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Les initiatives de la FAO : de la mise à l'agenda à l'évaluation multidimensionnelle de l'agroécologie
TAPE - Tool for Agroecology Performance Evaluation

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

Abram Bicksler, Fabrizia De Rosa, Dario Lucantoni and Anne Mottet

Colloque INRA de restitution de la Prospective interdisciplinaire pour l'agroécologie

Food and Agriculture Organization of the United Nations

International Symposia 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)

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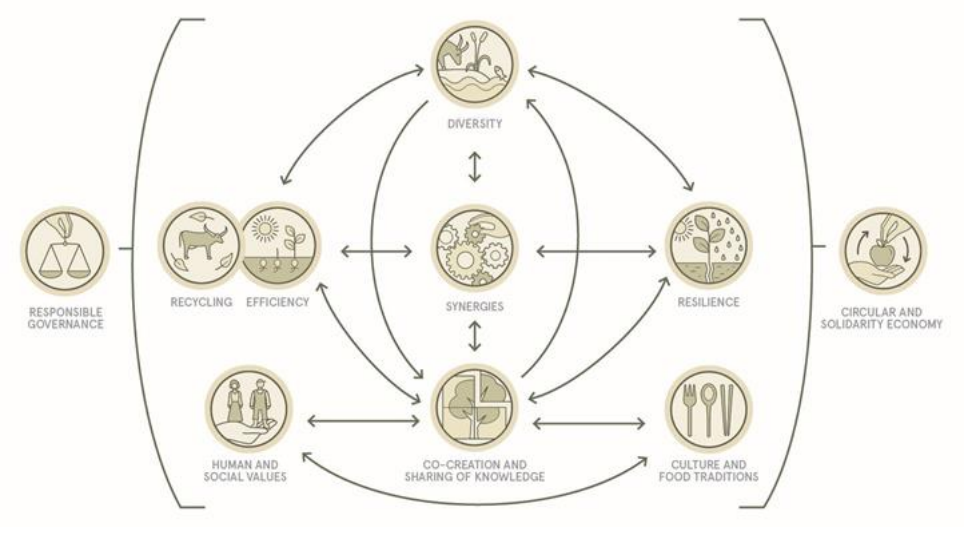
The 10 Elements of Agroecology:
Guiding Transition To Sustainable Food and Agricultural Systems



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)

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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.

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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

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

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	» 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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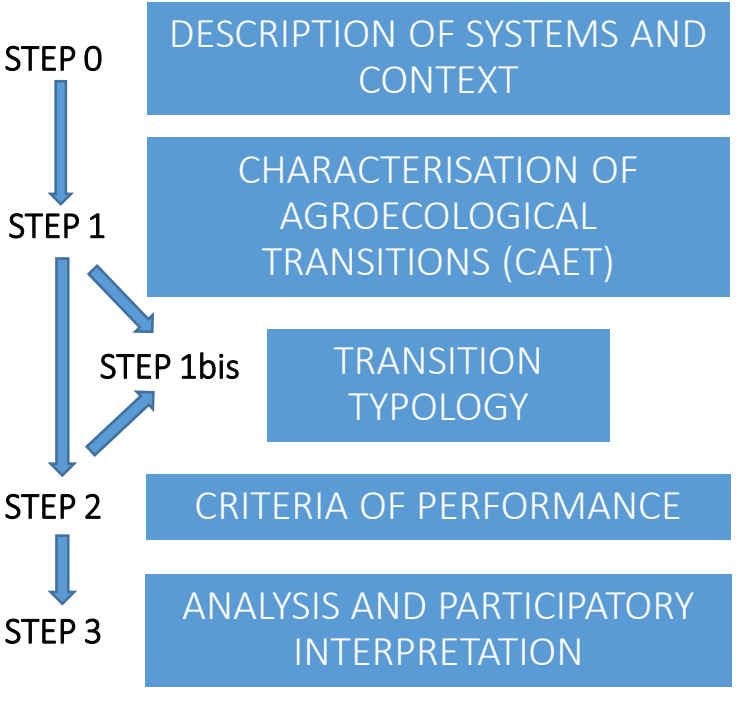
TAPE, step by step



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 0 – Description of system and context

- 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. extension services, cooperatives, knowledge platforms, producers' organization, participatory governance mechanisms …)

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

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

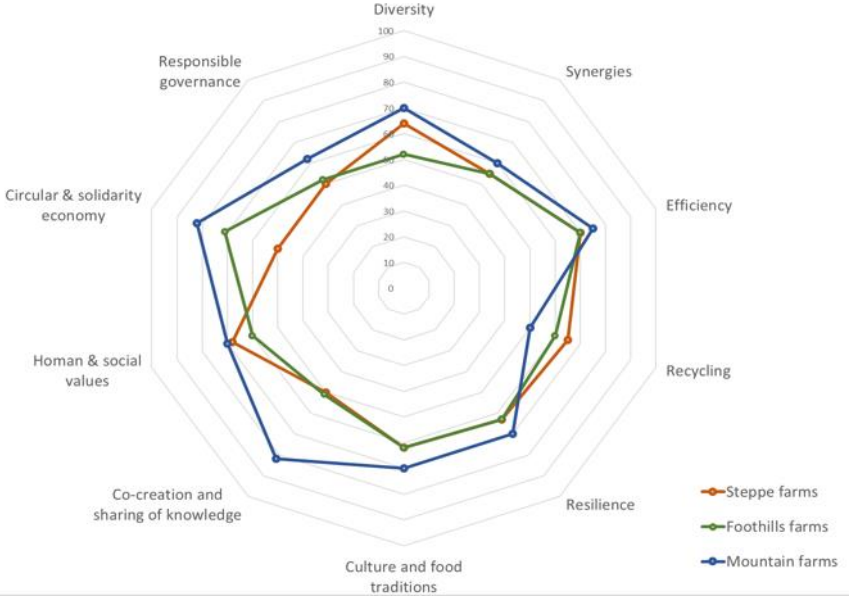
Half a day assessment for one farm

	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

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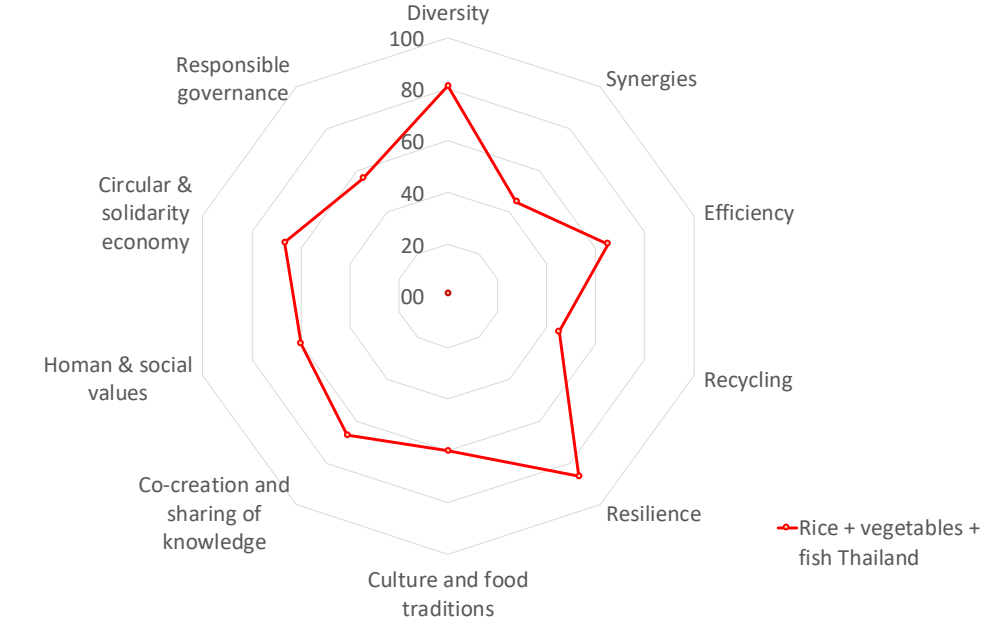
Test CAET in Thailand



Step 2 – Core Performance Criteria

10 criteria

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

Traffic light approach

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

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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	Farm output value per hectare (SDG 2.4.1 sub-indicator 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 +interests – 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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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

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Test Step 2 – Thailand

Core criteria of performance	Results
Secure land tenure	No document but perception of secure land
Productivity	USD 9,460/ha/year (Average Thailand 1,678) USD 10,915/FWU/year (Average Thailand 3204) FWU = 1 Daughter + 0.3 Father
Income	USD 9,567/FWU/year (Average Thailand ? same agroecosystem ?)
Added value	USD 10,376/FWU/year (Thailand 3204) Paid labor 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 Woman = 8
Women's empowerment	A-WAEI 0.849 (but leadership component 0.497)
Youth employment	No young people in the household
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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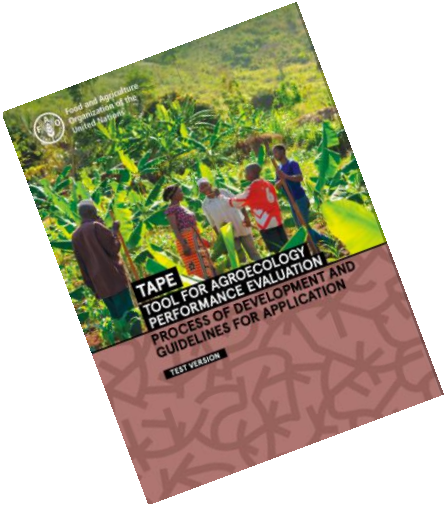
Dataset (Excel)

	A	B	C	D	E	F	G	H	I	J	K	
1	Timestamp	Email address	Name of the inquirer	Name of the system assessed	Type of system assessed	Country	Location	Name of the producers	Number of MEN living in the system	Number of WOMEN living in the system	Crops	nals
2	9/24/2019 13:15:41	rong.fu@fao.org	FU Rong	Shared Harvest Farm	Household/farm	China	Beijing		20	20	itions. Spatially diversified	ngin
3	9/25/2019 7:37:46	sreanpao@gmail.com	Pao Srean	Rainfed upland of Battambang	Household/farm	Cambodia	Battambang		2	2	overing more than 80% of	imal
4	9/24/2019 13:19:34	outthavong@nuol.edu.	Saykham Bouthavong	Thongsy	Household/farm	Laos	Xiengkhouang Province		3	3	itions. Spatially diversified	ngin
5	9/25/2019 4:03:23	mod@swissaidindia.(	Pramod	Ram	Household/farm	India	Gariabandh		2	2	2 - Small number of crops	imal
6	9/25/2019 4:11:26	tendra.jaiswal@fao.or	Jitendra Jaiswal	Dry Zone Farming System	Household/farm	Myanmar	Nyaung-U Township			3 - Diversified number of crops	adapted to local and	ecie
7	9/25/2019 4:17:03	agrnrw@ku.ac.th	Naroon	Corn-based	Household/farm	Thailand	Wang Num Kieow		3	3	overing more than 80% of	imal
8	9/25/2019 4:18:31	nangan_s@hotmail.co	Apinun Suvarnaraksha	Mae Chaem	Household/farm	Thailand	Chiang Mai		2	2	overing more than 80% of	imal
9	9/25/2019 7:37:57	laotheanh@gmail.com	Dao	Coffee farm	Household/farm	Vietnam	Dac lac		3	2	2 - Small number of crops	ecie
10	9/25/2019 4:32:30	namvongs@gmail.com	S.Namvong	Keoset	Community/territory	Laos	Xiengkhouang		40	45	2 - Small number of crops	ngin
11	9/25/2019 4:37:21	wrauf2010@yahoo.co	abdul wahid	Rice farmin in irigated area	Household/farm	Indonesia			3		2 - Small number of crops	ecie
12	9/25/2019 4:42:50	keovichith@gmail.com	Chintanaphone	Thongmang organic farm	Household/farm	Laos	Vientiane capital		20	30	ops adapted to local and	ecie
13	9/25/2019 4:44:39	adakong@yahoo.com	Rada	Rattanak Mundol farmer05	Household/farm	Cambodia	ttanak Mundol, Battambang		2	3	2 - Small number of crops	imal
14	9/25/2019 7:28:17	ong.napha@gmail.co	Hong	Nathong farm	Household/farm	Laos	Vientiane		1	2	ops adapted to local and	ngin
15	9/25/2019 6:53:32	rong.fu@fao.org	Fu Rong	Shared Harvest Farm	Household/farm	China	Beijing		20	20	itions. Spatially diversified	ngin
16	9/25/2019 7:05:42	geng.herianto@fao.or	Ageng Herianto	Organic rice	Household/farm	Indonesia	Sanggau		2	3	overing more than 80% of	imal
17	9/25/2019 7:05:56	ckieffer@agrisud.org	Claire	Ms Bom								
18	9/25/2019 7:07:28	agrnrw@ku.ac.th	Nr	Corn-based	Household/farm	Thailand	Wang Num Kieow		3	2		
19	9/25/2019 8:55:03	outthavong@nuol.edu.	Saykham Bouthavong	Thongsy	Household/farm	Laos	Xiengkhouang Province		3	3		
20	9/25/2019 7:35:29	mod@swissaidindia.(	Pramod	Ram	Household/farm	India	Garibandh		2	2		
21	9/25/2019 7:59:03	namvongs@gmail.com	S.Namvong	Keoset	Community/territory	Laos						
22	9/25/2019 9:19:20	keovichith@gmail.com	chintanaphone	Thongmang organic farm	Household/farm	Laos	Vientiane capital		20	30		
23	9/25/2019 11:18:36	adakong@yahoo.com	Rada	Rattanak Mundol Farmer 05	Household/farm	Cambodia	ttanak Mundol, Battambang		2	3		
24	9/25/2019 11:46:12	wrauf2010@yahoo.co	wahid		Household/farm		Soppeng, south sulawesi		10	9		
25	9/27/2019 3:41:54	adakong@yahoo.com	Rada	Integrated Farming, Manee	Household/farm	Cambodia	uri district, Pathum Thani province		0	1	itions. Spatially diversified	imal
26	9/29/2019 19:46:19	adakong@yahoo.com	rada	grated Farming, Ms Manee Supe	Household/farm	Thailand	uri district, Pathum Thani Province		0	1		
27	################	rank.escobar@fao.org	Frank Escobar	Private Household	Household/farm	Vincent and the Grena	Vermont	Kenroy Balcombe	2	1	2 - Small number of crops	ecie
28	10/13/2019 1:49:50	rank.escobar@fao.org	Frank Escobar	Alfred Y.	Household/farm	Vincent and the Grena	Langley Park	Alfred Yecawodd	1	1	2 - Small number of crops	0
29	################	rank.escobar@fao.org	Frank Escobar	The Watson's	Household/farm	Vincent and the Grena	Vermont	Stephen Watson	1	1	2 - Small number of crops	imal
30	################	rank.escobar@fao.org	Frank Escobar	JH	Household/farm	Vincent and the Grena	Mesopotamia	Josephine Haz	1	2	ops adapted to local and	cl 0
31	################	rank.escobar@fao.org	Frank Escobar	LJ farm	Household/farm	Vincent and the Grena	Vermont	Latisha Jones	1	2	ops adapted to local and	imal
32	10/14/2019 0:59:16	rank.escobar@fao.org	Frank Escobar	Patricia B	Household/farm	Vincent and the Grena	Mesopotamia	Patricia Browne		1	2 - Small number of crops	imal
33	10/14/2019 2:58:19	rank.escobar@fao.org	Frank Escobar	Vesta N	Household/farm	Vincent and the Grena	Vermont	Vesta Nila		3	ops adapted to local and	ecie
34	10/14/2019 4:53:08	ltkien@cendiglobal.or	Kien Dang	Vườn HEPA An Linh Sơn	Household/farm	Vietnam	Quảng Bình	Trần Văn Dũng	2	3	itions. Spatially diversified	ecie
35	10/14/2019 7:11:25	rank.escobar@fao.org	Frank Escobar	Glendelin H	Household/farm	Vincent and the Grena	Mesopotamia	Glendelin H.	2	1	2 - Small number of crops	imal

Piloting

- **RAP**: LoA with Louvain Cooperation in Cambodia (50 farms) and with the CSA organization Shared Harvest in China (40 farms) + proposal of 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**: possible LoA with Schola Campesina for Italy, Georgia and Kyrgyzstan and discussion with BMZ (Germany) for funding and EU project UNISECO
- **RAF**: pre-testing of CAET with FAO project (FiBL, Biovision, Enda Pronat)



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

On-line tool for data collection

https://enketo.ona.io/x/#13escnmL

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 for data collection and populate the global database
- Revise and validate TAPE in a second international workshop (June 2020)

Thank you

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