Sustainability assessment and complementarity or How do we know if organics is good?

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What is organics?
• Organic history: organics as protest against conventional
• Organic certification: organics as sector and market
• Organic principles: organics as movement and agroecology

What does science say?

There are many perspectives on organics

Perspective
Methods
Values
Aspect
What does science say?

There is much debate on whether organic is better than conventional or not.

A few examples:

Nature quality: biodiversity

- Organic farms vs. Conventional farms
- Number of plant species per 100 m hedge
- Sand vs. Clay soil
- Old hedge (> 50 years)
- 3 row hedge (16 years)

(From the REFUGIA project)

Nature quality: dedicated nature areas

- 25% larger area needed for organic food production

Is “feed the world” a question of production?

Technology is the solution

Organic is luxury

or distributive justice?

- Food sovereignty and self-sufficiency
- What is meant by “conventional”
- The question of rapidly changing diets

Climate change is also a challenge

Niels Roland
Climate from a product perspective (LCA)

Conv.: 1.20 kg CO₂ eq. per litre
Org.: 1.27 kg CO₂ eq. per litre

Climate from a farm perspective

Conv.: App. 10 ton CO₂ eq. per hectare
Org.: App. 6 ton CO₂ eq. per hectare

Animal welfare: options for natural behaviour

Animal welfare: human care and control

Conv.: mortality 24 %
Org.: mortality 33 %
Summing up the debates on whether organic is good

Debating values without knowledge is empty!
Debating knowledge without values is blind!

Sustainability assessment and complementarity

• These debates turn on value-laden and contested concepts and these contested values are at the basis of sustainability assessments

Typical sustainability assessment

Sustainability assessment and complementarity

• These debates turn on value-laden and contested concepts
• These contested values are at the basis of sustainability assessments

• Some values seem contradictory, and maybe complementary?

Niels Bohr’s complementarity

Quantum physics: position | momentum

Quantum physical complementarity is based on the quantum of action: $\Delta x \cdot \Delta p \geq \frac{\hbar}{2}$

But Bohr considered complementarity to be a general epistemological lesson that applies to other fields:

Generalisation of complementarity

A phenomenon always belongs to a perspective that determines what can be observed and what cannot be observed.

Complementary observations are observations of the same object • that exclude each other due to the conditions for observation, • but which both/all contribute to the representation of that object.

$\text{(Drawings by Bohr 1949)}$

The phenomenon includes the whole experimental apparatus
The semiotic basis of observation

The semiotic basis of observation is based on the semiotics of Charles S. Peirce (1839-1914). See the papers by Alrøe & Noe 2011, 2014 on hugo.alroe.dk

Forms of observation complementarity

Quantum physics: e.g. position | momentum

Observer stance: from without | from within

Rubin’s vase: figure | ground

Different forms of complementarity that are relevant to sustainability assessment

Observer stance complementarity

detached | involved

Value complementarity

mercy | justice

Value complementarity in product quality

Uniform standard

Diversity of experiences

Value complementarity in animal welfare

Care

Naturalness

Different forms of complementarity that are relevant to sustainability assessment

Observer stance complementarity

detached | involved

Value complementarity
Value complementarity in nature quality

- Authentic, untouched
- Rich, human-made

Complementarity and sustainability

Three perspectives on growth and sustainable development:

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<td>ecological justice</td>
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Byrne & Glover 2002, Byrne et al. 2006

Planetary boundaries


Growth and ecological injustice

Kerala, India, 2004

Observer stance complementarity

Two forms of farm research in Denmark in the 1990’s

Detached monitoring

Involved development

Niels Roland
### Full versus rapid sustainability assessment

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Marchand et al. 2014, Triste et al. 2014

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### Use of knowledge: risk versus precaution

- **Risk assessment**
  - Principle of precaution
    - In front of possible irreversible damage
    - Precautionary action without a conclusive scientific understanding
  - Science-based assessment
  - But the scientific knowledge is limited

- **User driven**
- **Criteria (values)**
- **Chain / system**
- **Concrete initiatives**

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### Assessment from without or within

- Research driven
- Effects (performance)
- Entity (farm, sector)
- General aspects

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### A full assessment tool

- Full versus rapid sustainability assessment
  - detached | involved

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### A full assessment tool

- Full assessment tools
  - Description and monitoring
  - Accurate, general

- Rapid assessment tools
  - Learning and development
  - Enabling action, site-specific

Marchand et al. 2014, Triste et al. 2014
Implications for sustainability assessment

Two main problems of sustainability assessment

The problem of integration: The surplus of possibilities for integration

The problem of implementation: Getting from sustainability assessment to sustainability transformation

Indexes are integration machines ...

indexes hide information

Including:

- Differences in values and concerns
- Possible issues of complementarity

Even typical sustainability assessments ...

are based on indexes

Complementarity and participation

detached | involved Observer stance complementarity

- Participation in itself is not enough – stakeholders can be involved without their perspectives being involved
- The complementarity between monitoring and development is important
- Involved means influence on the values behind – and this means the values must be exposed
Complementarity between sustainability assessment and sustainability transformation

- Science tends to take a detached stance to produce a valid sustainability assessment.
- But taking a detached stance excludes taking an involved stance to help bring about sustainability transformation.

A better understanding of complementarity

- Can help see why complementarity cannot be overcome – only handled in better or worse ways.
- And focus attention on how to handle issues of complementarity better.
- Can help distinguish between issues of complementarity and other problematic issues – and thereby between problems that may be resolved and those that may not.
- And focus attention on how to better recognize issues of complementarity.