



Maryline Darmaun, Dr.
Researcher at CIFOR-ICRAF



Assessing a diversity of agroecosystems undergoing an agroecological transition

Results of the use of a co-designed assessment method in four use situations in France and in Senegal



1st International Congress of Mediterranean Agroecology

4th National AIDA Congress

2nd Italian Agroforestry Forum AIAF

Agrigento, June 9-12, 2025

Agroecological and Agroforestry approaches for a Sustainable future

Complexity of agroecology

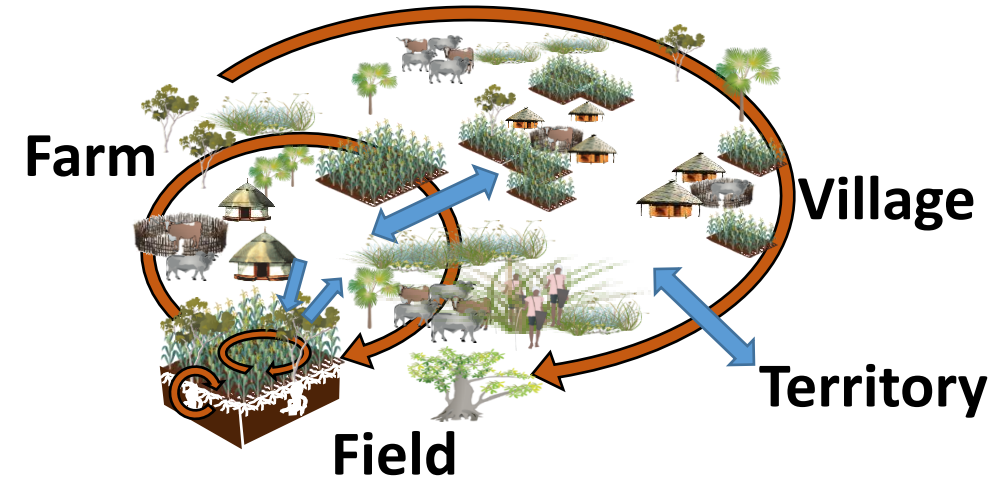
Polysemous

Dynamic

Multidimensional

Multiscale

Context-specific



Methodological challenges
to assess agroecosystems undergoing an
agroecological transition (AET)

Need to assess agroecosystems undergoing an AET

- Assess to better understand and support agroecosystems undergoing an AET
- Need to evolve evaluation approaches to cope with the complexity of agroecology
 - ❑ Integrating several dimensions into the assessment
 - ❑ Integrating several scales
 - ❑ Designing an assessment method involving end-users

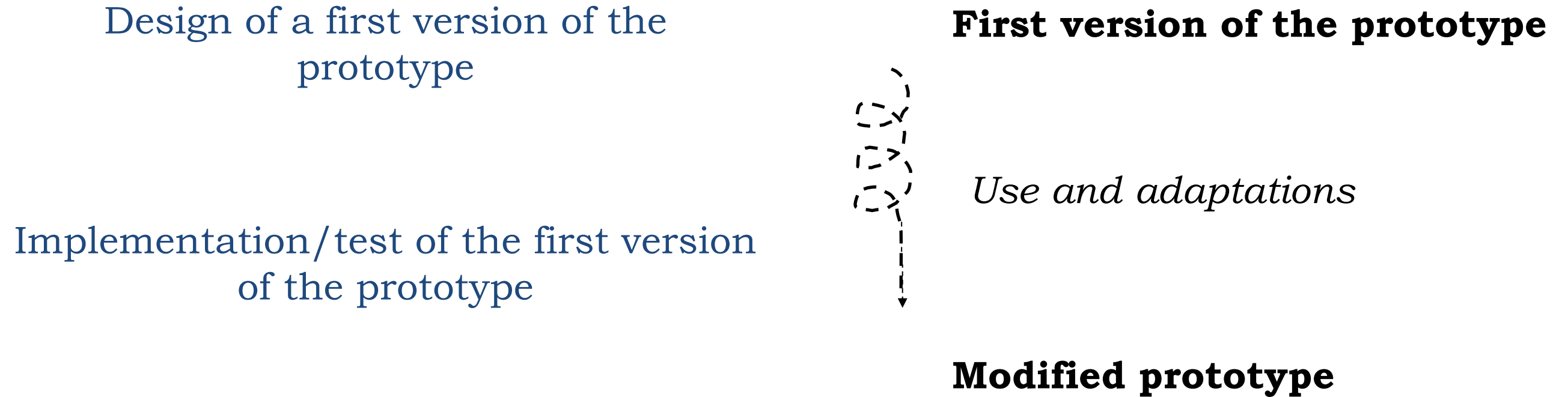
McCown, 2002
Prost et al. 2018
Arulnathan et al., 2020

Research question

How to assess agroecosystems undergoing an AET with a support objective using a method that can be adapted to a variety of use situations?

Adaptability -> the prototyping method

Allows end-users to be involved in the design and continue the design through the use



Designing the Prototype method: bringing together end-users' expectations with the literature

1) End-users' expectations



Conceptual framework

Assess **a diversity** of agroecosystems undergoing an AET: **adaptability ++**
Include several steps

2) Systematic review of the literature



Methodological framework

Tools from the 14 methods covering the **5 methodological challenges**

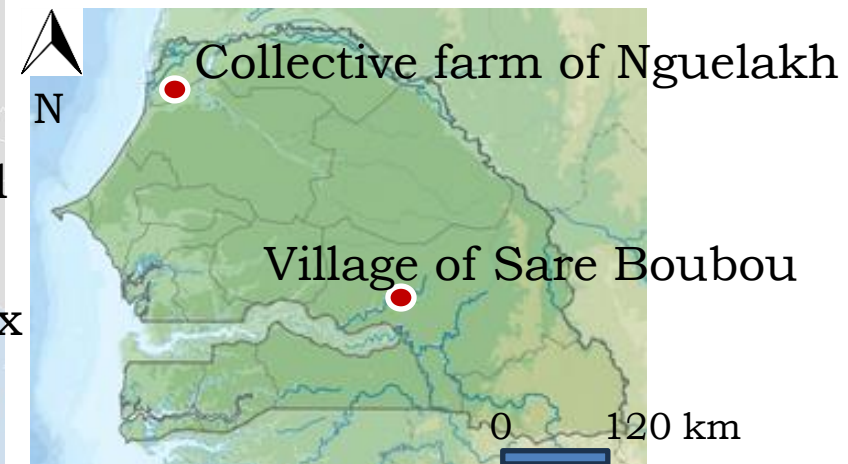
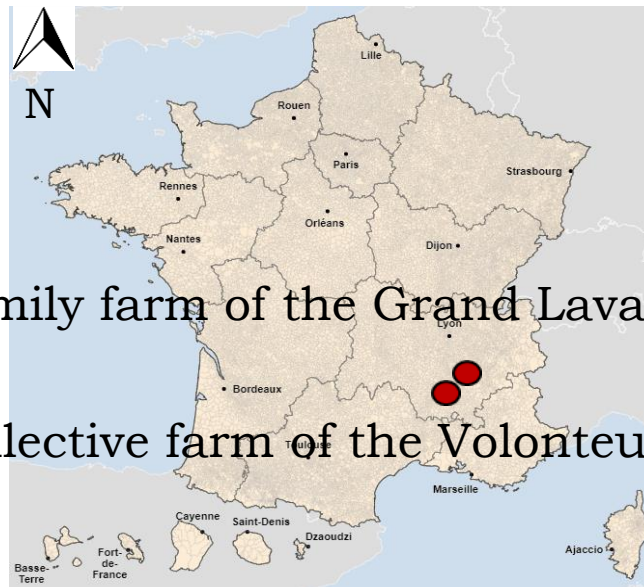
Darmaun M, Chevallier T, Hossard L, Lairez J, Scopel E, Chotte J-L, Lambert-Derkimba A, de Tourdonnet S (2023) Multidimensional and multiscale assessment of agroecological transitions. A review. International Journal of Agricultural Sustainability 21:2193028. <https://doi.org/10.1080/14735903.2023.2193028>

Four different use situations

Diversity of contexts

Diversity of scales

- a **village** composed of nine family farms : Sare Boubou
- Two **collective farms** : Nguelakh and the Volonteux
- One **family farm**: the Grand Laval



The Prototype method : covers five methodological challenges and end-user expectations

Context-specificity → **Step 1** **Characterization of the agroecosystem**

What are the characteristics of the agroecosystem undergoing an AET ?

Polysemous → **Step 2** **Level of advancement in the AET**

How advanced in the transition is the agroecosystem?

Dynamic → **Step 3** **Development conditions of the AET**

Where does the agroecosystem stand in its AET trajectory?

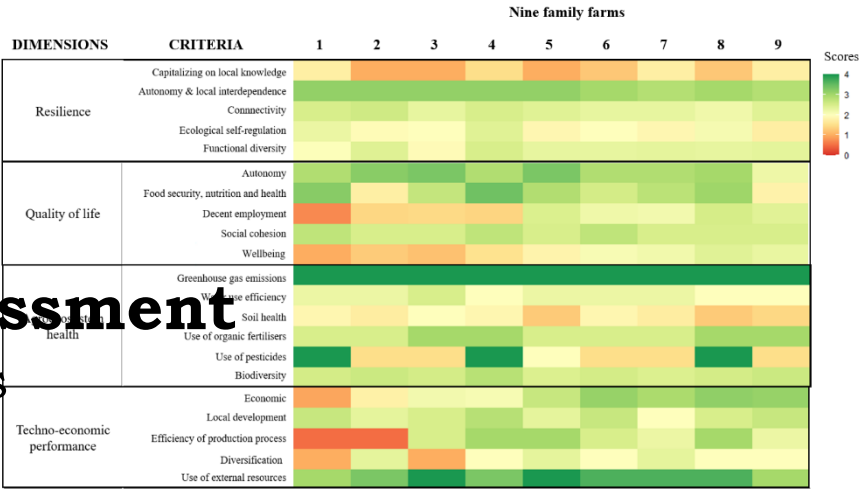
Multidimensionnal

Multiscale

How
satisfactory is
the AET?

Step 4 **Performance assessment**

3 scales, 4 dimensions



Some similar trends despite very different contexts and types of agroecosystems

A good territorial anchorage

- local supply of agricultural inputs
- majority of their value-added made through direct sale or short local circuits
- creation of jobs in the area, with a high labor intensity

A high level of biodiversity

- polyculture poly-livestock systems
- very diversified crop rotations
- a large and diversified number of animal species
- use of a significant proportion of organic fertilizer

Trade-offs between environmental and economic performance

Two different strategies to deal with these trade-offs

High-price sales (niche markets),
high environmental performance

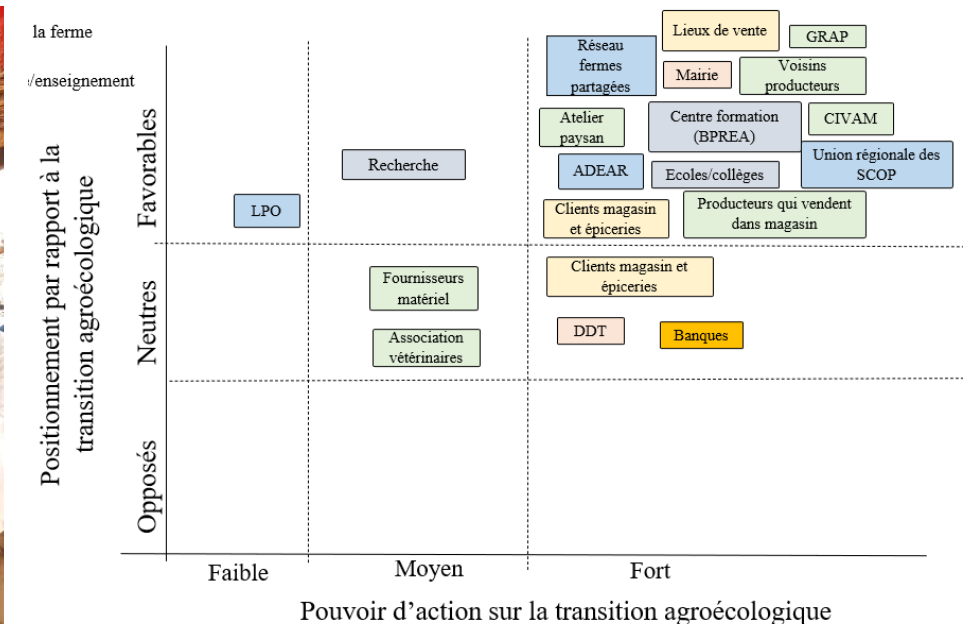
Selling at **reasonable prices**: by choice for Volonteux or by constraint for Sare Boubou

→ **impacting the level of environmental ambition** in the practices implemented: eg. use of productive hybrid varieties, use of pesticides

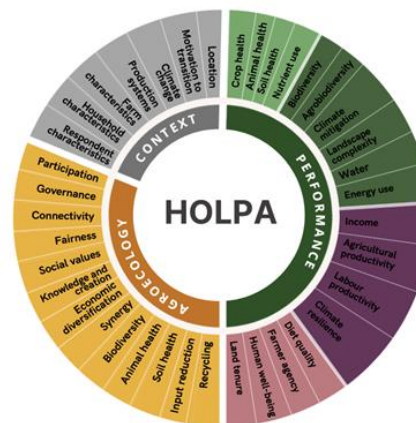
« An important question in agroecology is how much income can be made from it (...). With current economic constraints, it's difficult to do agroecology the way we'd like to. » (farmers, Volonteux)

Outcomes of my work: methodological and operational

- A holistic and adaptable method: meets two of the priorities for evaluation methods adapted to agroecosystems undergoing an AET (cf. Prost et al., 2023)
 - ❑ An exhaustive multi-criteria evaluation : very in-depth social component with indicators based on perception
 - ❑ A support method whose results are useful for farmers' work
- Feeds research on design *via* prototyping method
ex. Prost, 2008; Cerf et al., 2012; Clerino, 2023



Perspectives: towards more holistic assessments

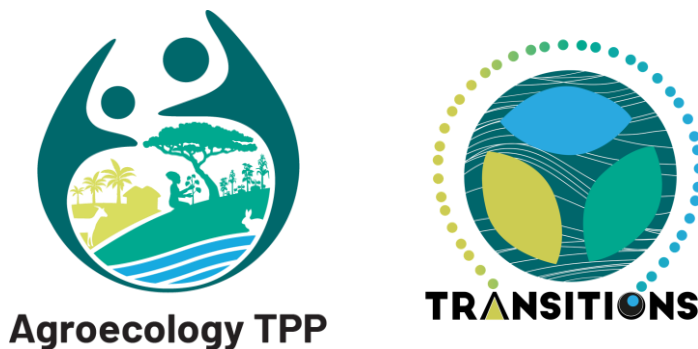


The Agroecology TPP DIALOGUES #3

MEASURING WHAT MATTERS

17.12.2024 12:00-15:00 UTC 3 hours!

ON TEAMS



Developing holistic assessments of food and agricultural systems

A meta-framework for metrics users

Christine Lamanna
Richard Coe
Mary Crossland
Lisa E. Fuchs
Carlos Barahona

Brian Chiputwa
Levi Otero
Beatrice Adoyo
Matthias Geck



WORKING PAPER 4
FEBRUARY 2024

The TRANSITIONS Metrics Library

What is it?

What does it look like?

Holistic Performance Measurement for Food Systems Transformation

A scoping study in Burkina Faso, Ghana, and Tunisia

ICARDA IDRC-CRDI

Matthias Geck & Mary Crossland

Outlook on Agriculture
Volume 52, Issue 3, September 2023, Pages 349-359
© The Author(s) 2023, Article Reuse Guidelines
<https://doi.org/10.1117/00307270231196309>

Sage Journals

Perspectives

Measuring agroecology and its performance: An overview and critical discussion of existing tools and approaches

frontiers Frontiers in Sustainable Food Systems

TYPE Systematic Review
PUBLISHED 25 February 2025
DOI 10.3389/fsys.2025.1472219

Check for updates

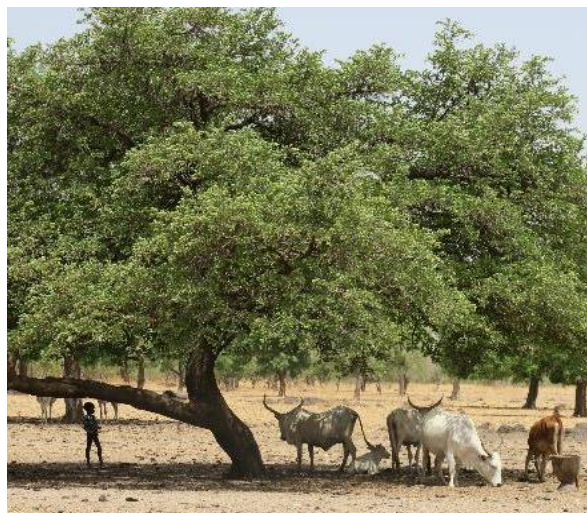
OPEN ACCESS
EDITED BY
Vasilios D. Litsas,
Independent Researcher, Lefkosa, Cyprus
REVIEWED BY
Raghuvaran Aggarwal,
Universidad Nacional de Educación a Distancia (UNED), Spain
Gerrit A. B. Muller,
Instituto Nacional de Tecnología Agropecuaria (INTA)—Instituto de Investigación y Desarrollo Tecnológico para la Agricultura Familiar (INTA) Patagonia, Argentina
*CORRESPONDENCE
Mary Crossland
✉ m.crossland@icfcr-ncf.org

Measuring the holistic performance of food and agricultural systems: a systematic review

Mary Crossland^{1*}, Ric Coe^{1,2}, Christine Lamanna³, Brian Chiputwa⁴, Levi Otero⁵, Beatrice Adoyo⁶, Sandhya Kumar⁷, Victor Mutugi Mwangi⁸, Edith Anyango⁹, Lisa Elena Fuchs¹, Anne Kuria¹ and Matthias Geck¹

¹World Agroforestry (ICRAF-ICRAF), Nairobi, Kenya; ²Statistics for Sustainable Development (Stats4SD), Reading, United Kingdom; ³International Center for Tropical Agriculture (ICAT), Nairobi, Kenya

Thank you for your attention !



1st International Congress of Mediterranean Agroecology

4th National AIDA Congress

2nd Italian Agroforestry Forum AIAF

Agrigento, June 9-12, 2025

Agroecological and Agroforestry approaches for a Sustainable future