

Agroecology

Pre-proof version

Citation: Anderson, C.R., Lamine, C. & M. Caswell (2024). Agroecology. In: Holloway, L., Goodman, M., Maye, D., Kneafsey, M., Sexton, A. and A. Moragues Faus (Eds). *Elgar Encyclopedia of Food and Society*. Elgar Publishing.

Abstract: Agroecology represents a paradigm for just transitions in food systems amidst global ecological, economic, and health related crises. It has gained international prominence and legitimacy in the realms of science, practice, and social movements. Based on principles developed through the study of peasant agriculture and indigenous and regional foodways, agroecology is specifically attuned to the surrounding ecological context. Agroecology is realised through social and political processes that center the agency of farmers, peasants, Indigenous peoples and communities deeply connected to the ecologies they inhabit. This entry explores agroecology as a transgressive framework rooted in the struggle for food sovereignty, contesting and replacing the corporate-industrial paradigm. We focus on the importance of co-creating knowledge, territorial approaches to rescaling food systems, the role of technology, and the need to continually centre issues of power and equity. Finally, we discuss the importance of being wary of cooptation as agroecology gains increasing recognition.

Keywords: Agroecology; Food Systems; Food Sovereignty; Just Transitions; Knowledge co-creation

Colin R. Anderson: 0000-0001-5447-3012
UVM Institute for Agroecology, University of Vermont

Claire Lamine: 0000-0001-6192-7481
INRAE Ecodéveloppement, Avignon, France.

Martha Caswell: 0000-0002-9238-996X
UVM Institute for Agroecology, University of Vermont

This paper was supported by the Agroecology Transitions for Territorial Food Systems (ATTER) project which has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No 101007755

INTRODUCTION

While agroecology as a term has been around for almost 100 years, over the last 20 years it has gained international recognition and embeddedness in science, policy, and practice. It is increasingly recognised for its potential to address multiple crises in the food system, including climate breakdown, biodiversity loss, deteriorating rural livelihoods, food and nutrition insecurity, environmental degradation, and inequity (HLPE, 2019). Agroecology is defined as the application of ecological and social principles to the design and functioning of agriculture and food systems. Agroecology is differentiated from other related concepts (e.g., sustainable agriculture, climate smart agriculture, nature-based solutions, organic agriculture) by the uncompromising commitment to each of the ecological, social, political, and cultural dimensions of sustainability, addressing power imbalances and centering the agency, voice and knowledge of local people, peasant farmers and Indigenous communities.

==Early academic thinking on agroecology emerged out of the careful study of socio-ecological principles of production as observed in the practices and lives of Indigenous and peasant communities of Africa, the Americas, Asia, Australia, Europe, and Polynesia. Although these groups did not use the term agroecology, their practices are reflected in the principles of what is now called agroecology. Thus, agroecology as a practice has no single centre of origin per se but has been – and continues to be – held in a deep reservoir of practice, culture and knowledge in all areas of the world where peoples, nature and food systems have evolved together through living in deep relationship with land, nature and territory.

Agroecology is associated with a multifaceted body of transdisciplinary knowledge that aims to better understand agroecologically-based food and farming systems. Early research documented the practices of indigenous foodways and peasant farming systems to understand the principles and approaches that underpin their resilience and sustainability. From these observations, agroecology grew into a science of designing farming systems that mimic biodiversity and the structure and functioning of natural ecosystems to enhance functional diversity. Agroecology was later broadened to include the ‘ecology of food systems,’ thus emphasising the embeddedness of farming in wider social-ecological relations.

More recently, the political dimensions of agroecology have been articulated and emboldened by social movements, such as La Via Campesina, and by scholars who have deployed theoretical approaches from critical agrarian studies, political ecology and social movement studies to conceptualise agroecology as a contested terrain of struggle for power, control, and resources. Most prominently, agroecology has been linked with the struggle for food sovereignty. Here, agroecology is viewed as the confluence of a political and technical project, linking agroecology with the struggle for people’s collective rights, self-determination, agency, and emancipation from intersecting systems of oppression. In the following sections, we review several of the defining dimensions of agroecology followed by an overview of several key areas of tension that will shape the future of agroecology.

AGROECOLOGY TODAY

Agroecology’s Transgressive Foundation

In its most holistic and deepest expression, agroecology is fundamentally transgressive of the project of modernity and the trappings of linear western notions of development that characterise most approaches to agricultural development. Agroecology calls for a reterritorialisation and repeasantisation of small-scale agriculture and food systems, emphasising food sovereignty and autonomy from monopolistic agribusinesses and other forms of oppression. Through this reorganising of social relations with land and in territory, agroecology reconfigures political ecological relations in ways that subvert the extractive logics of capitalism. Through the redesign of agricultural systems in harmony with natural processes, circular economies and worldviews that position people as part of nature (rather than outside of it), agroecology represents a process of repair with the potential to heal the metabolic rift between society and nature.

The agroecological approach transcends other frameworks (e.g. sustainable agriculture) because it is viewed as incompatible and in confrontation with existing world-systems and food regimes. To this end, agroecology is utopian in its imagination, but pragmatic in its application. It calls for the pursuit of “real utopias” within a wider system that is hostile to alternatives. By revaluing reproductive labour, valorising local knowledge and the knowledge of women, youth and other marginalised peoples, and centering the goals of well-being, the good life, radical collectivism and social justice, new possible futures are opened in time and space. In this way, agroecology challenges the dominant development goals of increased productivity, profit and technological modernisation as well as the neoclassical economic construct of individuals as purely self-interested calculators. Agroecology challenges neoliberalism, racial capitalism, coloniality, patriarchy, caste and other systems of power that prevent the realisation of collective political struggle and thriving food systems. Agroecology affirms the development of pluriversal agroecologies that emerge through collective processes rooted in the cosmologies and particularities that emerge in place. Agroecology thus rejects the cherry-picking of technical fixes, or single dimension solutions (e.g., focusing only on ecological considerations), and looks for entry points to meet people wherever they are in the process of transition towards agroecology, facilitated by iterative learning, mutual support and collective action (Anderson et al. 2021).

Knowledge and Knowledge Networks

Agroecology is sustained through knowledge networks and methods that relate to and enhance the specificities of local socio-ecological contexts. It reaffirms bottom-up approaches to knowledge co-production and valorises farmers’ knowledge and expertise. The importance attached to situated and contextualised knowledge raises a key question: how can such knowledge circulate beyond the context in which it has been produced? There are multiple answers to this, including the importance of sharing and iterating through networks such as *campesino a campesino (farmer to farmer)*, which allow knowledge exchange among farmers, participatory action research, collective on-farm experimentation, as well as larger transdisciplinary approaches involving other actors. These knowledge processes have varying degrees of formalisation, and generally involve the collective identification of concerns by farmers and possibly other agrifood systems’ actors and workers who develop them into problems to be addressed by finding or generating suitable knowledge.

Agroecology more generally requires a shift from the “monoculture of scientific understanding” to an “ecology of knowledge” (Santos, 2011) in which diverse forms of knowledge and ways of knowing exist and interact. Within agroecology, the roles of professionals and institutions shift away from extracting knowledge and then extending it to knowledge users towards facilitating knowledge co-creation with farmers and agrifood systems’ actors and workers. These knowledge systems, which are lighter, decentralised and flexible at the local level avoid the risk to autonomy that arises from centralised information and knowledge systems. Under these networked models the goal is to find the most appropriate responses within particular contexts, thus reinforcing the power of diversity and seeding healthy skepticism for solutions that are touted as a fit for all.

Re-scaling Food Systems and the Territorial Approach

Agroecology involves a re-scaling of food systems away from the prevailing emphasis on the integration of agriculture into global markets and supply chains and the deterritorialisation of peasant farmers. Regional, territorial, and local approaches have been developed through ideas such as bioregionalism or territorial ecology and concrete forms such as bioregions, ecoregions, or biodistricts. The territorial approach focuses on reconfiguring actors, networks, and rules to proactively influence agri-food systems in territories. Diverse food systems actors then assess and reflect together on past trajectories, to develop shared visions and possible transition pathways forward.

Working at the territorial scale brings to light direct interactions between ecological and social processes, which can point to concrete arrangements linking situated biophysical features with technical, organisational, market and social forms of innovation, in order to support the reconnection of agriculture, food, environment, and health (Anderson et al. 2021). The territorial perspective facilitates the identification and involvement of diverse actors representing different components of agrifood systems (farmers, agrifood chain actors, public institutions, civil society, etc.), in addition to exposing both competing visions and interests, which can risk the cooptation of agroecology’s transformative potential as discussed in the last section.

The territorial scale is socially constructed and may be analytically tackled according to a range of circumstances and context-specific factors, including geo-physical and environmental conditions, political and administrative structures, and cultural identities. The territory is a spatial unit at which policy and governance activities are delivered and can be a key locus for transversality between agricultural, food, health, and social policies. This need for reterritorialisation has been institutionally recognised both at the international level (OECD, FAO) and at national levels, with some devoted policies such as the “territorial food project scheme” set up in France since 2014 or municipal agroecological policies in Brazil and other countries.

While agroecology has gained much ground as a transformative approach towards more just and sustainable food systems, the future of agroecology remains contested as it is continually remade and potentially co-opted by a diversity of actors and processes. The next section provides critical insights into future pathways for agroecology.

AGROECOLOGY TOMORROW

Agroecology and Technology

The role of technology in agroecology has been a contentious issue and a point of ongoing debate. On the one hand, appropriate technologies have a vital role to play in the deepening and expansion of agroecology. On the other hand, novel technology has been a powerful and privileged driver of injustices that arise from industrial agricultural development. From the green revolution to contemporary times, the dominant trend has been the imposition of western agricultural technologies to raise productivity. Early distribution of technological packages focusing on hybrid seeds, fertilisers and chemical pesticides displaced agroecological farming systems, shifted entire regions towards monocultural export-oriented farming and displaced people-natures in the Global South through processes of depeasantisation and the capitalist reorganisation of agrarian relations. Today, this technology-driven approach is still evident in the drive for a new green revolution in Africa, and the 4th Industrial Revolution, including through the advancement of disruptive technologies such as automation, big data and gene editing.

Agroecology is not anti-technology, yet the values and principles of agroecology demand a critical questioning of new technologies and their long-term impact on the agency and autonomy of farmers, their communities and the health of land and nature. This implies a need for precautionary principles and participatory technological assessments that interrogate issues of power, control, and the long-term implications of technologies on the functioning of landscapes and the structure of societies. This critical examination of technology is especially important when technology is being proposed as magic bullet solutions in crisis narratives. Under this model, solutions are proposed that allegedly solve immediate problems, yet longer-term implications of the technologies are unknown. Further work is needed to examine what kinds of technology should be refused and which are appropriate within an agroecological approach, and how they can be wisely developed, adopted, disseminated, and governed. Critical discussions on the compatibility between technologies and agroecology are calling for deeper analysis within the framework of technology sovereignty to understand under what conditions and processes can appropriate technologies best support agroecology (Montenegro de Wit, 2022).

Agroecological Resilience in a Crisis-laden Present and Future

As the spectre of climate collapse, political instability and other intersecting vulnerabilities grows, diverse agroecological food systems have shown the potential to be highly resilient and relevant in a turbulent future. Recent shocks including pandemics, floods, coups, and war have revealed serious hazards associated with the high-input globally complex systems of agriculture and food systems. In the face of rapid and accelerating environmental degradation, agroecological approaches encourage the maintenance and/or restoration of crop varieties that are acclimatised to specific contexts, with an emphasis on biodiversity, functional redundancy, and the minimal use of external inputs. Increased levels of autonomy and lower levels of dependence on state support and industrial supply chains have contributed to impressive levels of resilience within agroecological systems after extreme weather events and in relation to the ongoing effects of climate change, such as in the wake of Hurricane Maria in Puerto Rico (e.g. McCune et al. 2019). Agroecological systems also demonstrate strength in

response to political and economic instability, due in large part to social and cultural mechanisms intrinsic to the approach, including intentionally networked relationships, shorter supply chains, and a high value placed on collective work. Working from the ground up, using diversified and distributed approaches, agroecology offers a context-specific nimbleness that is designed for both resilience and sovereignty.

Just Transitions – Centering Equity

As agroecology has grown and matured as a concept, nascent work to interpret agroecology through the lens of equity has led to important connections between agroecology and wider movements of people struggling for ‘just transitions’ (i.e. centering the dismantling of inequity and oppression in efforts to transition towards sustainable economies). In these spaces, the notion of intersectionality provides a prism through which the entangled influences of patriarchy, racism, able-bodism, caste-ism, class-ism and other intersecting axes of injustice within our food systems are parsed. Connecting with fields such as decoloniality, solidarity and sharing economies, feminism, degrowth and post-development alternatives, agroecology provides prefigurative influences that deeply confront the status quo. By reimagining what is possible, agroecology offers a path away from consolidation and abuses of power and toward reciprocal and regenerative futures. Several examples where a more transgressive and self-critical agroecology is being deepened include: a) social movements, including La Via Campesina, the largest alliance of farmers, peasants, and rural workers in the world, which has argued that without feminism there is no agroecology; b) critiquing the caste system in agroecological projects; and c) and pursuing land reform toward the return and redistribution of previously colonised lands. Linking agroecology to these wider struggles can help to avoid the ‘development-mindset’ often found in articulations of agroecology that emanate from institutions, NGOs, politicians, and researchers, while also forging solidarities that are needed to build momentum in transformative processes for a more just and sustainable world.

The Future – Centering Transformation, Resisting Cooptation

As agroecology gains legitimacy and is taken up by different actors, there is a risk of its cooptation and depoliticisation. The contestation over the meaning of agroecology has given rise to efforts to strategically centre the emancipatory, transgressive, and transformative basis of the agroecological project. Indeed, there is no consensus around a single definition of agroecology, and there are different ideologies, framings, ontologies and interpretations of agroecology from distinctive camps and positions. In this sense, there is a battle over the meaning of agroecology, rooted both in different diagnoses of problems and diverging theories of how to affect change. These debates revolve around questions of who the protagonists of the agroecological transition should be, and how different actors with uneven relations of power and privilege can and should be involved in advancing agroecology. These multiple positions reveal differences in the proposed pace and scope of necessary change (incremental versus transformative), the intersection with issues of power (technical versus emancipatory), and the most desirable sites of intervention (movement, institutional, etc.). For example, should the voice of scientists and policy-makers lead, or should it be led by peasant farmers and their organisations? Is agroecology a process of development (from a liberal modern perspective) or autonomous emancipation (from a more radical post-development

perspective)? Should agroecology work on reforming existing systems, institutions, and regimes, or are these very systems the root of the problems whereby investing faith and power in them would undermine transformation? Attempts to reflexively assess the extent to which 'agroecological approaches' align with the transformative perspective, requires both a critical eye and a commitment to multiple ways of knowing that avoids the traps of duality. They also require a constant analysis of power, participation, and agency, which is why explicit links to food sovereignty, the right to food, rights of nature, degrowth, and other related struggles is so important. The land-based experience of agroecology that has emerged from peasant farmers and Indigenous stewards of the land across the globe is steeped in self-determination and connection to place. These innate understandings of agroecology need to be accompanied by political work to mobilise knowledge and build legitimacy for a fully transformative agroecology.

REFERENCES

Anderson, C R, Bruil, J, Chappell, M J, Kiss, C, & Pimbert, M P (2021) *Agroecology Now! Transformations Towards More Just and Sustainable Food Systems*. Cham, Palgrave MacMillan.

de Sousa Santos, B (2009) A non-occidental west? Learned ignorance and ecology of knowledge. *Theory, Culture & Society*, 26(7-8), 103-125
<https://doi.org/10.1177/0263276409348079>

HLPE (2019) *Agroecological and other innovative approaches for sustainable agriculture and food systems that enhance food security and nutrition*. CFS High Level Panel of Experts. Rome, FAO.

McCune N, Perfecto I, Avilés-Vázquez, K, Vázquez-Negrón J, & Vandermeer J (2019) Peasant balances and agroecological scaling in Puerto Rican coffee farming. *Agroecology and Sustainable Food Systems*. 43(7-8), 810-826 <https://doi.org/10.1080/21683565.2019.1608348>

Montenegro de Wit, M (2022) Can agroecology and CRISPR mix? The politics of complementarity and moving toward technology sovereignty. *Agriculture and Human Values*. 39(2), 733-755 <https://doi.org/10.1007/s10460-021-10284-0>

Trevilla Espinal D L, Soto Pinto M L, Morales H, and Estrada-Lugo, E I J (2021) Feminist agroecology: analyzing power relationships in food systems. *Agroecology and Sustainable Food Systems*. 45(7), 1029-1049 <https://doi.org/10.1080/21683565.2021.1888842>

RECOMMENDED FURTHER READING

Declaration of the International Forum for Agroecology (2015). Nyéléni, Mali: 27 February 2015. *Development* 58, 163–168. <https://doi.org/10.1057/s41301-016-0014-4>

This declaration is the outcome of the gathering of social movements from around the world and provides an articulation of agroecology from a movement perspective.

IPES-Food (2016). From uniformity to diversity: a paradigm shift from industrial agriculture to diversified agroecological systems. International Panel of Experts on Sustainable Food Systems (IPES)

This seminal report provides an accessible, visual and thorough overview of the rationale for shifting away from industrial food systems towards agroecology.