



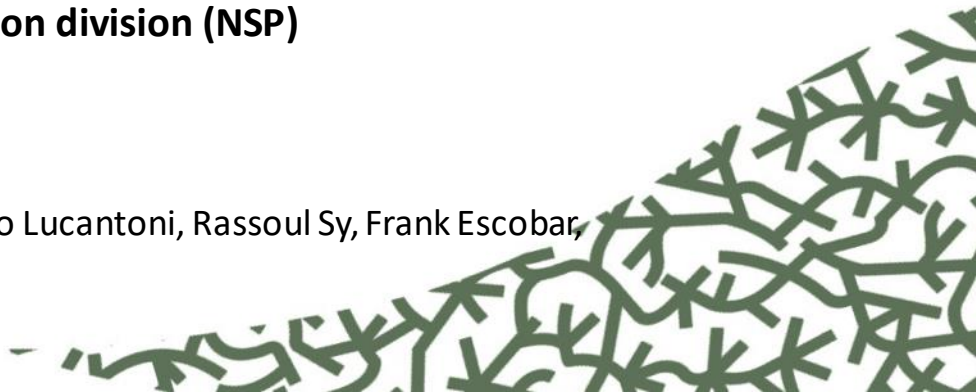
Food and Agriculture Organization  
of the United Nations

# Using agroecology to measure sustainability in agriculture

## *TAPE – the Tool for Agroecology Performance Evaluation*

**Animal Production and Health Division (NSA)**  
**Plant Production and Protection division (NSP)**  
**Strategic Program 2 (SP2)**

Anne Mottet, Abram Bicksler, Dario Lucantoni, Rassoul Sy, Frank Escobar,  
Jimena Gómez and others





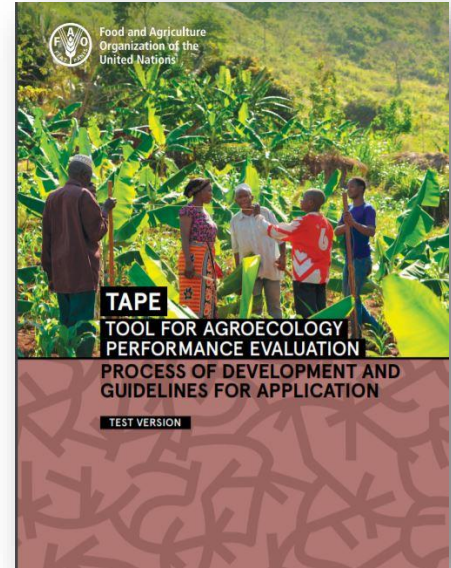
# Overview

TAPE is a **comprehensive tool** based on various existing assessment frameworks, the was developed by FAO and partners to respond to a mandate received by member nations.

TAPE uses agroecology for **measuring the performance** of any kind of agricultural system **across the different dimensions of sustainability** (social, economic, environmental, health, and governance).

It collects data at **farm level** but can provide information and results at community and **territorial level**.

The tool was designed to remain **simple** and to require **minimum training** and data collection.





# A large and global consultative process

- A 3-day international workshop with 70+ experts and practitioners from 25+ countries
- An on-line consultation to review and prioritize about 70 indicators
- A working group of 16 scientists and representative of civil society as authors of TAPE
- An on-going piloting phase in more than 25 countries in various contexts

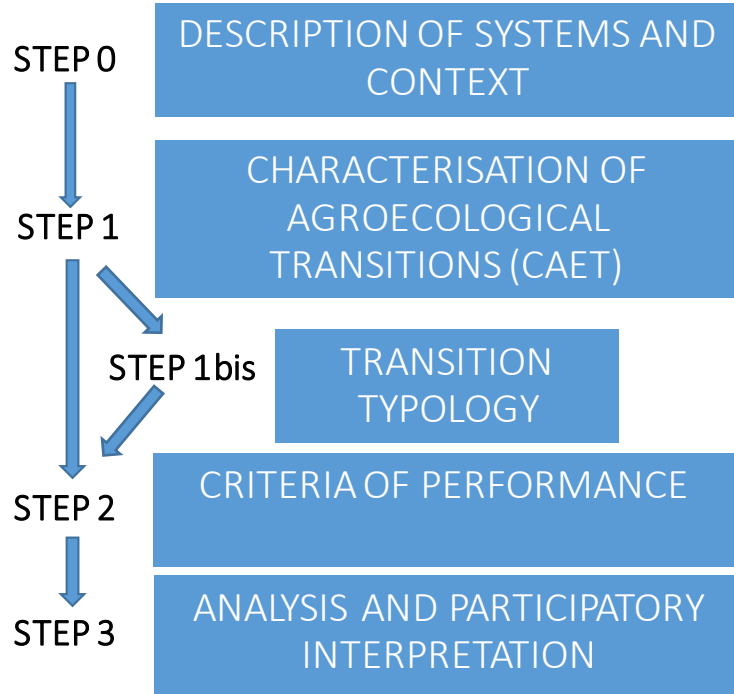


# Results of the consultation

- 5 dimensions of sustainability to be addressed: social, economic, environmental, health, and governance
- 20 founding principles addressing:
  - a) Processes: building on existing frameworks and datasets; using approaches for both sector-specific and integrated production systems; testing the tool with partners involving producers;
  - b) Scope of the tool: globally applicable; producing evidence at various scales, using the farm/household as assessment unit but collecting information and being relevant at the community/territory level;
  - c) Relevance of the evidence produced: linking closely with the SDGs; informing global sustainability challenges; and
  - d) Characteristics of the tool and methodological choices: simplicity, requiring minimum data collection, but extendable; scientifically robust but operationally flexible; characterizing agroecological transitions using the 10 Elements of Agroecology (FAO, 2018a) and evaluating the performance of the systems using objective indicators.



# TAPE stepwise approach



## 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:

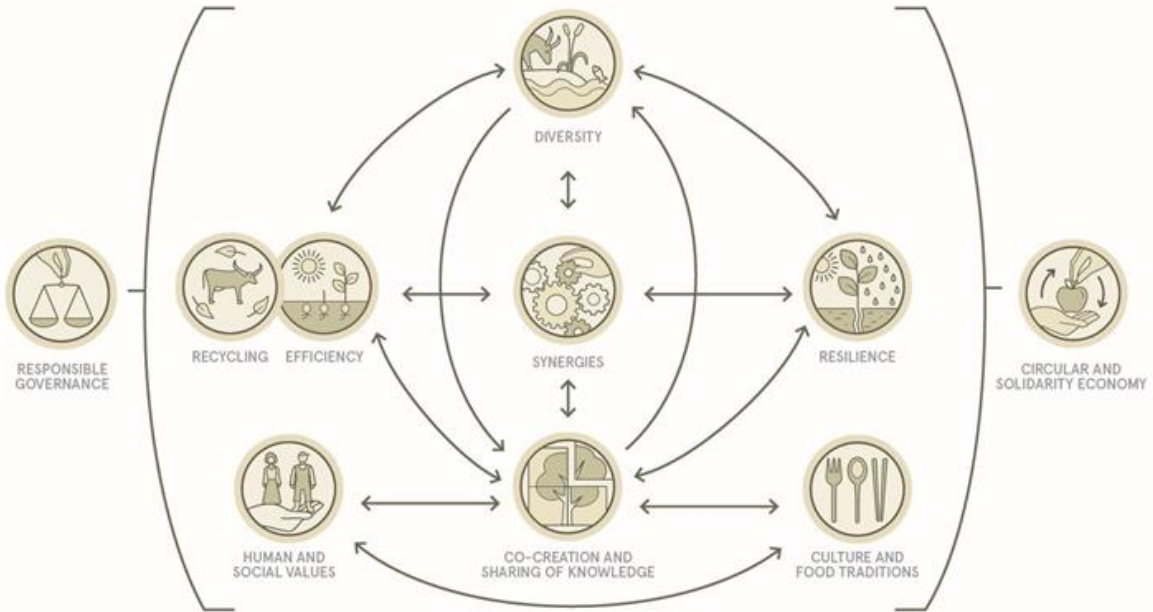
- Measure progress and quantify impact
- Addressing 5 key dimensions for policy makers and SDGs
- Time/cost constraints: keep it simple!

## At territory/community scale:

- Review CAET results, explain with context, enabling environment
- Review Performance results and explain with CAET
- Analyze contribution to SDGs



# The 10 Elements of Agroecology





# Example for STEP 1: CAET - Diversity



	Index	0	1	2	3	4
<b>DIVERSITY</b>	<b>Crops</b>	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
	<b>Animals (including fish and insects)</b>	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
	<b>Trees (and other perennials)</b>	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
	<b>Diversity of activities, products and services</b>	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



## 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)





# 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
- 6 UN languages: + 15 other languages

<https://ee.humanitarianresponse.info/x/#mFov3aos>

### Step 0 - Description of systems and context



\*1a. Select your region:

none selected

\*2. Location (municipality, province):

3a. Please take GPS of this location.

latitude (x,y °)

longitude (x,y °)

altitude (m)

accuracy (m)

search for place or address



### Step 1 - Characterisation of agroecological transitions



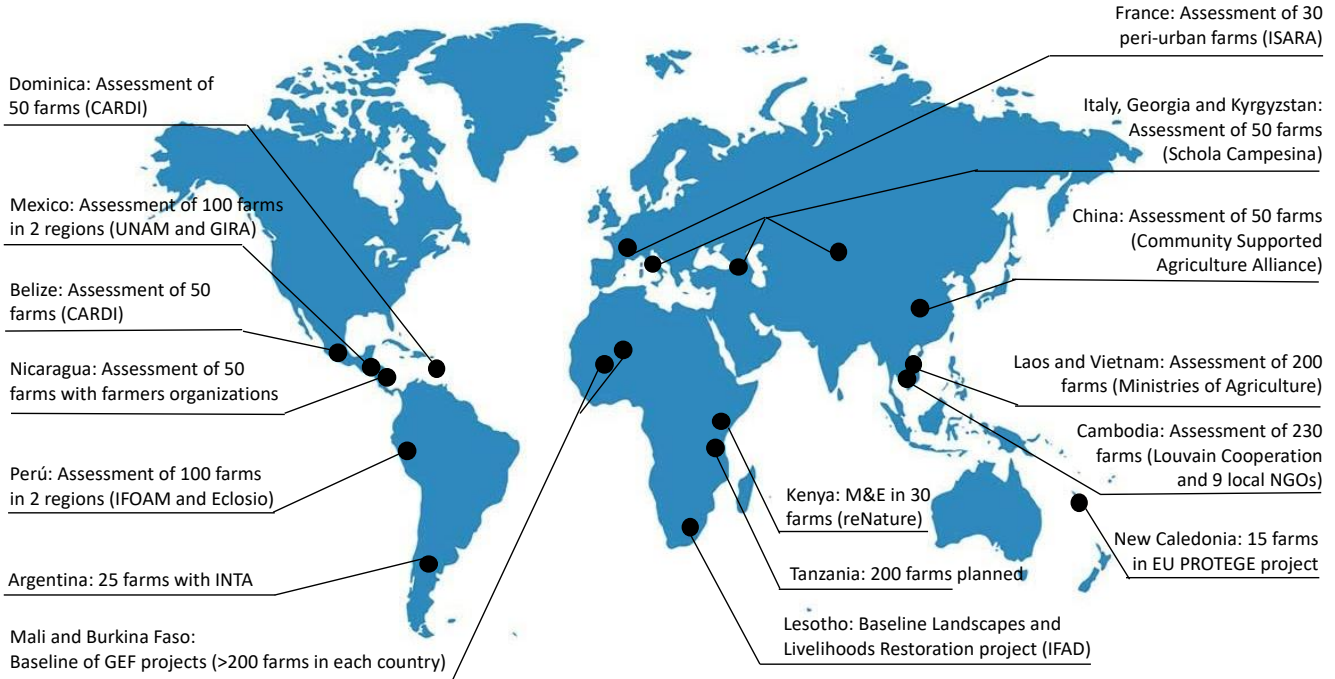
#### \*Crops

- 0 - Monoculture (or no crops cultivated).
- 1 - One crop covering more than 80% of cultivated area.
- 2 - Two or three crops with significant cultivated area.
- 3 - More than 3 crops with significant cultivated area adapted to local and changing climatic conditions.
- 4 - More than 3 crops of different varieties adapted to local conditions and spatially diversified farm with multi-, poly- or inter-cropping.

#### \*Animals (including fish and insects)

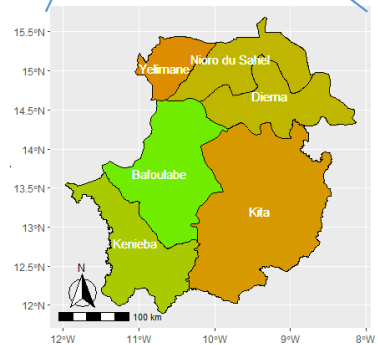
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#### \*Trees (and other perennials)



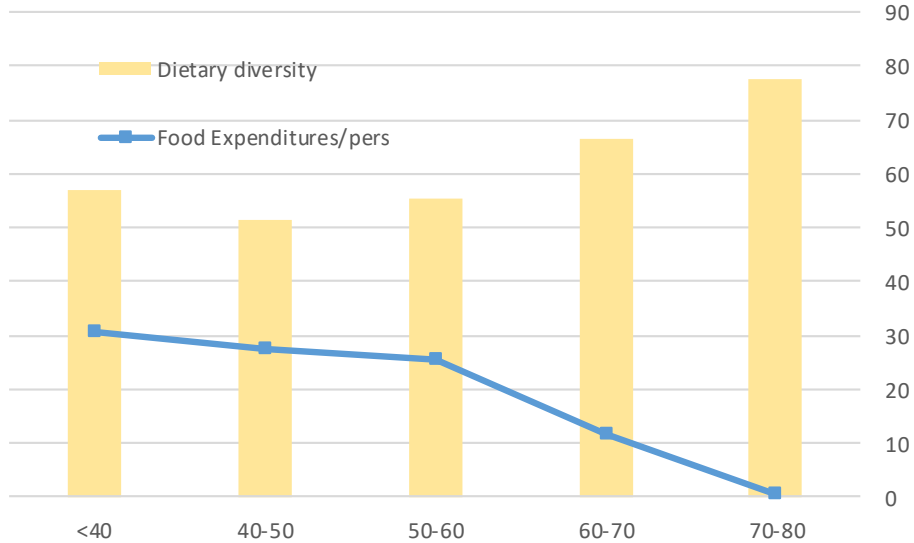


# Step 1: Territorial typologies in Mali





# STEP 2 : dietary diversity and food self-sufficiency - results from 233 farms in Mali

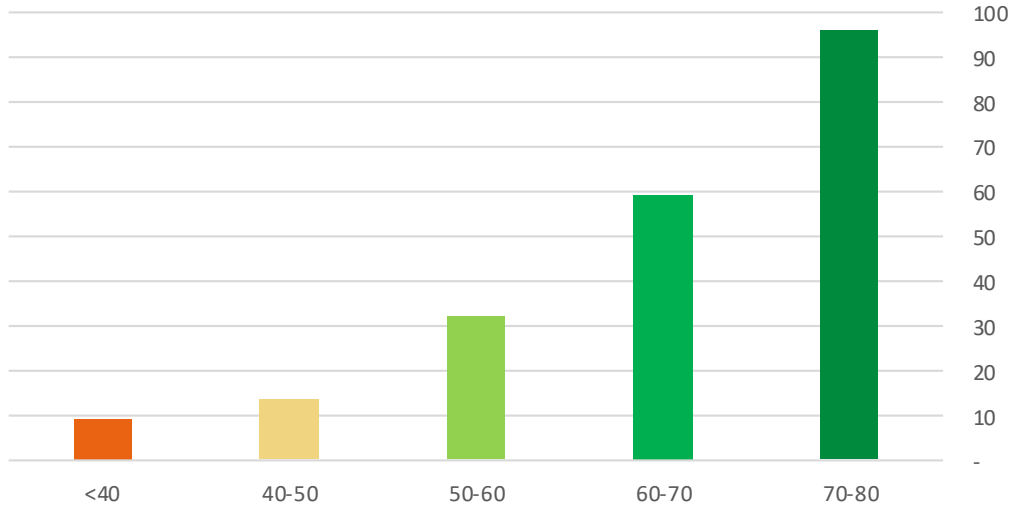


Step 1 : quintile of average CAET score based on the 10 elements



# STEP 2 : youth employment and emigration - results from 233 farms in Mali

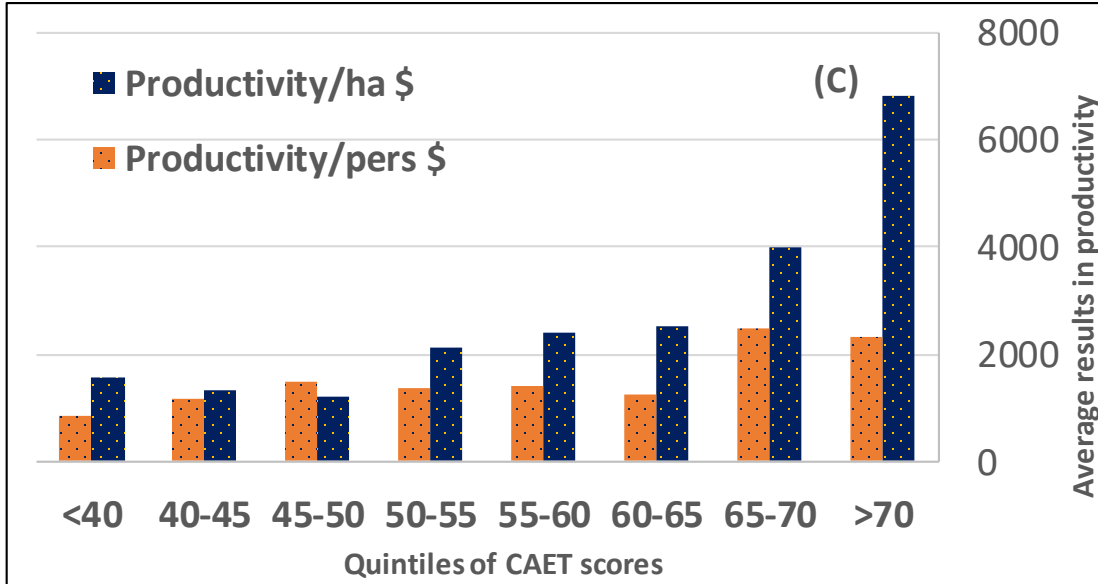
## Youth employment and emigration index



Step 1 : quintile of average CAET score based on the 10 elements

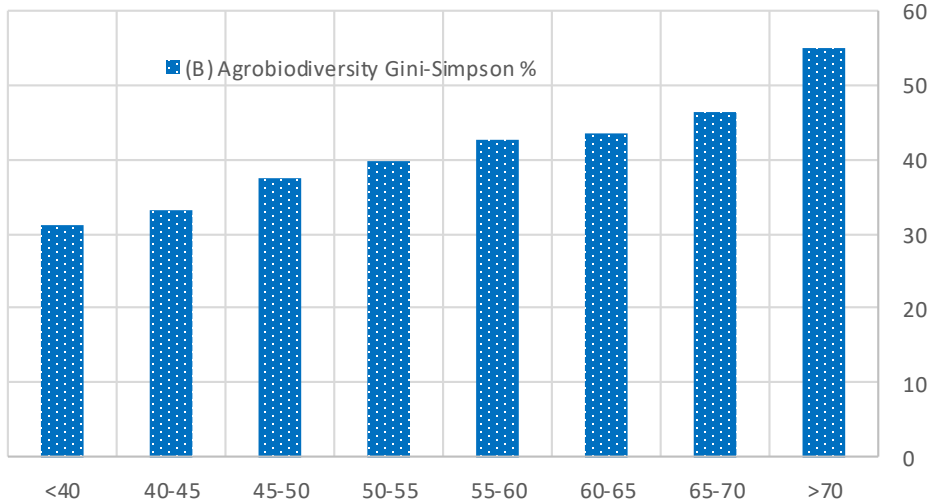


# STEP 2 : aggregated results from 228 farms in Cambodia





## STEP 2 : aggregated results from 228 farms in Cambodia



Step 1 : quintile of average CAET score based on the 10 elements



# Some results from France

Step 1 (10 elements)

