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Transforming our food systems is the only way to nourish the world

Katharine Earley

The way we produce our food is under pressure like never before. And with the climate crisis and the Covid-19 pandemic now posing the greatest challenges to nourishing the expanding global population, our precious and fragile food system is fast reaching breaking point.

So do we intensify the current system of farming or is there a better way? Much criticism has been levelled at alternative approaches to conventional farming, for example – that they can't produce enough food for 10 billion people by 2050, they're not always climate friendly, and consumers reject the cost of sustainable food.

Writing in a new book, *Transformation of our food systems*, published by sustainable development organisation Biovision and German farming charity Foundation on Future Farming, scientists and food security experts refute these criticisms. Agroecology - a farming philosophy and approach that works for nature and people - they say, can nourish the world, fight climate change and help solve the global food security crisis.

Importantly, the book also builds on the first global UN-led work on food security, the International Assessment of Agricultural Knowledge, Science and Technology for Development (IAASTD) report. Published in 2009, the report highlighted the urgent need for greater resilience in order to sustain future food supplies. It even warned that our food system would not withstand a global pandemic, and informed many of the UN's 2030 Sustainable Development Goals.

Over a decade later, there is increasing awareness of the fundamental need for a sustainable food system. Now, ahead of the Committee on World Food Security (CFS) and the UN's Food System Summit in 2021, it is vital that the world moves decisively towards a better food future, informed by science-based targets.

Understanding the need for change

Industrial agriculture is exceeding the planet's natural limits. Its focus on short-term economic growth and heavy reliance on synthetic chemicals has a profound, adverse impact on the climate and living systems we need to survive. Food production is now responsible for 21-37% of total human-caused greenhouse gas emissions. Of the 6,000 plant species cultivated for food, just nine account for 66% of total crop production,¹ exposing food supplies to considerable risk. And as more forests are cleared for cattle, soy beans and oil palms, for example, biodiversity loss is reaching a global crisis.

¹ UN Food and Agriculture Organization, 2019

There are serious human consequences too. At least 690 million² people suffer from food insecurity, and ultra-processed food is leading to major health issues including obesity and diabetes, placing a significant strain on health systems.

“Our current food system is undermining our ability to produce food in the future,” says Hans Herren, founder of Biovision. “World leaders must embrace the transformation of our food systems as the most powerful way to drive change, eliminate under and over nutrition and social inequality, and build climate resilience by respecting planetary boundaries.”

What is agroecology?

Agroecology is a holistic, inclusive system that respects nature and seeks to take only what we need. This progressive, regenerative farming philosophy is founded on science, knowledge and skills from multiple disciplines, as well as technologies and innovations, and centres around producing food in a way that is environmentally sound, supports greater biodiversity and protects the climate. In parallel, it helps to improve people’s health through healthier diets, empowers women farmers and workers and strengthens rural livelihoods. It is also accessible to small-scale and family farmers, who produce at least 80% of the world’s food (by value),³ and seeks to value and include indigenous and traditional knowledge. And it is rapidly gathering momentum worldwide.

“In the race to the bottom on price, it’s smallholder farmers who suffer the most,” says sustainable food systems expert Prof. Molly Anderson. “A shift to lower cost agroecology would provide more rural jobs and enable young people to continue farming the land their families have tended for generations.”

In rural Tanzania, Janet Maro, Executive Director of the Sustainable Agriculture Tanzania (SAT) organisation, farms a variety of crops – maize, sunflower and sorghum, as well as cassava – on 20 hectares of land. In between these crops, she plants beans and peas, crops that help to add nitrogen (which is fundamental to healthy plant growth) to the soil. Together with compost, these legume crops cover the surface of the soil (reducing evaporation) and help to improve soil health, increasing water retention.

Maro is far from the only woman involved. 60% of farmers involved in SAT are women, and through the scheme, they have also diversified to grow organic vegetables, herbs and spices that are sold in local shops.

“The diversity of crops we grow not only raises crop quality and yields, it also improves nutrition among local households,” says Maro. “With the improved income, farmers can invest more in health and education for their families.”

Indeed, some 30% of farms around the world are estimated to have redesigned the way they grow crops around agroecological principles, with a real groundswell of activity at the grassroots level. However, research and training in this area has slowed down over the past ten years, representing only 14% of agricultural aid in sub-Saharan Africa in 2017.⁴

² UN Food and Agriculture Organization http://www.fao.org/3/ca9692en/online/ca9692en.html#chapter-executive_summary

³ UN FAO State of Food and Agriculture, 2014

⁴ Biovision and IPES Money Flows Report, 2020

Significantly more research and funding are urgently needed to support further expansion, Biovision finds.

Agroecology as a powerful lever for food security

“Sustainably produced food can nourish the world, but our diet has to change,” says nutrition and obesity expert Prof. Boyd Swinburn. “For a smarter use of land and healthier, thriving populations, we must move away from monocultures and industrially-produced dairy and beef to more plant-based and whole foods.”

In 2019, the EAT-Lancet Commission invited 37 scientists from 16 countries to identify what it would take to create a diet that would be good for people and the environment, supported by science-based targets. The ‘Planetary Health Diet’ would mean doubling the consumption of healthy foods such as fruits, vegetables, legumes and nuts, and a more than 50% reduction in global consumption of less healthy foods such as added sugars and red meat.⁵ To achieve this healthier, more diverse diet, the Commission recommends transformative growing practices to reduce yield gaps (by at least 75%).

For example, in Zambia’s Luangwa Valley, social enterprise Community Markets for Conservation (COMACO) is supporting more than 179,000 smallholder farmers in 80 co-operatives in adopting sustainable, climate-friendly practices, while providing alternative livelihood skills for illegal wildlife poachers. Like Maro, they plant legume food crops such as soy and ground nuts to improve soil health. They also rotate their crops to keep their fields productive, and plant native *Gliricidia* trees alongside their crops to add more nutrients to the soil and naturally repel pests. This approach has improved maize yields by two to three times over three years (compared to conventional practices), improving farmers’ incomes by up to 450%. The trees’ leaves also form the basis of organic compost, further avoiding the need for chemical fertiliser.

COMACO pays farmers a premium for their crops and helps to expand their access to markets – turning produce into saleable commodities and marketing them across the country through its own ‘It’s Wild!’ brand. The farmers’ richer soils and increased yields also help to boost local and national food security.

Building climate resilience

In 2019, the Intergovernmental Panel on Climate Change stated that we must change food production if we are to stop global warming.⁶ Yet controversy remains surrounding the climate impacts of more sustainable solutions. Agroecology can play an important role in creating a lower carbon food system. Its focus on soil health is also a natural climate solution, with healthy soils helping to capture and keep carbon in the ground. And a 2020 Biovision-FAO study demonstrates that agroecology also builds climate resilience.

Janet Maro explains: “I’ve experienced far fewer crop losses in heavy rains than farmers using conventional practices,” she says. “And my crops are more able to withstand periods of prolonged drought.”

In India, the Zero Budget Natural Farming initiative, which is on track to reach 1 million farmers by the end of 2020, uses ‘excess resources’ such as crop residues or manure to

⁵ Healthy Diets From Sustainable Food Systems, 2019

⁶ Climate Change and Land Use, IPCC, 2019

nourish the soil. Farmers learn to coat seeds in beneficial microbes, and use biological, locally available materials such as cow dung to promote soil fertility, while improving water retention and reducing the need for irrigation.

Where possible, ZBNF farmers also integrate trees within their land, increasing the level of interaction between different plant and animal species, and helping to promote a flourishing environment for crops.

Farmers can even be rewarded for protecting their forests through schemes such as the REDD+ carbon crediting scheme. COMACO protects more than 1,000,000 hectares of land in this way, with 228,000 tonnes of CO₂ emission reductions recorded in the first period alone, resulting in \$490,000 paid to the participating chiefdoms to reinvest in their farms and communities.

The true cost of food

“Cheap, nutrient-poor food is a false economy,” explains Haerlin, of the Foundation on Future Farming. “The low cost of production is achieved to the detriment of people and the environment. Healthier foods must become more accessible and affordable.”

Indeed, the global costs of repairing damage to health and the environment are estimated at \$12 trillion annually, and are projected to rise to \$16 trillion by 2050.

“We urgently need to change the way we prioritise the outcomes of agriculture,” says Swinburn. “We must think systemically – shifting away from the historical focus on productivity and dollars per hectare, and adopting a more holistic system that leads to good health, environmental sustainability, nutritional equity and prosperity.”

In ‘Transformation of our Food Systems’, food and environment specialist Nadine Azzu recommends one such approach. In 2018, she contributed to a new framework created by the Economics of Ecosystems and Biodiversity for Agriculture and Food (TEEBAgriFood), which values the contribution of natural resources and the impacts of production on nature, together with health and socio-economic impacts, including employment.

“True cost accounting provides us with clear evidence of the significant and quantifiable costs to people and planet of industrial, chemical-intensive agriculture,” explains Dr Marcia Ishii-Eiteman, senior scientist at the Pesticide Action Network. “In contrast, agroecology not only avoids these costs but provides measurable benefits including healthy soils, clean water, conservation of pollinators and natural predators, thriving rural economies, better health and greater resilience.”

At a consumer level, the radical transparency offered by true cost accounting will be a fundamental part of shifting behaviours and attitudes – and raising awareness of the existential threats posed by biodiversity and climate change. For example, sustainable food distributor EOSTA embraces true cost accounting to build transparent relationships with stakeholders. It also provides retailers and consumers with direct access to the producer as well as their ecological and social impact, through its [Nature & More](#) website.

Changing consumer attitudes have been heightened by the Covid-19 outbreak. Some 55% of Americans would be willing to eat more plant-based meat alternatives.⁷ Ecovia reports sales

⁷ 2020 survey by the Yale Program on Climate Change and the Earth Day Network

increases of more 40% among some organic food stores in France in 2020, and the Soil Association reporting 50% growth in the UK organic market in the past ten years.

Looking ahead

“The food and agricultural system has become the single most important lever to address climate change and biodiversity loss and meet the goals of the SDGs and Paris Agreement as well as the Convention on Biodiversity,” concludes Haerlin.

- **A major focus on research and knowledge-sharing**

“A wholesale institutional change is required at the government level to support independent, credible agricultural and food system research that informs clear guidance for consumers and sound advice for farmers and farming communities as they transition to new practices,” explains Herren.

This focus on research, capacity-building and knowledge-sharing is vital. “The soil microbiome will need time to adjust to more natural methods after years of synthetic chemicals,” explains Anderson. “This means helping farmers to overcome the knowledge and income gaps while the land is adjusting.”

- **Harnessing progressive policy to catalyse change**

“Fundamentally, we must rebalance power in the food system,” adds Ishii-Eiteman. “This can be done by reversing trends in corporate consolidation and dominance over public policy decisions. Similarly, implementing fair trade and strict competition rules with rights-based policies is integral to protecting the rights of farmers, women, indigenous people and other vulnerable groups.”

“Politicians must start to incorporate health, the environment and social equality within economic thinking, undeterred by commercial lobbies” says Swinburn. “These progressive actors will be the winners.”

Meaningful change will also require a complete shift in subsidies, away from conventional agriculture and towards agroecological research and innovation.

- **People must demand better**

“People must have sovereignty over the food they eat and produce,” concludes Haerlin. “Agroecology is a democratic movement towards a better way of life in which we are all empowered by greater knowledge over how and where our food is produced.”

“The future for farmers is bright,” says Maro. “I’ve seen how agroecology has transformed farmers’ lives and inspired others to take part. My message is that everyone – governments and individuals – should look at the benefits of this way of farming and create space for this evolution in policy, development aid and research. This is how we’ll provide healthy food for the growing global population.”

For further information or to download the book, please visit globalagriculture.org/transformation.

About Transformation of our Food Systems

Transformation of our food systems - the making of a paradigm shift was written by a team of 40 international experts to support governments, NGOs and the wider public as they make vital choices that impact the future direction of food production. It has been published ahead of major food security talks including the UN Committee on World Food Security (CFS) and UN's 2021 Food System Summit. In particular, the book describes major food production trends and impacts since the IAASTD report in 2009, and seeks to illustrate, from a variety of perspectives, that agroecology could be a fundamental pathway to redesign food production systems in the wake of the Covid-19 pandemic.

Food system statistics

- Food production is now responsible for 21-37% of total human-caused greenhouse gas emissions
- Livestock alone accounts 14.5% of emissions, more than the global transport system
- In 2014, the UN's Food and Agriculture Organization (FAO) warned that unless action is taken to restore the health of our soils, the world may have just 60 harvests left.
- Better soil management could boost the carbon stored in the top layer of the soil by up to 1.85 gigatonnes annually.⁸
- Of the 6,000 plant species cultivated for food, just nine account for 66% of total crop production.
- 690 million people suffer from undernourishment, and Oxfam predicts that 12,000 people could die per day by the end of 2020 as a result of hunger linked to COVID-19.

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Caption: In her training centre in Morogora, Tanzania, Janet Marot (2nd from left, see text) imparts valuable knowledge on agro-ecological methods to farmers from the surrounding area. Credits: Peter Luethi/Biovision

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⁸ <https://www.nature.com/articles/s41598-017-15794-8>

