Pilot with GEF project in Mali as a tool for baseline establishment
- Preliminary and partial test in Senegal
- General interest in collaborating from > 30 academia and civil society organizations
- Interest in funding 1 regional workshop in RAF



http://www.fao.org/3/ca7407en/ca7407en.pdf

On-line tool for data collection

- Using Open Data Kit (Kobo Toolbox)
- Works also offline
- Secured on UN server
- Available on Android mobile devices and all others via URL
- 3 languages: EN, FR, SP

https://ee.humanitarianresponse.info/x/#mEov3aos

Next steps

- Organize regional RAF and REU workshops
- Continue filling the global database from pilots and providing assistance/data harmonization and simple analysis for territories
- Refine global database and ensure validity
- Look for analysis tools that work with ODK/KoBo
- Continue evaluating the potential of TAPE for monitoring and evaluation of projects (IFAD, GEF and DPI – on going discussions)
- Continue engaging technical partners and identifying financial partners for pilots
- Continue strengthening the place of livestock in FAO's work on agroecology, including through TAPE pilots
- Validate TAPE (end of 2020?)
- Begin thinking about advanced analysis (CAS, multi-dimensionality, visualization, GIS, etc.)

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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