Using and maintaining biodiversity is one of the 13 generic agroecological principles set out by the 2019 HLPE report.

Photo: Georgina Smith/ CIAT

Wind of change – the growing momentum for agroecological transitions

Food-related debates are being held more and more from a moral angle – food is a highly political issue. Answers to the question how we can achieve food and nutrition security while protecting our natural resources, safeguarding biodiversity and tackling the climate crisis are accordingly controversial. Our author looks at the different approaches and shows why and how agroecological principles can result in productive, environmentally sustainable and socially equitable food systems that reconcile addressing global challenges with meeting local needs.

By Fergus Sinclair

It is evident that the global food system is broken. There are four main dimensions to this. Firstly, it does not feed the human population equitably. More than eight hundred million people are going hungry, and numbers are rising, while at the same time, there is an obesity epidemic. Both these phenomena are unequally distributed around the world and aggravated by the COVID-19 pandemic. Secondly, agriculture massively contributes to the climate crisis, being responsible for around a third of greenhouse gas emissions, while simultaneously having to adapt to increasingly frequent and severe droughts, floods and other climate change effects. Thirdly, current agricultural methods harm the very land and water resources upon which they are based, with an estimated quarter of agricultural land degraded, water tables dropping and water courses in many areas polluted. Last but not least, business as usual agriculture contributes to catastrophic biodiversity loss that threatens not only agricultural production itself, through loss of pollinators, but the survival of many species as well. This applies not only to agricultural land – pollution from agriculture also reduces biodiversity in protected areas.

The drivers of unsustainable food systems

A key problem is that the drivers of non-sustainability are the very same things which have massively increased agricultural productivity over the last few decades, reducing the prevalence of undernourishment globally until around 2014, when the trend reversed. These include the use of industrially produced agrochemicals and irrigation to provide nutrients, water as well as pest and disease control for intensively managed crop monocultures, coupled with intensive livestock production, that are often dislocated from one another, reducing opportunities for recycling. The key metric has been yield, while problems of hunger, pollution and climate change have been treated as externalities. Forcing agricultural systems in this way, rewarding production and not adequately costing externalities, has made agriculture more uniform by masking ecological, economic and social variation, generating increasing reliance on a centralised and narrow genetic base and unhealthy soil that require industrial inputs to be productive. More holistic metrics of agricultural and food system performance, coupled with policies to correct market failures that favour quick gains over sustainable investments, could be expected to drive agriculture in a different direction towards greater sustainability.

Challenging the status quo – an ambitious task

Given the urgency of the interrelated climate, hunger, biodiversity and natural resource degradation crises, it is clear that incremental im-

provements in the efficiency of 'business as usual' agriculture will not be sufficient to address them. A transformation of food systems, involving changing patterns of food consumption as well as methods of production, storage, processing, transport and retail, is required. This is not an easy task, because it involves challenging the status quo, including the vested interests of those who profit from the way in which things are done at present. Many private sector actors are increasingly interested in addressing sustainability and equitability concerns as these begin to threaten prevailing business models. This happens not least when consumers demand food that is produced in an environmentally sustainable and socially equitable manner, but there is a long way to go.

A key problem is that more sustainable production methods require a completely different way of doing things, biodiverse landscapes and fields which have more natural barriers to pest and disease spread than simplified monocultures, which incorporate biological nitrogen fixation rather than relying on artificial fertiliser, and which intensify more with respect to knowledge and labour than capital. Essentially, farming more in harmony with nature and supporting more decent rural jobs, including through adding value locally, which can attract young people to stay in, or return to, the countryside rather than seek an urban future.

Principles to guide transformation

The 2019 UN Committee on World Food Security (CFS), High Level Panel of Experts (HLPE) report on agroecological and other innovative approaches to sustainable agriculture for food security and nutrition set out 13 agroecological principles (see upper Box) derived from the literature and experience of agroecology over the last century and incorporating the ten elements of agroecology developed by FAO and endorsed by 147 countries. These principles have been suggested as a framework to drive food system transformation with a call for them to be adopted by the United Nations Food Systems Summit (UNFSS), and already signed by more than 300 organisations and 800 individuals. The principles are universal, but when applied, through co-creation of knowledge with local stakeholders, generate a diversity of locally adapted practices. They cover whole food system transformation from agroecosystem management to the governance of food systems, including ensuring equity in agency for all actors within food systems from producers through to consumers.

THE 13 HLPE (2019) AGROECOLOGICAL PRINCIPLES

Agroecological approaches involve an alternative paradigm to business as usual agricultural and foods systems with different goals, values and mindsets. These are summarised in 13 generic agroecological principles which, when applied through participatory processes with local stakeholders, result in a diversity of agroecological practices that suit the local cultural and ecological context. Seven of these principles are mainly concerned with agroecosystem management to encourage farming that is in harmony with nature and confers resilience: avoiding environmentally disruptive inputs, recycling, using and maintaining biodiversity, synergy (managing interactions amongst components), economic diversification, and ensuring animal and soil health. The other six concern whole food systems and are fundamental for catalysing and sustaining transformative change: co-creation and sharing of knowledge, land and natural resource governance, connectivity (particularly of producers and consumers), social values and diets, fairness and participation (referring to agency of producers, consumers and all other actors in food systems). The need for these principles to be applied simultaneously has led to agroecology manifesting as a science, a set of practices and a series of social movements. Widespread transformative change is only likely to occur where these three manifestations coalesce and work together.

Universal principles, but different pathways

Global transformation of food systems through the application of agroecological principles is an ambitious undertaking that requires both bold action to effect change and many different transition pathways appropriate to different starting points and contexts. The most widely understood articulation of agroecological transformation is probably Stephen Gliessman's five transition levels, assuming a starting point of industrial or green revolution agriculture that uses a high level of artificial inputs (see Infographic on page 32). This, not surprisingly, starts by reducing inputs and moves on to the redesign of the farm and eventually the whole food system, in a series of increasingly fundamental change processes or transition levels. While this transition pathway makes sense for much of Europe, Asia and the Americas, it is not relevant for large parts of sub-Saharan Africa, where farmers use few inputs and degradation progresses through lack of investment in sustainable practice. What is required here is to leap-frog from unsustainably low productivity to higher productivity without incurring the environmental damage and social inequities associated with 'business as usual' models of agricultural improvement. To do this, intensification is required, but using technology that favours natural rather than industrial processes which avoid negative externalities. This generally involves more knowledge and labour-intensive solutions, rather than a capital intensification, because using biodiversity and ecological processes embraces and harnesses their complexity, rather than homogenising the environment through the application of agrochemicals. The same principles, when applied across contexts, generate different transition pathways to sustainable agricultural and food systems.

A look at the different approaches

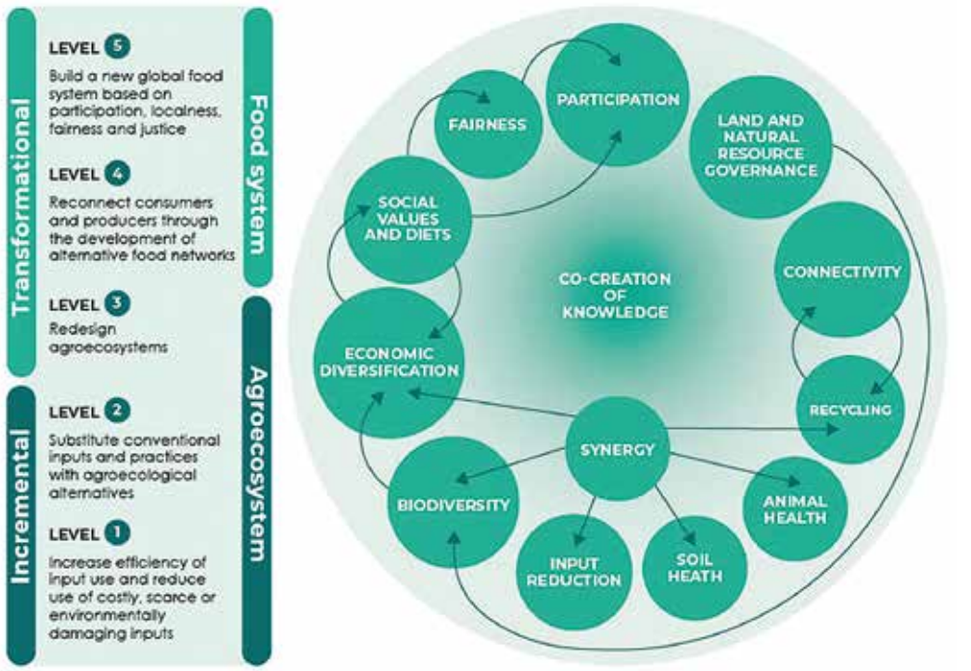
Agroecological and other approaches to food security and nutrition overlap considerably, although there are also clear and important

TECHNOLOGY AND INNOVATION

All approaches rest on technology and innovation but approach them in different ways. **Agroecology** supports local innovation, using co-creation and sharing of knowledge as a cornerstone of how technologies are developed, whereas much **sustainable intensification** seeks to spread technologies developed in one context (often experimental) as widely as possible. These alternative paradigms, not surprisingly, require different configurations of research, extension and education that tend to produce different results. The concept of **transdisciplinary science** in agroecology is problem-focused, solution-oriented, involves stakeholders and their knowledge in the scientific process in an equitable way and is reflexive with regard to method. This requires a fundamental reconfiguration of how research, extension and education are approached, changing whose knowledge counts through addressing power asymmetry in the generation and dissemination of knowledge.

distinctions amongst them (see lower Box on page 31). So, for example, conservation agriculture is a form of 'sustainable intensification' that is often considered 'climate smart' but is only agroecological if it uses biological or mechanical means to control weeds rather than herbicides. What throws light on the distinctions amongst approaches is the principles and mindsets involved. Sustainable intensification starts from the premise that production per unit of land needs to increase whereas agroecological principles define how to produce without damaging the environment or aggravating social inequity and are concerned with changing the consumption patterns that drive how much needs to be produced. Nature-based solutions start from the conservation of nature and realise that tolerating farming is necessary, whereas agroecology tries to farm as much as is possible in harmony with nature. While it might be expected these would meet in the middle, in practice the people espousing these approaches tend to come from different backgrounds, have different values, mindsets and hence intuitions in respect of what solutions are appropriate in any particular context.

The agroecological principles in relation to Gliessman's transition levels



Source: A. Wezel, B. Gemmill Herren, R. Bezner Kerr, E. Barrios, A.L.R. Gonçalves, F. Sinclair (2020). Agroecological principles and elements and their implications for transitioning to sustainable food systems. A review. Agronomy for Sustainable Development 40 (6), 1-13.

Controversy and power asymmetry

Polarisation has dogged the progress of agroecological transitions, arising from discomfort amongst conventional agricultural scientists with the political economy perspective of agroecological science, resulting in an often dismissive attitude regardless of evidence; the often uncompromising stance of many civil society organisations and social movements towards business as usual agricultural improvement and its proponents, and a massive disparity in the investment in agroecological approaches vis-à-vis business as usual alternatives, resulting in a far from level playing field. Many extant policies, such as subsidies for agrochemical inputs, lock in 'business as usual' models of agricultural improvement and lock out agroecological approaches.

In exploring a range of prominent controversies dividing different approaches to sustainable agriculture, such as biotechnology and biofortification, the CFS/HLPE (2019) report found that disagreement centred more on how technology was accessed, controlled and used rather than fundamental objections to the nature of technologies themselves. This suggests possible ways forward to greater consensus by seeking greater clarity on separating disagreements about values as opposed to those relating to what causal mechanisms can deliver desirable outcomes, something that articulating principles of different approaches can help to achieve. There is, however, an increasing moralisation around food which, on the one hand, pushes it up the agenda of policy-makers while at the same time making it more difficult for them to peruse evidence-based policy rather than adjudicating amongst competing convictions. Despite chronic underinvestment, there is ample evidence that in specific contexts, agroecological practices can be as productive as or even more productive than 'business as usual' alternatives with fewer externalities, but huge gaps remain in understanding how different agroecological practices perform across different contexts, which is critical for driving wide-scale uptake.

Making use of the UNFSS momentum for change

There are signs of a wind of change blowing through the United Nations Food Systems Summit, with growing demand for agroecological approaches to be taken seriously. Early on, many civil society groups boycotted the summit because of a perception that agroecological approaches were not prominent enough and a 'business as usual' mindset with incremental rather than transformational change was driving the agenda. Things began to change when the CFS adopted policy recommendations endorsing the role of agroecological approaches in achieving necessary food system transformation, and the President of Sri Lanka got their implementation off to an ambitious start by announcing a bold policy of national agroecological transformation at a side-event organised by the newly formed Transformative Partnership Platform on Agroecological Transitions (TPP; see also opposite page).

A solution cluster on agroecology and regenerative agriculture under Action Track 3 of the Summit attracted over 80 game-changing solutions and soon transcended all Action Tracks as signatures accumulated on the call for the 13 HLPE agroecological principles to be adopted by the Summit. Pressure from countries for a session on agroecology in the main programme of the Pre-Summit was eventually heeded and a session shoe-horned in at the last minute to complement the already established parallel session. These have resulted in a coalition for action based on agroecological principles which has helped shape the Pre-Summit and is poised to contribute to outcomes of the upcoming summit itself, and more importantly, action beyond it to effect widespread agroecological transformation of food systems.

Fergus Sinclair is Chief Scientist at CIFOR-ICRAF through collaboration with Bangor University (UK) and Co-convenor of the Transformative Partnership Platform on Agroecological Transitions.
Contact: f.sinclair@cgiar.org