Participatory design of a tool to evaluate the sustainability of tropical farming systems: the case of French Reunion Island

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A tool for what ?

The increasingly constrained context of agricultural production calls for the re-examination of the ways agricultural innovation is built. Participatory methods can provide solutions to this problem but needs dedicated tools to both identify improvement objectives and to evaluate the system that needs to be redesigned. Here we report the co-design of a dual-purpose tool adressed to farmers to assess farm sustainability and to identify improvement objectives.

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Objectives

Acquire pedagogic tool based on :

- **the 3 scales of the sustainability concept**
- **easily understandable indicators and aggregation method**

1 What is a sustainable farm on Reunion Island ?

To define a set of shared sustainability objectives for local farms

2 Which indicators/ variables to evaluate these objectives ?

Collectivelly select/define indicators and variables grouped into sustainability components

3 Which weight to give to the variables/ indicators ?

Collectivelly define wheight of indicators and celing values of components

Scales	Components (ceiling value)	Indicators	to preserve and maintain water, soil, land, air, energy resources	to protect and enhance marine and terrestrial biodiversity as part of the natural heritage	to preserve landscapes	to adapt the farming system to soil, climate, economic, and social contexts	to ensure human welfare and animal health	to ensure the quality and safety of products	to contribute to local economic development and participate in citizen initiatives	to preserve the quality of life of the farmer and employees	to preserve the cultural heritage and local knowledge	to reduce and recycle waste by replacing imported chemical inputs	to maintain satisfactory levels of economic performance, competitiveness and autonomy	to ensure the sustainability of the farm-	Values
Agro-ecological (100)*	Management of the domestic biodiversity (20) *	Diversity of species, breeds and varieties	✓	✓	✓	✓							✓		18
		Use and germplasm conservation		✓		✓			✓		✓				6
	Space management (20) *	Ecological regulation area	✓	✓	✓		✓						✓		15
		Space use and grassland management	✓	✓	✓		✓						✓		10
	Agricultural practices (60) *	Management of water resources	✓	✓				✓	✓				✓		10
		Protection of soil resources	✓	✓	✓	✓							✓		12
		Energy dependence	✓									✓	✓		10
		Fertilization management	✓	✓				✓				✓	✓		15
		Phytosanitary and veterinary treatments	✓	✓			✓	✓	✓	✓			✓		15
		Alternative methods for pests and diseases control		✓		✓		✓					✓		8
		Quality initiatives					✓	✓	✓		✓				6
Social/territorial (100)*	Quality of products and territories (40) *	Contribution to the heritage of the island identity							✓		✓				5
		Waste treatment and management	✓		✓				✓	✓		✓			12
		Agricultural spaces	✓		✓				✓						13
		Preservation of the agricultural spaces				✓			✓	✓	✓				4
	Employment and services (30) *	Services to the territory	✓			✓			✓		✓	✓	✓		20
		Contribution to the stabilization of employment				✓			✓	✓	✓				15
	Ethics and human development (30) *	Contribution to autonomy and local food security	✓			✓		✓	✓		✓				12
		Animal wellbeing					✓	✓		✓					3
		Quality of life								✓					10
		Training				✓	✓	✓		✓			✓		8
		Hosting, health and safety	✓						✓	✓					4
Economic (100)*	Viability (30) *	Economic viability				✓			✓	✓			✓		23
		Risk factors				✓		✓	✓				✓		12
	Independence (25) *	Financial autonomy				✓				✓			✓		25
	Transferability (20) *	Transferability of the farm				✓			✓	✓			✓		20
	Efficiency (25) *	Efficiency of the production process	✓										✓		25
		Number of relevant indicators per objective	**14**	**9**	**6**	**13**	**6**	**9**	**15**	**11**	**7**	**4**	**16**		

Conclusions

Starting from the conceptual frame work of an existing tool (Zahm, Viaux et al. 2008), we proposed here an original participatory approach that resulted in a tool adapted to local expectations for farm sustainability. Evaluation both at different levels of aggregation, i.e. from the level of sustainability to the indicator), allows to easily identify the levers for improvement. The tool is currently being tested on a sample of farms which are representative of the main farming systems used in Reunion Island today.

Reference Zahm, F., P. Viaux, et al. (2008). "Assessing Farm sustainability with the IDEA Method - From the concept of Agriculture Sustainability to Case Studies on Farms." Sustainable Development 16: 271-281.

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