

# Feeding the growing global population while investing in the health of the planet

Lessons from the HLPE report  
Agroecological and other innovative approaches  
Annual Biocontrol Industry Meeting - ABIM

Patrick Caron  
HLPE/CFS Chairperson (2015-2019)

# Take-away messages

- ✓ Agroecological approaches: not the promotion of ancestral agriculture
- ✓ Making polysemy a richness
- ✓ Enough evidence to invest more in agroecological approaches
- ✓ Many gaps ... more research
- ✓ New role of science and scientists

2009: UN Committee on world Food Security (CFS) reform:  
2 key elements

**CFS IS INCLUSIVE  
AND EVIDENCE-BASED**

HLPE (High Level Panel of Experts)

- created 2010
- contributes to these 2 elements

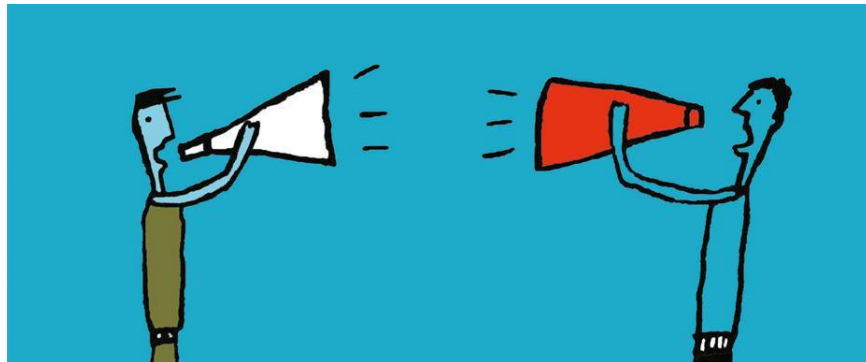


## The HLPE reports :

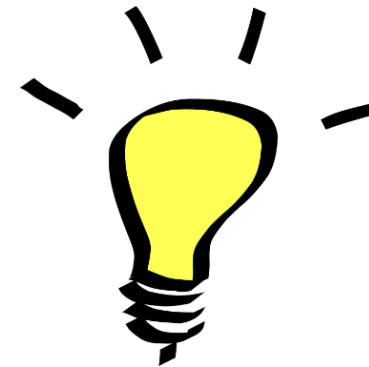
*“One of the key roles of the reports is to help members and participants in CFS to understand why they disagree”*

MS Swaminathan, 1<sup>st</sup> HLPE Chair

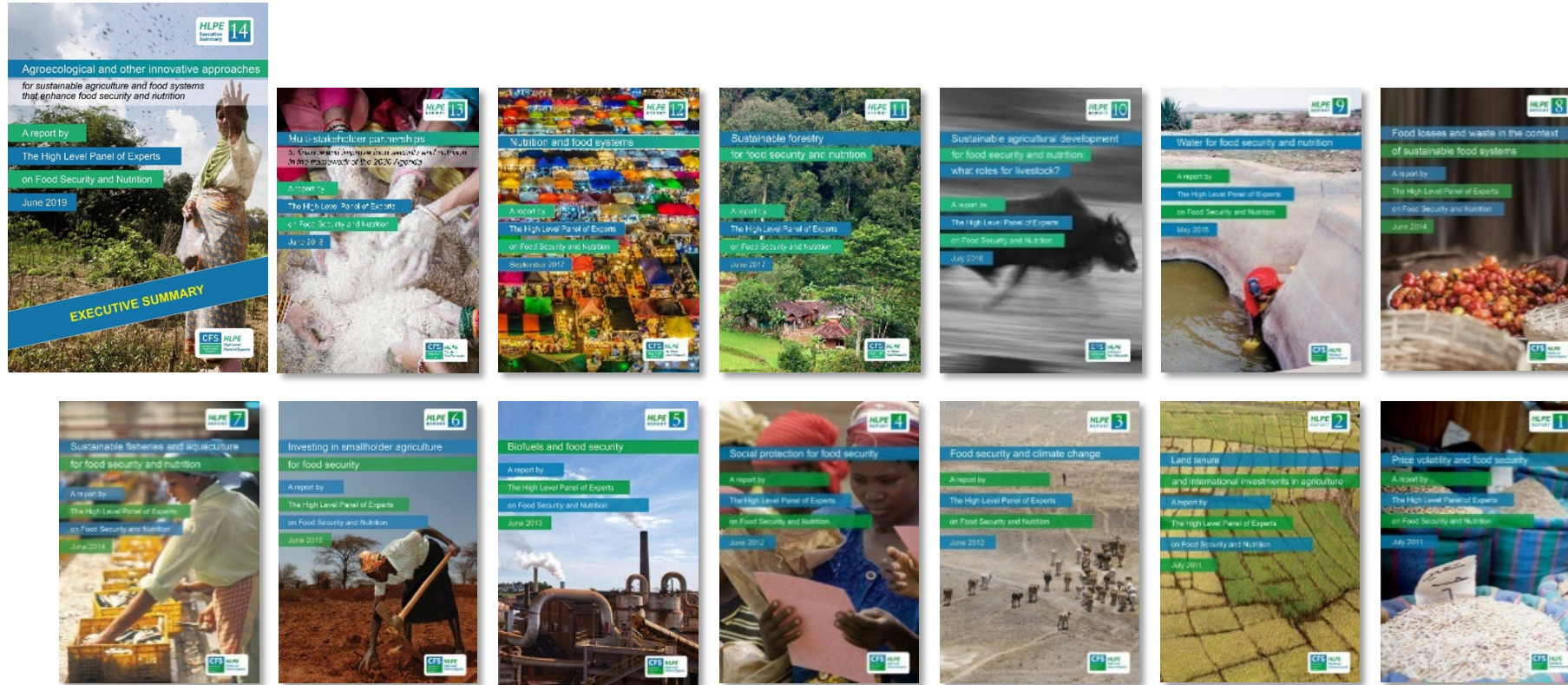
*And how acknowledging and moving beyond such disagreement help designing future actions*



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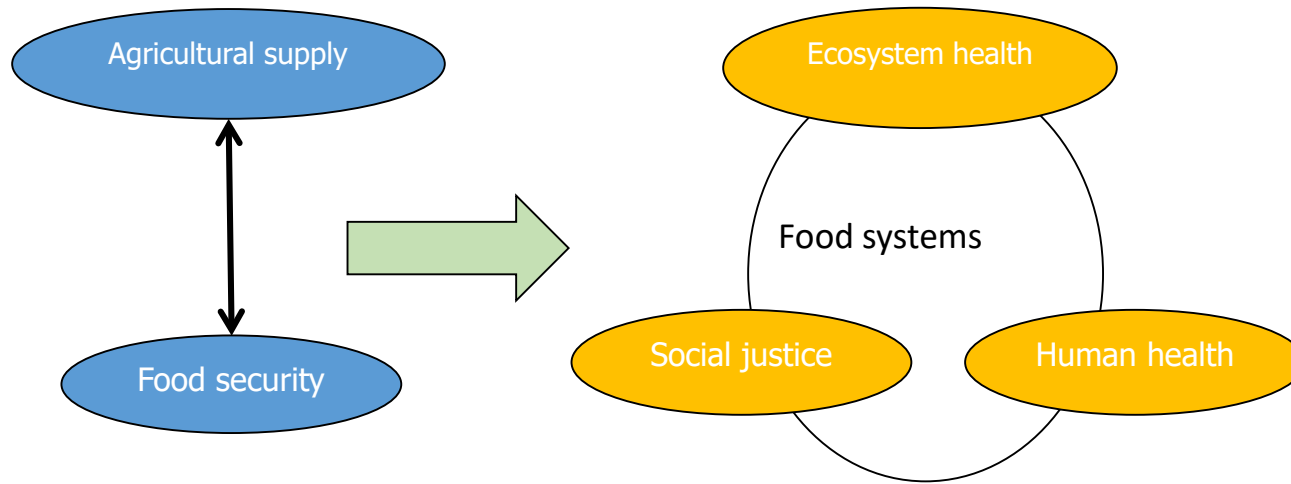


# HLPE published reports... agroecology



**A inclusive,  
rigorous,  
collective  
process**

For more information and to download the reports:  
[www.fao.org/cfs/cfs-hlpe](http://www.fao.org/cfs/cfs-hlpe)



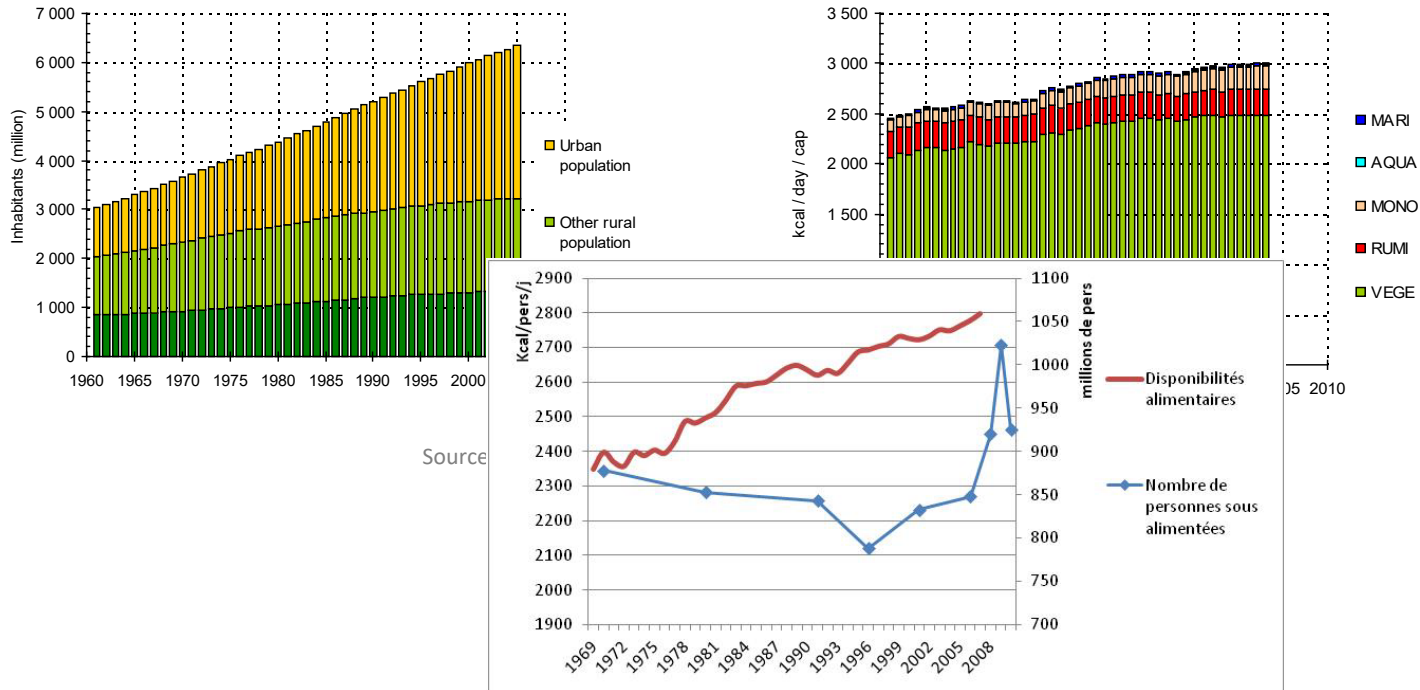
# Producing more at the global level?

## Lack of consensus and diversity of contexts

Population



Kcal available / person / day



Source: data FAO-STAT



Environment, climate,  
social justice, obesity,  
...

**Better balance food  
security / environment**

# Critical & Emerging Issues for Food Security and Nutrition (HLPE 2017)

- Anticipating the inter-connected future of urbanization and rural transformation
- Conflicts, migrations and FSN
- Inequalities, vulnerability, marginalized groups and FSN (reviewing C&EI in 2014)
- Impacts of trade on FSN
  
- Agroecology for FSN in a context of uncertainty and change
  
- Agrobiodiversity, genetic resources and modern breeding for FSN
- Food safety and emerging diseases
- From technology promises towards knowledge for FSN
- Strengthening governance of food systems for an improved FSN



© HLPE, 2017



# Critical & Emerging Issues for Food Security and Nutrition (HLPE 2017)

## Agroecology

Gaining **traction**

International FAO symposium in Rome in 2014

Regional FAO meetings in 2015

HLPE livestock report 2016

**Principles well established, but how to put them into practice** on a larger scale raises many **questions**

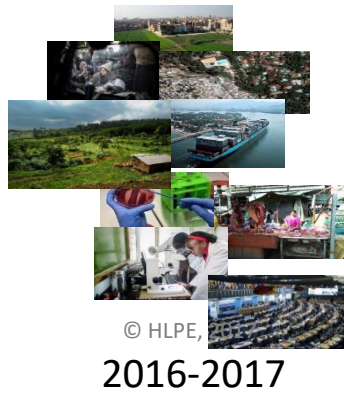
- ... improve resource efficiency, strengthen resilience, secure social equity/responsibility? **Controversies and uncertainties?**
- ... markets and **regulations** to support agroecological farming...? ... trade rules, intellectual property rights,... food and safety regulations?
- integrate different **knowledge** systems ... to tailor ... innovations?

Agroecology for FSN in a context of uncertainty and change



# Not an easy report!

« Agroecological approaches and other innovations for sustainable agriculture and food systems that enhance food security and nutrition »



Request  
CFS 44  
October 2017

2 open consultations  
(310 contributions)

Public event  
(Bern, 2018)

Peer review



Approval Report  
Plenary CFS 46  
October 2019

On-going policy  
convergence process

Negotiation  
request CFS  
(March-July 2017)

Call for Project  
Team (early 2018)  
255 applications



Launch Report  
July 2019



# A collective process



Project Team

Wide range of origins, disciplines, views

# Agroecology: no single definition

(HLPE, 2019, adapted from Wezel, 2017)



## Dynamic concept

- **Science:** transdisciplinary
- **Set of practices:** harness ecological processes in and between agricultural production (nature based solutions)
- **Social movements:** assert collective rights for smallholder farmers

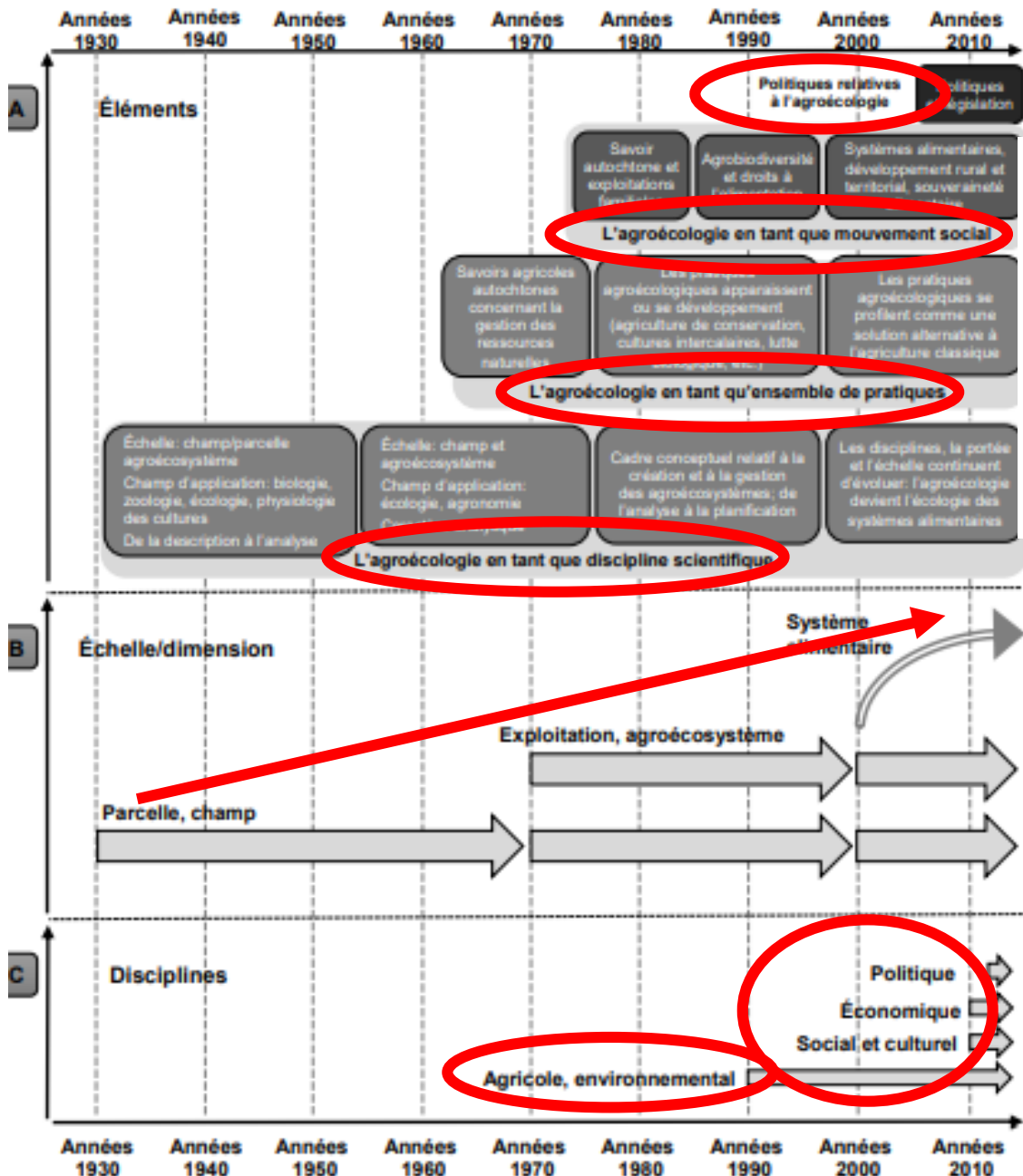


@ Locatelli, Cirad



@ Dugué, Cirad

Figure 2 Évolution historique de l'agroécologie



No single definition – tensions

Definition of agroecological approaches – 13 principles

HLPE, 2019

**Definition 2** Agroecological approach to sustainable food systems for food security and nutrition

Agroecological approaches favour the use of natural processes, limit the use of purchased inputs, promote closed cycles with minimal negative externalities and stress the importance of local knowledge and participatory processes that develop knowledge and practice through experience, as well as more conventional scientific methods, and address social inequalities. Agroecological approaches recognize that agrifood systems are coupled social-ecological systems from food production to consumption and involve science, practice and a social movement, as well as their holistic integration, to address FSN.

Based on Definition of Sustainable agricultural development SAD (2016 HLPE report on livestock)

Improving resource efficiency

Securing social equity/responsibility

SAD

Strengthening resilience

# Transformational

**Level 5** Build a new global food system based on participation, localness, fairness and justice

**Level 4** Reconnect consumers and producers through the development of alternative food networks

**Level 3** Redesign agroecosystems

**Level 2** Substitute conventional inputs and practices with agroecological alternatives

**Level 1** Increase efficiency of input use and reduce use of costly, scarce or environmentally damaging inputs

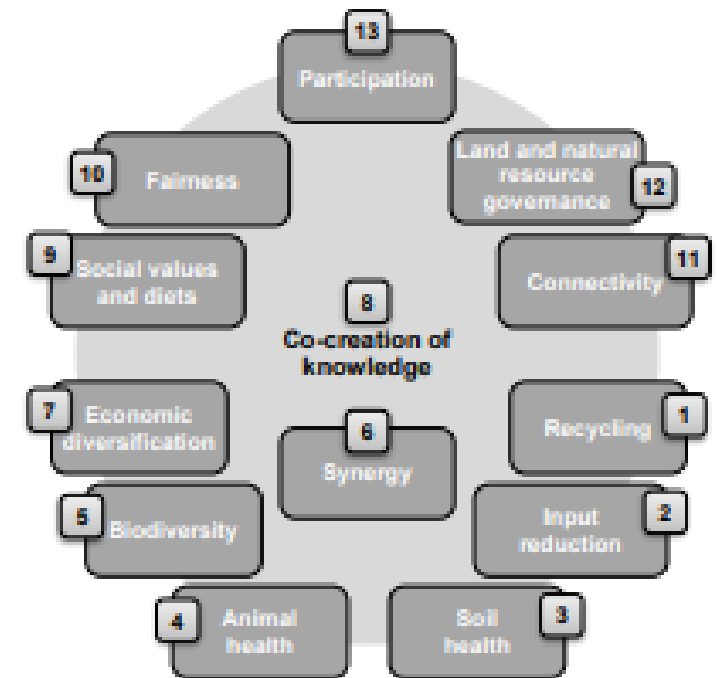
# Incremental

# Food system

# Agroecosystem



(HLPE, 2019 adapted from Gliessman, 2007)



# Comparison of different innovative approaches

Table 4 Comparison of different innovative approaches towards SFSs for FSN

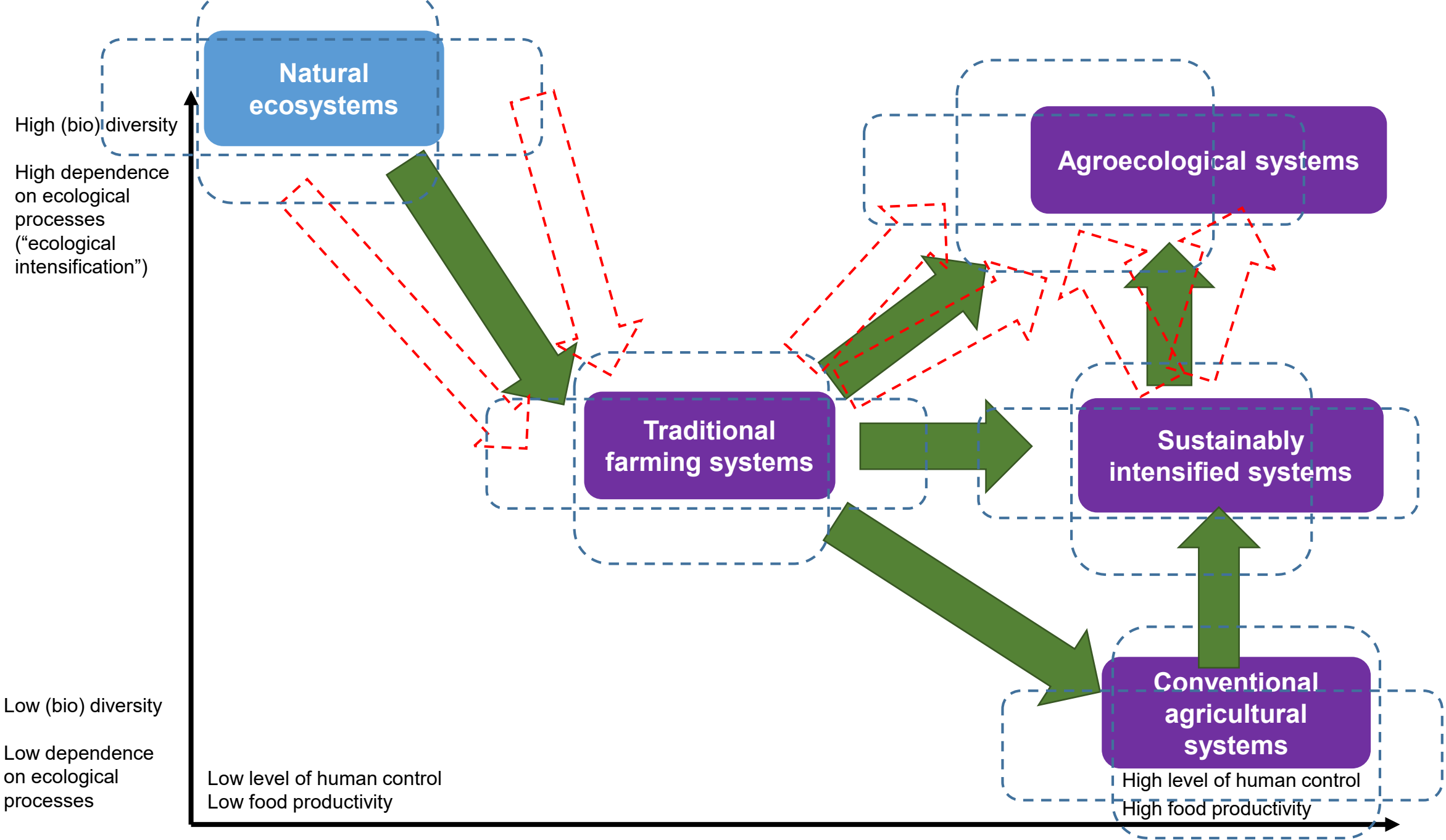
Characteristic	Agroecological and related approaches					Sustainable Intensification and related approaches			
	Agroecology	Organic Agriculture	Agroforestry	Permaculture	Food sovereignty	Sustainable intensification	Climate smart agriculture	Nutrition sensitive agriculture	Sustainable food value chains
<b>Resource efficiency</b>									
Regenerative production, recycling and efficiency								No evidence	No evidence
Biodiversity, synergy and integration									
<b>Resilience</b>									
Economic diversification versus specialisation									
Climate adaptation and mitigation									
<b>Social equity/responsibility</b>									
Knowledge generation and technology transfer									
Human and social values: Equity									
Human and social values: Labour versus capital intensification									
Connectivity (value chains/circular economies) versus globalization									
Governance: rights, democratization and participation									

**Agroecological approaches:**  
input reduction, diversification, ecological processes and/or addressing power asymmetries

**Sustainable intensification approaches:**  
increasing production per unit of land and addressing environmental concerns

Approaches overlap, convergence and divergence

**Many transition pathways: from different starting points, in different contexts, at different paces**



Source: Adapted from Etienne Hainzelin and Michel Griffon 2013



**Box 9 Participatory agroecology research to address food security and nutrition in Malawi**

Using participatory education and agroecology in Malawi, thousands of rural families have seen dramatic improvements in maternal and child nutrition, food security, crop diversity, land management practices and gender equality. Central to the success of this long-term programme has been iterative, participatory, transdisciplinary research methods that used multiple measures to assess and improve farming and social change with participating farmers (Bezner Kerr and Chinwa, 2004; Nyantakyi-Frimpong et al., 2017). Agroecology education was integrated with nutrition and social equity issues through interactive, dialogue-based methods, such as recipe days, discussion groups and theatre (Satzinger et al., 2009; Bezner Kerr et al., 2016a; Bezner Kerr et al., 2018a). Peer-driven farmer-led methods mobilized communities to test and use agroecological practices such as legume intercropping, compost, agroforestry and crop diversification (Bezner Kerr et al., 2007; Bezner Kerr et al., 2015b; Owuputi et al., 2018). When farmers used more agroecological practices, such as the incorporation of nutrient-rich legumes into maize-based cropping systems, yields stabilized, fertilizer costs fell and soil cover increased (Snapp et al., 2010; Kangmenang et al., 2017; Owuputi et al., 2018). Households using agroecological practices who participated in community education programmes had significant improvements in child growth, food security, maternal dietary diversity and self-reported health (Bezner Kerr et al., 2010; Nyantakyi-Frimpong et al., 2016a; Owuputi et al., 2018). There was also evidence of improved gender and other forms of social equity in communities for households with HIV-positive family members (Bezner Kerr et al., 2016b, 2019; Nyantakyi-Frimpong et al., 2016b). In households where spouses began discussing farming practices with each other, there were higher levels of food security and dietary diversity. Farmers began to take more pride in their own experimentation, traditional knowledge and ability to mentor others (Bezner Kerr et al., 2018b). Some communities organized the sharecrops.



**Participatory plant breeding of sorghum in Burkina Faso**  
Participatory plant breeding (PPB) actively involves producers at all stages of varietal development. In Faso, sorghum and pearl millet are the main staple foods in terms of area, covering more than 70% of the country. Yields of sorghum remain relatively low for smallholder farmers, at approximately 1.5 t/ha.



Key findings from the study include: 1. Increased crop diversity and yield stability. 2. Improved soil health and reduced fertilizer costs. 3. Enhanced food security and dietary diversity. 4. Strengthened community resilience and social equity. 5. Improved gender relations and women's empowerment. 6. Increased pride in local experimentation and knowledge. 7. Development of mentorship networks within communities.

**Box 7 Rede Ecolida in Southern Brazil**

The Rede Ecolida or 'Ecolife Network' is a decentralized system of cooperatives, farmer groups and non-profit organizations that practise agroecology in 150 municipalities in three southern Brazilian states. The network developed in the 1970s as part of broader social movements mobilizing around issues of environmental damage from agriculture, of high social inequalities and uneven land distribution.

Today it currently comprises 29 farmers' organizations, 2 700 farming households, 10 cooperatives, 25 associations, 180 farmers' markets and 30 agrifood private companies. Beyond profit, this network promotes a solidarity economy between producers and consumers in local markets (including door-to-door sales, community canteens, farmers' markets and restaurants). It uses participatory certification to ensure that farming practices are rooted in agroecology and strengthen the relationships/trust between producers and consumers.



**Box 10 Territorial approach to sustainable food systems: La Vallée de la Drôme (France)**

In southeast France, the territory called Vallée de la Drôme-Diois, with around 54 000 inhabitants in 2006 (INSEE, 2011), comprises diverse agroecosystems including livestock rearing in mountainous areas, wine, cereal, fruit and lavender production on hillsides, and cereals, poultry, walnut and fruit production in lower valley regions. Organic agriculture, using farmer-to-farmer knowledge sharing, combined with cooperatives and organic supply chains, has emerged as a significant source of livelihoods, with 40 percent of organic farmers in the Valley (compared to only 8 percent country-wide).

The Biovallée project aims to make the Drôme Valley and its adjacent area an ecological leader through a multi-pronged approach aiming at: (i) reducing energy consumption by 20 percent in 2025 and by 50 percent in 2040 and producing local renewable energy to cover 25 percent of local needs in 2025 and 100 percent in 2040; (ii) converting half of the farmers and of the area to organic agriculture by 2020; (iii) protecting rural land from urbanization; (iv) offering 80 percent of organic or local products in collective/institutional catering by 2025; (v) reducing by half the waste routed to treatment centres by 2025; (vi) creating 2 500 new jobs on the territory in sustainable sectors by 2025; (vii) investing in research, education and capacity building on sustainable development to create employment.

As part of this initiative, a social innovation in supply chain infrastructures and intersectoral collaboration was developed. A Committee for the Agricultural Development of the Diois provided a platform for organic agriculture experimentation, market, technical advice and training. A large-scale food hub and vegetable-processing factory was built, which facilitated the public procurement of organic foods, and their distribution in school canteens and day-care centres. A social enterprise, La Carline, governed by producers, consumers and employees, connected local consumers to organic producers, and grew from 30 to 800 families, with an annual turnover of EUR 1.2 million in 2014. There were independent organic input providers, cooperatives, trade unions and municipal councils that had already developed networks before the Biovallée project.



facilitated by newly formed agricultural collectives (CETAs), as well as by the presence of administrative council leaders. Organic agriculture from a small fringe niche to a rural model and inspiring farmers to adopt adapted organic extension services and advisory advisers in France. Several initiatives have now been established in the Drôme Valley. Productivity increased as they became a source of high-quality, ecological production and innovation with the agroecology project for France. The project has also led to the development of a local food system, with a focus on organic and local products. This has resulted in increased resilience and sustainability of the region's food systems.

# Enough evidences and experiences to act

**Box 8 Zero Budget Natural Farming – Scaling-up agroecology in India**

Zero Budget Natural Farming (ZBNF) is both a set of farming methods and a grassroots peasant movement in India born in Karnataka. It is estimated that ZBNF methods are used by 100 000 farming families in Karnataka, and by millions of families at the national level. In 2015 the Government of Karnataka set its objective to reach 500 000 farmers with ZBNF by 2020.

ZBNF is not relying on credit, and not buying inputs, promises to put an end to the debt cycle of farmers and reduce production costs. 'Natural Farming' means farming with nature and not using pesticides and equipment (mechanization and irrigation), which have been linked to the deaths of a quarter of a million farmers who have committed suicide in India in the last decade. ZBNF methods include: mulching, intercropping, controlled use of local earthworm species and fermented microbial culture; combined use of local cow urine, dung, and soil.

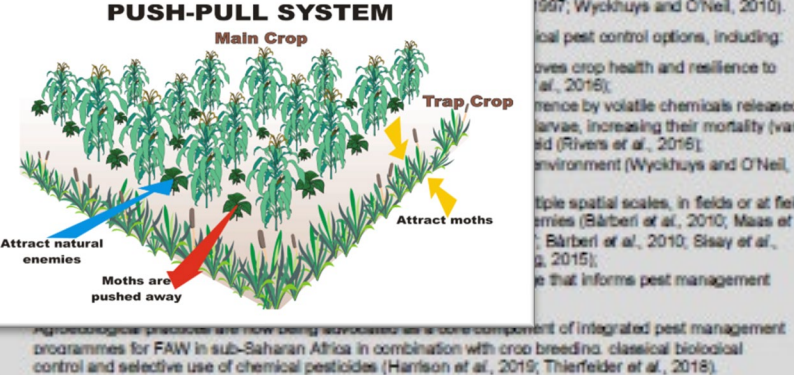
ZBNF is implemented mainly through volunteers, members of farmer organizations and NGOs. It is supported by the founder of the movement, Subhash Palekar, an agricultural activist who has published numerous publications on ZBNF methods. At the state level, intensive five-day training camps are organized for volunteers and allied organizations. A survey of 97 ZBNF farmers reported improved yields, seed diversity, product quality, household food autonomy, income and reduced farm expenses and credit needs. Critics were critical for the successful implementation of ZBNF in India. However, a highly charismatic teacher, Subhash Palekar has played a key role in scaling up ZBNF methods through books, training courses and other public activities.

- Horizontal pedagogical practices. While Palekar teaches in a more vertical manner, most of the teaching is done through farmer-to-farmer exchanges and mentoring.
- Supportive public policy. Training is provided at the state level in several Indian states.
- Local and favourable markets. At least eight shops exclusively retail ZBNF products in cities such as Bangalore and Mysore, but marketing remains a challenge.
- Strong social organization. States organize training camps and informal networks support training and ongoing support for ZBNF with links to allied organizations.
- Efficient farming practices. Farmers report improved yields, food quality and income, and reduced farm expenses and credit.
- Cultural relevance. ZBNF methods address the credit and debt concerns of farmers in socially and culturally adapted ways.

Sources: Khadse et al. (2018); Kumar (2018); La Via Campesina (Undated)

**Box 6 Agroecological practices to control fall armyworm in Africa**

Fall armyworm (FAW), a voracious agricultural pest native to North and South America, was first detected on the African continent in 2016 (Goergen et al., 2016). Since then it has spread across sub-Saharan Africa affecting thousands of hectares of cropland, causing up to USD13 billion per annum in crop losses (Abrahams et al., 2017) and threatening the livelihoods of millions of farmers. In their haste to respond to FAW, governments have sometimes relied heavily on agrochemicals that, beyond the short-term pest control, have led to undermine biological pest control (Rivers et al., 2016; Wyckhuys and O'Neil, 2010). Alternative pest control options, including agroecological practices, are being explored as a core component of integrated pest management programmes for FAW in sub-Saharan Africa in combination with crop breeding, classical biological control and selective use of chemical pesticides (Harrison et al., 2019; Thierfelder et al., 2018).



**Box 8 Traditional rice-fish-duck system in Hani terraces, China**

The rice-fish-duck system is an important traditional agroecosystem in Yunnan Province, Southwest China. Integration of crops and animals and circularity of this system. Fish and ducks eat weeds and pests and loosen the soil to improve the environment for rice, while rice provides food, shade and shelter for fish and ducks.

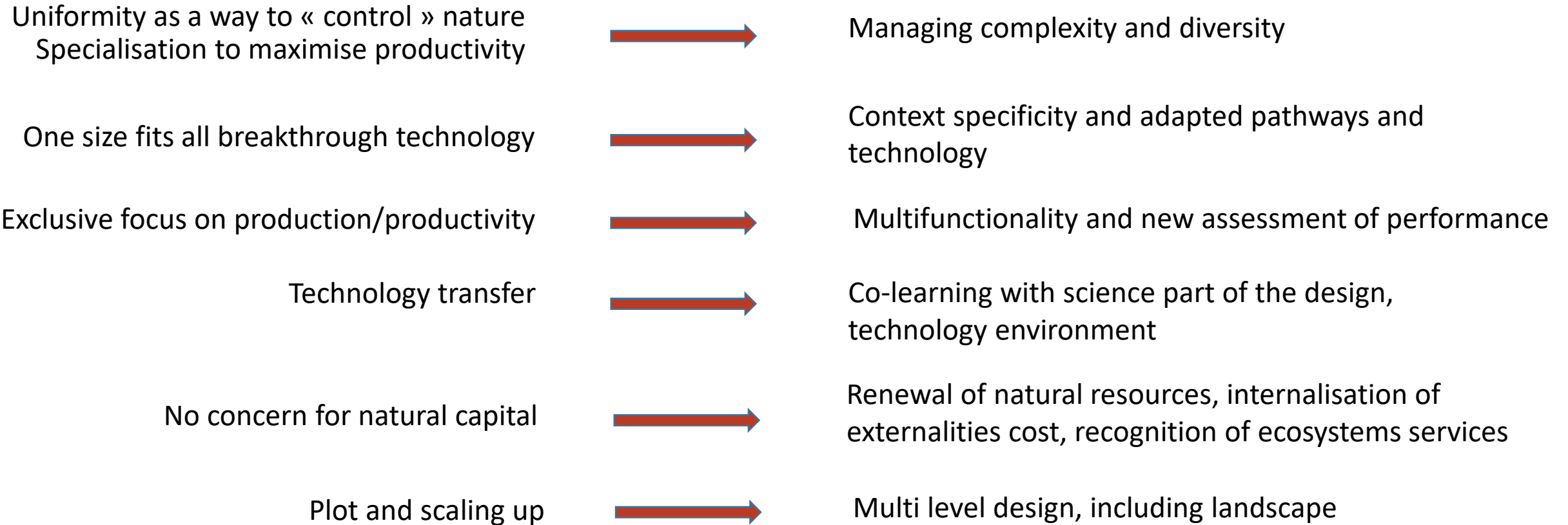


Pesticides are not used in this system. Therefore, the system is more resilient to pests and diseases. An improved system has been developed to popularize paddles for winter duck and fish farming. This is an important traditional agriculture. There is a need to protect and promote this system.



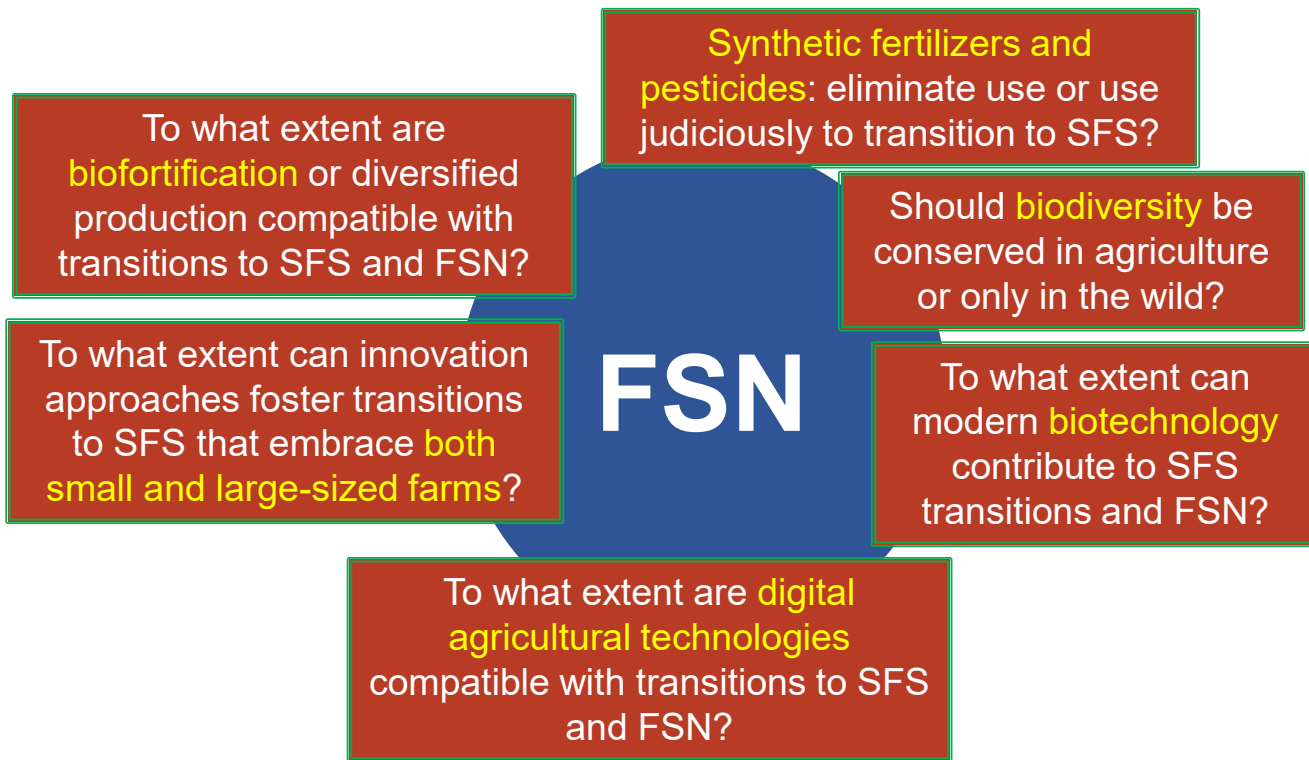
The system has been recognized as a World Cultural Heritage site. It is a model of sustainable agriculture and food security. The system has been studied and documented by researchers and practitioners. It is a valuable resource for agroecology and sustainable development.

# Towards agroecological approaches



# What was learnt from analyzing diverging perspectives

- Perspectives diverge more around **how** technology is accessed, **used and controlled** rather than the fundamental nature of technologies themselves
- **Moralization** of food increases motivation of policy makers to act but difficult to move beyond competing convictions (& obstacles - HLPE 2017 - : asymmetries, conflict of interest, difficulty to implement the right to food)
- **Understanding the basis and nature of controversies** helps us to **get beyond the divisions**



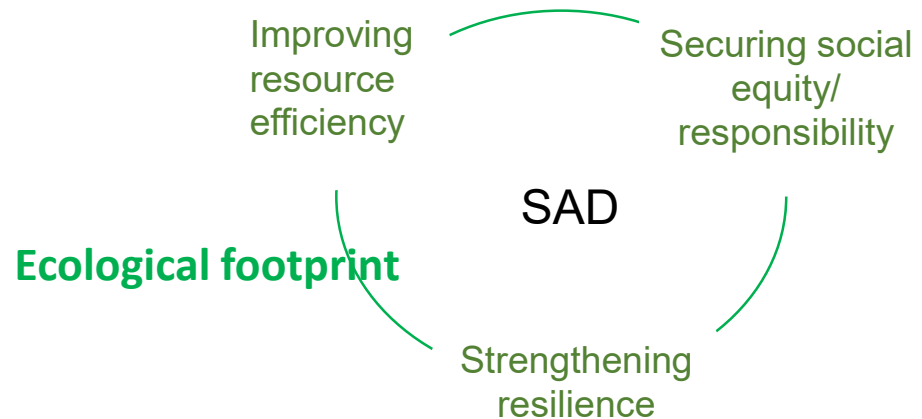
# General conceptual and political recommendations

## 1. “Agency” as a fifth pillar of FSN

To cover institution-based opportunity that people have to influence how food is produced, processed, transported and sold

## 2. A fourth operational principle of sustainable agricultural development: “ecological footprint”

To address the degradative or regenerative nature of production processes



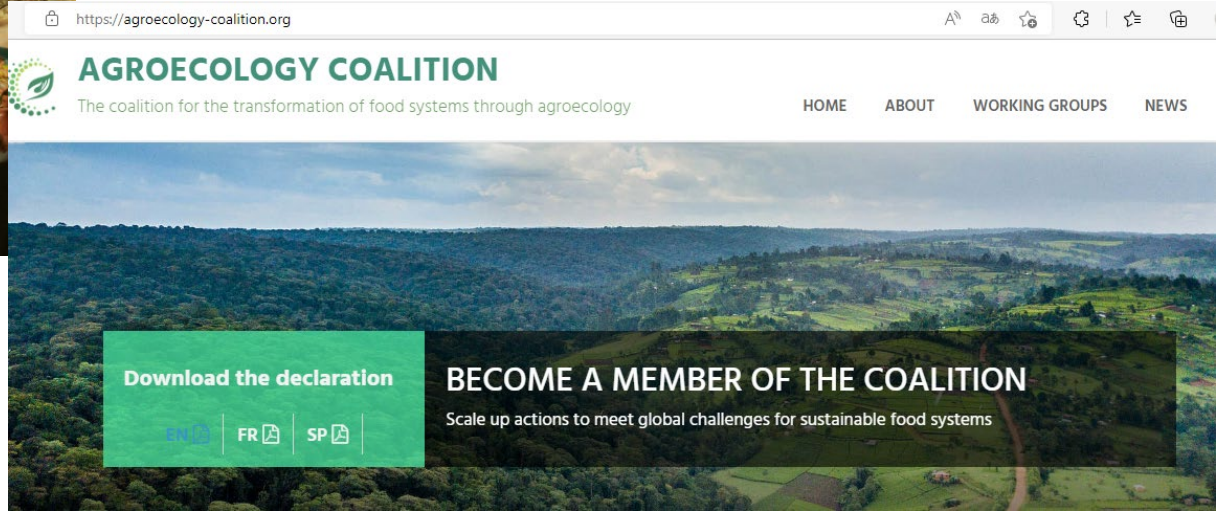
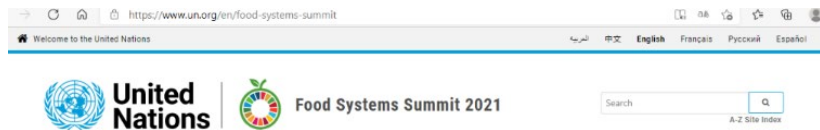
# Key actions to foster transitions

- 1. Acknowledge diversity of food systems** and their **specificity and context** across scales when developing transition pathways
- 2. Broaden performance metrics** for food systems
- 3. Encourage integration of transdisciplinary science and indigenous knowledge** to support local innovation

# Five “formal” areas of recommendations

1. **PROMOTE AGROECOLOGICAL AND OTHER INNOVATIVE APPROACHES IN AN INTEGRATED WAY TO FOSTER TRANSFORMATION OF FOOD SYSTEMS**
2. **SUPPORT TRANSITIONS TO DIVERSIFIED AND RESILIENT FOOD SYSTEMS**
3. **STRENGTHEN SUPPORT FOR RESEARCH AND RECONFIGURE KNOWLEDGE GENERATION AND SHARING TO FOSTER CO-LEARNING**
4. **STRENGTHEN AGENCY AND STAKEHOLDER ENGAGEMENT, EMPOWER VULNERABLE AND MARGINALIZED GROUPS AND ADDRESS POWER INEQUALITIES IN FOOD SYSTEMS**
5. **ESTABLISH AND USE COMPREHENSIVE PERFORMANCE MEASUREMENT AND MONITORING FRAMEWORKS FOR FOOD SYSTEMS**





# Back to take-away messages

- ❑ Agroecology:
  - not the promotion of ancestral agriculture,
  - but rather science, technology, knowledge and innovation intensive
  
- ❑ Making polysemy a richness: if principles made explicit, not fuzzy nor loose
  
- ❑ Enough scientific evidence to invest more in agroecological approaches
  
- ❑ Remaining gaps that do not prevent action and justify more research
  
- ❑ Diversity of visions / values / interests / objectives... diversity of approaches