Evaluation of the transition potential of farms towards agro-ecology in two African regions

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INTRODUCTION

- Agricultural *yields* in the ECOWAS region are generally *very low* and differ between cropping systems (Blein et al., 2008).
- ***Agroecology*** (Fig.1) is part of the solutions to the region's agricultural, food and environmental challenges (Altieri et al., 2012; Gliessman, 2014);
- The *amplification on the scale of territories* and for a real transition of family farming towards agroecology remains the main challenge;
- **What are these barriers and the potential of current farms towards agroecology?**
- What are the similarities and differences in the levers of action to unlock the agro-ecological transition in two regions (*Fig.2)* with similar pedoclimatic conditions?

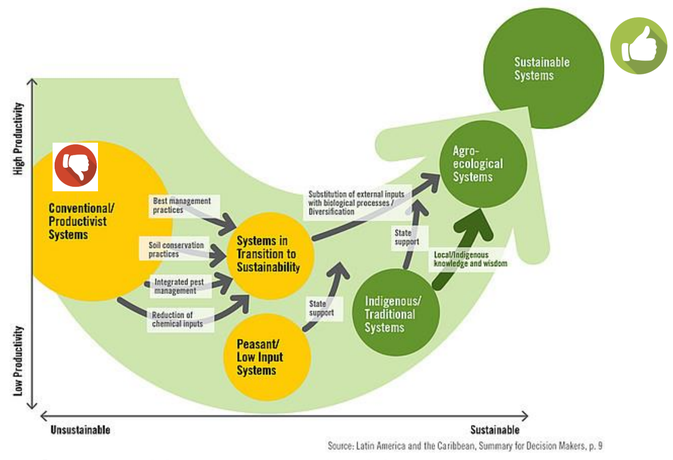


Fig. 1: Transition to Sustainable Systems. IAASTD Latin America and the Caribbean (LAC)

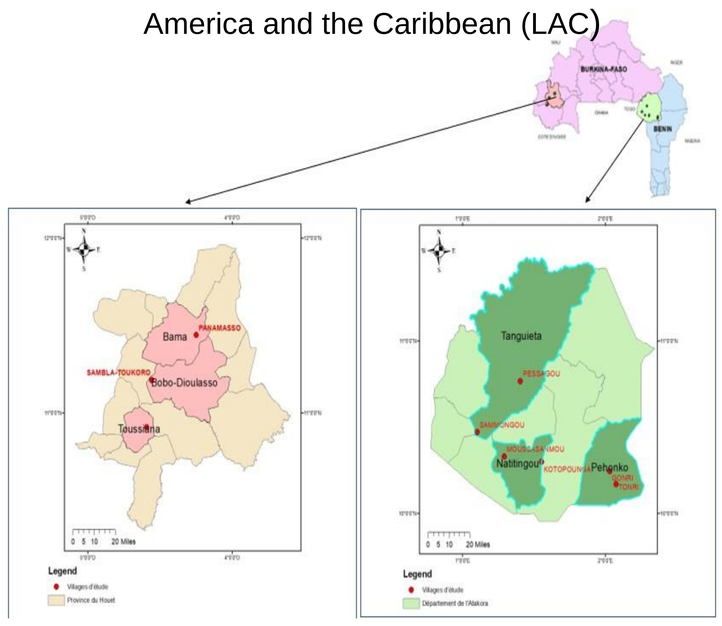


Fig. 2 Study Area

METHODS

3 steps:

Typology based on expert opinion (Bélières et al., 2017)

- 90 and 79 people respectively participated in the focus group in Benin and Burkina Faso

Fig.3: Identification of classification criteria per group of experts (farmers, technicians and project leaders,…)

Fig.4: Collective validation of the typology results

Characterization of farm types

- based on quantitative variables measuring the intensity of use of fertilizers, pesticides and agroecological practices

Fig.5: Interview with a farmer

survey: 650 farmers in Benin and Burkina Faso

stratified random sampling

Assessment of the degree of agro-ecologisation of farms

A set of performance criteria: based on relevance to this study, feasibility for the study regions, and reliability

Indicators: for each performance criterion

$$Performance\ criteria = \sum standardized\ indicators\ in\ \%)$$

- We used and adapted the Characterization of Agroecological Transition (CTAE; FAO, 2018) methodology in relation to the 13 principles of agroecology (Wezel et al., 2020)

- ***7 performance criteria defined:***

1.Input independence

2.Use of biological inputs

3.Environmental conservation

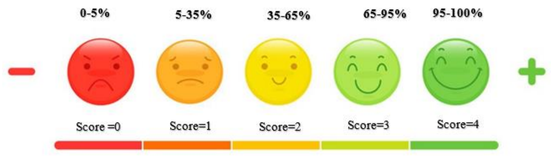
6.Biodiversity

7.Synergies

4.Biomass and nutrient recycling

5.Water conservation

- Five performance classes were defined to identify the assets and challenges to be met in order to promote the agroecological transition



Highlights

- In neither region exclusively organic or agroecological farms are currently found;
- A greater diversity of agro-ecological practices is observed on farms in Burkina Faso compared to farms in Benin;
- Farms present common assets but also specific challenges to be met in terms of the use of synthetic pesticides and reasoned fertilization, the use of crop residues and the integration of agriculture and livestock for an agro-ecological transition

RESULTS

Table 1. Agro-ecological practices in two regions

Farming practices	Atacora, Benin (%)	Houët, Burkina Faso (%)
Crop association	94	74
Crop rotation	93	47
Agroforestry	48	48
Sticks bunds	36	4
Cereal and legume association	21	23
Drainage system	13	14
Simple fallow	13	11
Rotational grazing	11	6
Ploughing Perpendicular to the slope	7	55
Mulching	6	18
Assisted Natural Regeneration	3	45

Types of farms in two regions

- Large-scale market gardening operations (E1)
- Individual market gardening farms (E2)
- Rainfed cropping farms (E3);
- Rainfed cropping + livestock farms (E4)
- Farms owned by Fulani herders (E5)
- Rainfed cropping and vegetable-based operations (E6)
- Farms that associate crops and orchards (E7)

Table 2: Characteristics of farm E1

Variables	Moy ± écart-type	
	Benin	Burkina Faso
Ntotal _ FM (kg/ha/an)	1.3 ± 0.1	514.9±425.3
Ntotal _ FO (kg/ha/an)	231.6 ±144.6	464.2±420
Index of phytosanitary treatment frequency	2.2 ± 1.3	2.1±1.9
Area (ha)	0.1 ± 0.05	0.2±0.1
Agroecological practices	5.4 ± 0.8	3.1±1
Livestock density (UBT)	0.04 ± 0.1	0.7 ± 0.8

RESULTS

Fig 6. Level of agro-ecological transition of farm types

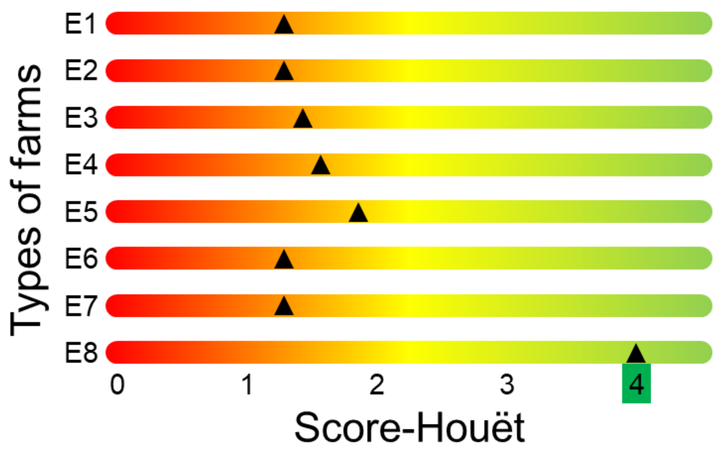
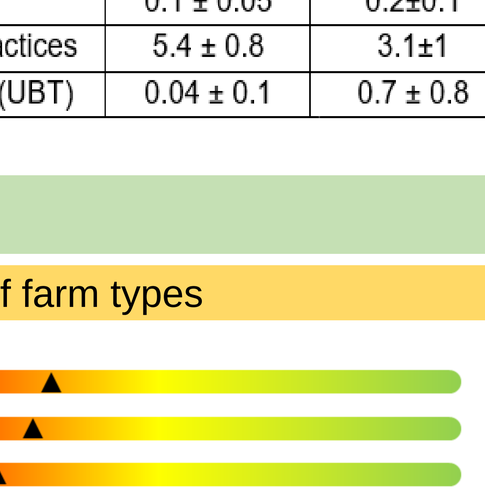


Table 3. Strengths and challenges (%) of the agro-ecological transition for each type of farm

Types of farm		Performance criteria						
		1	2	3	4	5	6	7
E 1	Atacora	49.6	42.1	50.4	0	4.9	16.1	8.7
	Houët	40.1	24.8	51.1	0	24.4	44.1	19.9
E 2	Atacora	39.3	16.6	53.1	0	23.9	18.3	11.5
	Houët	33.2	7.6	50	21.9	19.6	41.1	16.6
E 3	Atacora	26.2	3.6	46.3	3.74	4.7	19.1	19.3
	Houët	31.8	4.3	55.2	39.4	14.6	40.6	18.9
E 4	Atacora	31.2	4.8	43.6	15	0	25.8	45.7
	Houët	37.7	5.9	62.9	54.8	20.7	43.1	27.5
E 5	Atacora	46.5	17	55.7	42.9	0	29.1	49.9
	Houët	37.4	27.8	52.5	66.7	11.7	37.4	24.1
E 6	Atacora	40.3	23.8	53.9	2.1	10.8	19.6	21.1
	Houët	33.6	3.9	55.7	37.8	21.7	39.7	16.5
E 7	Atacora	24.2	0	53.9	0	13.7	27.8	51.7
	Houët	32.2	8.5	61.7	23.1	13.8	52.3	28.3

Low-scoring performance criteria are the most urgent issues to be addressed in order to promote the amplification of the agroecological transition



Acknowledgments

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