PRACTICE ABSTRACT

Using farm sustainability assessment tools to assess the impacts of diversification

Problem

The agricultural sector faces global sustainability challenges, including overuse of agro-chemicals, rising greenhouse gas emissions, degraded soils, simplified landscapes, poor working conditions, waning profitability and loss of livelihoods (IAASTD 2009, Poore and Nemecek 2018).

Solution

Several farm-based "Sustainability Assessment Tools" (SATs) have been developed to address these challenges by allowing farmers to assess their performances and support better management decisions.

Applicability box

Theme: Sustainability performance of farms

Geographical coverage: Depends on the tool

Application time: When available

Required time: Hours to days (depends on tool)

Period of impact: Typically 1 year of operations

Equipment: SAT software (web-based, apps etc.)

Best in: All production systems

Current state of Sustainability Assessment Tools

A farm sustainability assessment can illuminate challenges (e.g. agrobiodiversity conservation) and highlight strengths (e.g. high productivity). The results can be used for learning, improvement, communication, monitoring or benchmarking. SATs should be easy to use, cover all sustainability dimensions, use qualitative and quantitative data and support strategic decisions (Pintér et al. 2012). At least 19 free SATs emerged in the past decade for farm decision-making (Arulnathan et al. 2020). They differ in goals, criteria, level of detail and ease of use (Coteur et al. 2020). Four examples are shown in Table 1. SATs can facilitate system comparisons and generate useful datasets for research, such as assessing the benefits of farm diversification (Figure 1).

Practical recommendation

- **Goal of assessment and tool choice (Table 1)**: Simple self-assessments (e.g. FSA) can raise awareness. Third party assessments (e.g. SMART-Farm) can be used to compare systems and communicate. Detailed farm-specific assessments (e.g. RISE) can guide farm improvements. Purpose is key in choosing a tool.

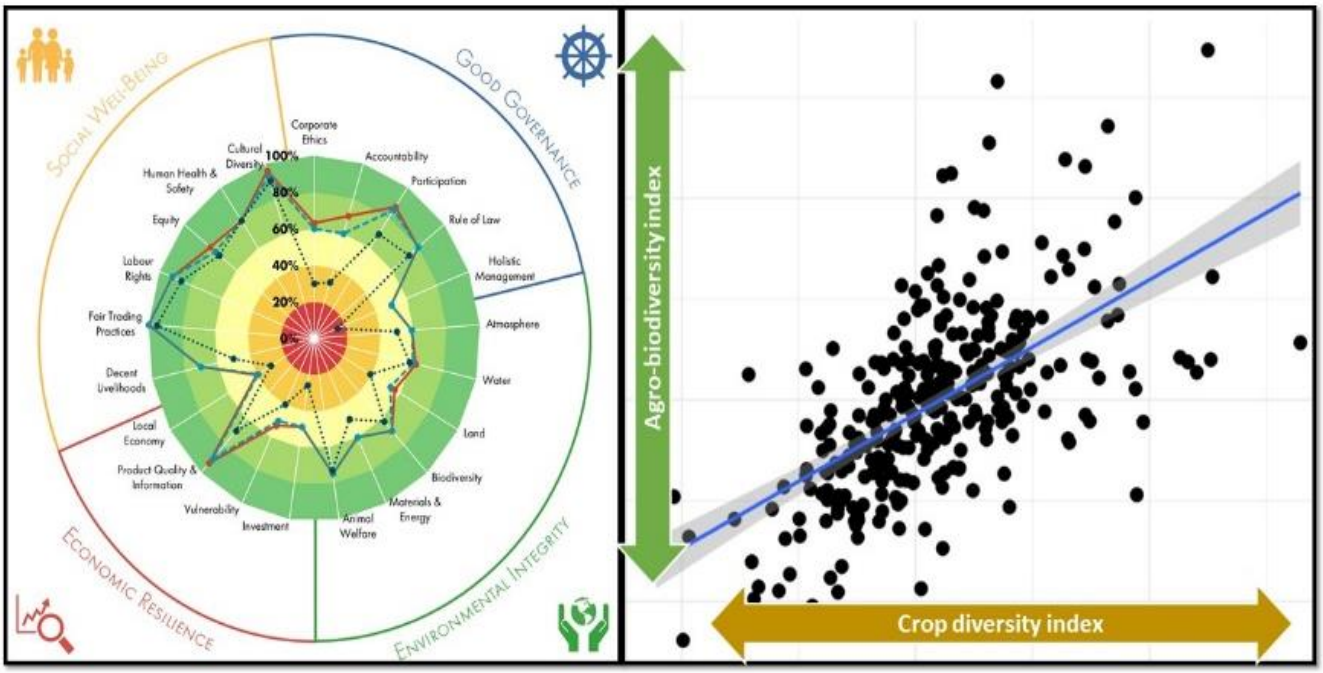

Figure 1: Results of the SMART-Farm Tool comparing farm types (left; Ssebunya et al. 2019) and indices of crop diversity and agro-biodiversity across a sample of EU farms (right; unpublished data, SMART-Farm database).

FiBL. Farm sustainability assessment.
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- **No one-size-fits-all**: The more in-depth the assessment, the more information and time is needed. If only one issue is of interest (e.g. CO_2 or biodiversity) a purpose-built tool is preferable to a general SAT.
- **Different tool, different results**: Each SAT carries assumptions and subjective choices (e.g. of criteria, indicators or stakeholder participation). Indicators of cultural value for England (e.g. using the Public Goods Tool) are not relevant for farmers in France (de Olde et al. 2016). The expectations of the end user should influence the tool choice to maximize impact. In order to support end user in their tool choice, DiverIMPACTS developed a specific toolbox (https://www.diverimpacts.net/toolbox.html).

Tool	Goal	Application	Benefits	Disadvantages
Farm Sustainability Assessment (FSA) Tool	Basic assessment for benchmarking, comparison and communication	Web and excel based self-assessment; ca. 2 hrs data entry	Simple and fast, wide scope, hotspot detection	Lack of detail, limited support for strategic improvements
Public Goods (PG) Tool	Basic assessment of public goods for comparison, monitoring and communication	Excel tool requiring training; ca. 2 hrs data entry	Simple and fast, overview of societal benefits generated by a farm	Public goods tend to reflect UK values, bias towards environmental dimension
Sustainability Monitoring and Assessment RouTine (SMART)-Farm Tool	Basic to moderate assessment for benchmarking, comparison and research	Stand-alone software requiring training; ca. 2-3 hrs data entry	Wide scope, recognised assessment framework from the FAO (SAFA)	Varying levels of detail depending on the theme, difficult to interpret results
Response Induced Sustainability Evaluation (RISE) Tool	Moderate assessment for education and farm improvement	Stand-alone software requiring training; ca. 3-6 hrs data entry	Farm-specific, detailed analysis; designed for extension	High data requirements, limited ability to compare farms

Table 1: A description of some common SATs (source: de Olde et al. 2016, Coteur et al. 2020). A complete list can be found in Arulnathan et al. (2020).

Further information

Video

- SMART (DE/FR): https://www.youtube.com/watch?v=nPYJauHnmeA/
- RISE (EN): https://www.youtube.com/watch?v=Xly-futzQKI

Further readings

Arulnathan, V., M. D. Heidari, M. Doyon, E. Li, and N. Pelletier. 2020. Farm-level decision support tools: A review of methodological choices and their consistency with principles of sustainability assessment. Journal of Cleaner Production 256:120410.

Coteur, I., H. Wustenberghs, L. Debruyne, L. Lauwers, and F. Marchand. 2020. How do current sustainability assessment tools support farmers' strategic decision making? Ecological Indicators 114:106298.

IAASTD. 2009. International assessment of agricultural knowledge, science and technology for development (IAASTD) : global report. Island Press, Washington, DC.

de Olde, E. M., F. W. Oudshoorn, C. A. G. Sørensen, E. A. M. Bokkers, and I. J. M. de Boer. 2016. Assessing sustainability at farm-level: Lessons learned from a comparison of tools in practice. Ecological Indicators 66:391–404.

Pintér, L., P. Hardi, A. Martinuzzi, and J. Hall. 2012. Bellagio STAMP: Principles for sustainability assessment and measurement. Ecological Indicators 17:20–28.

Poore, J., and T. Nemecek. 2018. Reducing food's environmental impacts through producers and consumers. Science 360:987–992.

Ssebunya, B. R., C. Schader, L. Baumgart, J. Landert, C. Altenbuchner, E. Schmid, and M. Stolze. 2019. Sustainability Performance of Certified and Non-certified Smallholder Coffee Farms in Uganda. Ecological Economics 156:35–47.

Weblinks

- **Toolbox for crop diversification**: https://www.diverimpacts.net/toolbox.html
- **FSA Tool**: https://saiplatform.org/fsa/; **SMART-Farm Tool**: https://www.sustainable-food-systems.com/en/smart/; **Public Goods Tool**: https://www.organicresearchcentre.com/; **RISE Tool**: https://www.bfh.ch/hafl/en/research/reference-projects/rise/

About this practice abstract and DiverIMPACTS

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Project website: www.diverimpacts.net

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