



FROM
UNIFORMITY
TO
DIVERSITY

EXECUTIVE SUMMARY

A paradigm shift from industrial agriculture to diversified agroecological systems

Key messages

- Today's food and farming systems have succeeded in supplying large volumes of foods to global markets, but are generating negative outcomes on multiple fronts: widespread degradation of land, water and ecosystems; high 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.
- Many of these problems are linked specifically to 'industrial agriculture': the input-intensive crop monocultures and industrial-scale feedlots that now dominate farming landscapes. The uniformity at the heart of these systems, and their reliance on chemical fertilizers, pesticides and preventive use of antibiotics, leads systematically to negative outcomes and vulnerabilities.
- Industrial agriculture and the 'industrial food systems' that have developed around it are locked in place by a series of vicious cycles. For example, the way food systems are currently structured allows value to accrue to a limited number of actors, reinforcing their economic and political power, and thus their ability to influence the governance of food systems.
- Tweaking practices can improve some of the specific outcomes of industrial agriculture, but will not provide long-term solutions to the multiple problems it generates.
- What is required is a fundamentally different model of agriculture based on diversifying farms and farming landscapes, replacing chemical inputs, optimizing biodiversity and stimulating interactions between different species, as part of holistic strategies to build long-term fertility, healthy agro-ecosystems and secure livelihoods, i.e. 'diversified agroecological systems'.
- There is growing evidence that these systems keep carbon in the ground, support biodiversity, rebuild soil fertility and sustain yields over time, providing a basis for secure farm livelihoods.
- Data shows that these systems can compete with industrial agriculture in terms of total outputs, performing particularly strongly under environmental stress, and delivering production increases in the places where additional food is desperately needed. Diversified agroecological systems can also pave the way for diverse diets and improved health.
- Change is already happening. Industrial food systems are being challenged on multiple fronts, from new forms of cooperation and knowledge-creation to the development of new market relationships that bypass conventional retail circuits.
- Political incentives must be shifted in order for these alternatives to emerge beyond the margins. A series of modest steps can collectively shift the centre of gravity in food systems.

This report explores the potential for a shift to occur from current food systems, characterized by industrial modes of agriculture, to systems based around diversified agroecological farming. Based on a review of the latest evidence, the report identifies the major potential for diversified agroecological systems to succeed where current systems are failing, namely in reconciling concerns such as food security, environmental protection, nutritional adequacy and social equity. This report also asks what is keeping industrial agriculture in place, and what would be required in order to spark a shift towards diversified agroecological systems.

1. The outcomes of industrial agriculture

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.

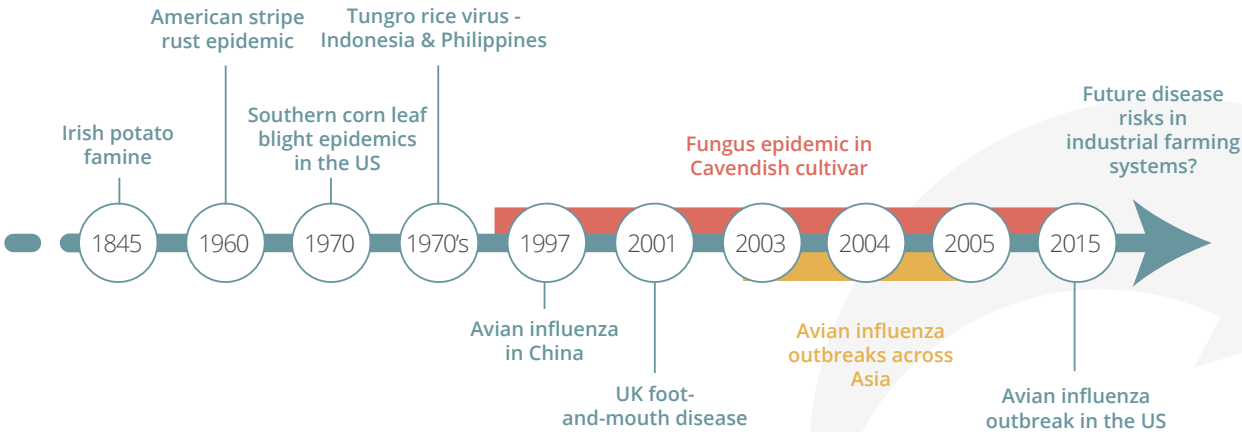
Some of the key outcomes of industrial agriculture include:

- **Productivity:** Major productivity increases were achieved through the 'Green Revolution' of the post-war decades, which focused on breeding crops and livestock to be highly responsive to external inputs

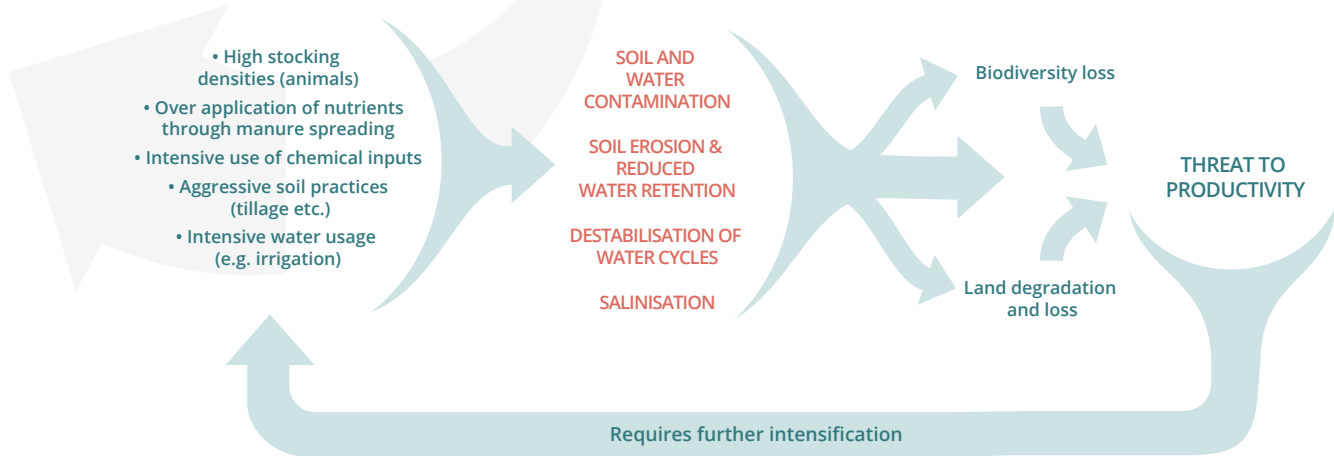
(e.g. chemical fertilizers and pesticides, antibiotics, protein feed) in order to thrive in uniform, intensive systems. While these approaches have driven significant increases in global staple foods production, yields failed to improve, stagnated or collapsed in 24-39% of the world's maize, rice, wheat and soybean production zones over recent decades.

- **Pest resistance and disease vulnerability:** The mass pesticide usage associated with industrial agriculture has led to increasing problems of pest resistance, affecting yields and generating costs for farmers (e.g. additional seeds and pesticides). The intensity and genetic uniformity of industrial systems has also left them vulnerable to devastating environmental shocks and disease epidemics.

A TIMELINE OF DISEASE OUTBREAKS IN HIGHLY-SPECIALIZED SYSTEMS



VICIOUS CYCLES OF SOIL AND WATER DEGRADATION IN INDUSTRIAL SYSTEMS



- **Land use:** Land can be ‘spared’ in industrial systems by increasing production on existing farmland. However, rarely have increases in productivity and decreases in cropland actually occurred together. *How* land is farmed (not *how much*) may in fact be the most pressing concern. Globally, 20% of land is now considered to be degraded, with industrial agriculture contributing significantly to this trend. Most developed countries have become net importers of animal feed and biomass for human consumption, exacerbating environmental pressures and competition for land in supply regions.
- **Greenhouse gas emissions:** Global food systems generate one-third of all GHGs. Much of this is linked to industrial modes of farming, e.g. fertilizer production, or deforestation to make way for large-scale plantations and animal feed production.
- **Water contamination and over-usage:** The excessive application of fertilizers and pesticides in crop monocultures, and the waste generated by industrial animal feedlots, have resulted in severe water pollution and contributed to ‘dead zones’ at the mouths of many rivers. Because of poorer soil structure in industrial farming systems, water runoff is greater and retention is lower, requiring increased irrigation. Aquifer exploitation and water table depletion are now occurring at alarming rates, particularly in industrial cropping zones such as the US Midwest.
- **Biodiversity loss and erosion of genetic pool:** The worldwide loss of pollinators now occurring is closely linked to agricultural intensification, habitat fragmentation and the use of agrochemicals. Industrial agriculture is therefore putting itself and the future of food production at risk: some 35% of global cultivated crops depend on pollination. ‘Underutilized’ and minor crop species are disappearing as food and farming systems are increasingly

- » Asian cereal production doubled with only 4% increase in land from 1970-1975
- » Without improved yields, 1.76 million hectares of additional cropland would have been required to reach 2005 production levels.
- » The EU’s ‘virtual land area’ is 35 million hectares
- » Most developed countries are net biomass importers

GENETIC EROSION OF LIVESTOCK BREEDS



focused around a handful of industrially-produced varieties of rice, maize, wheat and other staple crops. Eroding the genetic pool exacerbates risks in food systems by limiting the options available to future generations for adapting to changing environments.

- **Income:** Yield increases in industrial farming systems have helped to raise income for many farmers. However, industrial agriculture also comes with high costs (e.g. chemical inputs), while margins are often tight. As a result, the economic situation of farmers in industrial farming systems, even highly-subsidized ones, remains precarious. Meanwhile, the pathway offered by industrial agriculture – and the costs and risks it entails – remains unviable for many small-scale farmers around the world.
- **Trade and export orientation:** Export cropping zones have emerged alongside the rise of highly-specialized industrial agriculture. Export commodities have developed into an essential source of income, employment, and government revenues. However, the orientation of agriculture towards global markets has engendered risks by exposing economies to price shocks and ‘commodity-induced poverty traps’.
- **Hunger, food security and nutrition:** Industrial agriculture has led to significant reductions in hunger by increasing net food production.

However, 795 million people still suffered from hunger in 2015, with 2 billion afflicted by micronutrient deficiencies, and 1.9 billion obese and overweight. In some cases, the export orientation of agriculture (see above) has been linked to the exacerbation of domestic food insecurity. Overall, the shift towards industrial farming has brought a focus on energy-rich, nutrient-poor staple crop varieties, while pulses and other minor crops with high nutritional value continue to be overlooked.

- **Health risks:** Pesticide exposure in industrial farming systems has been linked to a range of health problems, e.g. Alzheimer’s disease, birth defects, cancers, developmental disorders. Additionally, the preventative use of antibiotics in industrial animal production systems has exacerbated the problem of bacterial resistance to antibiotics, creating health risks for human populations.

- » Rice, maize and wheat make up more than 50% plant-based food intake
- » Declining consumption of pulses and minor crops
- » Staples/cash crops pushing out traditional foods
- » General decrease in nutrition density of foods

2. What is keeping industrial agriculture in place?

What is keeping industrial agriculture in place, in spite of the negative outcomes it is producing on so many fronts? To answer this question, it is crucial to understand the context in which farmers, communities, regions and countries are opting for industrial modes of production.

Industrial food systems have in fact taken shape around industrial agriculture, creating a set of feedback loops ('lock-ins') that serve to reinforce this mode of farming. Eight key lock-ins are identified below:

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').

A range of political incentives and retail imperatives have further encouraged large-scale industrial farming, including:

- Policies to keep fossil energy cheap
- Area-based farm subsidies
- Research focused on a few major species and structured around the needs of large-scale industrial farms
- Bulk supply contracts from retailers

These incentives have reinforced the tendency for farmers to remain on their current path - regardless of how industrial agriculture is performing.

LOCK-IN 2: EXPORT ORIENTATION

The share of food traded internationally has continued to increase over recent decades - from 15% in 1986 to 23% in 2009 - but most

food consumed around the world does not cross international borders. Nonetheless, 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 and in spite of the risks and problems associated with export orientation and regional monocultures (e.g. price volatility, environmental degradation, competition for land). A variety of measures have incentivized export orientation:

- Subsidies for specific commodity crops
- Development programmes tied to commodity crops
- Reduced transport costs through policies to subsidize energy
- Trade liberalization measures and trade agreements
- Environmental deregulation allowing 'comparative advantages' to be enhanced/maintained

LOCK-IN 3: THE EXPECTATION OF CHEAP FOOD

Industrial agriculture and shifting consumer habits have helped to facilitate the emergence of mass food retailing, characterized 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. For example, food now accounts for as little as 11.4% of US household expenditure. In parallel, consumers have become increasingly disconnected (physically and emotionally) from food production.

In this context, farmers have received clear signals to industrialize their production:

- Demand for large volumes of undifferentiated crop commodities and vegetable oils as ingredients for processed foods.
- Demand for bulk commodity feedstocks to support industrial meat and dairy production.
- Standardization requirements, safety rules and bulk supply contracts that are difficult for small-scale and diversified farms to meet.

In other words, retailers have become increasingly reliant on the cheap and flexible supply of uniform commodities that industrial agriculture is uniquely positioned to provide – helping to reinforce this mode of production.

LOCK-IN 4: COMPARTMENTALIZED THINKING

The ‘Green Revolution’ succeeded in raising food production, on the basis of a highly-focused set of priorities:

- Crops bred to respond to external (chemical) inputs
- Wide applicability > localized approaches
- Focus on a few major species > minor species
- Technological innovation > social innovation

Green Revolution thinking remains dominant today, even as the need to reconcile productivity growth with other concerns has been increasingly recognized. 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. For example:

- 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.
- Sectoral ‘value chain’ organizations share knowledge vertically (by product) rather than encouraging food systems approaches.

- Increasingly privatized agricultural R&D programmes remain focused on the handful of crop commodities for which there is a large enough market to secure significant returns.
- Educational silos remain in place, while emerging cross-disciplinary fields of knowledge (e.g. on agro-ecosystem resilience) are shut out or under-funded.

LOCK-IN 5: SHORT-TERM THINKING

Diversified agroecological systems offer major benefits for farmers and for society (see below). 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.
- Publicly-traded agribusiness firms are required to deliver rapid returns to shareholders.
- Retailers are bound by consumer expectations for year-round availability of a variety of foods at low prices.
- Farmers often face immediate economic pressures (e.g. to pay back investments in equipment, inputs etc.).

These conditions are not conducive to fundamental shifts in production requiring a transitional period in order to bear fruit. This helps to reinforce the status quo of industrial agriculture.

LOCK-IN 6: ‘FEED THE WORLD’ NARRATIVES

In light of persistent hunger and micronutrient deficiencies, there has been increasing recognition that food security is fundamentally a distributional question tied to poverty and access to food. Nonetheless, 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 deliver sufficient calories at the global level.

These narratives and approaches have been particularly prominent in the wake of the 2007-2008 food price spikes. Often the lens has been broadened to accommodate specific ecological or social concerns alongside food security imperatives, e.g. 'sustainable intensification', 'climate smart agriculture'.

However, all narratives based around 'feeding the world' predispose us to approach the question in terms of global production volumes of mainly energy-rich, nutrition-poor crop commodities. This means that industrial agriculture continues to be seen as the solution, while several key questions are side-lined:

- Problems of poverty and access
- Social equity and power relations
- Root causes of insufficient diets
- *Where* and by *whom* additional food must be produced
- How to improve multiple food systems outcomes simultaneously and durably

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 is emerging, particularly in recent long-duration studies, to 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, including:

- High total outputs
- High nutrient content of outputs
- Reduced health risks
- Resilience to shocks
- Provision of ecosystem services
- High resource efficiency
- Job creation

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.

The interests of powerful actors tend to converge around supporting industrial agriculture. Food systems in which uniform crop commodities can be produced and traded on a massive scale are in the economic interests of crop breeders, pesticide manufacturers, grain traders and supermarket retailers alike. Meanwhile, there is a mismatch between the huge potential of agroecology to improve food systems outcomes, and its much smaller potential to generate profit for agribusinesses.

The power accruing to dominant actors can be brought to bear in various ways in order to support the status quo of industrial agriculture:

- Framing the problems (e.g. the need to increase global food production) and providing the solutions (e.g. new ranges of input-responsive crop breeds).
- Lobbying policymakers to adopt favourable policies.
- Co-opting the alternatives within the mainstream or keeping them off the agenda altogether.

3. How can food systems outcomes be improved by diversified agroecological farming, and what can be done to support the transition?

THE PROMISE OF DIVERSIFIED AGROECOLOGICAL SYSTEMS

Industrial agriculture’s weaknesses are its core characteristics: the principles of specialization and uniformity around which it is organized, and the reliance on chemical inputs as a means of managing agro-ecosystems. For every increase in productivity achieved on this basis, there is a price to be paid sooner or later, in the shape of disease vulnerability, yield stagnation, environmental degradation or the ratcheting up of economic pressures on farmers.

If the vast and inter-connected challenges in food systems are to be met, efforts to improve specific aspects of industrial agriculture will not suffice.

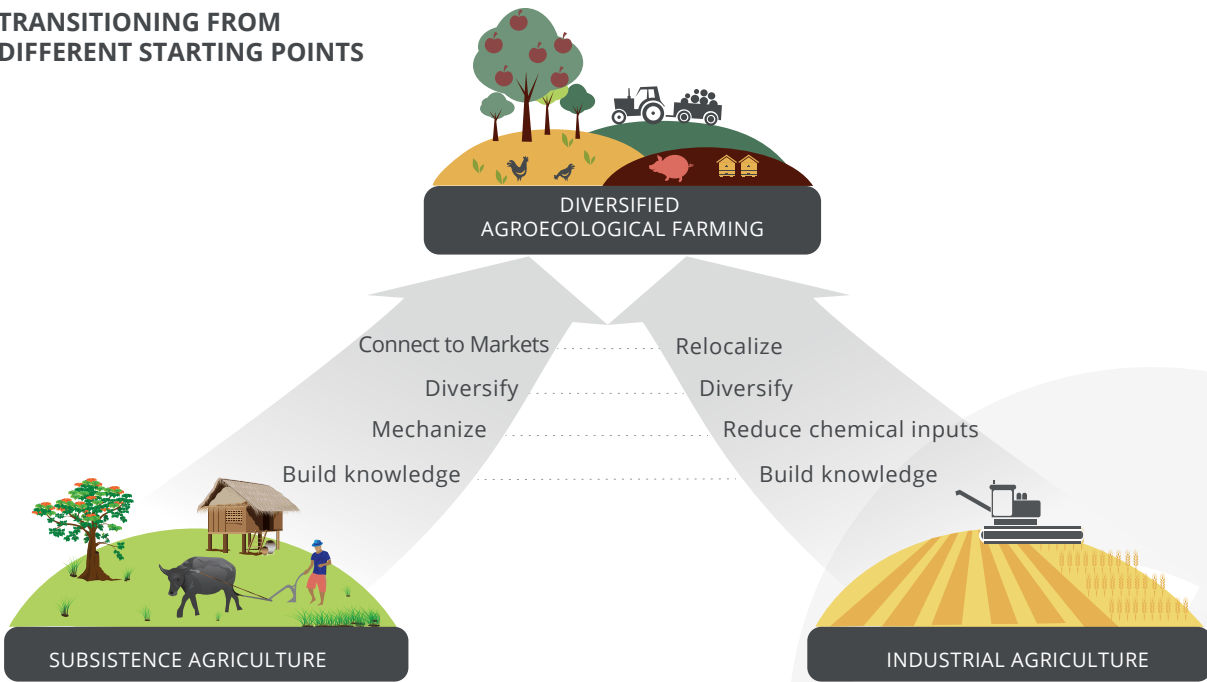
What is required is a transition to ‘diversified agroecological systems’, i.e. to diversify farms

and farming landscapes, replace chemical inputs, increase biodiversity and stimulate interactions between different species, as part of holistic strategies to build long-term fertility, healthy agro-ecosystems and secure livelihoods. This transition is viable and necessary whether the starting point is highly specialized industrial agriculture, or forms of subsistence farming in poor developing countries.

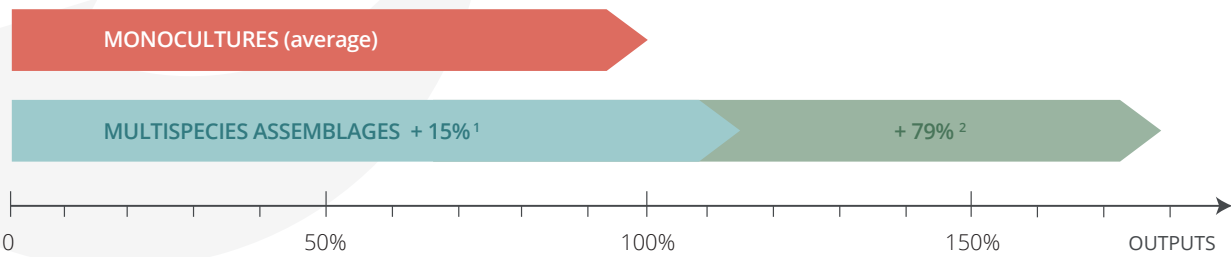
Less data is available on diversified agroecological systems than on industrial agriculture, which has become the dominant production model and development pathway around the world.

However, the potential of diversified agroecological systems to improve on the outcomes of industrial agriculture has been increasingly documented over recent years. In contrast to industrial agriculture, farming systems based

TRANSITIONING FROM DIFFERENT STARTING POINTS



THE PRODUCTIVITY OF DIVERSIFIED GRASSLAND SYSTEMS



around diversity have shown the ability to deliver mutually-reinforcing benefits, and to sustain them over time.

Evidence is particularly strong on the ability of diversified agroecological systems to deliver strong and stable outputs on the basis of building environmental resilience and highly-functioning agro-ecosystems, e.g. by boosting biodiversity and improving soil fertility and water retention. The capacity of diversified agroecological systems to sustain yields, limit losses and enable recovery in the face of environmental stresses and shocks has been documented in a variety of settings. In particular, diversified systems have shown the capacity to raise productivity in the places where additional food is desperately needed.

While few comprehensive yield comparisons between highly contrasting systems have been undertaken, intensive diversified systems (e.g. polycultures) have tended to compare favourably to monocultures in comparisons of total outputs. Meanwhile, recent data from long-duration studies has found positive yield and income effects in organic systems, which are often highly diversified.

2007 meta-study of organic yields relative to conventional:

- » -8% in developed countries
- » +80% in developing countries

There is also growing evidence of positive linkages between agricultural diversity and

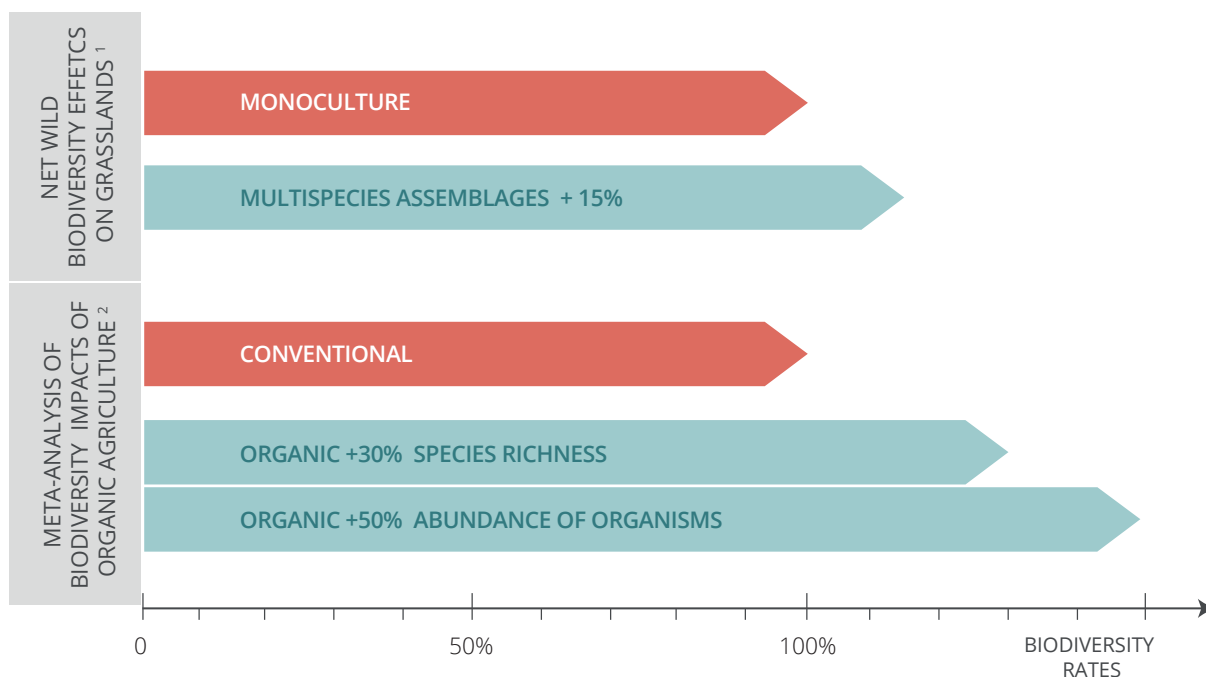
nutritional diversity at the household and local level, through the increased availability of nutrient-rich diverse foods throughout the year. Meanwhile, health-giving qualities have been identified in foods not treated with chemical pesticides; for example, concentration of antioxidants or omega-3 fatty acids have been found to be substantially higher in organic foods.

What this means for 'food security' is complex. Diversified systems produce diverse and changing outputs, making it more difficult to make meaningful projections in terms of net availability of specific crops. However, it should not be assumed that 'food security' would be jeopardized by a shift towards diversified agroecological systems. As described above, the tendency to frame food security in terms of 'feeding the world' (i.e. net volumes of commodities on global markets) does not reflect what really matters in terms of improving the lives of the food insecure.

Meanwhile, diversified agroecological systems hold huge potential to keep carbon in the ground. There is also growing evidence to show that agroecological farming not only has the capacity to improve land management, but to restore previously degraded land. As such, this type of farming takes agriculture from being one of the major contributors to climate change to being one of the key solutions.

Reintegrating agriculture with healthy ecosystems holds the key to a range of other positive outcomes.

FIGURE 10 - BOOSTING BIODIVERSITY IN ALTERNATIVE SYSTEMS



Because risk is a daily reality for many farmers around the world, crop and livestock diversification acts as a form of self-insurance; it allows income to be stabilized in the face of crop failure or loss of livestock, as well as reducing the risks that come with variable yields and seasonal shortages. Increased profitability has also been observed by virtue of reducing input costs, e.g. in organic systems.

40-year, 5-continent study of organic v conventional :

- » +22-35% profitability
- » +20-24% benefit/cost ratios

Agroecological systems also tend to be more labour-intensive, especially during their launch period, and spread labour more evenly throughout the year, allowing for full-time employment of farm labourers. Retaining traditions, traditional knowledge and the

capacity to adapt also appears to go hand in hand with diverse agroecological systems.

Industrial agriculture has occupied a privileged position for decades, and has failed to provide a recipe for sustainable food systems. More data and more experimentation is required, but there is enough evidence to suggest that a shift towards diversified agroecological systems can dramatically improve these outcomes and put food systems onto sustainable footing. While industrial systems often improve one outcome (e.g. productivity) at the expense of others (e.g. environmental degradation, nutrient availability), diversified agroecological systems are showing major potential to reconcile the various priorities. The evidence is particularly impressive given how little funding and support has been dedicated to the agroecological alternative to date.

HOW TO SHIFT THE CENTRE OF GRAVITY IN FOOD SYSTEMS

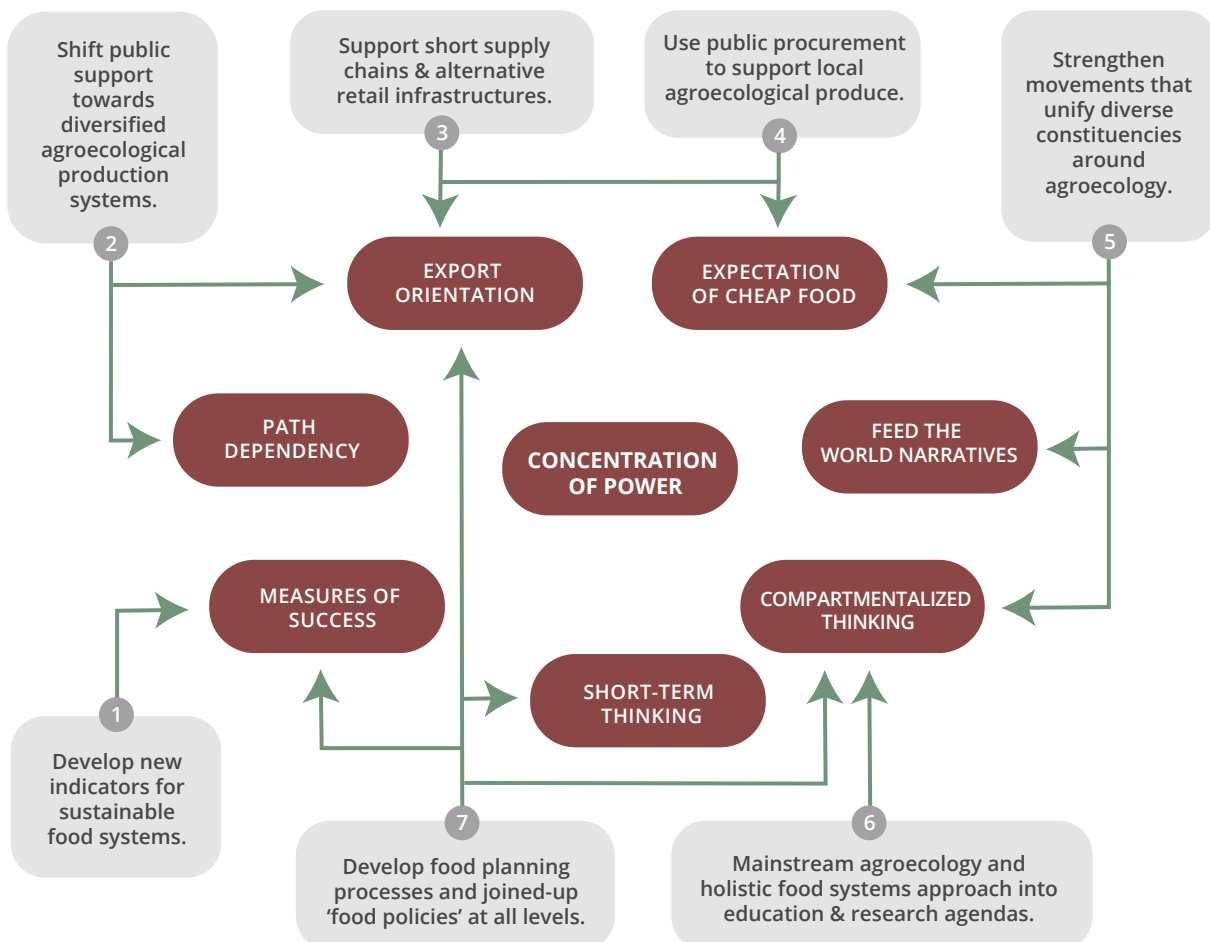
Encouragingly, alternatives are emerging through the cracks of industrial food systems. The status quo is being challenged on multiple fronts. Farmers are seeking to leave the industrial model behind by diversifying their outputs and activities, experimenting with natural pest management, and aiming for nutritious, high-quality production.

Efforts are emerging in parallel to forge new forms of cooperation bridging traditional divides, and to develop new market relationships bypassing conventional retail circuits.

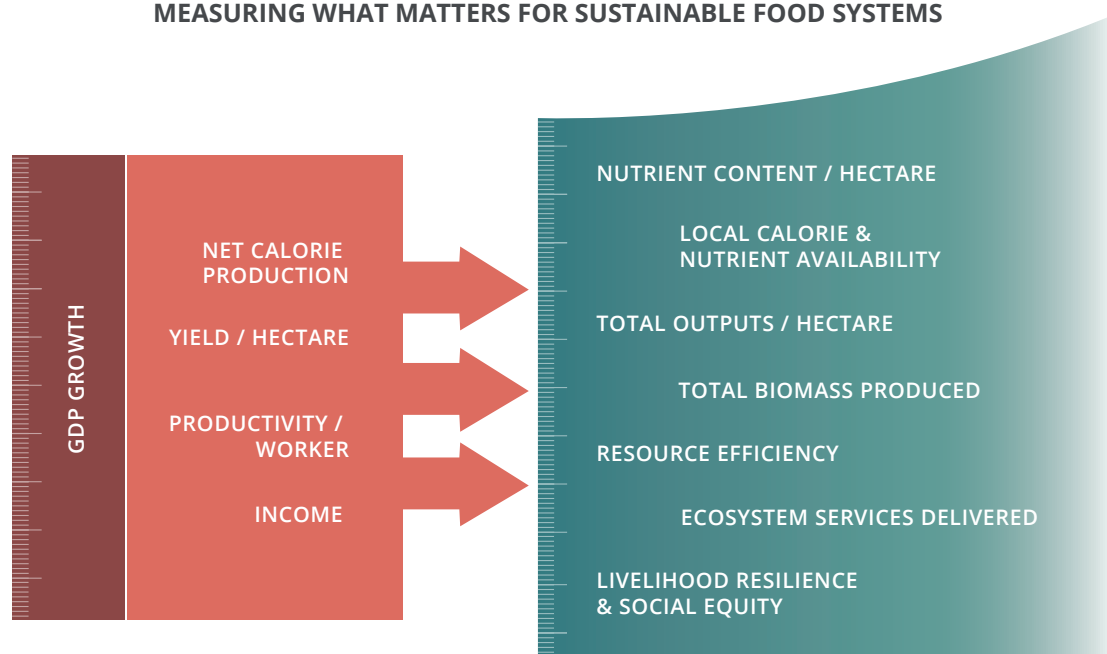
But these initiatives remain on the margins of food systems. The odds are still stacked against those seeking alternatives. Rather than encouraging farmers to go a step further, the current incentives in food systems keep farmers locked into the structures and logics of industrial agriculture.

What is required are 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.

TURNING LOCK-INS INTO ENTRY POINTS FOR CHANGE



MEASURING WHAT MATTERS FOR SUSTAINABLE FOOD SYSTEMS



Recommendation 1 Develop new indicators for sustainable food systems.

What is already happening:

In recent years there has been increased momentum for a shift towards integrated food systems research, focused on building resilience in food systems, agroecology and high-diversity farming systems. In parallel, there has been increasing interest in finding ways to capture the benefits of alternative systems and the costs of industrial agriculture.

What needs to change:

The benefits of diversified agroecological farming are still systematically undervalued by the criteria typically used to measure agricultural performance. It is therefore essential to adopt and systematically refer to 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.

What is already happening:

In some parts of the world, governments have started to provide support and incentives for moving away from industrial modes of agriculture. These measures range from baseline diversification requirements for receiving subsidies to approaches supporting a broader shift in practices.

What needs to change:

Governments must ultimately shift all public support away from industrial production systems, while rewarding the array of positive outcomes in diversified agroecological systems. In some contexts, access to land and productive resources may be more important than subsidies in determining which modes of agriculture are able to take hold, requiring steps to prioritize the needs of those willing and able to practice diversified agroecological farming over competing land uses such as large-scale monocultures.

Whatever the local context, governments must find measures that allow all 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 vicious cycles of industrial agriculture.

Recommendation 3 Support short supply chains & alternative retail infrastructures.

Recommendation 4 Use public procurement to support local agroecological produce.

What is already happening:

Concerns about nutrition, diets, sustainability and equity in food systems have been steadily rising, leading to growing demand for sustainably-sourced products, e.g. organic or FairTrade certified. In addition, grassroots initiatives have emerged aiming to reduce the distance between producers and consumers. For example, the provision of weekly fruit and vegetable boxes directly from farmers to consumers is on the rise in many countries in the global North (e.g. Consumer Supported Agriculture in the US, 'AMAPs' in France).

Governments have also shifted public sourcing policies in line with rising health and equity concerns. For example, in Brazil, the 2009 Law on School Feeding includes the procurement of diversified products from local family farms; Copenhagen has set incremental targets aiming for 90% organic procurement by 2016.

What needs to change:

Farmers need new markets if they are to take on the challenge of diversifying their production and shifting to agroecological practices. There is a long way to go before consumer pressure translates into something more than market niches, becoming a genuine counterweight

to export-oriented, mass retail-driven supply chains and the cheap food they transmit to consumers. 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.

Meanwhile, 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.

What is already happening:

Many of the most promising developments in food systems are grassroots initiatives that reach across divides and create new constituencies of pooled interest. Likewise, some of the most promising opportunities for spreading agroecological knowledge come in the form of intensive collaboration between farmers and researchers.

What needs to change:

There is scope to further unify these voices and to operationalize their demands. Together, these shared messages can powerfully counter the 'feed the world' narratives which currently hold sway. Governments can support the creation of these unified constituencies, e.g. by strengthening farmers' groups, community-based organizations and social movements which encourage the spread of agroecological practices and advocate for sustainable food systems, and by ensuring 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.

What is already happening:

Some educational structures and programmes are now evolving towards systems analysis and higher-order thinking; several universities have recently opened Food System Centres or Units that tend to break down the traditional silo structures. Collaborative research programmes are also forming around agroecology and high-diversity farming systems. Meanwhile, there has also been a recent spread of agroecological research through participatory, practical applications, e.g. through peasant innovation systems and demonstration farms. Attitudes towards knowledge are also starting to shift in the intergovernmental sphere: in 2014, FAO directly addressed agroecology for the first time at the International Symposium on Agroecology for Food Security and Nutrition.

What needs to change:

A broader transition is unlikely to occur insofar as the structures for developing and delivering knowledge to farmers remain aligned with industrial systems. Public research agendas must be redefined around different priorities, and be shaped by and designed to serve a wider range of actors. Reinvestment is urgently required, but must be redirected towards equipping farmers to shift their production, rather than further relying on industrial solutions. In particular, the mission of university research should be redefined around the delivery of public goods. The FAO and other international agencies should progressively 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 re-focused around diversified agroecological systems and farmer participatory research.

Recommendation 7

Develop food planning processes and 'joined-up food policies' at multiple levels.

What is already happening:

Increasingly, efforts to integrate the policy processes affecting food systems are bridging the divides between key actors (scientists, policy-makers, civil society) and constituencies (health, environment, development etc.). In some cases, this has taken the shape of 'food policy councils' at the city/municipal level. At the national level, e.g. in Brazil and Thailand, new bodies have been created to oversee joined-up strategies for food security. There are also increasing initiatives for managing and improving the outcomes of food systems at the landscape or territorial level, e.g. focused on 'city-region food systems'.

What needs to change:

None of the changes envisaged above will move far or fast enough while policy processes are constrained by compartmentalized approaches and short-term thinking. It is therefore crucial to build on the promising examples of joined-up policymaking for food systems. Long-term, cross-party, inter-ministerial planning around food systems – reaching across political boundaries and transcending electoral cycles – should therefore be supported. Building on landscape management and territorial planning initiatives, these policies and processes must be organized at the various levels where food systems can be meaningfully planned, and where food security can be meaningfully targeted and understood in terms other than 'feeding the world'. Crucially, these forms of food systems planning must be based on broad participation, bringing together the various constituencies and groups with a stake in food systems reform. At the global level, the Committee on World Food Security (CFS), as the foremost inclusive, intergovernmental policy space on these issues, should advocate for coherent food policies and contribute to strengthening diversified agroecological food systems.

Report by the International Panel of Experts on
Sustainable Food Systems (IPES-Food)

Full Report:

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

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Lead coordinating author: Emile A. Frison

Editorial lead: Nick Jacobs

Citation: IPES-Food. 2016. From uniformity to diversity:
a paradigm shift from industrial agriculture to diversified agroecological
systems. International Panel of Experts on Sustainable Food systems.

www.ipes-food.org

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