

Agricultural Systems

Agroecology

- Higher nutrient crops
- No toxic pesticide residues
- Improves small farmer income by 30%^[1]
- Rural employment
- Based on combination local knowledge and scientific expertise
- Polycultures
- Good soil health
- Low input
- Low energy use
- No pollution
- High labor intensity
- Higher knowledge requirement
- The cultivating community
- Circular
- Local
- Comparative productivity dependent on environmental and management conditions
- Increased productivity in rural subsistence communities
- Decreased productivity compared to industrial agriculture
- Comparison to organic unknown
- (Productivity measure by biomass)

Industrial

- Low nutrient, high calorie crops
- High pesticide residues
- 1/3 of food grown that is wasted worldwide^[2]
- Primary used for livestock feed and biofuels
- International
- Export oriented
- Power concentrated into large agribusinesses
- Farmers tied to volatile global prices
- Requires expensive machinery and chemical inputs
- Based on technical knowledge
- Monocultures
- Soil exhaustion
- High input
- Energy intensive
- Agricultural runoff pollution
- Low labor intensity
- Higher productivity compared to organic and agroecology
- (Productivity measure by biomass)

Organic

- Low pesticide residues
- Higher nutrient crops
- Elite upper class
- Organic buyers annual household income of \$75000 or more^[3]
- Export markets
- 'Big Organic' Agribusiness pushing out smaller farms
- Organic market inaccessible to smaller stakeholders due to expensive certification process
- Varied
- Local CSA's*
 - Similar to agroecology
- "Big Organic"
 - Input-intensive
 - Energy-intensive
 - Monocultures
- Varied
- CSA's* are local, circular
- 'Big Organic' is international, export-oriented
- Comparative productivity dependent on environmental and management conditions
- Decreased productivity compared to industrial agriculture
- Comparison to agroecology unknown
- (Productivity measure by biomass)
- Higher labor intensity overall
- More mechanized farms closer to industrial labor requirement

KEY

- high uncertainty
- Measure of performance in that area.

* Community Supported Agriculture
 [1] FAO's Work on Agroecology
 [2] FAO
 [3] <http://www.takepart.com/article/2015/04/21/who-is-buying-organic>

Potential Pathways to Transition

agroecology

organic

industrial

Developing World



- Implementation of agroecological practices to improve...
 - Food sovereignty
 - Nutrition
 - Livelihood stability
 - Surrounding environment
- NGO, FAO, grassroots supported and funded 
- Connecting **community knowledge** and **local actors** to science and innovation

Driven by food insecurity and local environmental impacts

Developed World

- Consumer preferences drive organic market up 
- More holistic certification process
 - Accessible to small local farmers
 - More stringent for large agribusinesses
- Expansion of Community Supported Agriculture (CSA)

“Tinkering at the edges of industrial agriculture” [2]

- Price environmental externalities 
- Increased government subsidies for sustainable farming practices 
- Increased efficiencies of practices

Eventual Change?

Urban Agriculture



- To address food deserts in cities
- Implemented by individual cities
- More city green spaces
- In 2001, urban agriculture produced 60% of the vegetables in Cuba^[1]