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# WHAT IS AGROECOLOGY?



*This piece is a summary of the TABLE Explainer [What is Agroecology?](#) and aims to define the concept and illuminate key debates. Citations and references for the information discussed below can be found in the full explainer.*

Various groups, including the [FAO](#), present [agroecology](#) as a solution to various issues ([malnutrition](#), climate change, [biodiversity](#) loss etc) faced by the world's food system. However, debate continues around the definition of, and approaches associated with, agroecology, with some seeing it as a science, others as a practice, and others still as a political and social movement. There are also debates about its potential to address societal and environmental challenges.

## Agroecology as a science

Agroecology as a science combines principles from [ecology](#) and [agronomy](#) to understand how interactions between plants, animals, soils, and climate contribute to the functioning of agricultural systems. Agroecology originally focussed on these interactions at the field or farm level, but its scope has since been expanded to 'the ecology of the entire food system'.

## Agroecology as a practice

As a practice, agroecology combines knowledge from traditional and Indigenous farming systems, along with agroecological science, to develop farming techniques that optimise productivity, sustainability and [resilience](#) whilst minimising external inputs and maintaining natural resources (water, soil, wildlife etc) and biodiversity. This is achieved using various techniques as appropriate to context, including [crop rotation](#), [cover crops](#), [polyculture](#), [green manure](#), [minimal tillage](#), natural irrigation, and [crop-livestock integration](#). Agroecology is also associated with several broader principles: responsible and democratic governance; knowledge exchange with farmers and producers; economic diversification and solidarity; and the defence and revival of Indigenous cultures and traditions.

## Included in this summary

Agroecology as a science, practice, and movement

Is agroecology transformative, effective and equitable?

Environmental impacts

How and why should we work with nature



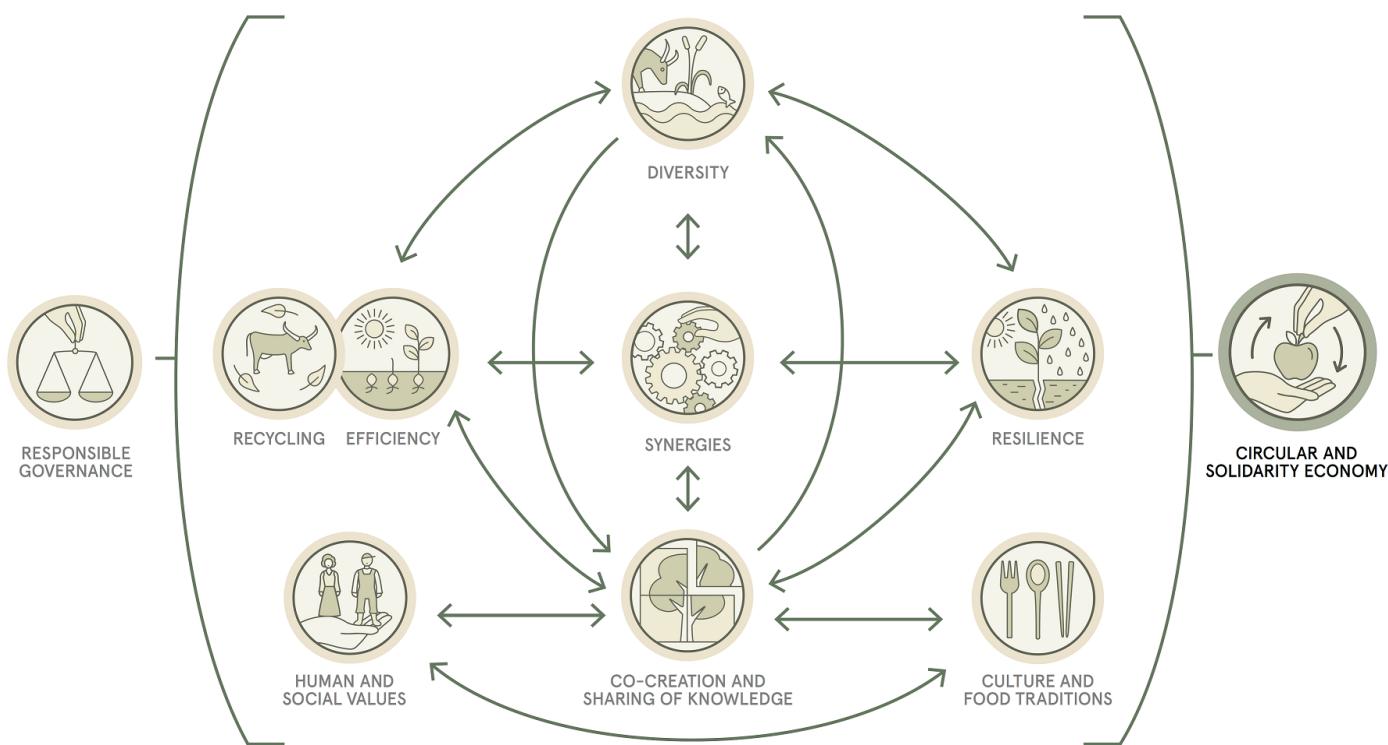


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## Agroecology as a movement

Agroecology is often promoted as a means for achieving **food sovereignty** (see [What is food sovereignty?](#)). Thus, when seen as a movement, agroecology is often framed as inseparable from certain values and priorities, including the expansion of collective rights and the commons; racial and gender equality; respect for diversity; and the rejection of **anthropocentric** worldviews and solely technological- or market-based responses to problems. Overall, agroecology is frequently seen to be an essential means of achieving food sovereignty and a more just and equitable food system. For example, the transnational peasant movement **La Vía Campesina** (LVC) promotes agroecology as 'a key form of resistance to an economic system that puts profit before life' and as such a way of achieving food sovereignty.

## How far-reaching and transformative should agroecology be?

Approaches to agroecology shift according to the viewpoints, values, and priorities of different actors. While some organisations have fundamental issues with agroecology, others offer a more 'reformist' or pragmatic approach – they support agroecology as a science and practice but worry that focusing on transformative, principles-based approaches might limit its adoption. Meanwhile, social movements and affiliated activist-academics claim we must defend more 'radical' approaches to agroecology which focus on agency, democracy, equity, and political and economic transformation, if it is to transform the food system. For example, whilst some argue that agroecology could be used to contribute to **sustainable intensification** (SI) (see [What is sustainable intensification?](#)) or **climate-smart agriculture** (CSA), others denounce SI and CSA for failing to explicitly address socio-economic and power inequalities in the food system, and the continued use of technologies that maintain corporate control of agri-food systems and extractive, environmentally-harmful approaches to nature.



## Can agroecology effectively feed the world?

Critics often state that agroecology lacks the productivity required to feed growing demand on existing agricultural land. While studies linking agroecological approaches and yield are few in number and heavily contested, studies of productivity in [organic farming](#) are relevant due to the similar practices used. Research suggests that [industrial agriculture](#) produces approximately 20% higher yields than organic farming per given land area; however, these findings are highly contextual (they depend greatly on crop type, region, timeframe, methods, and measurement practices). Moreover, supporters of agroecology argue that focusing on productivity is irrelevant, because hunger and malnutrition, at least at the global level, result from inequitable and unsustainable distribution and consumption patterns rather than a lack of food per se. Instead, they emphasise how agroecology could drive political, economic, and production changes. Indeed, comparisons of industrial and agroecological food systems that account for changes in diet and industrial crop usage, along with improved waste management, find that agroecological farming can produce sufficient food in a sustainable and equitable manner (for example, see [What is feed-food competition?](#) and [What is food loss and food waste?](#)).

Regardless of the debate around productivity, agroecology would still need to be 'scaled up and out' (applied on a larger scale and/or over a wider area). However, similar debates remain. For example, are the high labour inputs feasible on a large scale and how will distribution work when agroecology often relies on small-scale farming?

## Can agroecology result in a more equitable food system?

Proponents of agroecology, particularly transformative agroecology, envision an equitable, inclusive food system, based on the principles of food sovereignty. For example, they emphasise studies showing how agroecology improves farmer incomes and generates rural livelihoods and economies, thus allowing smallholder farmers to maintain agricultural ways of life. Moreover,


the democratic and inclusive methods of knowledge exchange and social organising facilitate the inclusion of Indigenous communities and minority groups who have been marginalised by mainstream agricultural techniques and policy. Overall, supporters of agroecology argue that it can address socio-economic inequalities and power imbalances in a food system dominated by large-scale agri-business.

However, critics often point to the high labour input associated with agroecological farming which may tie people to poverty-stricken and labour-intensive rural livelihoods. They state that this is particularly problematic for women, who often undertake additional farm work (see the article [here](#)). Instead, they suggest that modernised agriculture or non-agrarian livelihoods may be preferable for smallholders. Moreover, some suggest that agroecological food production (which promotes fair prices for farmers) and associated dietary changes (particularly less processed food) could be more expensive for consumers. This would disproportionately affect marginalised, less affluent communities and countries (see [UNSCN report on Advancing equity, equality and non-discrimination in food systems: Pathways to reform](#)).

## What are the environmental impacts of agroecology?

Agroecologists argue that, compared to industrial farming, agroecology has many environmental benefits. It can tackle soil erosion and degradation; avoid pesticide and fertiliser related pollution; [sequester carbon](#); and reduce greenhouse gas emissions and reliance on fossil-fuel inputs (by reducing the use of on-farm machinery, long-distance food transportation, and energy-intensive off-farm processes such as ammonia production).

Debates around maintaining both the environment and agricultural production often focus on a choice between '[land sparing](#)' and '[land sharing](#)' (see our explainer on [What is the land sparing-sharing continuum?](#)) Thus, critics express concerns that agroecology would use more land than necessary for agri-food production, particularly once organic fertiliser production is considered. They suggest that higher yielding practices would result in higher net levels of biodiversity by, in theory, releasing



more land for dedicated conservation and carbon sequestration efforts elsewhere, for example through afforestation or **rewilding** (see our explainer on **rewilding and its implications for agriculture**). However, others challenge the idea that agroecology would require more land for farming, stating that truly agroecological systems (based on dietary changes, reduced food waste, crops for feed and fuel, and wider political/economic changes) would allow for both agricultural biodiversity *and* land spared for nature.

## Why and how should we work with nature?

The goal of 'working with nature' is fundamental to agroecology; however, critics question what the aspiration means. For example, drawing on Darwinian evolutionary biology, they state that natural selection happens only at the level of individual species, not **ecosystems** more widely. Therefore, they think that instead of studying ecosystem interactions, the study (and improvement) of individual plants and animals would be more worthwhile.

Nevertheless, increasing numbers of scientists focus on mutualistic **sympiotic relationships** within natural communities, highlighting examples such as pollination and fungi-plant relationships to demonstrate how certain components of ecosystems construct **ecological niches** and provide essential services for other organisms to flourish. They emphasise that while ecosystems might not maximise productivity, they reproduce, adapt, and sustain themselves in the face of serious disruption and so provide a useful model for agriculture.

Overall, disagreements about the value of working with nature often arise due to different priorities for

agricultural systems. While sceptics primarily value productivity and efficiency (in part for its potential for sparing land for nature), agroecologists highlight the importance of resilience and long-term stability and the benefits of seeing humans as integrated into and part of the natural world.

## Conclusion

This explainer summary has discussed the concept of agroecology as a science, a practice, and a movement. Increasing numbers of stakeholders are arguing for agroecology as a way of providing healthy, nutritious food equitably and sustainably. However, there are still questions about the ways in which agroecology could and should relate to technological change, global trade, and corporate agriculture. There is also uncertainty about the viability of agroecology on a larger scale given its dependence on changes to political and economic processes, consumption habits and rural-urban dynamics. Overall, it remains to be seen the extent to which agroecology will drive food systems change.

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**The full report (with associated citations and references) is available at:**

<https://www.doi.org/10.56661/96cf1b98>

1      FAO (2018). The 10 Elements of Agroecology: Guiding the transition to sustainable food and agricultural systems. *Rome, FAO*. Available at: <http://www.fao.org/3/I9037EN/i9037en.pdf>