Agri-PDB Platform

Agri-PDB Platform Working Group

February 2025

Paradigm shift in food production: Analysis of the challenges of the transition from intensive systems to agroecology and the tools available to assess the transition

1. Introduction

Intensive agricultural production systems, once seen as a panacea for meeting the growing demand for food, are increasingly scrutinized by various stakeholders in society. With recent research highlighting their limitations, both environmentally and socio-economically, it is becoming essential to rethink our approach to agriculture. This is all the more true given the pressing need for a transition to agro-ecology. This approach is a relevant and necessary response to the current environmental, social and economic challenges affecting our planet and the people who live on it.

This transition to agro-ecology aligns with the global commitments to combat climate change, reduce pollution, ensure food security and respect the right to food. These issues, which are at the heart of the Sustainable Development Goals (SDGs) adopted by the United Nations, underline the urgent need to act to preserve our planet and ensure the well-being of present and future generations. Agroecology, by proposing a systemic and multifunctional approach to agriculture, appears to be an essential lever for achieving these ambitious goals. It offers practical solutions for reducing greenhouse gas emissions, preserving biodiversity and restoring soils and ecosystems, all while ensuring sustainable, high-quality food production. What's more, by placing farmers and local communities at the heart of the process, agroecology helps to strengthen their autonomy and resilience in the face of the economic and social challenges they face.

Understanding the implications of this transition is crucial for evaluating its impact on food production, biodiversity, and ecosystem resilience. This involves not only understanding the impact of this change on biodiversity and ecosystems, but also analysing how more environmentally friendly agriculture can improve the resilience of food systems.

This document presents the foundations of intensive agriculture, its limitations and the needs of the agro-ecological transition. It also explores the tools for assessing this transition and the role of financial institutions in supporting it.

2. Foundations of intensive agriculture

Intensive agriculture has been developing since the 1950s, driven by advances in the chemical industry and improved seeds. Over the decades, this approach has led to the adoption of practices aimed at intensifying and specialising agricultural production, such as large-scale monoculture and the intensive use of chemical inputs, including fertilisers and pesticides.

Although these methods have profoundly changed the agricultural landscape, they have also had significant consequences. The predominant characteristics of this model include low crop diversity, high farm specialisation and severe impact on biodiversity. This cultivated uniformity accentuates dependence on water resources, exacerbating the challenges of water management.

The environmental effects of this intensive agriculture are reflected in soil degradation, erosion, and loss of essential organic matter. These systems also make a significant contribution to CO2 emissions, exacerbating climate change. At the same time, intensive farming is facing growing criticism regarding its environmental sustainability, long-term profitability, and its impact on soil health, which is essential for tomorrow's agriculture.

Over the years, intensive farming has evolved to meet the growing demand for food, adopting practices focused on optimizing production. This evolution has largely led to ever-increasing specialisation, intensive use of chemical fertilisers and pesticides, and larger-scale farms.

These changes have had a considerable impact on traditional farming practices, radically altering the agricultural landscape over the decades. The effects of this transformation are felt not only on the environment, but also on consumer health, the biodiversity of ecosystems and the sustainability of resources.

The main characteristics of intensive agriculture include large-scale monocultures, crop specialisation, massive use of chemical fertilisers and pesticides, and low crop diversity. These traits define an intensive agricultural system focused on maximising production at the expense of environmental sustainability and biological diversity.

The environmental impacts of intensive farming are extensive, including soil degradation, erosion, depletion of organic matter, and a significant contribution to CO2 emissions. Moreover, this system reduces biodiversity in and around croplands and places heavy demands on water resources.

3. Limitations and criticisms

The limitations and criticisms of intensive farming primarily focus on its environmental sustainability, negative impact on biodiversity, long-term profitability, and harmful effects on soil health. Additionally, this system is increasingly questioned due to its extensive use of chemical fertilizers and pesticides, as well as its significant contribution to CO2 emissions, creating challenges for transitioning to more sustainable and environmentally friendly systems.

4. The principles of agroecology

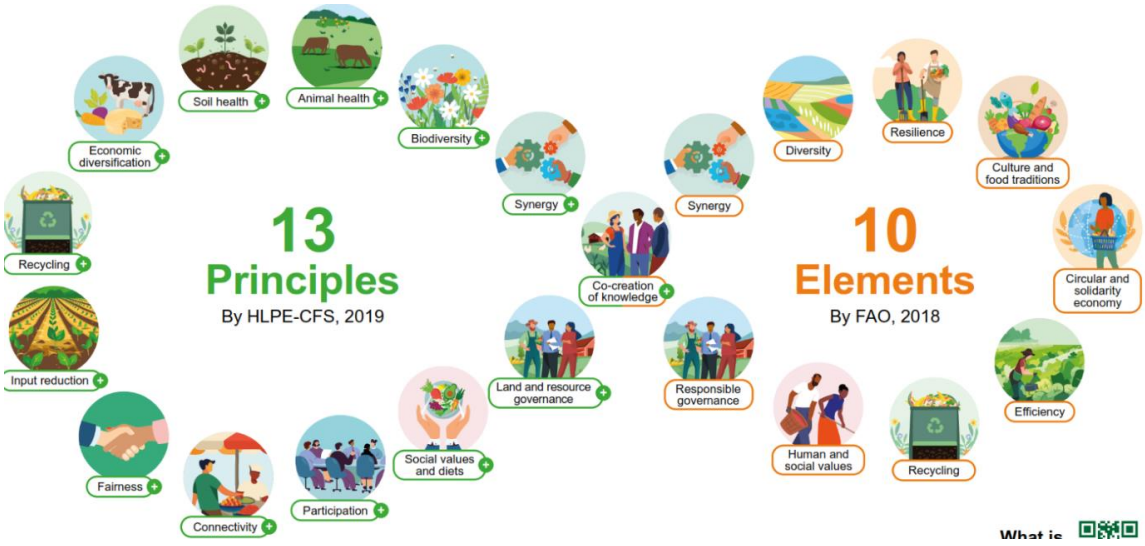
The transition to agroecology is based on key principles aimed at promoting sustainable and balanced agricultural production systems. These principles stem from a holistic approach to agriculture, integrating crop diversification, balanced management of natural resources, the promotion of biodiversity, and agroecological interactions. Agroecology also encourages the active participation of local communities, the establishment of fair and sustainable food structures, and the use of environmentally friendly practices. In

short, the principles of agroecology aim to create a food system that is resilient, environmentally friendly, and socially just.

Agroecological methods are characterised by their ability to promote the use of natural processes while limiting the reliance on purchased inputs. They advocate for closed cycles that minimize negative externalities and stress the importance of local knowledge and participatory processes, enabling knowledge and practices to be developed through experience, while incorporating more conventional scientific methods. By addressing social inequalities, these methods recognize that food systems are coupled socio-ecological systems, from production to consumption. They thus engage scientific, practical, and social dimensions in a holistic manner, aiming to build a sustainable and equitable food system in harmony with ecosystems.

The HLPE report[1] emphasizes that there is no single, universal definition of agroecology, as it is contextual and evolving. This flexibility is an asset, allowing agroecological approaches to be adapted to local needs and conditions while preserving the fundamental principles dedicated to ecological, social, and economic sustainability. Furthermore, experts note that agroecology has expanded beyond simple farming practices to encompass entire food systems, linking production, distribution, consumption, and waste management through an integrated approach to sustainability. The expert group defines 13 principles aligned with the 10 principles established by the FAO in 2018 (Figure 1). The essential principles of agroecology include the promotion of functional biodiversity, the creation of fertile and healthy soils, the natural regulation of pests, the reduction of dependence on external inputs, the enhancement of local knowledge, and the involvement of local stakeholders. These principles aim to place agriculture in a global context, adopting an ecosystemic approach and integrating natural processes harmoniously into food production systems.

Figure1 Principles and elements of the agro-ecological approach



Source: Agroecology Coalition

[1] https://www.csm4cfs.org/summary-recommendations-hlpe-report-agroecology-innovations/

4.1 Advantages and benefits

The transition to agro-ecology has many advantages and benefits, both environmental and socio-economic. This approach helps to preserve biodiversity, restore soil, reduce the carbon footprint, improve the resilience of farming systems, promote local and fair agri-food chains, and create jobs in environmentally-friendly professions.

In addition, agro-ecology helps to improve consumer health through healthier and more diverse food, while strengthening social cohesion within rural communities.

5. Assessing the agro-ecological transition: a promising new framework

Agroecology, a holistic approach to transforming food and farming systems, is attracting growing interest worldwide. However, measuring the extent to which agroecological principles have been integrated into projects and programmes remains a challenge. To address this need, researchers and organisations involved in monitoring agroecology-related funding, development aid analysis, climate finance, and research funds have joined forces to develop a new evaluation framework.

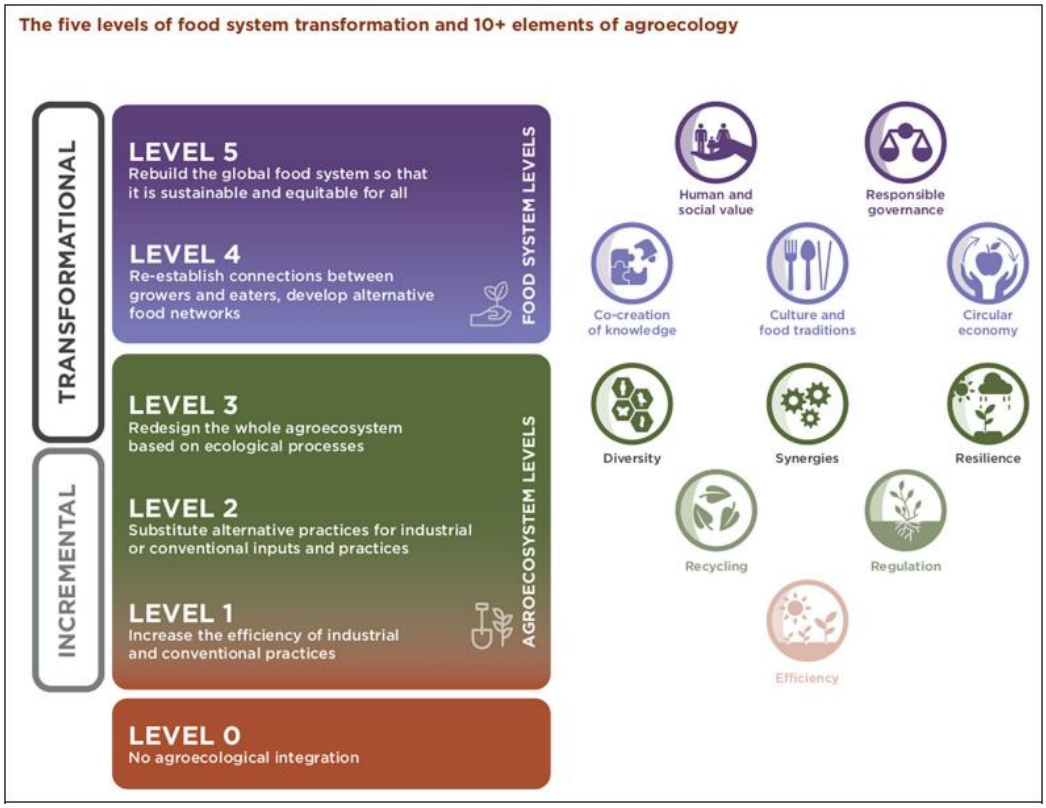
Before assessing an agroecological transition project, it is important to check for any exclusion or "red flag" criteria, such as GMO production, priority given to synthetic inputs, prioritisation of increasing productivity, focus on seed production systems, factory farms, production of processed food, extractivism, marginalisation and gender issues, and failure to respect human rights.

If one or more of these criteria, which are opposed to the agroecological transition, are present in the project being evaluated, the analysis will not continue.

This innovative framework is based on the 13 principles of agroecology defined by the High-Level Panel of Experts (HLPE) and the 10 elements defined by the FAO, ensuring a solid and recognised foundation. It has been designed to overcome the limitations of previous methodologies, which did not sufficiently account for the systemic and transformative nature of agroecology. Indeed, this new framework views agroecology as a genuine paradigm shift, rather than simply a gradual evolution of agricultural practices.

One of the main strengths of this framework lies in its ability to assess the level of integration of agroecological principles into a given project or programme in a comprehensive and nuanced way. In doing so, it provides a better understanding of the progress made, as well as the challenges that remain to be addressed for the successful transition to agroecology.

Figure2 Level of transformation of food systems and elements of agroecology



Source : FAO

Figure 2 shows the 5 levels of food production system transition defined by Gliesman (2007, 2016)[2].

6. Criteria opposed to agroecology or "red flags"

If the project being evaluated or in the formulation phase meets one of the following 9 criteria, it is excluded from the agro-ecological approach because it diverges from the logic of the transition to sustainable agriculture.

GMOs: The project focuses on introducing genetically modified organisms (GMOs) and associated genome-editing technologies. Synthetic products: The project promotes the use of synthetic fertilizers and pesticides.

Monoculture: The project exclusively promotes the extensive cultivation of a single cash crop at the expense of diversified strategies.

Productivity: The project prioritizes productivity, leading to the unnecessary destruction of vital ecosystems and their services.

Seed systems: The project actively supports regulations or actions that hinder or dismantle local, farmer-managed seed systems.

[2] https://www.fao.org/agroecology/database/detail/en/c/1401309/

Industrial agriculture: The project focuses on the large-scale intensification of animal production (industrial livestock farming).

Discrimination: The project excludes or discriminates against women and other marginalized groups.

Processed foods: The project exclusively promotes highly processed, industrially produced foods with low nutritional value.

Extraction: The project promotes the production of extractive raw materials without local added value.

Violation of human rights: The project supports approaches that violate human rights, including customary rights, disregard prior informed consent, or result in displacement and/or land grabbing.

7. Assessment tools for the agro-ecological transition

TAPE FAO

Tool for Agroecological Performance Evaluation (TAPE)[3]

This agro-ecological performance evaluation framework is a valuable tool for political decision-makers, funding agencies and players in the field. It provides a clear, standardised view of the progress made, making it easier to take decisions and allocate resources. It also encourages in-depth reflection on how to strengthen the integration of agro-ecological principles in future initiatives.

The tool aims to:

- Inform policy makers, development institutions and other stakeholders by creating references to the multidimensional performance of agroecology and its potential to contribute to multiple SDOs;
- Build knowledge and empower producers through the collective process of producing and sharing data and evidence based on their own practices.

How it works

TAPE can be used to assess all types of production systems and sub-sectors: crop and livestock production, aquaculture, fisheries and forestry. The tool is adaptable to local contexts and languages and is flexible enough to be supplemented by other indicators or methodologies, to provide information on other dimensions of sustainability or to provide more in-depth analyses on a specific subject.

STEP 0: This "preliminary stage" involves gathering all the relevant contextual information, at territorial and higher levels, including descriptions of production systems and the agroecosystem, as well as the local and regional environments that support them.

STEP 1: The 10 elements of agroecology are used to characterise production systems by assessing their level of transition towards agroecology. This diagnosis can be used

[3] https://openknowledge.fao.org/server/api/core/bitstreams/8a17b7b6-9fe5-47e6-bb19-c74613c62339/content

to identify the strengths and weaknesses of the systems assessed, but also to monitor and evaluate projects or to establish entry points for future activities to meet needs.

STEP 2: The ten core performance criteria quantify the impact of the level of transition to agroecology assessed in STEP 1 by providing information on various dimensions of sustainability, namely: land tenure, productivity, income, value added, pesticide exposure, dietary diversity, women's empowerment, youth employment, biodiversity and soil health.

STEP 3: The final step is a participatory analysis of the results, in which performance (STEP 2) is examined in the light of the level of transition to agroecology (STEP 1) and the context and enabling environment (STEP 0). STEP 3 can help to identify ways of achieving greater sustainability with the community.

BIOVISION F-ACT

The Farm Level Agroecology Criteria Tool (F-ACT)[4] is a digital decision-support tool that enables farmers to identify ways of making their farms more efficient, more resilient, more equitable and, ultimately, more agroecological.

F-ACT is designed for participatory on-farm assessments, facilitated by external actors (e.g., extension service providers, NGOs, etc.) or for farmer-led assessments where literacy levels and access to technology allow. In both cases, F-ACT is intended to support and complement existing local knowledge rather than replace it. Additionally, it serves as a thinking tool that empowers farmers rather than imposing specific practices or decisions.

The results generated by F-ACT in this context can be used to :

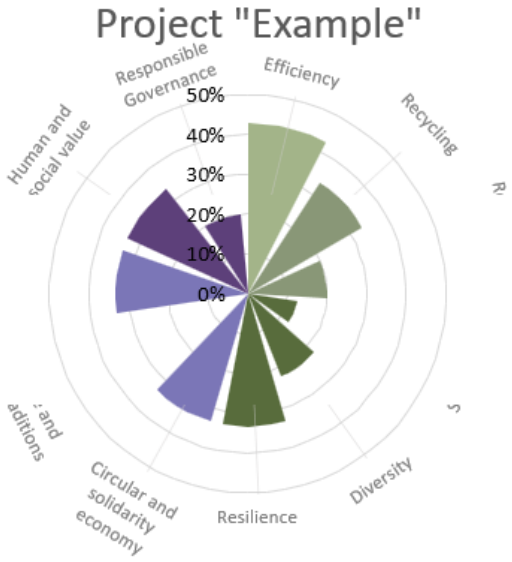
- Highlighting the strengths of agro-ecology and areas for development.
- Stimulate discussion on the objectives and challenges of the operation.
- Create practical action plans to achieve objectives.
- Set benchmarks and monitor progress through subsequent assessments.

The BIOVISION F-ACT tool can be used to assess small-scale projects or individual farms. It is based on an Excel file that lists the 10 transition elements, each accompanied by a set of transition criteria with examples of practices, systems, or themes. The assessor records the presence or absence of each criterion by marking 1 or 0 and can add comments in a designated cell.

The evaluation results are displayed graphically, showing the percentage for each transition element.

[4] https://www.agroecology-pool.org/fact/

Figure3 Example of graphical evaluation



Source : agroecology-pool.org

The result does not provide a strict assessment but elements for discussion and interpretation that enable the assessors to estimate the degree of transition of the farmers included in the analysis group or sample.

Agroecology Coalition Assessment Tool[5]

This is a tool for evaluating projects/initiatives/calls for proposals for their support for agro-ecological transformations by rating their contribution to the implementation of each of the 13 principles of agro-ecology (HLPE).

- It can be used to evaluate individual projects/initiatives or entire portfolios of projects.
- It can also be used to guide agro-ecological projects or the development of proposals by giving examples of actions that contribute to the implementation of each of the 13 principles.
- It will be accessible to any institution wishing to use it to evaluate its own projects/portfolios.

Stage 1: review of the 9 flags

Stage 2: review of the 13 principles of agroecology and assessment of the degree of transition

Stage 3: analysis of the results and discussion between the various stakeholders to establish a consensus and an intervention strategy to accelerate the agro-ecological transition.

[5] https://agroecology-coalition.org/agroecology-finance-assessment-tool/

Figure4 Assessment of the 13 agro-ecological principles

Source: Agroecology Coalition

8. How are BPDAs affected by tools for assessing the agro-ecological transition?

Agricultural development banks play a crucial role in financing and supporting agricultural projects and programs. BDPAs have a strong interest in utilizing agroecological transition assessment tools to enhance the impact and sustainability of their investments, manage risks, ensure effective monitoring, and promote learning and knowledge sharing in the agricultural sector.

As key players in the industry, they find these tools particularly valuable for several reasons:

- **Resource allocation**: Agricultural development banks must ensure that the funds they grant are used efficiently and in line with their sustainability objectives. Agro-ecological transition assessment tools provide a better understanding of the extent to which the projects financed integrate the principles of agro-ecology, thus helping banks to make informed decisions on the allocation of resources.
- **Risk management**: Agricultural projects that incorporate agro-ecological principles are often considered to be more resilient in the face of climatic and economic shocks. By using agroecological transition assessment tools, agricultural development banks can better evaluate the risks associated with the projects they finance and adjust their strategies accordingly.
- **Monitoring and evaluation**: Agricultural development banks need standardised tools to monitor and evaluate the progress made by the projects they support. Agro-ecological transition assessment tools provide a common framework for measuring progress and identifying areas requiring particular attention, thus facilitating project

monitoring and evaluation.

- **Accountability and transparency**: By using recognised and rigorous assessment tools, agricultural development banks can demonstrate their commitment to sustainability and transparency. This strengthens their credibility with stakeholders and the public and helps attract additional investment.
- **Learning and knowledge sharing**: Agroecological transition assessment tools can help agricultural development banks to identify best practice and lessons learned from the projects they finance. This information can then be shared with others in the sector, encouraging mutual learning and the wider adoption of agro-ecological principles.
- **Communication on investment in sustainable agriculture**: These tools also help BPDAs to structure their investment strategies and to access financing dedicated to sustainable agriculture, green and climate financing (e.g. international funds such as the Green Climate Fund).

9. Conclusion

In conclusion, the transition from intensive systems to agroecology represents a major and complex challenge for modern, sustainable agriculture. It is essential to take into account a wide range of economic, social, environmental and regulatory aspects to ensure the lasting success of this transition to more responsible practices.

Success stories in this field, promising technological innovations and committed community initiatives play a fundamental and essential role in promoting and developing agroecology. However, factors such as resistance to change among farmers, the crucial need for professional training, financial constraints on farms and a regulatory framework that is still too rigid remain significant obstacles to be overcome. It is therefore of the utmost importance to put in place agricultural policies that are favourable and provide incentives for agroecology, as well as appropriate financial products, while at the same time raising awareness and training those involved in the agricultural sector to ensure a successful and beneficial transition for all.

Published by: International Fund for Agricultural Development (IFAD)
Registered Office: Via Paolo di Dono 44, 00142 Rome, Italy
Contact : Thierry Latreille : t.latreille@ifad.org
Telephone: +39 – 0654591; Fax: +39-065043463

Author: Olivier Pierard
Editors: Mohamed Ali Trabelsi, Alejandro Enciso
Design Layout: Yue Hu; Darcie Giriwanyu Umukundwa
Webites: www.ifad.org; https://www.agri-pdb.org/
AgriPDB@org; ifad@ifad.org
As at: February 2025