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Agroecology and the challenges of food production

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There's a lot of talk about agroecology, but we don't always know what this alternative production system actually means. This is what the author explains, going back over the increasingly disparaged premises of the Green Revolution, which still largely underpin the concept of food security.

In 2015, under the aegis of the United Nations (UN), the international community made a commitment to end hunger, achieve food security, improve nutrition and promote sustainable agriculture by 2030. This second Sustainable Development Goal (SDG) was ambitious, but at the time the UN was basing its approach on the downward trend in the level of food and nutrition insecurity seen in preceding years. It is clear that not only will this SDG not be achieved within the next six years but, what's more critical, the global food and nutrition situation has steadily worsened since 2015.

A current system based on outdated assumptions

The current agricultural and food systems inherited from the Green Revolution are now acknowledged as having major adverse effects. Based on an intensification of agricultural production through mechanisation, the development of irrigation and the large-scale use of cereal varieties with high yield potential and synthetic inputs, this policy has led to the degradation of ecosystems, pollution of the soil, water and air, massive loss of biodiversity and economic and social inequality. In 2020, the hidden costs (environmental, social, economic) of agrifood systems were estimated at US$12,700 billion – equivalent to 10% of global GDP.[1]

The concept of food security and agriculture promoted by international organisations and major international non-governmental organisations (NGOs) is largely rooted in this legacy. It is based on maximising yields, starting from the premise that increasing production will improve availability and automatically help cut the price of food in order to make it more accessible. In this respect, it reflects the agricultural policies and strategies of Western countries pursued since the 1950s, but this prevailing approach to food security is problematic in more ways than one.

It is based on a simplistic and reductionist understanding of agricultural and food systems. Focusing on the production of a small number of commodities, preferably market-linked, it reflects neither the diversity nor the complexity of traditional and/or indigenous models. It glosses over this complexity by hiding or minimising entire sections of the food economy of rural communities by adopting the principle that what cannot be quantified does not exist. This is the case, for example, with kitchen gardens (or

[1] FAO, *The hidden costs of the agri-food industry,* 2024, https://www.fao.org/interactive/state-of-food-agriculture/en

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"cottage gardens") whose role in providing families with food is largely under-estimated, or with the outright disregard for gathering wild fruit and plants. On a different level, compartmentalising activities such as crop production and livestock farming – even though they are part of the same agricultural system – is an economic, cultural, social and ecological aberration. This approach, the result of a drift based on specialisation, is out of touch with the reality of rural life which is dominated by mixed farming.

Incidentally, this notion of food security reflects a colonial legacy that it perpetuates through its underlying ideology. It is built on disparaging, if not racist, presumptions of the so-called ignorance and incompetence of the rural populations of the Global South. International organisations therefore pursue the "civilising mission" of Western countries by purporting to educate these populations in "good" agricultural, nutrition and hygiene practices. The repetition of the same awareness activities over many years is rarely questioned, as the responsibility for failure is systematically attributed to the ignorance of the populations themselves. As a result of such circular reasoning, failure may even be used to justify the activity. The supposed incompetence of rural communities is fuelled by the contempt for and belittlement of empirical knowledge in favour of a technical approach. Yet this perception is really a reflection of the ignorance of the employees of international organisations who largely come from an urban background and generally have only a partial and distorted understanding of rural life. The illiteracy of women, for example, is presented as an insurmountable limit to their knowledge, without taking into account other forms of transmission and, above all, ignoring the breadth of their knowledge of medicinal or food plants, forestry or even seeds.

Furthermore, the dominant model of food security has long conveyed sexist stereotypes about agriculture, downplaying the role of women in agricultural production or assigning them to certain activities such as market gardening. Taking gender-related problems into account has helped counter this view, which reflects the invisibility of women in the Western agricultural world. Yet the argument about the emancipation of women is sometimes used to justify vast land-privatisation programmes. By arguing that societies which deny women the right to own land are archaic, the aim of international organisations such as the World Bank is to continue the colonial enterprise of dismantling collective or public ownership. Promoting women's rights therefore legitimises the commodification of land by avoiding the historical reality which shows that these privatisation policies have never benefited the poorest people and even less so women – quite the opposite in fact.[2] Food security and gender equality can thus be used as a means of justifying the grabbing of natural resources.

Lastly, organisations which promote food security have an increasingly open-minded relationship with the private sector, particularly the major agrifood (fertilisers, seed, phytosanitary products etc.) and internet multinationals. The World Food Programme, for example, has been attending the World Economic Forum in Davos since 2004 in a determined effort to develop partnerships with the private sector; indeed, when presented as a sector worth US$ 8,000 billion in 2021, the food industry is certain to attract a lot of interest. Climate-smart agriculture is an example of this collusion between UN agencies and actors involved in NBIC (nanotechnology, biotechnology, information technology and cognitive sciences), whose "aim [is] to subjugate natural processes to the needs of the economy".[3] Partnerships with the private sector are increasingly found at local level in the form of delegated public services, bypassing both local authorities and user committees. In some cases, this practice leads to privatisation which is often synonymous with the withdrawal of common resources (seed, land, water) and questions the indirect allocation of public subsidies to private interests.

[2] Fatiha Talahite, « Pour une économie politique genrée des droits de propriété », *Cahiers du Genre,* vol. 1, n° 62, mai 2017, p. 19-42.
[3] Hélène Tordjman, *La croissance verte contre la nature. Critique de l'écologie marchande,* Éditions La Découverte, 2021.

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Even though this hegemonic model is supported by UN agencies, funding bodies (the United States Agency for International Development, the European Union, the World Bank, etc.) and – it must be said – the main international NGOs involved in food and nutrition security, it is a failure. It is even fuelled by the perpetuation of crises. This is demonstrated by the fact that the same solutions have sometimes been provided to the same populations for decades with no obvious improvement in their food and economic situation – or even a worsening thereof – and with the lack of results not calling into question the solutions provided and the funding allocated. The failure is then blamed on the negligence of governments, the cronyism of local authorities or the archaic nature of rural societies that are resistant to change. As for the "independent" assessments, they are far too biased[4] to question the ideological concept of humanitarian or development aid. While the agrifood industry is never required to prove its ability to address the agricultural and food challenges of the twenty-first century, alternative systems are constantly expected to do so. This is the case for agroecology, where there is abundant scientific evidence of its effectiveness in addressing the main food challenges (climate change, soil degradation, competition for water and forest resources, social inequality).[5]

Agroecology as a viable and fair countermodel

Agroecology is defined as a set of agricultural practices, a sharing of knowledge and a social movement. It seeks to maintain soil fertility in the long term, preserve the balance of ecosystems and guarantee the farmers' autonomy by promoting approaches based on the enhancement of ecological processes and respect for diversity. It is now widely accepted that agroecological transition must occur outside agricultural practices and that social, political and cultural change is also required.[6] Agroecology involves a paradigm shift from the dominant model of food security. It requires a transition from a linear, sector-based and specialised approach to a systemic approach for agricultural and food systems.[7] It is no longer a question of maximising results in just one parameter (for example, yields or harvests from a single crop) using standardised "technical packages", as is the case for the current dominant sector. On the contrary, agroecology offers locally adapted solutions, identified by following an adaptive approach, *i.e.* solutions based on observation, sharing experiences and co-construction between a wide variety of actors.

The originality of the concept of agroecology lies in the fact that it was built on a dual foundation of North American scientific work and the commitment of social movements in several Latin American countries. Agroecology thus succeeds in bringing science closer to political, social and societal concerns. Observations made by several agronomists and ecologists during their Latin American field research prompted them to build an alternative development model based on a critical assessment of the effects of the Green Revolution. The most famous is Miguel Altieri, a Chilean-born agronomist and professor at the University of Berkeley (California), who defines agroecology as "the application of

[4] The organisations whose projects are evaluated are both judges and jury in the evaluation process: recruitment of the consultants, sharing of information, validation of reports, payment of fees.
[5] HLPE, *Agroecological and other innovative approaches for sustainable agriculture and food systems that enhance food security and nutrition,* A report by The High Level Panel of Experts on Food Security and Nutrition, July 2019, https://www.fao.org/3/ca5602en/ca5602en.pdf
[6] Omar Felipe Giraldo and Peter M. Rosset, "Agroecology as a territory in dispute: between institutionality and social movements", *The Journal of Peasant Studies*, vol. 45, no. 3, 2018, pp. 545–564.
[7] Emile A. Frison, *From uniformity to diversity: A paradigm shift from industrial agriculture to diversified agroecological systems*, IPES-Food, June 2016, https://www.ipes-food.org/_img/upload/files/UniformityToDiversity_FULL.pdf

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ecological concepts and principles to the design and management of sustainable agro-ecosystems".[8] In other words, it relies on the natural regulators of the agro-ecosystem rather than on inputs to secure agricultural production without wasting resources, especially those that are not renewable.[9] The theoretical framework developed by these scientists will provide the various social actors already engaged in agroecological practices with a reference framework to think about alternatives to chemical agriculture.

Civil society organisations which defend farmers' rights have played a central and historic role in defining agroecology.[10] This definition is closely linked to the concept of food sovereignty as defined by *La Via Campesina* in 1996[11] and then in the Nyéléni Declaration of 2007 and 2015.[12] It emphasises power relationships, in particular by denouncing the control exercised by agrifood actors over the resources needed to produce, process and distribute food, to the detriment of small producers. For civil society organisations, agroecology is not a narrow set of agricultural techniques but, practices aside, a political struggle which requires people to "question and transform power structures in society".

The 2000s were a milestone in the development of agroecology, reflecting the growing awareness of climate and ecological threats to agricultural and food systems. The notion of agroecological transition, a theory developed by many authors,[13] allows us to reflect on the multifaceted challenges that agricultural and food systems are currently facing in the countries of both the Global North and the Global South: environmental emergencies, climate change, social inequality, the artificialisation and grabbing of land and water, to name but a few.

The most widely shared current concept of agroecology is based on the thirteen principles proposed by the High Level Panel of Experts on Food Security and Nutrition (HLPE) in 2019.[14] Without claiming to be exhaustive, the following three aspects illustrate agroecology's contribution to improving food and nutrition security.

Autonomy as a founding principle

The autonomy of farmers and ecosystems is not one of the thirteen principles of the HLPE, but it is fair to say that each of them converges towards this objective. Striving for balance within ecosystems allows us to move away from the use of chemical inputs and thus limit dependence on the market. By relocalising and strengthening the ability of farmers and citizens to make decisions and take action, agroecology allows them to choose the agricultural and food practices and models that best suit them. By defending the rights of rural communities – especially the most marginalised – to access and use

[8] Miguel A. Altieri, *Agroecology: The scientific basis of alternative agriculture*, University of Berkeley, 1983 et *Agroecology: The science of sustainable agriculture*, Westview Press, 1995.
[9] Jean-Marc Meynard, *L'agroécologie, un nouveau rapport aux savoirs et à l'innovation,* EDP Sciences*, 2017.*
[10] Allison Loconto and Eve Fouilleux, "Defining agroecology: Exploring the circulation of knowledge in FAO's Global Dialogue 1", *The International Journal of Sociology of Agriculture and Food*, vol. 25, no. 2, 2019, pp. 116–137.
[11] *La Via Campesina*, Rome Declaration on food sovereignty (1996).
[12] The International Forum for Agroecology (Nyéléni, 2015), considers "agroecology as a key element in the construction of food sovereignty".
[13] Steve Gliessman, "Transforming food systems with agroecology", *Agroecology and Sustainable Food Systems*, vol. 40, no. 3, 2016, pp. 187–189 ; François-Xavier Côte, Emmanuelle Poirier-Magona, Sylvain Perret *et al.*, *La transition agro-écologique des agricultures du Sud*, Éditions Quae, 2019 ; Alexander Wesel, Barbara Gemmill-Herren, Rachel Beznel Kerr *et al.*,"Agroecological principles and elements and their implications for transitioning to sustainable food systems. A review", *Agronomy for Sustainable Development*, vol. 40, no. 6, 2020.
[14] HLPE, *Agroecological and other innovative approaches…, op. cit.*

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land and natural resources, agroecology contributes to the food autonomy of rural communities. It encourages and secures the investments made in the land (enrichment, planting trees, irrigation systems, etc.).

Diversity as a counterpoint to standardisation

Diversity affects agricultural practices (crops on living soil,[15] crop combinations, natural vegetation associated with crops, agroforestry, pollination, etc.), the landscape (*bocage*, integrating trees into the agricultural system, pastures, etc.), the environment (preservation of ecosystems such as wetlands, grasslands, forests, etc.), crops (diversity of species and varieties, locally produced seeds, etc.), diet (locally adapted, seasonal, diverse, nutritious, etc. products) and social and economic organisation (a wide range of actors and activities, market diversity [including local markets], control of land and water resources limiting the risk of concentration and encouraging collaboration between the actors). Biodiversity helps improve soil quality, which in turn enhances the nutritional value of food (according to FAO, fifteen of the eighteen nutrients essential for plants are provided by the soil). Preserving biodiversity mitigates the risks associated with climate change, attacks by bio-aggressors or diseases (mainly linked to pesticide use) and various crises.

The "knowledge dialogue" as a deconstruction of a hierarchical model

By taking local and indigenous knowledge into account and combining it with scientific research, agroecology stimulates the collective dynamics of knowledge creation and sharing.[16] This approach differs from agricultural extension in its horizontality, the type of actors it mobilises and the roles it assigns to them. Agricultural advisors are no longer the holders of knowledge that they pass on to farmers but are part of a process of collective experimentation. Discussion groups for farmers play a central role for learning about innovative solutions, and peer-to-peer knowledge is disseminated through networks of farmers or farmers' organisations. Action research is thus a constituent part of agroecology, in the sense that it accompanies change through a participatory approach combining practice and the production of knowledge.

Agroecology is not therefore a simple foundation for greening-up food security but a decolonial concept of food. It is therefore important to understand its basic premises so as not to strip the concept of its substance and reduce it to a few ecologically acceptable practices. The challenge is all the more important in that the appropriation of the term by actors with sometimes very different visions can be both an asset and a risk. When the search for compromises with the agrifood industry leads, for example, to the use of chemicals in agroecological practices being tolerated even though this is incompatible with striking a balance in the ecosystem, there is a real risk that agroecology will be distorted. Its practitioners therefore have a responsibility to defend its emancipatory values and deconstruct a highly standardised and ideologised approach to agriculture and food.

Translated from the French by Derek Scoins

[15] Cultivation on living soil no longer involves working the soil but adding organic matter to it to stimulate natural cycles.
[16] Miguel Altieri, "Agroecology, Small Farms, and Food Sovereignty", *Monthly Review*, vol. 61, no. 3, 2009, pp. 102–113.

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Biography

Caroline Broudic • Co-founder of the consultancy GéoEco Alternatives, Caroline Broudic, a socio-economist by training, has nearly thirty years' experience of agriculture- and food-related issues. Her expertise covers the political, economic, social and ideological aspects of food in emergency (conflicts, natural disasters, etc.) and "development" settings. Her favourite subject is the theory and practice of agroecology as an approach which respects the living world and as a tool for social transformation. Caroline pays particular attention to gender-related issues in agriculture and food. She is currently involved with setting up an association with collegial governance to study the relationships between human beings and the living world.