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METROPOLI AGRICOLE

The contribution of agroecology to sustainable food systems in metropolitan areas

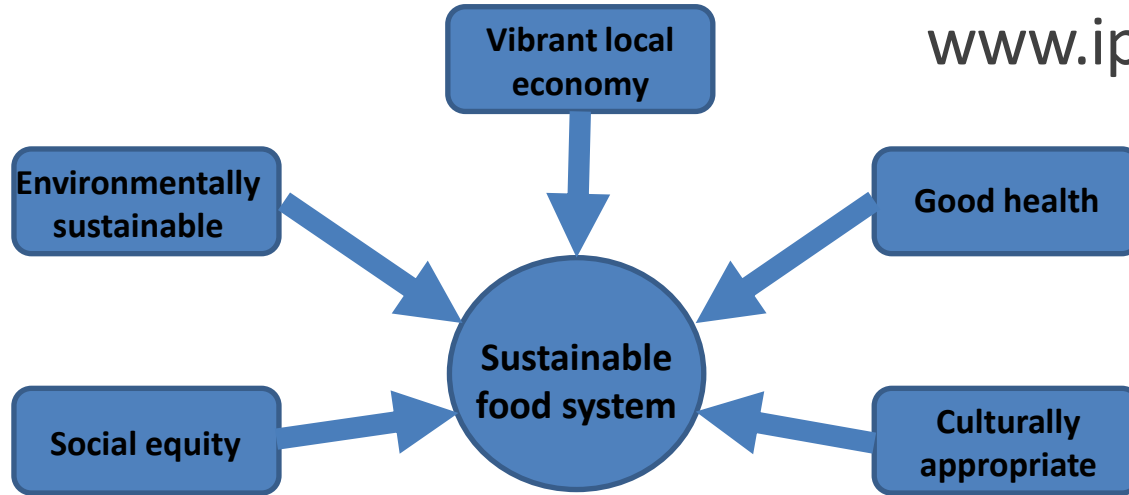
Urban & peri-urban farming as pathways to agricultural transformations

Molly Anderson

Middlebury College (USA) & IPES-Food

Sustainable food systems

www.ipes-food.org



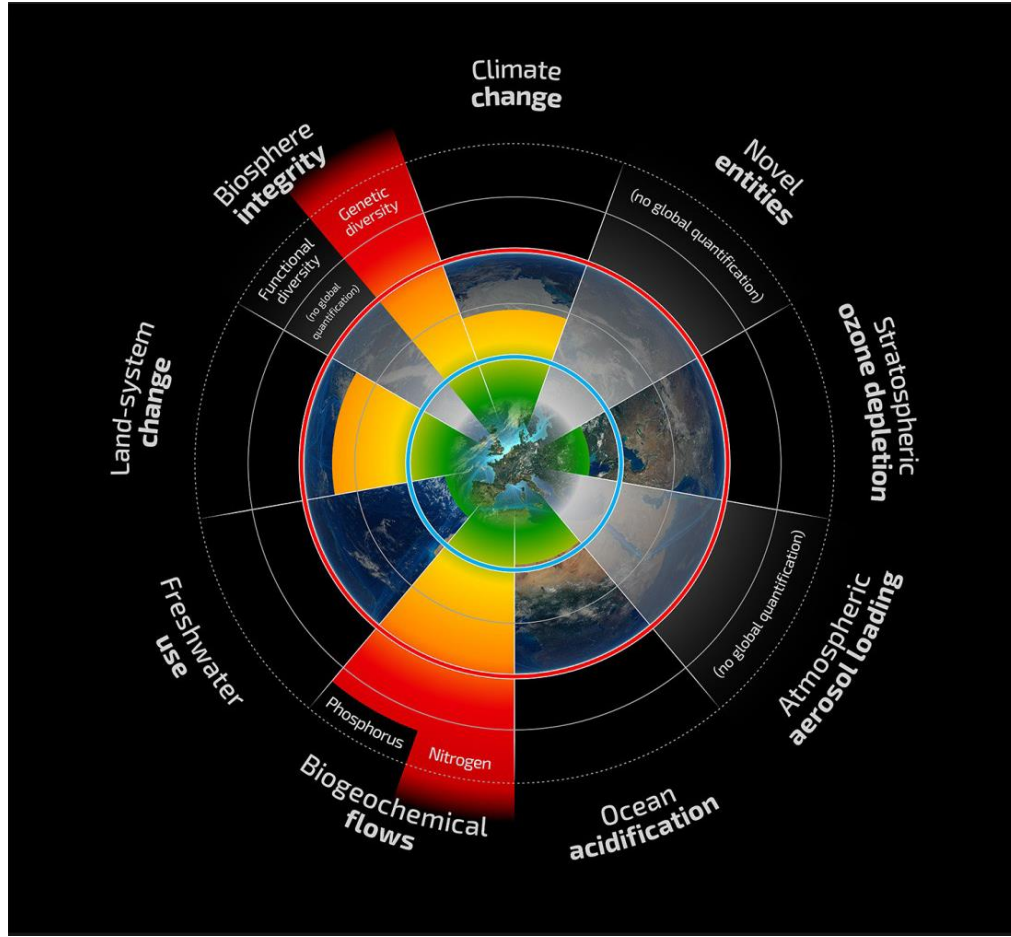
Working approach: Transdisciplinary - Political economy

What is wrong with our food systems?

- **Triple burden of malnutrition**
 - Hunger, micronutrient deficiencies, obesity & NCDs
- **Environmentally unsustainable**
 - Biodiversity losses, water pollution, soil degradation, GHG emissions, unsustainable use of natural resources, low resilience
- **Social inequities**
 - Poverty, disempowerment
- **Loss of cultural values, direct relationship between people and food, people and land**
- **→ Directly associated with reliance on industrial agriculture**

Planetary Boundaries

A safe operating space for humanity



METROPOLI AGRICOLE The contribution of agroecology to sustainable food systems in metropolitan areas



FROM
UNIFORMITY
TO
DIVERSITY

A paradigm shift from industrial agriculture to diversified agroecological systems

Questions considered:

- What are the outcomes of industrial agriculture and diversified agroecological systems?
- What is keeping industrial agriculture in place?
- How can the balance be shifted?

Industrial vs diversified agroecological systems

Conventional/industrial

- Mainly monocultures, concentrated animal feedlots
- Genetically uniform varieties and specialized breeds
- Vertical and horizontal segregation of product chains
- Highly mechanized, labor saving with use of seasonal labor at peak times (e.g. harvest)

Diversified agroecological

- Temporal & spatial diversification at plot, farm & landscape level
- Less uniform, locally adapted varieties and breeds
- Integrated systems with natural synergies
- More labor intensive, all year round employment with better employment conditions

Industrial vs diversified agroecological systems

(continued)

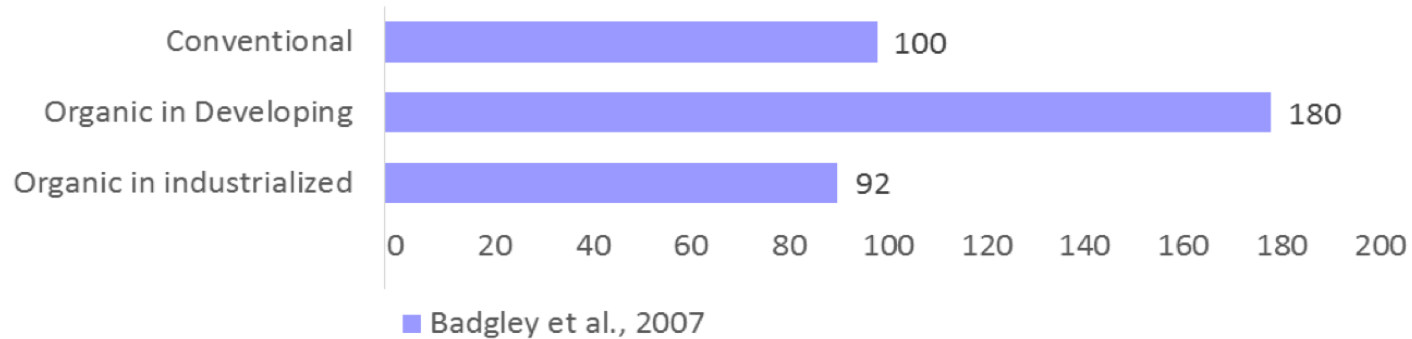
Conventional/industrial

- Maximization of yield/ha from a single/few product(s)
- Intensive use of external/synthetic inputs
- Large volumes of homogenous products for national and international markets through long value chains

Diversified agroecological

- Maximization of multiple outputs/products
- Low external inputs, nutrient cycling, circular economy
- Wide range of diverse products, often marketed through short value chains. Multiple sources of production, income and livelihoods.

Outcomes of organic agriculture: productivity



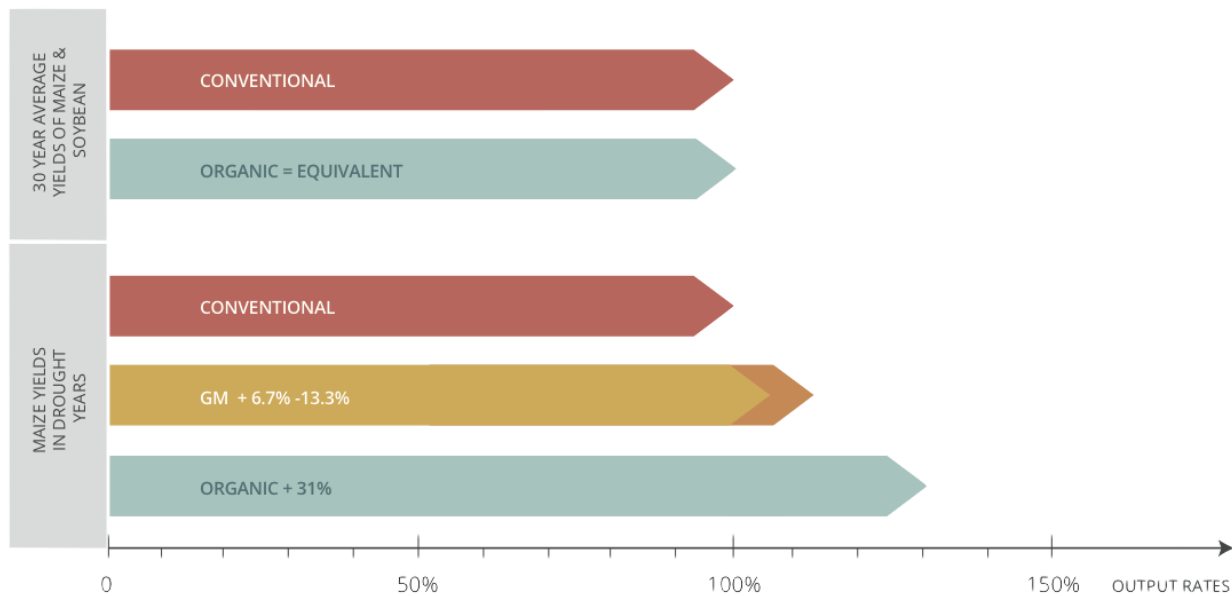
“Overall, organic yields are typically lower than conventional yields. But these yield differences are highly contextual ..., and range from 5% lower organic yields to 34% lower yields” (Seufert et al. 2012)

Increased yield in 17% of comparisons for organic agriculture and 87% of comparisons for SRI (Garbach et al. 2016)

Note that most comparisons are done over short periods!

Outcomes of diversified agroecological systems: productivity & resilience

30 year comparison of organic/conventional



Data from Rodale Institute, 2015

What diversified agroecological systems can bring

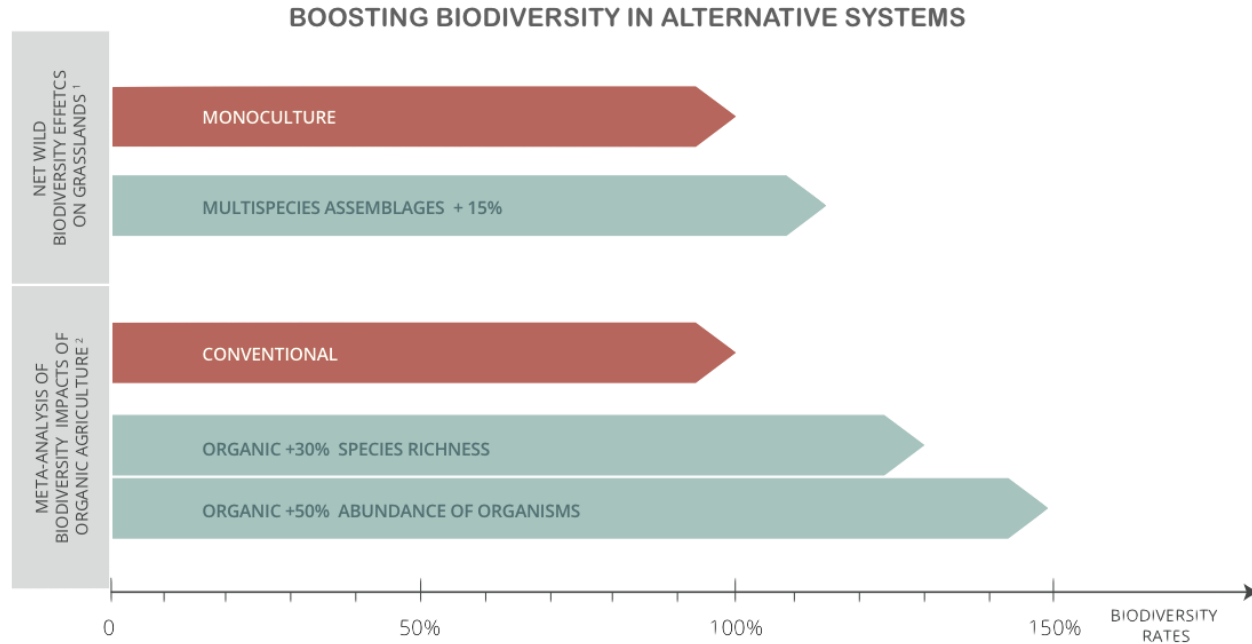
- Environmental
 - Ecosystem services
 - Biodiversity
- Economic
 - Productivity and income
 - Resilience and stability
- Health: Better nutrition and healthy environment, lower occupational hazards
- Social: Decent livelihoods
- Cultural: Respect for cultural preferences and knowledge

Environmental benefits

- Keep/put carbon in the soil: turn agriculture into a solution rather than a problem (now emits between)
- Restore degraded land
- Improve ecosystem services
 - Water and nutrient cycling
 - Pollination
 - Pest and disease management



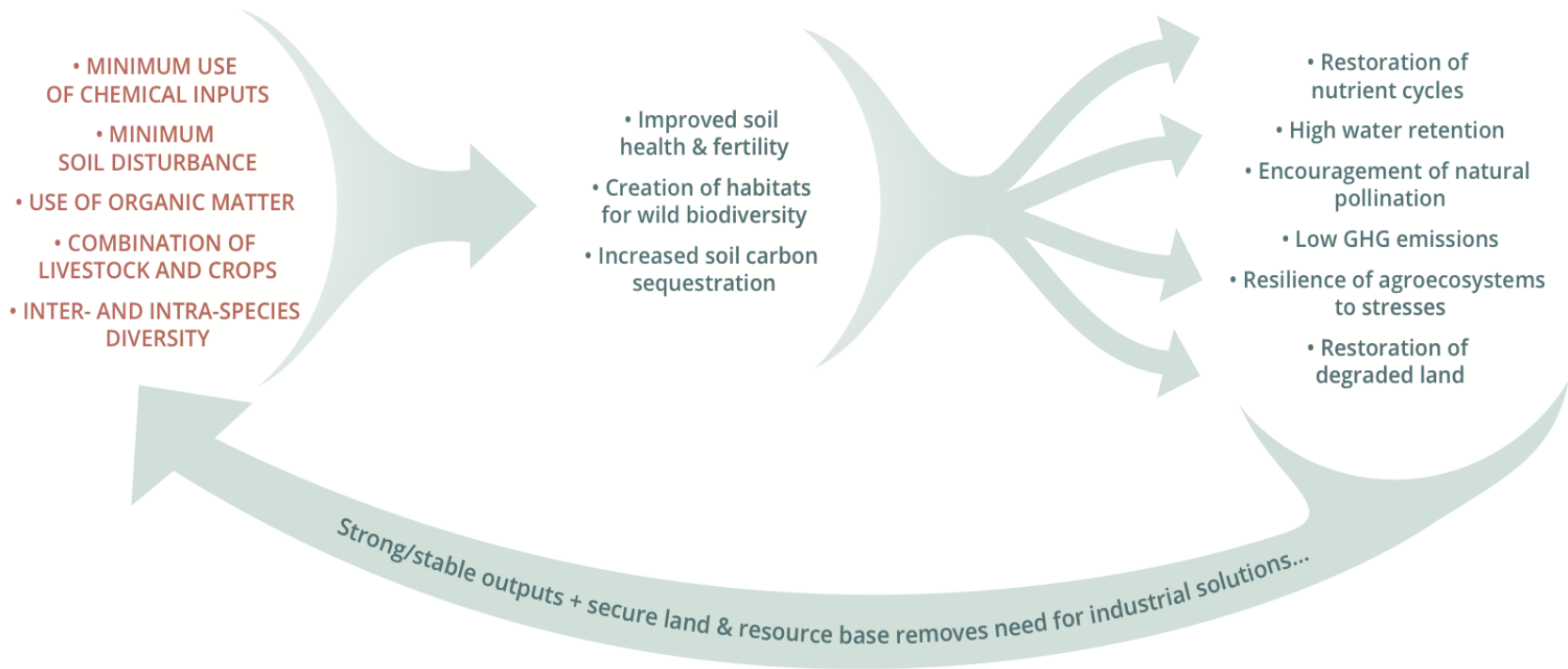
Outcomes of diversified agroecological systems: boosting biodiversity



1. Data from Prieto et al., 2015

2. Data from Bengtsson et al., 2005

VIRTUOUS CIRCLES OF ECOSYSTEM HEALTH IN DIVERSIFIED AGROECOLOGICAL SYSTEMS



Nutrition and health benefits

- Elimination of negative health outcomes of industrial agriculture due to pesticides, antibiotics
- Diverse, healthy diets
- Increased levels of beneficial nutrients, such as omega-3 fatty acids antioxidants



Social and cultural benefits

- Social:
 - More employment
 - Employment throughout the year
 - Closer links with consumers through local or regional markets
- Cultural:
 - Cultivation of diversity of traditional crops
 - Integration of traditional knowledge

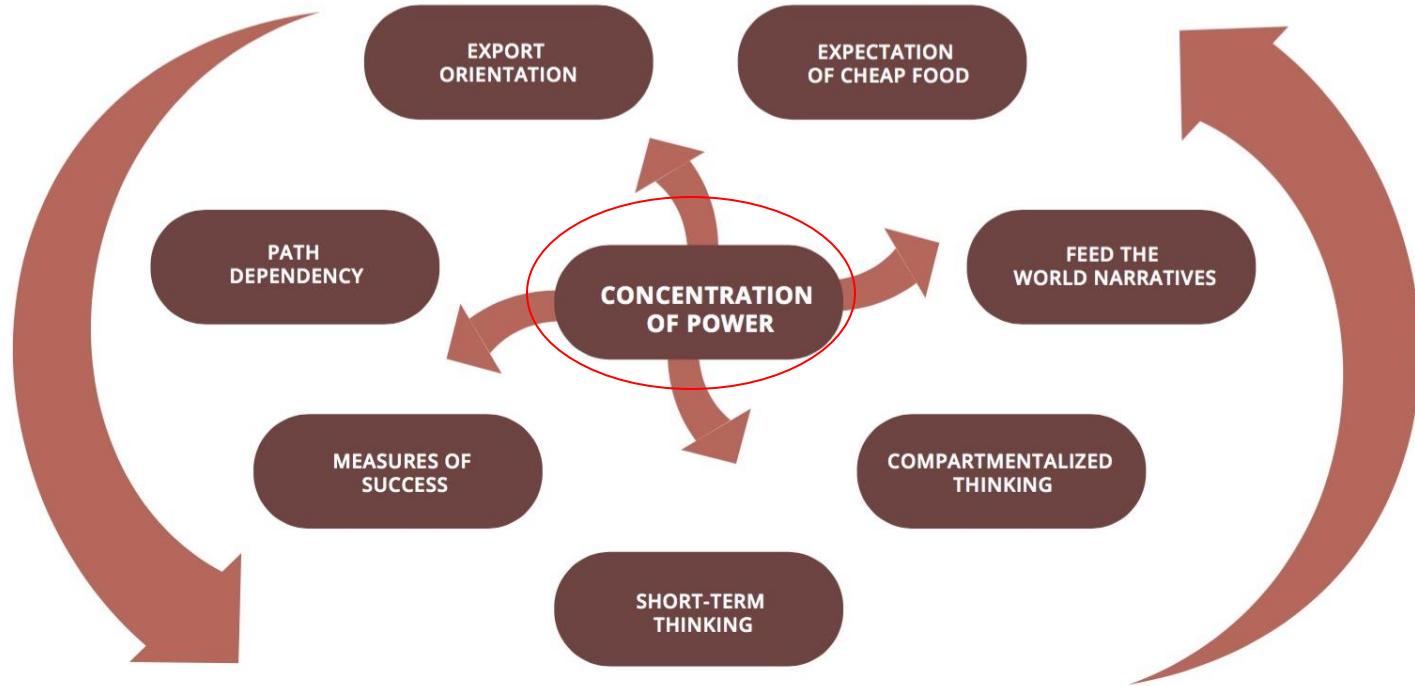


But...

Why do we not see a major transition towards diversified agroecological systems, given the expanding evidence that they can deliver on all dimensions of sustainable food systems?

→ The political economy of food systems

What prevents change: 8 Lock-ins



Market concentration in multiple sectors

65% ?

- 3 companies control ~~50~~% of commercial seed market
- 7 companies control majority of fertilizer sales
- 5 companies share 68% of agrochemical market
- 4 firms account for 97% of private R&D in poultry
- 4 firms control up to 90% of the global grain trade

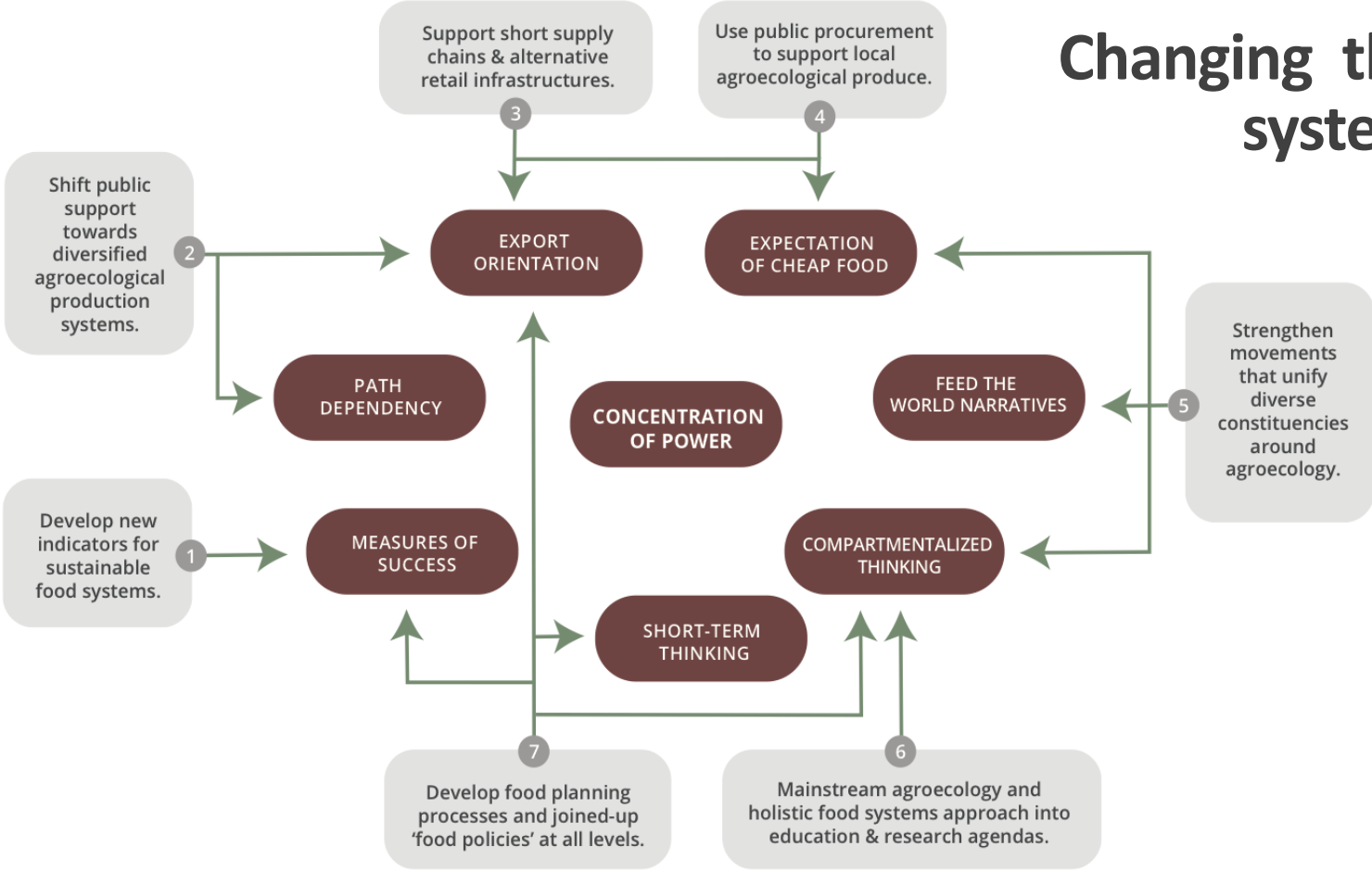


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Changing the system



Emerging opportunities for the transition to diversified agroecological systems

- **Global recognition of agroecology**(MEA, IAASTD, FAO, 10YFP)
- **Changing policies** (Brazil, Cuba, France)
- **Emerging multi-actor initiatives** (FPCs)
- **Integrated food systems science**
- **Peer-to-peer and participatory action research**
- **Healthy eating and sustainable sourcing**
- **Short supply chains, integrated territorial markets that operate at the city-region unit**
- **Rise of urban and peri-urban agriculture**

Urban & peri-urban agriculture in the US



Meaning(s) of agroecology

- Application of ecological principles to agriculture
- Set of practices
- Philosophy
- Social movement

<i>Table 1. Agroecological principles for the design of biodiverse, energy efficient, resource-conserving and resilient farming systems</i>
▪ Enhance the recycling of biomass, with a view to optimizing organic matter decomposition and nutrient cycling over time.
▪ Strengthen the “immune system” of agricultural systems through enhancement of functional biodiversity – natural enemies, antagonists, etc.
▪ Provide the most favourable soil conditions for plant growth, particularly by managing organic matter and by enhancing soil biological activity.
▪ Minimize losses of energy, water, nutrients and genetic resources by enhancing conservation and regeneration of soil and water resources and agrobiodiversity.
▪ Diversify species and genetic resources in the agroecosystem over time and space at the field and landscape level.
▪ Enhance beneficial biological interactions and synergies among the components of agrobiodiversity, thereby promoting key ecological processes and services.

Source: Gliessman 1998

Emerging social principles of agroecology

AGROECOLOGY AND SUSTAINABLE FOOD SYSTEMS
2016, VOL. 40, NO. 1, 24–47
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Clarifying the socioeconomic dimensions of agroecology: between principles and practices

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What urban & peri-urban agriculture bring to agroecology

- Food security
- Supplemental income
- Greater connection to land/food production
- Improved dietary diversity
- Potential for social connections
- Support for cultural values and culturally appropriate foods



Urban and peri-urban agriculture can rebuild the relational aspects of agri-culture, thereby letting people participate directly in agroecology but also fostering greater appreciation for it



Recommendations from IPES-Food report *

1. Develop **new indicators** for sustainable food systems.
2. Shift **public support** towards diversified agroecological production systems.
3. Support **short supply chains & alternative retail infrastructures**.
4. Use **public procurement** to support local agroecological produce.
5. **Strengthen movements** that unify **diverse constituencies** around agroecology.
6. **Mainstream** agroecology and holistic food systems approaches into **education and research agendas**.
7. **Develop food planning processes** and **'food policies'** at all levels from local to international.

* Note that ALL apply to urban and peri-urban agriculture.

Thank you!



www.ipes-food.org