

Proving the value of agroecology for farmers and food systems: what methods and evidence do we have?

Summary of the EvalForward discussion

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Ravinder Kumar, associate professor at the University of Greenwich, London, started a discussion on EvalForward aimed at gathering experience of how to assess agroecology and prove its value at farm and food-systems level. Some of the key points that emerged are summarized below for each of the questions proposed. The full discussion is available at: <https://www.evalforward.org/discussions/value-agroecology>

Questions

- 1. How can we measure the performance of agroecological interventions in terms of their contribution to poverty alleviation, human health and the environment?**
- 2. What are some of the innovative methodological ways of measuring agroecological transitions on different scales? Are these innovations replicable in different contexts?**
- 3. Do we already have some demonstrative empirical evidence proving or disproving the value of agroecology?**



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Agroecology at farm level is about good agricultural practices, such as crop diversification and rotation, intercropping, crop-livestock integration, manure recycling and integrated pest management. It also includes elements of farmer resilience building, farmer organizations, fair wages for farm workers and soil management. More broadly, agroecology is connected to entire food systems, building circularity and reducing waste in agricultural supply chains.

“Agroecology is a diverse approach to farming, one that marries a particular place’s unique ecology with local farmers’ knowledge of how to make their landscapes useful to humans and represents the only way to feed the Earth’s rapidly growing population without destroying the planet.” (Daniel Ticehurst)

1. How can we measure the performance of agroecological interventions in terms of their contribution to poverty alleviation, human health and the environment?

Current metrics for evaluating agroecology primarily emphasize productivity and profitability and often fail to capture the multifunctionality inherent in agroecological farming systems. To gauge the true effects of agroecological systems on poverty reduction, human health and the environment, there is a pressing need for harmonized and context-relevant approaches. Despite its potential, agroecology faces scepticism in academic circles and is often associated with political agendas. It is, therefore, crucial to prove its worth amid ongoing investment.

Given the complexity involved, it is understandable that there has been a limited number of initiatives to measure the impact of agroecological transition. Learning from ongoing initiatives can provide insights and innovative methodologies to effectively measure the impact of interventions promoting agroecological transition.

“There will never be a perfect tool or framework for assessing agroecology that can meet every objective in all possible contexts.” (Ravinder Kumar)

The **Tool for Agroecological Performance Evaluation (TAPE)**, developed by the Food and Agriculture Organization of the United Nations (FAO), adopts a comprehensive approach to:

- characterizing the level of agroecological transition of any type of production system in agriculture; and to
- assessing performance across environmental, social, economic and cultural dimensions.

For poverty alleviation, TAPE considers economic indicators, such as productivity, value added and income. For human health, it measures dietary diversity, food security and exposure to pesticides. For environment, it measures, among other things, agrobiodiversity and soil health.

Methodologically, TAPE takes a participatory approach and encourages the establishment of baseline data, enabling the tracking of changes over time and the assessment of the effectiveness of interventions.

The tool's versatility allows users to customize assessments to fit specific farm or food-systems contexts, providing a nuanced understanding of performance. However, although the tool is context specific and adaptable to different scales and geographical locations, some participants in the discussion raised concerns about the implementation of the three phases of TAPE, which can be complex, and added that certain themes or concepts may have no equivalent in some contexts and local realities.

2. What have been some innovative methodological ways of measuring agroecological transitions on different scales? Are these innovations replicable in different contexts?

Participants shared experiences and views on measuring agroecological transitions, noting specifically that:

- It is important to consider environmental, economic and social/institutional aspects in evaluating performance, but also the likelihood of the results continuing.
- Performance indicators, which may vary depending on the local context, can include indicators such as the presence of pollinators, level of pest attack, dilatory diversity and food security, the use of traditional/indigenous crops, diversity of plants/crops used for food and medicinal purpose, contribution to farm income, level of stress (such as climate risks) tolerance and so on.
- Research led by the **Natural Resources Institute** (NRI) and implemented by Agrinatura in Madagascar used the community scorecard methodology in focus-group discussions on several elements of agroecology, such as resilience, synergy, farm-worker welfare and rights, as well as in the household survey to assess different aspects of agroecology. This has been useful in quantifying the status of agroecological transitions. Community scorecards will be used again in 2024–2025 when conducting endline research, to assess the extent of these agroecological transitions and, more importantly, how they are contributing to poverty reduction, human health and the environment.
- In general, participatory tools such as community scorecards, which use people's observations/satisfaction ratings, can prove more useful than performance assessment, which uses quantitative techniques, given externalities and known–unknown/unknown–unknown interactions and functions.
- Potential ways to assess performance could include satellite data that provide some insights at a moderate/low resolution (village or farm field level). It should be possible to assess the impact of different practices on vegetation/food-system productivity and, consequently, on the Sustainable Development Goals.

3. Do we already have some demonstrative empirical evidence proving or disproving the value of agroecology?

Practical examples shared by participants included some from big programmes such as TAPE and the NRI-led research project. Participants also shared the studies and publications available in the “further reading” section of this document.

- **TAPE** has already reached more than 10 000 production systems in over 50 countries around the world: numerous case studies and projects have showcased positive outcomes, demonstrating the value of agroecology in fostering sustainable and resilient food systems (results from Argentina, Lesotho and Mali have been already published).

- **The European Union-funded research project led by NRI and executed by Agrinatura** drew inspiration from TAPE and has developed an empirical approach to assessing agroecological transitions at the farm level. This involves data from 1 695 households in Madagascar, incorporating survey responses, focus-group discussions and key informant interviews. The measurements focus on agroecology aspects such as diversity, resilience, efficiency and recycling, with a goal to evaluate the connections between agroecology interventions and outcomes related to poverty, nutrition and women's empowerment. Employing a quasi-experimental approach, the project conducted a baseline exercise in 2022 and plans to conduct the endline research in 2024–2025 to observe the effects of agroecology interventions. The research identifies various challenges in Madagascar, including insecure land tenure, land fragmentation, shifting agricultural patterns, low-quality and costly inputs, insecurity and theft, limited collectivization, storage issues, manure scarcity, financial constraints and low women's empowerment. These challenges hinder the application of agroecology principles and addressing them is crucial for agroecology to achieve positive outcomes in terms of poverty alleviation, human health and the environment. This necessitates flexible and holistic programmes designed to understand and tackle context-specific obstacles.
- **A farmer case study:** Master water harvester Zepheniah Phiri from Zvishavane District, Zimbabwe, integrated scientific understanding with his knowledge of how to make his local landscapes useful to humans. His approach reintegrates livestock, crops, pollinators, trees and water in ways that work resiliently with the landscape. Unlike other farming systems that rely only on annuals that grow rapidly during the brief rainy periods, this system focuses on perennials, or at least multiyear species such as bananas, reeds, bamboo, sugar cane and yams. With deep and extensive roots, they can access water and nutrients at a deeper level. The roots also have a stabilizing effect, tying up the soil and preventing surface erosion by wind and water. As the roots slow water runoff, they can help manage streams and avoid dry or flash-flooding situations. Mr Phiri practices a wide diversity of crop rotations tailored to meet the different soil-water conditions and to help manage weeds, pests and diseases.

“Farming systems need to “rhyme with nature” if they are to be sustainable.” (Zepheniah Phiri, quoted by Daniel Ticehurst)

Further reading shared by participants

A systems approach to agroecology

Tittonell, P. 2023. Springer.

<https://link.springer.com/book/10.1007/978-3-031-42939-2>

Agro-ecology and water harvesting in Zimbabwe

Oakland Institute and Alliance for Food Sovereignty in Africa

Zepheniah Phiri Maseko has pioneered a unique, innovative vision for community and agricultural development through judicious water management; his system has been widely adopted across the country, increasing agricultural productivity and resilience in this semi-arid region.

https://afsafrica.org/wp-content/uploads/2019/04/water_harvesting_zimbabwe.pdf

Grassroots evidence for agroecology

Free e-course by the Agroecology Fund and Stats4SD, which describes the process developed to create evidence-based cases for agroecology for grassroots organizations and summarizes the learning from a pilot of cases between 2020 and 2022. The aim is to provide a clear idea of what an evidence-based case is and increase the capacity of grassroots organizations to propose and develop cases that persuade audiences about the efficacy and importance of agroecology.

<https://statistics-training.org/login/index.php>

Foresight and African agriculture: innovations and policy opportunities

UK Government Office for Science

A review of 40 agroecological projects in 20 African countries: between 2000 and 2010, these initiatives doubled crop yields, resulting in nearly 5.8 million extra tonnes of food. Furthermore, agroecology values farmers' relationship with and knowledge of their lands.

<https://assets.publishing.service.gov.uk/media/5a7e00c6ed915d74e33ef6a8/14-533-future-african-agriculture.pdf>

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

Geck, M.S., Crossland, M. and Lamanna, C. *Outlook on Agriculture*, 52: 349–359

This paper includes ongoing initiatives on behalf of the Agroecology Transformative Partnership that aim to overcome these shortcomings and offer a promising avenue for working towards the harmonization of approaches.

<https://journals.sagepub.com/doi/full/10.1177/00307270231196309>

Scaling-up agroecological approaches: what, why and how?

A discussion paper produced by Oxfam in 2014 that provides an extensive body of evidence demonstrating how efficient scaling-up of agroecological approaches can contribute to ensuring sustainable and resilient agricultural and food systems today and in the future.

https://www.gaiafoundation.org/wp-content/uploads/2017/09/Agroecology_Scaling-up_agroecology_what_why_and_how_-OxfamSol-FINAL.pdf

Social and economic performance of agroecology

D'Annolfo, R., Gemmill-Herren, B., Graeub, B.E. and Garibaldi, L.A. Second International Conference on Global Food Security. Ithaca, NY, 2015.

This study found that agroecology can create valuable employment opportunities in communities. In addition, the emphasis that it places on biodiversity dramatically improves nutrition in many developing countries, especially in areas formerly reliant on cereal-based systems, which lack vital micronutrients

https://www.researchgate.net/publication/283721240_Social_and_economic_...