

Lessons in Freedom: Agroecology, Localisation and Food Sovereignty

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Industry figures and scientists claim pesticide use and GMOs are necessary in 'modern agriculture'. But this is not the case: there is now [sufficient evidence](#) to suggest otherwise. It is simply not necessary to have our bodies contaminated with toxic agrochemicals, regardless of how much global agribusiness firms try to reassure us that they are present in 'safe' levels.

There is also the industry-promoted narrative that if you question the need for synthetic pesticides or GMOs in 'modern agriculture', you are somehow ignorant or even 'anti-science'. This is again not true. What does 'modern agriculture' even mean? It means a system adapted to meet the demands of global agri-capital and its international markets and supply chains.

As writer and academic Benjamin R Cohen [states](#):

"Meeting the needs of modern agriculture – growing produce that can be shipped long distances and hold up in the store and at home for more than a few days – can result in tomatoes that taste like cardboard or strawberries that aren't as sweet as they used to be. Those are not the needs of modern agriculture. They are the needs of global markets."

Current policies favour a (heavily subsidised and inefficient – when externalised health, social and environmental costs are factored in) geopolitical corporate-industrial agriculture and the strengthening of a globalised neoliberal food regime that by its very nature fuels and thrives on, among other things, unjust trade policies, indebtedness, population displacement and land dispossession, environmental degradation, illness, nutrient-deficient diets and a narrowing of the range of food crops available for public consumption.

These policies prioritise urbanisation, giant retailers, global markets, long supply chains, external proprietary inputs (seeds, synthetic pesticides and inorganic fertilisers, etc),

chemical-dependent monocropping, commodified corporate knowledge, highly processed food and market dependency at the expense of rural communities, independent enterprises and smallholder farms, local markets, short supply chains, on-farm resources and indigenous knowledge, diverse agroecological cropping, nutrient-dense diets and food sovereignty.

Unfortunately, global agribusiness concerns have secured the status of 'thick legitimacy' based on an intricate web of processes successfully spun in scientific and policy arenas.

This perceived legitimacy derives from the lobbying, financial clout and political power of agribusiness conglomerates which have set out to capture and shape government departments, public institutions, the agricultural research paradigm, international trade (WTO), the lending strategies of global finance (World Bank, IMF) and cultural narratives concerning food and agriculture (for example, via the industry front-group International Life Sciences Institute).

Nevertheless, an alternative agri-food system is required. And it can be achieved.

The 2009 report [Agriculture at a Crossroads](#) by the International Assessment of Agricultural Knowledge, Science and Technology for Development, produced by 400 scientists and supported by 60 countries, recommended agroecology to maintain and increase the productivity of global agriculture. It cites the largest study of 'sustainable agriculture' in the Global South, which analysed 286 projects covering 37 million hectares in 57 countries and found that on average crop yields increased by 79% (however, the study also included 'resource conserving' non-organic conventional approaches).

The report concludes that agroecology provides greatly improved food security and nutritional, gender, environmental and yield benefits compared to industrial agriculture.

The message conveyed in the paper [Reshaping the European Agro-food System and Closing its Nitrogen Cycle: The potential of combining dietary change, agroecology, and circularity](#) (2020), which appeared in the journal *One Earth*, is that an organic-based, agri-food system could be implemented in Europe and would allow a balanced coexistence between agriculture and the environment. This would reinforce Europe's autonomy, feed the predicted population in 2050, allow the continent to continue to export cereals to countries which need them for human consumption and substantially reduce water pollution and toxic emissions from agriculture.

The paper by Gilles Billen et al follows a long line of studies and reports which have concluded that organic agriculture is vital for guaranteeing food security, rural development, better nutrition and sustainability.

In the 2006 book [The Global Development of Organic Agriculture: Challenges and Prospects](#), Neils Halberg and his colleagues argue that there are still more than 740 million food insecure people (at least 100 million more today), the majority of whom live in the Global South. They say if a conversion to organic farming of approximately 50% of the agricultural area in the Global South were to be carried out, it would result in increased self-sufficiency and decreased net food imports to the region.

In 2007, the FAO noted that organic models increase cost-effectiveness and contribute to resilience in the face of climatic stress. The FAO concluded that by managing biodiversity in

time (rotations) and space (mixed cropping) organic farmers can use their labour and environmental factors to intensify production in a sustainable way and organic agriculture could break the vicious circle of farmer indebtedness for proprietary agricultural inputs.

Of course, organic agriculture and agroecology are not necessarily one and the same. Whereas organic agriculture can still be part of the prevailing globalised food regime dominated by giant agri-food conglomerates, agroecology uses organic practices but is ideally rooted in the principles of localisation, food sovereignty and self-reliance.

The FAO recognises that agroecology contributes to improved food self-reliance, the revitalisation of smallholder agriculture and enhanced employment opportunities. It has argued that organic agriculture could produce enough food on a global per capita basis for the current world population but with reduced environmental impact than conventional agriculture.

In 2012, Deputy Secretary General of the UN Conference on Trade and Development (UNCTAD) [Petko Draganov](#) stated that expanding Africa's shift towards organic farming will have beneficial effects on the continent's nutritional needs, the environment, farmers' incomes, markets and employment.

A [meta-analysis](#) conducted by the UN Environment Programme (UNEP) and UNCTAD (2008) assessed 114 cases of organic farming in Africa. The two UN agencies concluded that organic agriculture can be more conducive to food security in Africa than most conventional production systems and that it is more likely to be sustainable in the long term.

There are numerous other studies and projects which testify to the efficacy of organic farming, including those from the [Rodale Institute](#), the UN [Green Economy Initiative](#), the [Women's Collective of Tamil Nadu](#), [Newcastle University](#) and [Washington State University](#). We also need look no further than [the results](#) of organic-based farming in Malawi.

But Cuba is the one country in the world that has made the biggest changes in the shortest time in moving away from industrial chemical-intensive agriculture.

Professor of Agroecology [Miguel Altieri](#) notes that due to the difficulties Cuba experienced as a result of the fall of the USSR it moved towards organic and agroecological techniques in the 1990s. From 1996 to 2005, per capita food production in Cuba increased by 4.2% yearly during a period when production was stagnant across the wider region.

By 2016, Cuba had 383,000 urban farms, covering 50,000 hectares of otherwise unused land producing more than 1.5 million tons of vegetables. The most productive urban farms yield up to 20 kg of food per square metre, the highest rate in the world, using no synthetic chemicals. Urban farms [supply 50 to 70% or more](#) of all the fresh vegetables consumed in Havana and Villa Clara.

It has been [calculated](#) by Altieri and his colleague Fernando R Funes-Monzote that if all peasant farms and cooperatives adopted diversified agroecological designs, Cuba would be able to produce enough to feed its population, supply food to the tourist industry and even export some food to help generate foreign currency.

A systems approach

Agroecological principles represent a shift away from the reductionist yield-output chemical-intensive industrial paradigm, which results in among other things enormous pressures on human health, soil and water resources.

Agroecology is based on traditional knowledge and modern agricultural research, utilising elements of contemporary ecology, soil biology and the biological control of pests. This system combines sound ecological management by using on-farm renewable resources and privileging endogenous solutions to manage pests and disease without the use of agrochemicals and corporate seeds.

It often draws on agrarian ecosystems based on centuries of indigenous knowhow that is increasingly recognised as valid for achieving food security, as outlined, for instance, in the paper [Food Security and Traditional Knowledge in India](#) in the Journal of South Asian Studies.

Academic [Raj Patel outlines](#) some of the basic practices of agroecology by saying that nitrogen-fixing beans are grown instead of using inorganic fertilizer, flowers are used to attract beneficial insects to manage pests and weeds are crowded out with more intensive planting. The result is a sophisticated polyculture: many crops are produced simultaneously, instead of just one.

However, this model is a direct challenge to the interests of global agribusiness. With the emphasis on localisation and on-farm inputs, agroecology does not require dependency on proprietary inputs or long-line global supply chains.

Agroecology stands in sharp contrast to the prevailing industrial chemical-intensive model of farming. That model is based on a reductionist mindset which is fixated on a narrow yield-output paradigm that is unable or more likely unwilling to grasp an integrated social-cultural-economic-agronomic systems approach to food and agriculture.

Localised, democratic food systems based on agroecological principles and short supply chains are required. An approach that leads to local and regional food self-sufficiency rather than dependency on faraway corporations and their expensive environment-damaging inputs. If the last few years have shown anything due to the closing down of much of the global economy, it is that long supply chains and global markets are vulnerable to shocks. Indeed, hundreds of millions faced food shortages as a result of the various economic lockdowns that were imposed.

In 2014, a report by the then UN special rapporteur [Olivier De Schutter](#) concluded that by applying agroecological principles to democratically controlled agricultural systems we can help to put an end to food crises and poverty challenges.

But Western corporations and foundations are jumping on the 'sustainability' bandwagon by undermining traditional agriculture and genuine sustainable agri-food systems and packaging their corporate takeover of food as some kind of 'green' environmental mission.

The Gates Foundation through its 'Ag One' initiative is pushing for [one type of agriculture](#) for the whole world. A top-down approach dominated by hugely powerful, unaccountable agribusiness and agritech corporations and [institutional investors](#) regardless of what

farmers or the public need or want. A system based on corporate consolidation and centralisation.

But given the power and influence of those pushing for such a model, is the outcome merely inevitable? Not according to the International Panel of Experts on Sustainable Food Systems, which has released a report in collaboration with the ETC Group: '[A Long Food Movement: Transforming Food Systems by 2045](#)'.

It calls for civil society and social movements – grassroots organisations, international NGOs, farmers' and fishers' groups, cooperatives and unions – to collaborate more closely to transform financial flows, governance structures and food systems from the ground up.

The report's lead author, [Pat Mooney, says](#) that agribusiness has a very simple message: the cascading environmental crisis can be resolved by powerful new genomic and information technologies that can only be developed if governments unleash the entrepreneurial genius, deep pockets and risk-taking spirit of the most powerful corporations.

Mooney notes that we have had similar messages based on emerging technology for decades but the technologies either did not show up or fell flat and the only thing that grew were the corporations.

Although Mooney argues that new genuinely successful alternatives like agroecology are frequently suppressed by the industries they imperil, he states that civil society has a remarkable track record in fighting back, not least in developing healthy and equitable agroecological production systems, building short (community-based) supply chains and restructuring and democratising governance systems.

And he has a point. A few years ago, the Oakland Institute [released a report](#) on 33 case studies which highlighted the success of agroecological agriculture across Africa in the face of climate change, hunger and poverty. The studies provide facts and figures on how agricultural transformation can yield immense economic, social, and food security benefits while ensuring climate justice and restoring soils and the environment.

The research highlights the multiple benefits of agroecology, including affordable and sustainable ways to boost agricultural yields while increasing farmers' incomes, food security and crop resilience.

The report described how agroecology uses a wide variety of techniques and practices, including plant diversification, intercropping, the application of mulch, manure or compost for soil fertility, the natural management of pests and diseases, agroforestry and the construction of water management structures.

There are many other examples of successful agroecology and of farmers abandoning Green Revolution thought and practices to embrace it.

Upscaling

In an interview on the Farming Matters website, Million Belay sheds light on how agroecological agriculture is the best model for Africa. Belay explains that one of the greatest agroecological initiatives started in 1995 in Tigray, Northern Ethiopia, and continues today.

It began with four villages and after good results, it was scaled up to 83 villages and finally to the whole Tigray Region. It was recommended to the Ministry of Agriculture to be scaled up at the national level. The project has now expanded to six regions of Ethiopia.

The fact that it was supported with research by the Ethiopian University at Mekele has proved to be critical in convincing decision makers that these practices work and are better for both the farmers and the land.

Bellay describes an agroecological practice that spread widely across East Africa – ‘push-pull’. This method manages pests through selective intercropping with important fodder species and wild grass relatives, in which pests are simultaneously repelled – or pushed – from the system by one or more plants and are attracted to – or pulled – toward ‘decoy’ plants, thereby protecting the crop from infestation.

Push-pull has proved to be very effective at biologically controlling pest populations in fields, significantly reducing the need for pesticides, increasing production, especially for maize, increasing income to farmers, increasing fodder for animals and, due to that, increasing milk production, and improving soil fertility.

By 2015, the number of farmers using this practice had increased to 95,000. One of the bedrocks of success is the incorporation of cutting-edge science through the collaboration of the International Center of Insect Physiology and Ecology and the Rothamsted Research Station (UK) who have worked in East Africa for more than 15 years on an effective ecologically based pest management solution for stem borers and striga.

It shows what can be achieved with the support of key institutions, including government departments and research institutions.

In Brazil, for instance, administrations have supported peasant agriculture and agroecology by developing supply chains with public sector schools and hospitals (Food Acquisition Programme). This secured good prices and brought farmers together. It came about by social movements applying pressure on the government to act.

The federal government also brought native seeds and distributed them to farmers across the country, which was important for combatting the advance of the corporations as many farmers had lost access to native seeds.

Agroecology should not just be regarded as something for the Global South. Food First Executive Director Eric Holtz-Gimenez argues that it offers concrete, practical solutions to many of the world’s problems that move beyond (but which are linked to) agriculture. In doing so, it challenges – and offers alternatives to – prevailing moribund doctrinaire neoliberal economics.

By creating securely paid labour-intensive agricultural work in the richer countries, it can address the hollowing out of the economies of the likes of the US and UK as well as the displacement of existing indigenous food production systems by global agribusiness and the undermining of rural infrastructure in places like India.

If policy makers were to prioritise agroecology to the extent Green Revolution practices and technology have been pushed, many of the problems surrounding poverty, unemployment and urban migration could be solved.

Various official reports have argued that to feed the hungry and secure food security in low-income regions we need to support small farms and diverse, sustainable agroecological methods of farming and strengthen local food economies.

Olivier De Schutter says:

“To feed nine billion people in 2050, we urgently need to adopt the most efficient farming techniques available. Today’s scientific evidence demonstrates that agroecological methods outperform the use of chemical fertilizers in boosting food production where the hungry live, especially in unfavourable environments.”

De Schutter indicates that small-scale farmers can double food production within 10 years in critical regions by using ecological methods. Based on an extensive review of scientific literature, [the study](#) he was involved in calls for a fundamental shift towards agroecology as a way to boost food production and improve the situation of the poorest. The report calls on states to implement a fundamental shift towards agroecology.

The success stories of agroecology indicate what can be achieved when development is placed firmly in the hands of farmers themselves. The expansion of agroecological practices can generate a rapid, fair and inclusive development that can be sustained for future generations. This model entails policies and activities that come from the bottom-up and which the state can then invest in and facilitate.

A decentralised system of food production with access to local markets supported by proper roads, storage and other infrastructure must take priority ahead of exploitative international markets dominated and designed to serve the needs of global capital.

Countries and regions must ultimately move away from a narrowly defined notion of food security and embrace the concept of food sovereignty. ‘Food security’ as defined by the Gates Foundation and agribusiness conglomerates has merely been used to justify the rollout of large-scale, industrialised corporate farming based on specialised production, land concentration and trade liberalisation. This has led to the widespread dispossession of small producers and global ecological degradation.

Across the world, we have seen a change in farming practices towards mechanised industrial-scale chemical-intensive monocropping and the undermining or eradication of rural economies, traditions and cultures. We see the ‘structural adjustment’ of regional agriculture, spiralling input costs for farmers who have become dependent on proprietary seeds and technologies and the destruction of food self-sufficiency.

Food sovereignty encompasses the right to healthy and culturally appropriate food and the right of people to define their own food and agriculture systems. ‘Culturally appropriate’ is a nod to the foods people have traditionally produced and eaten as well as the associated socially embedded practices which underpin community and a sense of communality.

Health and wealth

But it goes beyond that. Our connection with ‘the local’ is also very much physiological.

People have a deep microbiological connection to local soils, processing and fermentation processes which affect the gut microbiome – the up to six pounds of bacteria, viruses and microbes akin to human soil. And as with actual soil, the microbiome can become degraded

according to what we ingest (or fail to ingest). Many nerve endings from major organs are located in the gut and the microbiome effectively nourishes them. There is ongoing research taking place into how the microbiome is disrupted by the modern globalised food production/processing system and the chemical bombardment it is subjected to.

Capitalism colonises (and degrades) all aspects of life but is colonising the very essence of our being – even on a physiological level. With their agrochemicals and food additives, powerful companies are attacking this ‘soil’ and with it the human body. As soon as we stopped eating locally grown, traditionally processed food cultivated in healthy soils and began eating food subjected to chemical-laden cultivation and processing activities, we began to change ourselves.

Along with cultural traditions surrounding food production and the seasons, we also lost our deep-rooted microbiological connection with our localities. It was replaced with corporate chemicals and seeds and global food chains dominated by the likes of Monsanto (now Bayer), Nestle and Cargill.

Aside from affecting the functioning of major organs, neurotransmitters in the gut affect our moods and thinking. Alterations in the composition of the gut microbiome have been implicated in a wide range of neurological and psychiatric conditions, including autism, chronic pain, depression and Parkinson’s.

Science writer and neurobiologist Mo Costandi has discussed gut bacteria and their balance and importance in brain development. Gut microbes controls the maturation and function of microglia, the immune cells that eliminate unwanted synapses in the brain; age-related changes to gut microbe composition might regulate myelination and synaptic pruning in adolescence and could, therefore, contribute to cognitive development. Upset those changes and there are going to be serious implications for children and adolescents.

In addition, environmentalist Rosemary Mason notes that increasing levels of obesity are associated with low bacterial richness in the gut. Indeed, it has been noted that tribes not exposed to the modern food system have richer microbiomes. Mason lays the blame squarely at the door of agrochemicals, not least the use of the world’s most widely used herbicide, glyphosate, a strong chelator of essential minerals, such as cobalt, zinc, manganese, calcium, molybdenum and sulphate. Mason argues that it also kills off beneficial gut bacteria and allows toxic bacteria.

The 2015 Declaration of the International Forum for Agroecology argues for building grass-root local food systems that create new rural-urban links, based on truly agroecological food production. It says that agroecology should not be co-opted to become a tool of the industrial food production model; it should be the essential alternative to it.

The declaration stated that agroecology is political and requires local producers and communities to challenge and transform structures of power in society, not least by putting the control of seeds, biodiversity, land and territories, waters, knowledge, culture and the commons in the hands of those who feed the world.

As activist [John Wilson](#) says, agroecology goes beyond ‘science’ or sets of practices. It is about creative solutions, a (spiritual) connection to nature and the land, nurturing people, peaceful transformation and solidarity.

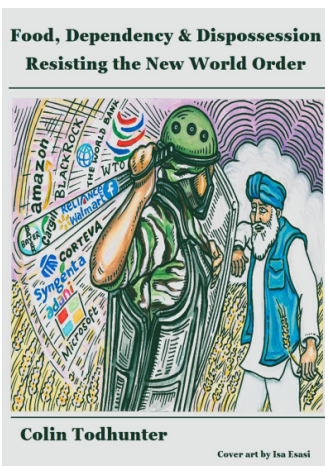
It is also about resistance and freedom.

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Read Colin Todhunter's e-Book entitled

Food, Dispossession and Dependency. Resisting the New World Order

We are currently seeing an acceleration of the corporate consolidation of the entire global agri-food chain. The high-tech/big data conglomerates, including Amazon, Microsoft, Facebook and Google, [have joined traditional agribusiness giants](#), such as Corteva, Bayer, Cargill and Syngenta, in a quest to impose their model of food and agriculture on the world.

The Bill and Melinda Gates Foundation is also involved (documented in '[Gates to a Global Empire](#)' by Navdanya International), whether through [buying up huge tracts of farmland](#), promoting a much-heralded ([but failed](#)) '[green revolution](#)' for Africa, pushing [biosynthetic food](#) and [genetic engineering technologies](#) or more generally [facilitating the aims of the mega agri-food corporations](#).

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