Indian J. Plant Genet. Resour. 29(3): 237-240 (2016)
DOI 10.5958/0976-1926.2016.00033.4

From Industrial Agriculture to Diversified Agroecological Systems

Emile Frison
Member, International Panel of Experts on Sustainable Food Systems (IPES-Food) and Former Director General, Bioversity International, Rome, Italy

Today's food and farming systems have succeeded in supplying large volumes of foods to global markets, but are now generating negative outcomes on multiple fronts. Many of these problems can be linked specifically to 'industrial agriculture', i.e. the industrial-scale feedlots and uniform crop monocultures that dominate agricultural landscapes, and rely on chemical fertilizers and pesticides as a means of managing agro-ecosystems. This form of agriculture is associated with widespread degradation of land, water and ecosystems; high greenhouse gas (GHG) emissions; biodiversity losses; persistent hunger and micro-nutrient deficiencies alongside the rapid rise of obesity and diet-related diseases; and livelihood stresses for farmers around the world.

What is Keeping Industrial Agriculture in Place

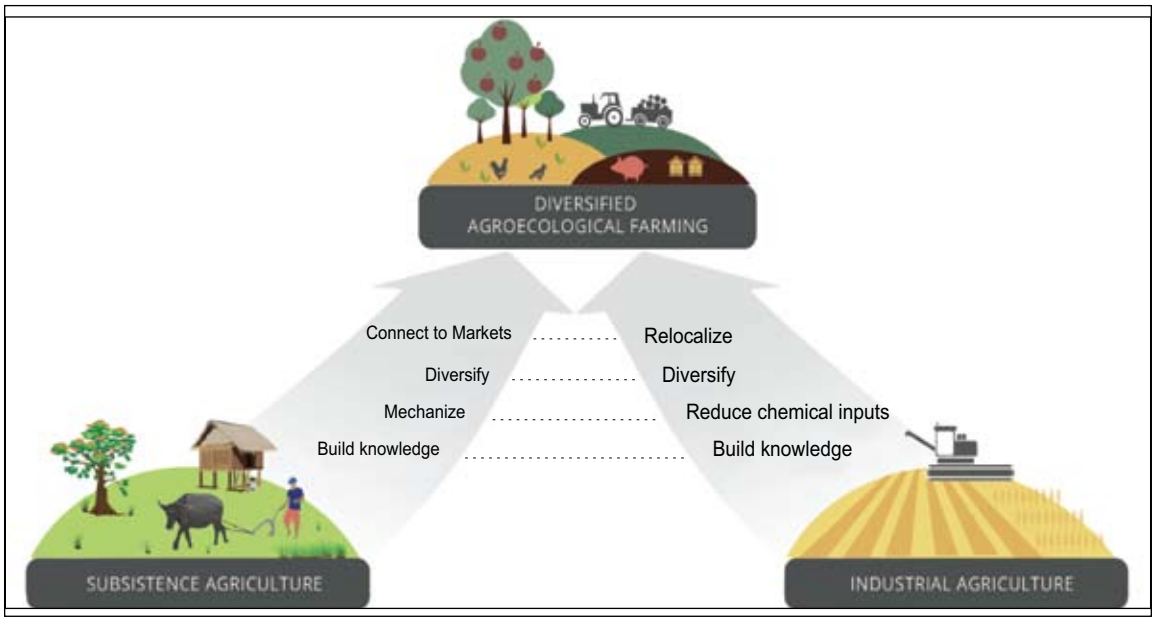
Eight 'lock-ins' can be identified, referring to the key feedback loops that characterise modern food systems and keep industrial agriculture in place:

Lock-in 1: Path Dependency

Industrial agriculture requires significant up-front investments, in terms of equipment, training, networks and retail relationships, and often requires farmers to scale up. Once these investments and structural shifts have been made, it is increasingly difficult for farmers to change course ('path dependency').

Lock-in 2: Export Orientation

As industrial agriculture has spread, generating abundant supplies of uniform, tradable crop commodities, trade has taken on disproportionate political importance. Specific supply chains (e.g. for animal feed, for processed food ingredients) have become increasingly export-oriented and export-dependent. Supporting these chains has often been prioritized over other interests (e.g. ensuring resources for local food production) and in spite of the risks and problems associated with export orientation and regional monocultures (e.g. price volatility,



1 This paper is based on a report by the International Panel of Experts on Sustainable Food Systems (IPES-Food) published in June 2016: from uniformity to diversity: a paradigm shift from industrial agriculture to diversified agroecological systems (http://www.ipes-food.org/).

**Author for Correspondence: Email- e.frison@cgiar.org*

environmental degradation, competition for land) various policy measures have incentivized export orientation.

Lock-in 3: The Expectation of Cheap Food

Industrial agriculture and shifting consumer habits have helped to facilitate the emergence of mass food retailing, characterised by the abundance of relatively cheap highly-processed foods, and the year-round availability of a wide variety of foods. In many countries, consumers have become accustomed to spending less on food. In this context, farmers have received clear signals to industrialize their production in order to respond to the increasing demand for large volumes of undifferentiated commodities.

Lock-in 4: Compartmentalized Thinking

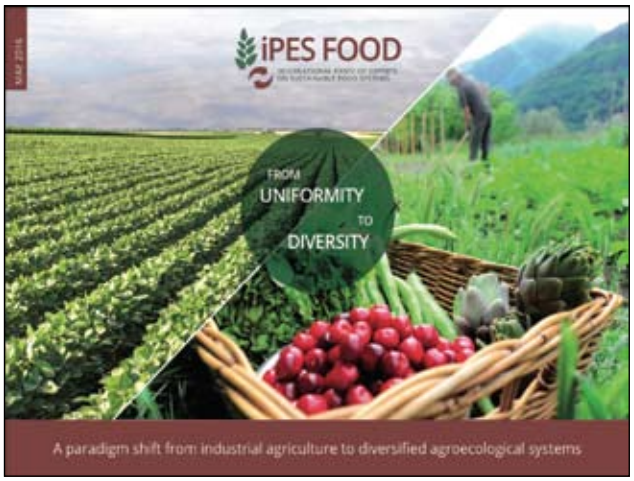
Highly compartmentalized structures continue to govern the setting of priorities in politics, education, research and business, allowing the solutions offered by industrial agriculture to remain at centre stage. Agricultural ministries, committees and lobbies retain a privileged position relative to other constituencies (e.g. environment, health) in setting priorities and allocating budgets for food systems. Increasingly privatized agricultural R&D programmes remain focused on the handful of commodities for which there is a large enough market to secure significant returns. Educational silos remain in place, and sectoral 'value chain' organizations share knowledge vertically (by product) rather than encouraging food systems approaches.

Lock-in 5: Short-term Thinking

Diversified agroecological systems offer major benefits for farmers and for society, however, the advantages will not be immediately visible, given the time needed to rebuild soil health and fertility, to increase biodiversity in production systems, and to reap the benefits of enhanced resilience. Unfortunately, key players in food systems are often required to deliver short-term results. Politicians are locked into short-term electoral cycles that encourage and reward policies that deliver immediate returns and publicly-traded agribusiness firms are required to deliver rapid returns to shareholders.

Lock-in 6: 'Feed the World' Narratives

Despite the fact that food security is recognized primarily as a distributional question tied to poverty and access to food, achieving food security continues to be framed



by many prominent actors as a question of how to 'feed the world', or in other words, how to produce sufficient calories at the global level. These narratives and approaches have been particularly prominent in the wake of the 2007-2008 food price spikes.

Lock-in 7: Measures of Success

The criteria against which farming is typically measured – e.g. yields of specific crops, productivity per worker – tend to favour large-scale industrial monocultures. Evidence in recent long-duration studies, suggest that diversified agroecological systems can compete well on productivity grounds. However, they are still disadvantaged by such comparisons. Diversified systems are by definition geared towards producing diverse outputs, while delivering a range of environmental and social benefits on and off the farm. Narrowly-defined indicators of agricultural performance fail to capture many of these benefits. Current systems will be held in place insofar as they continue to be measured in terms of what industrial agriculture is designed to deliver, at the expense of the many other outcomes that really matter to society.

Lock-in 8: Concentration of Power

The way food systems are currently structured allows value to accrue mainly to a limited number of actors, reinforcing their economic and political dominance, and thus their ability to influence the governance of those systems and the interests of these powerful actors converge around supporting industrial agriculture.

The Potential of Diversified Agroecological Systems

In contrast to industrial agriculture, diversified agroecological farming can deliver simultaneous and mutually-reinforcing benefits for productivity, the environment and society. These alternative systems deliver strong and stable yields over time by building healthy ecosystems where different species interact in ways that improve soil fertility and water retention. They perform particularly strongly under environmental stress and deliver production increases in the places where additional food is most needed. These systems have major potential to keep carbon in the ground, increase resource efficiency and restore degraded land, turning agriculture from a major contributor to climate change to one of the key solutions. Diversified agriculture also holds to key to increasing dietary diversity at the local level, as well as reducing the multiple health risks from industrial agriculture (e.g. pesticide exposure, antibiotic resistance).

Recommendations: How to Shift the Centre of Gravity in Food Systems

The IPES-Food report identifies a set of coherent steps that strengthen the emerging opportunities while simultaneously breaking the vicious cycles that keep industrial agriculture in place. Together, these steps must shift the centre of gravity in food systems, allowing harmful dependencies to be cut, the agents of change to be empowered, and alliances to be forged in favour of change.

Recommendation 1: Develop New Indicators for Sustainable Food Systems

It is essential to adopt a broader range of indicators, covering long-term ecosystem health; total resource flows; sustainable interactions between agriculture and the wider economy; the sustainability of outputs; nutrition and health outcomes; livelihood resilience; and the economic viability of farms with respect to debt, climate shocks, etc.

Recommendation 2: Shift Public Support Towards Diversified Agroecological Production Systems

Governments must shift public support away from industrial production systems, while rewarding the array of positive outcomes in diversified agroecological systems. Governments must implement measures that allow farms to diversify and transition towards agroecology. In particular, they must support young people to enter agriculture and adopt agroecological farming – before they are locked into the cycles of industrial agriculture.

Recommendation 3: Support Short Supply Chains and Alternative Retail Infrastructures

Governments should support and promote short circuits in order to make them a viable, accessible and affordable alternative to mass retail outlets, e.g. by repurposing infrastructure in cities to favour farmers' markets. More attention should also be paid to the role of informal markets and policy measures must be put in place that empower emerging initiatives linking farmers to consumers.

Recommendation 4: Use Public Procurement to Support Local Agroecological Produce

Public procurement should be used with increasing ambition in order to ensure sales outlets for diversified agroecological farms, while providing fresh, nutritious food and diversified diets for the users of public canteens, particularly schoolchildren.

Recommendation 5: Strengthen Movements that Unify Diverse Constituencies Around Agroecology

Governments can support farmers' groups, community-based organizations and social movements which encourage the spread of agroecological practices and advocate for sustainable food systems, and ensure the participation of diverse civil society groups from the global North and South in global governance processes and forums.

Recommendation 6: Mainstream Agroecology and Holistic Food Systems Approaches into Education and Research Agendas

Public research agendas must be redefined around different priorities. Investments but must be redirected towards equipping farmers to shift their production. The mission of university research should be redefined around the delivery of public goods. FAO and other international agencies should mainstream agroecology into all of their work, in order to spread existing knowledge and plug the remaining gaps in our understandings. Research conducted by the CGIAR Centres should be refocused around diversified agroecological systems and farmer participatory research.

Recommendation 7: Develop Food Planning Processes and 'Joined-Up Food Policies' at Multiple Levels

It is crucial to implement joined-up policymaking for food systems. Long-term, inter-ministerial planning – reaching across political boundaries and transcending electoral cycles – should be supported, building on landscape management and territorial planning initiatives, where food security can be meaningfully targeted and understood in terms other than 'feeding the world'. Crucially, food systems planning must be based on broad participation of various constituencies and groups with a stake in food systems reform. At the global level, the Committee on World Food Security (CFS) should advocate for coherent food policies and contribute to strengthening diversified agroecological food systems.

References

http://www.ipes-food.org/images/Reports/UniformityToDiversity_FullReport.pdf