A paradigm shift from industrial agriculture to diversified agroecological systems
Sustainable food systems

Vibrant local economy

Environmentally sustainable

Social equity

Good health

Culturally appropriate

Transdisciplinary - Political economy

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From Uniformity to Diversity

A paradigm shift from industrial agriculture to diversified agroecological systems

The report asks three key questions:

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

**Neglect of cultural values**
What diversified agroecological systems can bring

- Productivity
- Environmental
  - Ecosystem services
  - Biodiversity
- Health

... (more in the report)
Outcomes of diversified agroecological systems: productivity

THE PRODUCTIVITY OF DIVERSIFIED GRASSLAND SYSTEMS

1. Data from Preto et al, 2015
2. Data from Cardinale et al, 2008
Outcomes of diversified agroecological systems: productivity & resilience

**PRODUCTIVITY AND RESILIENCE IN ORGANIC FARMING SYSTEMS**

<table>
<thead>
<tr>
<th>30 Year Average Yields of Maize &amp; Soybean</th>
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<tr>
<td>Conventional</td>
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<td>Organic = Equivalent</td>
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<th>Maize Yields in Drought Years</th>
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<tr>
<td>Conventional</td>
</tr>
<tr>
<td>GM + 6.7% -13.3%</td>
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<tr>
<td>Organic + 31%</td>
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Data from Rodale Institute, 2015
Environmental outcomes

- Keep/put carbon in the soil: turns agriculture into a solution rather than a problem
- Restore degraded land
- Improve ecosystem services
  - Water and nutrient cycling
  - Pollination
  - Pest and disease management
Outcomes of diversified agroecological systems: boosting biodiversity

Boosting biodiversity in alternative systems

- Monoculture
- Multispecies assemblages + 15%
- Conventional
- Organic +30% species richness
- Organic +50% abundance of organisms

1. Data from Prieto et al., 2015
2. Data from Bengtsson et al., 2005
Outcomes of diversified agroecological systems: Virtuous cycles
Nutrition and health

- No negative health outcomes of industrial agriculture: pesticides/antibiotics
- Diverse, healthy diets
- Increased levels of beneficial nutrients, such as omega 3 fatty acids, and antioxidants such as polyphenols...
A major question

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

- 3 companies control 50% of commercial seed market.
- 7 companies control nearly 100% 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.
All have a common interest: maintaining industrial agriculture

.... But things are changing
8 Emerging opportunities for a transition to diversified agroecological systems

- **Global recognition** (MEA, IAASTD, FAO, 10YFP)
- **Changing policies** (CAP, Brazil, Cuba)
- **Emerging multi-stakeholder initiatives** (FPCs, JRC, NL)
- **Integrated landscape thinking** (City region, ILM, LPFN)
- **Integrated food systems science** (FSCs)
- **Peer-to-peer action research** (CaC, FFS ...)
- **Healthy Eating and Sustainable Sourcing** (OA, FT ...)
- **Short supply chains**
Changing the paradigm

1. Develop new indicators for sustainable food systems.

2. Shift public support towards diversified agroecological production systems.


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 approach into education & research agendas.

7. Develop food planning processes and joined-up ‘food policies’ at all levels.
Measuring what matters

GDP GROWTH

NET CALORIE PRODUCTION
YIELD / HECTARE
PRODUCTIVITY / WORKER
INCOME

NUTRIENT CONTENT / HECTARE
LOCAL CALORIE & NUTRIENT AVAILABILITY
TOTAL OUTPUTS / HECTARE
TOTAL BIOMASS PRODUCED
RESOURCE EFFICIENCY
ECOSYSTEM SERVICES DELIVERED
LIVELIHOOD RESILIENCE & SOCIAL EQUITY
Recommendations

1. Develop **new indicators** for sustainable food systems.
2. Shift **public support** towards diversified agroecological production systems.
3. Support **short circuits & 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.
Different pathways, common goal

Connect to Markets
Diversify
Mechanize
Build knowledge

Relocalize
Diversify
Reduce chemical inputs
Build knowledge

Subsistence Agriculture

Diversified Agroecological Farming

Industrial Agriculture
Key messages

• Industrial agriculture provides calories to global markets, but with many negative outcomes
• Problems are linked specifically to industrial agriculture
• Industrial agriculture is locked in place by a series of vicious cycles
• Tweaking practices can improve some of the specific outcomes, but will not provide long-term solutions to the multiple problems
Key messages (cont’d)

- What is required is a fundamentally different model of agriculture: diversified agroecological systems

- These systems can compete with industrial agriculture in terms of total outputs, performing particularly strongly under environmental stress

- Change is already happening

- A series of modest steps can collectively shift the centre of gravity in food systems
Thank you!

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