



What is agroecology, and how can it provide solutions to the crises that plague our food systems and create food democracies?

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Introduction

Founded amid the family farm crisis of the mid-1980s, the Institute for Agriculture and Trade Policy (IATP) has a 35-year history of working on solutions that benefit family farmers, rural communities and our planet. In pursuit of realizing IATP's vision of agriculture, trade and food systems that are good for all people involved in food systems (especially farmers and food system workers), ecosystems and environmental justice globally, we pursue cutting-edge solutions through research and action in coalition with partner organizations.

We apply a systems approach to analyzing and addressing the vexing, interconnected problems of industrialized food systems, and that is where agroecology comes in. Agroecology, with its roots in the traditional knowledge of food producing communities, has emerged as a set of practices based on principles that guide how to produce food sustainably, as well as how to manage the social relationships that govern food production, processing, exchange and waste management in a fair manner.

Since 2020, food prices have been on the rise following COVID-19-related supply chain interruptions, as well as climate disasters, such as drought, frost, fires and floods in a number of countries, among other factors. In early 2022, the war in Ukraine resulted in an unprecedented spike in food prices. In fact, the United Nations Food and Agriculture Organization (FAO)'s [global food prices index](#) reached its highest level ever in March. These successive crises demonstrate that our food and agriculture systems are extremely vulnerable to shocks: We must invest in building resilience. Diversity of knowledge, genetic resources and food systems that foster human rights are necessary to build this resilience.

In this Q&A, we dig deeper into the definition of agroecology, examining the principles and elements of agroecology, as well as the history and development of agroecology as we know it today. We compare and contrast models of industrial, regenerative and organic agriculture to agroecology. In addition, we look at how and where agroecology is flourishing around the globe, and the markets, trade agreements and investments that must be implemented to further agroecological transformations to help build resilience in our food and agriculture systems.

Overview of agroecology

1. What is agroecology?

As an approach, agroecology is fundamentally different from other approaches to agriculture and food systems development and represents an alternative paradigm in direct contrast to industrial agricultural approaches. Agroecology integrates transdisciplinary knowledge, the practices of food producers and

eaters, as well as the priorities of social movements, while recognizing their mutual dependence. Whereas the current industrialized system is extractive and exploitative, agroecology recognizes the interdependence of living systems and honor the principles of balance, diversity, harmony and respect. Agroecology creatively enables those involved in the food systems to connect with each other and solve problems specific to their unique situations.

This transformative vision is necessary to bringing about just and sustainable food systemsⁱ transitions — from production to consumption to waste management — to ensure local and regional level food security across the world, while simultaneously building ecological, social and economic resilience rooted in mutual respect for various cultural food traditions of local community members.

2. Why does IATP work on and advocate for agroecology?

IATP supports agroecology as food producing communities selectively combine traditional and modern practices to address concerns around equity, [parity](#), diversification of farms, productivity and food safety to build the ecological, social and economic resilience of communities. With a [long history](#) of work on international trade and investment-related policies in the context of agriculture, IATP is uniquely positioned to integrate our trade analysis into agroecological advocacy, with a focus on strengthening territorial markets and regional food systems.

Agroecology offers us the most effective pathway to transform both conventional (capital intensive) and traditional food systems to become healthier, diversified, resilient and democratically governed at all levels — local, subnational, national and international — while being accountable and responsive to the needs of those actively engaged in the system, including food eaters, food system workers and food producers.

3. The history of agroecologyⁱⁱ

The ideas, practices and the systems thinking that inform agroecology go back to Indigenous cultures across the world. However, the term agroecology was used for the first time in academia in 1928 by Dr. Basil M. Bensen ([a Russian agronomist](#) who received his education in agricultural sciences at the University of Minnesota, graduating with a M.S. in 1912), initially in reference to applying ecological methods to research on crops.

What we now know as agroecology began developing around 100 years ago along two separate but parallel tracks: In one, biological scientists, such as Dr. Bensen, began studying the application of ecology in agriculture. In the other, food producing communities sought alternatives — both by reclaiming systems lost and building upon old systems with knowledge gathered through new experiences — to the chemical farming that was affecting local biodiversity, soil health and food quality. These alternative sets of agricultural practices had different names in different regions, but all drew on the principle of living with nature.

By 1965, in perhaps one of the earliest books on the topic, “Agroecology” [“Agrarökologie”], German ecologist and zoologist Professor Wolfgang Tischler used the term as he combined ecology (interactions among biological components at the field level or agroecosystem) with agronomy (integration of agricultural management practices) to analyze the various compartments of the agricultural system (the

soil, plants, etc.), their interactions and the impact of human management of agricultural activities on each of these compartments.

[Frederick H. Buttel](#) described these earlier strands of agroecology as a scientific discipline, respectively, as *ecosystem agroecology* (predominant among ecologists) and *agronomic agroecology*. According to Buttel, a third type of agroecology emerged in the period after the 1970s. It drew on the political economic critique of modern agricultural systems and was often called *agroecological political economy*. The foundations of this third strand could have been laid down by the work of academics such as Professor Efraim Hernandez X. who defined agroecosystems as the interaction among ecological, technological and socioeconomic factors. Based on his research on Indigenous systems of knowledge in Mexico, he proposed that with the exclusive focus on productivity (i.e., a *productivist* approach), modern agricultural systems had lost their ecological foundation. In subsequent decades, researchers such as [Steve Gliessman](#) and [Miguel Altieri](#) proposed agroecology as the *application of ecological principles to the design and management of sustainable agroecosystems*. In this period, increasing awareness of the environmental impacts and pollution caused by industrial farming set the stage for many farmers moving to more sustainable agricultural practices.

By the late 1990s, academic writing on agroecology began broadening to include all aspects of food systems, including food production, processing and distribution. Political ecology became an important influence, leading to a more comprehensive understanding of the study of agroecology. Meanwhile, as corporations and global institutions were making decisions driven by profit, food producing communities sought alternatives to globalized food systems. Communities began advocating for food sovereignty,ⁱⁱⁱ the idea that people engaged in producing, processing, distributing and consuming foods should have control over the institutions and policies related to all aspects of food systems, from production to consumption. The [International Planning Committee for Food Sovereignty](#) (IPC) led by [La Via Campesina](#) and other social movements played a leading role in this advocacy starting with the [World Food Summit](#) of November 1996. Over the last two decades, the calls for food sovereignty, agroecology and related campaigns have been taken up across the world not only by grassroots organizations, but also by regional networks such as the [Asian Farmers Association](#), the [Alliance for Food Sovereignty in Africa](#), [U.S. Food Sovereignty Alliance](#) and many others.

The convergence of the work by scientists and the initiatives from food producing communities coming together and exploring solutions to the ecological, socioeconomic and political problems of the current food systems has resulted in a comprehensive understanding of agroecology as “the ecology of food systems,”^{iv} focused on food sovereignty.

These advances also led the United Nations Food and Agriculture Organization (FAO) to develop a set of agroecological principles in 2018 known as the FAO’s [10 element of agroecology](#).^v Further, [in response to a request](#) from the [U.N. Committee on Food Security](#) (CFS), the High Level Panel of Experts (HLPE) to the CFS developed a set of recommendations on the best possible pathways for just and sustainable food system transformations based on [13 agroecological principles](#) that were developed, outlined and agreed upon by the HLPE’s international experts. (FAO’s 10 elements and HLPE’s 13 principles are discussed in detail below.)^{vi}

The [HLPE report](#), presented to the CFS in October 2019, was the basis for extensive negotiations in 2020 and early 2021, [which IATP joined](#) along with other civil society organizations and social movements. The CFS adopted the multilaterally negotiated outcome, [the CFS Policy Recommendations](#), in June 2021.

However, civil society abstained from adoption because several [key elements were missing](#).^{vii} With these recommendations, agroecology has gained further visibility and support.

Definitions, Principles and Elements of Agroecology

4. What are the HLPE's 13 principles, and how are they different from or similar to FAO's 10 elements?

The 13 agroecological principles are aligned with and complementary to the FAO's 10 elements of agroecology. Both take a holistic approach in considering transformations towards sustainable food systems, and both are based on agroecology's three constituent elements: a set of practices, a science and a movement. While the HLPE's 13 agroecological principles and FAO's 10 elements are closely aligned, they are the results of two distinct processes. [FAO's 10 elements](#) of agroecology came out of regional consultations around the world and are designed to help structure the agency's work with member countries and with other international and U.N agencies. The [13 key principles](#) were developed by the HLPE through an extensive literature review of the concepts, definitions and principles of agroecology as a scientific basis for a set of policy recommendations for the CFS. (See the [report, Agroecological and other innovative approaches for sustainable agriculture and food systems that enhance food security and nutrition](#).)

While both take into account key ecological and techno-productive principles, they also incorporate sociocultural and political-economic considerations, as well as governance concerns from the local to global scale. At their best, practitioners of agroecology focus on a holistic approach in keeping with all 13 of the agroecological principles outlined by the HLPE to simultaneously ensure multiple benefits for all food system actors, local communities and ecology. The focus is not only on the farm and the design of the agroecosystems, but also on the needs of people within food producing communities, food system workers, consumers and especially women. Upholding these principles is crucial for the development of alternatives to industrial agriculture through movement building.

5. What is meant by saying agroecology is a science, a practice and a movement?^{viii}

As a science, agroecology is: 1) the integrative study of the ecology of the entire food system, encompassing ecological, economic, social and political dimensions; 2) the application of ecological concepts and principles to the design and management of sustainable food systems; and 3) the integration of research, education, action and change that brings sustainability to ecological, economic and social aspects of food systems.

As a set of agricultural practices, agroecology seeks ways to improve agricultural systems by harnessing natural ecological processes and ecosystem functions; creating beneficial biological interactions and synergies among the components of agroecosystems; minimizing synthetic and toxic external inputs, as well as waste production; maximizing functional biodiversity; and strengthening biological regulation in agroecosystems. Practices are designed to sustainably reconcile social, economic and environmental challenges to community agricultural development.

As a movement, agroecology seeks to transform agriculture to build locally relevant, resilient and sustainable food systems that strengthen the economic viability of rural areas based on short marketing chains, equity, and both fair and safe food production. This involves supporting diverse forms of smallholder food production and family farming, including farmers, pastoralists, fishers and gatherers.

Specific aims of the movement include food sovereignty, respect for and preservation of local knowledge, social justice, maintenance of local identity and culture, and rights to local and Indigenous seeds and breeds.

In agroecology, these three aspects are closely interrelated. The agroecology movement builds on agroecological science and knowledge for promotion and practice of the agricultural approach. Because of the interlinkages between and coevolution among these three aspects, agroecology **is a holistic approach**, oriented towards food system transformation to more just and sustainable food systems. It seeks to build resilient food democracies on the firm foundations of place-based, experiential, Indigenous knowledge systems. Its practices are enhanced through **mutually respectful intercultural interactions** and movement building among food producers, food system workers, consumers, with particular attention to women, as well as through cocreation of knowledge in collaboration with scientists.

6. Why is the definition of agroecology important? How does the definition intersect with policy?

Agroecology now has a central role in the agenda for transforming agriculture in multilateral food security debates. There has been a proliferation of definitions of agroecology, as different organizations and countries define it in ways that reflect their concerns and priorities. For IATP, the holistic definition of agroecology highlights a multifaceted approach based on a set of principles to guide food system transformations towards food sovereignty, ensuring food democracy, sustainability, viability and community resilience.

The set of principles is not a prescriptive plan but provides a holistic framework for addressing multiple challenges in the food systems, including: impacts of climate on agriculture and [reducing emissions](#); [nutrition diversity and food security](#); the conservation of biodiversity and water; and [reducing ecological footprints](#). It also offers a framework for addressing [social and economic inequities](#) in the food system and reducing food waste. Using this framework requires recognizing that each community and food system actors' needs and circumstances are different and impacted not only by biophysical feedback processes and interactions among interdependent humans, but also by governance decisions at local, national and international levels.

Despite its usefulness, and despite evidence-based assessments demonstrating agroecology as the most effective path for addressing multiple ecological and socioeconomic crises simultaneously, agroecology is missing in many policy spaces or only present in watered-down versions. Thus, civil society organizations advocate for the integration of agroecology in official positions of national and local policymakers, including ministries and departments of food, agriculture, environment, water, forests, wetlands and rural development, as well as city and regional planning for [access to healthy food and market development](#). In addition, advocacy is needed at local, national and international levels to increase agroecology-specific policies, research, extension, public finance, rules and legislation.

Most aspects of agroecology — such as extending a supportive environment where science intersects with local practices in their diversity — can be addressed in public policies. But a key constituent element of agroecology is the involvement and leadership of social movements and mutual accountability. This element can only be enabled by ensuring space for democratic engagement. Thus, social movements with a central focus on justice, fairness and food democracy become key to the real spread of meaningful and holistic agroecological transitions. The transdisciplinary nature of agroecology — which embraces not only multiple scientific disciplines, but also food system practices, as well as

social movements and the application of this transdisciplinary approach to the entire food and agricultural system — is key to food system transformations.

IATP is working with partners locally and globally to advance food system transformations rooted in these agroecological principles and by promoting food democracies.

7. What are the goals and benefits of agroecology?

We are at the precipice of an agrarian crisis: ecological, socioeconomic and political. While agroecology can improve farmers' yields and incomes, its true value goes well beyond that. Agroecological transformations, from production to consumption to waste management, offer us a pathway to address these multiple crises, through an approach that recognizes the interdependence of living systems (from microbes to plants and animals to humans) and honors the principles of balance, diversity, harmony and respect. These transformations entail a cultural shift and a worldview that is distinct from the exploitation and extraction implicit in industrialized agriculture.

Such just food systems transitions are necessary for building food democracies; for ensuring that consumers can afford healthy, culturally appropriate and nutritious food; for ensuring economic viability for food producers and workers in food systems; and for revitalizing rural areas and enabling fair trade in agricultural commodities and other crops. A just transition requires building local democratic governance structures and rebuilding the natural resource base, enabling climate resilience.

The role of technology in agroecology

8. How does agroecology differ from other traditional agriculture practices? How does it resemble these practices?

Unlike other traditional agricultural practices, the ecological and techno-productive dimension of agroecology focuses on the design of the farm and agroecosystems based on key [ecological principles](#) and adapting them to the local environment. Miguel Altieri^{ix} describes them as:

1. Enhance recycling of biomass and optimizing nutrient availability and balancing nutrient flow;
2. Securing favorable soil conditions for plant growth, particularly by managing organic matter and enhancing soil biotic activity;
3. Minimizing losses due to flows of solar radiation, air and water by way of microclimate management, water harvesting and soil management through increased soil cover;
4. Species and genetic diversification of the agroecosystem in time and space;
5. Enhance beneficial biological interactions and synergisms among agrobiodiversity components thus resulting in the promotion of key ecological processes and services; and a sixth principle was [added later](#): Strengthen the “immune system” of agricultural systems through enhancement of functional biodiversity — natural enemies, antagonists, etc., by creating appropriate habitats.

While many Indigenous farming systems continue to be based on some or all these principles, most communities are unable to continue such practices. Policies related to food, agriculture, seeds, water and agrichemical inputs have incentivized shifts away from such food system practices to practices that focus exclusively on the productivity of a few select crops or animals.

9. Is agroecology a return to “tradition,” rejecting all types of technology, inputs for agriculture and information regarding innovation?

No, agroecology is not a rejection of all technology. Use of technology is considered as the local context warrants it. Some technologies, such as genetic modification or gene editing,^x are considered incompatible with agroecological principles. To help decide which technologies — whether from traditional knowledge and practices or scientific innovations — make sense and which do not in a specific context, agroecology practitioners and scientists engage in mutually respectful conversation (or *diálogos de saberes*, i.e., dialog among different kinds of knowledge or methods of enquiry),^{xi} with each other and among themselves. They are constantly innovating based on specific local conditions, including social and cultural dimensions, to build on ancestral and experiential knowledge of the food producers and local communities on the one hand and the knowledge of agroecology scientists on the other hand.

Agroecology and sustainable intensification, regenerative and organic agriculture

10. How does agroecology differ from regenerative or organic agriculture?^{xii}

Over the last several decades, agroecology has evolved to become a holistic approach to food systems transformations, with strong ecological grounding. It seeks to foster intra and inter-community justice, economic and ecological resilience, and most crucially, resistance against corporatization of agriculture and food systems. While agroecology starts with redesigning the production practices in the agroecosystem to be more diversified, it goes beyond to developing shared economies and fair working conditions that honor the dignity of the people involved in the food system. The transformations are not only about addressing ecological concerns of the specific agroecosystem or ensuring access to organically produced food, but also about simultaneously addressing fundamental concerns of the food producers, food system workers and consumers around [parity](#), equity and intergenerational justice across and within countries.

The basic principles of organic agriculture — no use of genetically modified organisms (GMOs) or harmful synthetic chemicals (pesticides and fertilizers), encouraging building healthy soil and diversified agroecosystems, and grass-based ruminants — are consistent with what was initially promoted as regenerative agriculture. Both organic and regenerative agriculture may share many aspects of agroecology when it comes to production practices that are rooted in ecological resilience. This is not surprising since organic agriculture shares a history with agroecology, as both evolved as alternatives to chemical farming among farming communities. Organic agriculture has clear standards laid out either by national government bodies such as the U.S. Department of Agriculture’s [National Organic Standards Board](#) (NOSB), by food producers’ organizations, as in the case of the [Real Organic Project](#), or clear [norms](#), as in the case of the International Federation of Organic Agriculture Movements ([IFOAM-Organics International](#)).

In fact, in the U.S., the organic industry took the initiative to ask the federal government to regulate it for standardization, consistency and enforcement, as IATP pointed out in its [Revisiting Crisis by Design](#) series. [Labelling](#) is intended to assure eaters that what they eat is produced according to rigorous organic standards; this has helped ensure competitive access to premium markets, including global markets. The [dramatic increase in organic production](#) and overall growth in the sector has also been

accompanied by increasing corporate concentration in the organic industry. Unfortunately, with increased participation of food value chain companies in this growing sector, lobbying efforts to expand and weaken the definition of what is allowed to be called organic are ever present. As a result, NOSB standards [continue to be lowered](#).^{xiii} For example, concentrated animal feeding operations ([CAFOs](#)) [can be part of](#) the “organic” sector, as can [hydroponic](#) systems despite opposition from many organic farmers organizations.

Unlike agroecology, regenerative agriculture does not have a clear set of principles or key elements that have been agreed upon by a multilateral body, nor are there any national-level [rules and regulations](#) that govern regenerative agriculture, such as the USDA organic standards. Moreover, there is much ambiguity around the way term is used. [A review of scholarly and practitioner definitions](#) of regenerative agriculture shows how such ambiguity adds “confusion to understanding what the term ‘regenerative agriculture’ is being used to mean in any particular context.” Definitions of regenerative agriculture range from an approach that seeks to improve [soil and ecosystem health](#) to much narrower goals, such as [agricultural carbon sequestration](#) as a climate mitigation strategy with the promise of [monetization of carbon stored in soil](#), also called carbon farming.

In sum, while both these approaches can be part of agroecological transformations, organic agriculture and regenerative agriculture [are more amenable](#) to cooptation or manipulation by the corporate sector, compared to agroecology that emphasizes [circular and solidarity economy](#). Agroecology puts [human and social values](#), such as dignity, equity, inclusion and justice, at its the center, in addition to its emphasis on the conservation of biological resources through [diversity, synergies, efficiency, resilience](#) and [recycling](#).

In the U.S., in response to such cooptation and manipulation, organic farmers are coming together to develop the [Real Organic Project](#), with [its own standards](#) that [go far beyond](#) USDA’s [NOSB standards](#). A somewhat parallel initiative by those focused on regenerative agriculture, as well as better supply chain operations, is the [Regenerative Organic Alliance](#) (ROA), which defines regenerative agriculture as having three core pillars — soil health through organic [no-till](#), social fairness and animal welfare. [Regenerative Organic Certification](#) (Regenerative Organic Certified™) starts with the [NOSB standards](#) and not only brings together other existing third-party certifications, but also provides ROC-specific guidelines for each of its three pillars. While Real Organic Seals are available only to member producers, the Regenerative Organic Certified™ certification is available to producer operations and supply chain actors for U.S. and international markets.

Both the [farmer-driven approach](#) of the [Real Organic Project](#) and value-chain focused, aspirational [regenerative farming](#) are efforts in the U.S. to go beyond the NOSB’s organic standards, and both approaches embrace different aspects of the FAO’s 10 elements of agroecology. A parallel international initiative is [IFOAM’s Organics 3.0](#).^{xiv}

Truly embracing the agroecological principles in the U.S. context would require not only combining the best of both [Real Organic Project](#) and [Regenerative Organic Certification](#), it would also require [addressing racial, gender](#) and [food justice](#) concerns as a basis for building [more resilient and just food systems](#) through the inclusive leadership of social movements.

11. What is sustainable intensification? How is it different from agroecology?

Sustainable intensification (SI) focuses on improving productivity per unit of land while also trying account for some of the environmental externalities of the current model of industrial agriculture. It is a mainstream and (often) corporate response to the ecological crisis of food systems. Its principal focus continues to be productivist, seeking to improve the output plant-by-plant or animal-by-animal and using technological interventions to improve resource-use efficiency of specific inputs, such as water, labor or agrochemicals. SI is not holistic and does not pay attention to possible negative impacts of the technical interventions on the farming system, including the ecological balance of agroecosystems. For example, in SI practices, no-till farming is often accompanied by herbicide use; no-till helps with carbon sequestration especially if it is combined with other practices like planting cover crops, and the use of herbicides can help improve labor-use efficiency of the farm. However, in this example, the [net ecological impact^{xv} of no-till farming is negative](#), as the herbicide use can impact biodiversity, water quality, the ecological balance of the agroecosystems and even people's health. Most importantly the practitioners of SI do not challenge the problematic corporate concentration in food systems.

While there is an attempt to portray such piecemeal initiatives as agroecological, the CFS-HLPE report on agroecological and other innovative approaches clarifies how SI and agroecology are different. The report clusters several innovative approaches into two main categories: 1) sustainable intensification of production systems and related approaches (including climate-smart agriculture, nutrition-sensitive agriculture and sustainable food value chains) that generally involve incremental transitions towards sustainable food systems; and 2) agroecological and related approaches (including organic agriculture, agroforestry and permaculture) that some stakeholders consider to be more transformative.

While sustainable intensification starts from the premise that addressing future food security-related challenges requires an increase in productivity per unit of land in a sustainable manner, agroecology emphasizes reducing inputs and fostering diversity alongside social and political transformation. It is focused on improving ecological and human health and addressing issues of equity and governance.

Agroecology and “feeding the world”

12. It is argued that agroecology cannot feed the world. What is IATP's response? Should “feeding the world” be the goal of agriculture and food systems?

Food insecurity has plagued populations around the world for centuries. During the mid-20th century, the Green Revolution was ushered in to alleviate world hunger as part of international agricultural developmental efforts. The Green Revolution focused on increasing agricultural productivity through breeding and use of inputs, such as synthetic fertilizers and pesticides on selected crops amenable to monocropping, and infrastructures to support such practices. This helped to increase food grain production. In the meantime, government policies in the U.S. led to large-scale monocultures heavily dependent on agrochemicals and commercial seeds, creating an industrial food system that spread to other parts of the Americas and, by now, to the rest of the world. Family farmers were forced to “get big or get out,” a phrase attributed to former U.S. Secretary of Agriculture Earl Butz. Over the last five decades, we have come to experience the socioeconomic and environmental ill effects of such industrial food systems and corporate concentration, with increased distance between food producers and eaters.

The idea of needing to produce more for “feeding the world” is a myth started and promoted by agribusiness and the architects of industrial agriculture. In the U.S., farmers are told to produce more to feed the world, but behind this call is a false premise that there is not enough food in the world. The

volume of agricultural production required is a function of the way it is used (for food, feed or fuel), as much as the number of eaters and their ability to access healthy food. The “feed the world” approach ignores fundamental issues of distribution and equity. This simplistic association between agricultural output and food security has no basis in facts and ignores the fundamental reasons for world hunger: Hunger is rooted in structural inequalities: colonial experiences that have dispossessed people of their access to land, water and other resources, further exacerbated by international and national investment policies. Such structural inequalities are often enabled by authoritarian or neoliberal regimes.

A deeper analysis reveals two things about today’s dominant industrial food system. First, it is depleting and degrading the natural resource base — soil, water and biodiversity — and helping to intensify climate disruption. Second, despite producing [enough food for 9.7 billion](#) people (projected to be the world’s peak population by 2050), it has failed to address world hunger. Ensuring food and nutrition security for people around the world requires protecting the ecological resource base that is essential for producing food now and in the future. This must happen along with addressing power imbalances in the food system, nurturing food democracies and working toward implementing the right to food.

As the FOE [report](#) on agroecology (2016) notes, “Four decades of scientific evidence show that agroecological farming, including diversified⁶ organic agriculture, is the most effective agricultural response to the environmental challenges that threaten our future food security, such as climate change, soil erosion, water scarcity and loss of biodiversity.” Also, “as a systems-based approach to food and farming, agroecology addresses the social and economic drivers of chronic hunger endured by nearly 800 million people around the world.” The report concludes, “By transitioning from industrial to diversified organic and agroecological food and farming systems, we can produce enough food to feed the world, reduce poverty and restore essential natural resources to feed the planet for generations to come.”

13. How have efforts to ensure a nutritious diet for all been sidetracked by the goal of sufficient calories?^{xvi}

The current global calorie supply is more than enough for the world’s population. In many countries, the volume of food available is not the main problem; rather, the problem is the accessibility, distribution and affordability of culturally appropriate and nutrient-dense food. How the crops are used also matters. Much of the grain grown across the world is used for animal feed or fuel-feedstocks. If used for direct human consumption, it often undergoes extensive processing that strips most nutrients or converts it to less nutritious products (e.g., turning field corn into high-fructose corn syrup). According to the FAO, nearly one-third of food produced for human consumption — approximately 1.3 billion tons per year — is either lost or wasted globally.

The emphasis on calorie supply is a hangover of an older approach to measuring food security. A sufficient global calorie supply was the primary goal of 20th century agricultural development, which focused on increased grain output through Green Revolution technologies, augmented by aid and trade policies. This “productivist” approach sought to increase agricultural outputs by focusing on improving the productivity from a specific plant or animal. The goal was to meet national level food security (in calorific terms) and to increase agricultural exports for aid or trade.

This approach informed food, farm, trade and investment policies in agriculture and allied sectors, and it has been a dismal failure. Across the world, malnutrition has remained high, [obesity is increasing](#) and close to one billion people are hungry. It also affected farming communities negatively, with many

shifting from diversified farming practices to cash crop monocultures, such as soybeans or sugarcane. Sometimes, they have been pushed out of agriculture altogether due to agricultural [dumping](#). Farm families who continue farming often end up suffering from poverty and hunger.

In contrast, agroecology includes the goal of ensuring a nutritious and culturally appropriate diet for all. In most agricultural communities, agroecosystems have functioned as a source of diverse food, as well as other resources needed for communities' survival — fuel, fiber, medicines, cosmetics, cleaning needs, fencing and building materials, pollination and pest control, fertilizer, fodder and feed for farm animals. While the productivist approach focuses only on grain, food and feed outputs, agroecology emphasizes the multifunctionality of the agroecosystems while conserving the natural resource base. A nutritious and culturally appropriate diet for everybody requires a diversified food system that is accessible to all, which is central to agroecology.

Agroecology in practice

14. What countries have adapted and embraced agroecology?

Agroecological transitions are taking place in many developing countries and some developed countries. [France](#), [Germany](#) and [Switzerland](#) promote some version of agroecology as part of their bilateral aid. While there are several partial government initiatives at state level or sub-national level, no country has promoted agroecology at the national level. Bhutan, with its [National Framework for Organic Farming](#) and plans [to go 100% organic](#), has the potential for nation-wide just agroecological transitions but will require additional support and an enabling environment to become [an economy for food sovereignty and organic farming](#).

Agroecology is also being advanced in some select countries through an action plan that FAO has developed in collaboration with partners, known as the [scaling up agroecology initiative](#) (SUAI), a platform to catalyze cooperation on agroecology within the U.N. system.^{xvii} The International Fund for Agricultural Development (IFAD)'s engagement with SUAI has resulted in a [stock-taking report on agroecology in IFAD operations](#), looking at all 207 IFAD-supported projects across countries in the five IFAD regions.

One of the SUAI activities is technical support to countries in developing policy processes, including through South-South Cooperation in some states and regions in countries including India, Senegal and Mexico.^{xviii} In India, the initiative supports the government of Andhra Pradesh's program for Zero Budget Natural Farming (ZBNF), through Andhra Pradesh [Community Managed Natural Farming Programme \(APCNF\)](#).^{xix} In Senegal, at the invitation of the government, support was given to the National Committee "Dynamic for Agroecological Transitions in Senegal" (DyATES).^{xx} Other SUAI initiatives include a 10 Year Regional Programme for Agroecology in West Africa in response to a request from the Economic Community of the West African States (ECOWAS) and the Development of a Regional Policy Framework on Agroecology in response to a request from the Parliamentarian Front of the Latin America and the Caribbean (PARLATINO).

15. Has agroecology been adopted in the United States?

Agroecology, as defined in this Q&A, has not yet been adopted as part of state or federal level policies in the U.S. However, there are many farmers and civil society organizations in the U.S. that have been

advocating for the adoption of agroecology. Some of these farmers practice regenerative and organic agriculture at their best. The U.S. Food Sovereignty Alliance (USFSA) is a network of frontline organizations and allies (including IATP) advocating for agroecology. The alliance continues to shape the conversation about agroecology in the U.S., and late last year, it was joined by over 80 U.S. food, and farm justice organizations [to ask the Biden administration](#) to support agroecology.

16. What does agroecology have to do with the global climate commitments and U.N. Sustainable Development Goals? What about the U.N. Food Systems Summit or its AIM for Climate Coalition?

Just agroecological transitions are the most effective approach to simultaneously addressing global climate commitments and most of the Sustainable Development Goals. A just transition in food systems means recognizing that the climate crisis impacts people; that food producers and food system workers are the first to bear the brunt of it; and that agroecology is a key solution, both in terms of mitigation and adaptation, to build [climate-resilient livelihoods and food systems](#). Agroecology is about producing and processing with minimal pollution and emissions. It involves diversified and integrated farming practices and systems that enhance resilience in a variety of ways, including through more biodiversity and nutritional diversity, improved soil health and water retention capacity of soils. All this helps improve the adaptive capacities of the community. With its emphasis on locally and regionally focused processing and marketing, food and feed products need not travel as far, thereby reducing the climate footprint substantially.

Agroecological transformations can help countries meet their climate mitigation commitments in several ways while simultaneously building their adaptation capacities. The adaptation and mitigation potentials provide the rationale for diverting agricultural climate finance in support of agroecology. More importantly, with its roots in food sovereignty, agroecological transformations can help climate challenged communities to address the socioeconomic, ecological, political and cultural concerns of the community in a balanced manner, helping the community become resilient and food secure and helping [nations meet their SDG2030 goals](#).

The U.N. Food Systems Summit, despite being highly controversial,^{xxi} has mainstreamed the concept of food systems — the idea that we need to look holistically at food and agriculture production, processing, marketing and trade to address the multiple socioeconomic, ecological and energy crises. Agroecological transitions seek holistic transformations to the food systems, unlike productivist approaches that have been promoted through 20th century and until recently.

Despite the rhetoric, most of the coalitions that have come out of the Food Systems Summit have continued to promote the same productivist vision, albeit with a focus on improving input use efficiency in terms of labor or agrichemicals. This is clearly visible in two of the [four initiatives](#) highlighted by the U.S. at the U.N. Food Systems Summit: The Agriculture Innovation Mission for Climate ([AIM for Climate](#)) and [Sustainable Productivity Growth Coalition](#). In 2021, the Food Systems Summit became a space where multiple “solutions” and coalitions were promoted indiscriminately and marginalized [human rights concerns](#). The summit was perceived as a corporate effort to shift decision making away from one of the most inclusive, multilateral food governance space, the U.N. CFS, as well as a missed opportunity to address the devastating [impacts of COVID-19 and the underlying causes and governance issues](#) in the food systems.

[AIM for Climate](#) is an initiative [announced](#) by the U.S. in collaboration with United Arab Emirates well in advance of the Food Systems Summit but promoted during the summit to accelerate global innovation,

research and development (R&D) on food systems in support of climate action. As U.S. Agriculture Secretary Tom Vilsack [put it](#), this coalition will promote “voluntary, market based, science driven approaches to climate” as an alternative to the Europe’s [Farm to Fork Strategy](#) that seek to transform their food systems, including through reducing agrichemical use by 50% by 2030.

Another relevant initiative is the [Coalition for the Transformation of Food Systems through Agroecology](#). According to current members, it seeks to promote HLPE’s 13 agroecology principles, in line with [a call initiated by the IPES-Food, which IATP endorsed](#). The [Agroecology Coalition](#) has its origins in the [controversial U.N. Food Systems Summit](#). It is important to note that the Agroecology Coalition has members with a wide variety of stances on food system transformations. On one hand, it includes members such as the government of France, with its [4 Pour 1000](#), which advocates for input substitution and carbon sequestration. On the other hand, it has members such as the research network IPES-Food, focused on holistic food system transformation rooted in [diversified agroecological systems](#). Frontline communities and allied organizations that have successfully advanced agroecology in international policy spaces such as the FAO and CFS are either hesitant to embrace the [Agroecology Coalition](#) or cautiously supportive.

17. There are concerns that some institutions and nations are using the term agroecology to mean different things. Is cooptation of agroecology a growing problem? Are there cases where companies/corporations are explicitly using the language of agroecology when they’re not really practicing agroecology?

Cooptation of agroecology is a growing problem.^{xxii} Now that agroecology has moved to take a central role in the agenda for transforming agriculture in multilateral food security debates, we see many attempts by corporations, governments and [agrochemical lobby groups](#) to define agroecology in ways that reflect their concerns and priorities.^{xxiii} Those who initially tried dismissing agroecology as “a dead end” now suggest that “agroecology and biotechnology can work hand in hand.”^{xxiv}

Others, while not using the term agroecology, try to incorporate select natural farming practices, such as the use of cover crops or minimizing tillage farming and retaining crop residue on soils, that are amenable to industrial monocultures while leaving out other practices that are integral to natural farming (such as eliminating the use of pesticides and inorganic fertilizers) but antithetical to productivist approaches. These select practices, known as conservation agriculture and no-till agriculture, are promoted as part of approaches such as Sustainable Intensification (SI), Climate Smart Agriculture (CSA) or even regenerative agriculture. In fact, there are a few corporate initiatives around regenerative agriculture. Some examples include initiatives such as Nestlé’s version of [regenerative agriculture](#), Unilever’s [Regenerating Nature](#) and the initiative [to transform dairy farming towards regenerative agriculture](#) by a global alliance of leading AgriFoodTech companies, such as Yara and Danone, called [Farming for Generations](#).^{xxv} It is against this background that one of the leading civil society initiatives on regenerative agriculture, the U.S.-based Regenerative Organic Alliance, has begun insisting on a [regenerative organic certification](#) (Regenerative Organic Certified™).

When corporations incorporate minimal changes in farming operations to address climate mitigation obligations, to capture a share in carbon markets or for other financial benefits, those changes cannot be described as contributing to agroecological transformations. Such attempts, with no intention to mitigate the negative impacts of their operations, tend to be extractive with respect to local communities and environment, while agroecology helps create resources for and within a community.

Agroecological transformations

18. How important is the component of agroecology that addresses political power or transforming power structures in society?

This question goes to the heart of what agroecology is.

It is often asked if it is possible to practice agroecology without the food sovereignty component and simply work with nature's processes, i.e., minimizing inputs. Agroecological transformations are not simply about nature's processes occurring in a vacuum, but rather about recognizing that practitioners of agroecology are embedded in specific socioeconomic, cultural and political locations as they engage in food and agricultural practices. Agroecological transformations are also about having clarity on what you are shifting to — fair, healthy and sustainable food, farm and trade systems that help build revitalized rural communities, healthy people and planet — and how that shift is carried out. It is both about the outcome and about the process: these transformations involve changing power relations between producers and markets, consumers and companies, food system workers and their employers, so to build food democracies.

Minimizing inputs is a desirable step for farmers seeking to reduce input costs or reduce their environmental footprint, but those steps by themselves do not make for an agroecological transition. To start an agroecological transition, these steps need to be combined with fair wages for farmworkers and fair prices for farmers at the minimum, which could contribute to a fairer economy. Policies and other support from governments would help with such changes, but any such transitions imply political mobilization and have a food sovereignty component.

19. What kinds of markets, trade agreements and investments enable agroecological transformations to flourish?

Current trade and investment agreements have been designed to maximize flows of goods and services across borders, not to promote sustainable development. They are oriented towards the market, not food security, public health, parity or sustainability. The current regime often ends up undermining these directly or indirectly. The current trade systems support the myths of “feeding the world” and U.S. farmers being able to export their way to prosperity. In many countries, Green Revolution approaches were promoted in the name of national food security while actually focusing on export-oriented agricultural strategies, externalizing ecological and socioeconomic costs.

The case of Mexico is an example of how trade agreements could be used to undermine the potential for agroecological transformations. In 2021, the Mexican government announced [its plans to eliminate the use of glyphosate](#) and imports of GMO corn and cotton by 2024 as part of its broader program for food self-sufficiency. The assertion of national sovereignty could enhance biodiversity and human health. Depending on how it is implemented, it could also be a step in a transition to agroecology. However, U.S. agribusinesses falsely asserted that [the new rules violate](#) provisions in USMCA, a free-trade agreement between the U.S., Mexico and Canada. IATP's [policy brief analyzes the agricultural biotechnology provisions of the USMCA](#) to understand what they may require of the parties to the agreement and suggests that this argument does not hold water. Still, future trade commitments based on that language could create new tools for agribusinesses to challenge government actions around pesticides, GMOs, better information for consumers and other steps toward agroecology.

Agroecological transformations require a rethinking of the global trade systems. International peasant organizations, such as the Via Campesina, have long demanded that agriculture be excluded from all trade agreements. However, this could leave a default environment that is not fair to various actors in the food system, given that individuals and nations are interdependent for accessing our food. Given that agroecological transformations of our food systems are necessary, trade rules need to be designed to shelter agroecological food systems from floods of cheap imports produced unsustainably, and to promote (rather than restrict) seed sharing and cooperation. This would mean reforming trade accords so that they prioritize public policies that advance agroecology, climate action and human rights over commercial flows of goods, services and investment.

ⁱ Sustainable food systems are food systems that are: productive and prosperous (to ensure the availability of sufficient food); equitable and inclusive (to ensure access for all people to food and to livelihoods within that system); empowering and respectful (to ensure agency for all people and groups, including those who are most vulnerable and marginalized to make choices and exercise voice in shaping that system); resilient (to ensure stability in the face of shocks and crises); regenerative (to ensure sustainability in all its dimensions); and healthy and nutritious (to ensure nutrient uptake and utilization). Source: HLPE. 2020. Food security and nutrition: building a global narrative towards 2030. A report by the High-Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security, Rome.

ⁱⁱ For a comprehensive review, History and currents of agroecological thought, see chapter 2, pp:41-67 of [Agroecology: Science and Politics](#).

ⁱⁱⁱ Food sovereignty is the right of peoples to healthy and culturally appropriate food produced through ecologically sound and sustainable methods, and their right to define their own food and agriculture systems. It puts the aspirations and needs of those who produce, distribute and consume food at the heart of food systems and policies rather than the demands of markets and corporations. Source: [Declaration of Nyéléni](#), the first global forum on food sovereignty, Mali, 2007; For a discussion on Food Sovereignty see, *Pimbert, Michel Towards Food Sovereignty: Reclaiming Autonomous Food Systems, IIED, 2009*.

^{iv} See [The evolving landscape of agroecological research](#), a network science and bibliometrics based evaluation demonstrating that agroecology has indeed evolved to possess many of the characteristics of an “ecology of [the entire] food system.”

^v See section on Methods and processes to define principles, in Agroecological principles and elements and their implications for transitioning to sustainable food systems. A review, at <https://link.springer.com/article/10.1007/s13593-020-00646-z>.

^{vi} The High-Level Panel of Experts on Food Security and Nutrition of the UNCFNS was tasked with assessing “Agroecological approaches and other innovations” for their suitability to help sustainable agriculture and food systems transformations that enhance food security and nutrition. See the report here: <https://www.fao.org/3/ca5602en/ca5602en.pdf>.

^{vii} See our reflections on the negotiations [here](#).

^{viii} The [Nyéléni Declaration](#) organized by the International Planning Committee on Food Sovereignty defines agroecology as a people-led movement and practice; it says that those processes needs to be respected and supported, rather than led, by science and policy (and calls on them to stop supporting “forces that destroy.”) See here more on [Nyeleni process](#).

^{ix} Altieri, M.A. (2000) Agroecology: Principles and Strategies for Designing Sustainable Farming Systems. Hayworth Press, New York. Source: College of Natural Resources: University of California, Berkeley.

^x See a detailed examination of this question on technology and agroecology in the context of CRISPR here [Can agroecology and CRISPR mix? The politics of complementarity and moving toward technology sovereignty](#).

^{xi} For an extensive discussion on the role of diálogo de saberes in the construction and elaboration of the food sovereignty paradigm by LVC and in their collective construction of mobilizing frames for resistance and for promoting agroecology, see <https://www.fao.org/family-farming/detail/en/c/386215/>.

^{xii} See [a discussion](#) on organic, agroecological and regenerative agriculture in the context of IATP's [Revisiting Crisis By Design series](#).

^{xiii} For a detailed critique on dilution of NSOB standards and the developments in responses in the United States, see: <https://www.cornucopia.org/2018/04/will-additional-labels-on-organic-food-clarify-or-confuse/>.

^{xiv} IFOAM describes [Organic 3.0](#) as a revised understanding of the role of the organic movement, to help develop truly sustainable farming systems and markets based on organic principles. The concept is outcome-based and continuously adaptable to local contexts, but still grounded in clearly defined minimum requirements, and positions organic as a modern, innovative farming system that holistically integrates local and regional contexts. The core of Organic 3.0 is the living relationship between consumers, producers and our environment.

^{xv} The concept of ecological footprint is especially useful in the context of differentiating agroecological approaches from other approaches. See [here more on the ecological footprint](#), proposed by the HLPE report on agroecology as a 4th operational principle (in addition to the three traditional principles: improving resource efficiency; strengthening resilience; and securing social equity/responsibility) to help assess if a food system is sustainable or not.

^{xvi} See HLPE Report #12 for an extensive discussion: <https://www.fao.org/3/i7846e/i7846e.pdf>.

^{xvii} For a 2020 update on the Scaling up Agroecology Initiative with three interrelated areas of work: 1) Cocreation of knowledge and innovation; 2) policy processes including through leveraging existing policy processes and providing technical support; 3) Building connections and supporting networks) see:

<https://www.fao.org/3/nd420en/ND420EN.pdf>.

^{xviii} Read: <https://www.fao.org/agroecology/database/detail/en/c/1506272/>.

^{xix} ZBNF practices can be agroecological or not depending on the details. For an example of ZBNF as agroecological practice, see this [case study from Tamil Nādu](#).

^{xx} See here [more on the work](#) through Dynamique pour une Transition Agroécologique au Sénégal, (DyTAES), an institutional framework built to support policy debates on agroecology transitions and has farmers, consumer organizations, NGOs, local authorities, researchers and private firms as its members.

^{xxi} For a detailed discussion see: [Dismantling Democracy and Resetting Corporate Control of Food systems](#).

^{xxii} See a detailed discussion: [Is Agroecology Being Co-Opted by Big Ag?](#)

^{xxiii} See here, <https://croplife.org/news/what-is-agroecology/> from CropLife International. CropLife is an agricultural industry association that lobbies on behalf of its members, pesticides and plant biotechnology corporations such as Monsanto, DuPont, Syngenta and others.

^{xxiv} Alliance for Science, [primarily funded](#) by the Bill & Melinda Gates Foundation, seems to lead the public relations effort to undermine [agroecology advocacy](#) of African organizations through messaging such as [agroecology is a dead end for Africa](#) and [“agroecology and bio-technology can work hand in hand.”](#)

^{xxv} According to [Civil Eats](#) “Over the last few years companies including [General Mills](#), Danone, [Cargill](#), [McDonald’s](#), [Target](#), and [Land O’Lakes](#) announced plans to advance regenerative agriculture on millions of acres of North American farmland.”