Are organic farm input restrictions sufficient to secure ecosystem services? Lessons from New Zealand’s ARGOS and Sustainability Dashboard project

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Today’s talk

- The changing scope of sustainability frameworks and Ecosystem Services
- Results from ARGOS: Organic vs. Integrated Management vs. Conventional agriculture
- *NZ Sustainability Dashboard* as a response
- A Gap analysis: Challenges and opportunities for Organics

*Can organic standards and norms alone secure ecosystem services?*
Ecosystem Services: more than protecting natural capital

(Yesterday’s talks (n=12)

- Supporting (43%)
- Provisioning (37%)
- Regulating (18%)
- Cultural (2%)

Cultural, social and economic dimensions are the keys for transformation to more sustainable agriculture.
The Agriculture Group on Sustainability (ARGOS)
A 9-year project studying sustainability on 107 ‘real’ farms and orchards in New Zealand starting 1994. Transdisciplinary – examining social, economic and ecological dimensions of farm change over time. Organic farms matched with Conventional and Integrated Management farms (accredited to a market assurance scheme)
The Changing Face of Market Access for Ethical Food & Fibre Products

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<th>Late 80’s early 90’s</th>
<th>Mid-late 90’s</th>
<th>Circa 2000</th>
<th>Today</th>
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<td>GAP</td>
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<td>Food Safety</td>
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<td>Generic and customer GAP</td>
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<td>Trade security</td>
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The Tower of Eco-babble?
(Source: FAO SAFA Workshop, March 2013)

... more and more eco-labels?
... do people trust them?
... will Organic certification compete?

Don’t lump all “conventional” growers together!
- Sheep/beef
- Kiwifruit
- High Country pastoral
- Dairy
- Māori land holdings

- Total: 107 farms
- Clusters to match soil, altitude and ecological constraints
- Where possible used a Before-After-Control-Impact (BACI) experimental design.
... a first null Hypothesis across all ARGOS sectors

$H_0$: Economic, social and environmental outcomes are the same for organic, Integrated Management and conventional farming

Reject $H_0$ in 24% - 58% of tests depending on sector

... so going Organic really makes a difference
Annual production of dairy farms (Milk solids/ha)

- Conventional: 90% in 2003/04, 81% in 2004/05, 74% in 2005/06, 72% in 2006/07, 69% in 2007/08
- Converting to organic:
  - Before: 2003/04
  - Converting: 2004/05 to 2007/08
  - Certified Organic: 2008/09

Production (MS/ha)
All native species

Bird density (ha⁻¹)

Management system

Gold IM  Green IM  Organic

All native species

Are organic practitioners different from the others? (Hunt et al. 2009)

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<th>Index</th>
<th>Non-organic</th>
<th>Organic</th>
<th>t-Test significance</th>
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<tbody>
<tr>
<td>Economic Focus</td>
<td>+0.07</td>
<td>-0.15</td>
<td>0.034</td>
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<td>Social Breadth of View</td>
<td>-0.17</td>
<td>+0.37</td>
<td>0.000</td>
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<tr>
<td>Environmental Breadth of View</td>
<td>-0.16</td>
<td>+0.35</td>
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<td>Innovation likelihood</td>
<td>-0.21</td>
<td>+0.45</td>
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... a second farming intensity
meta-Hypothesis

$H_1$: Differences in economic, social and environmental outcomes between organic, Integrated Management and conventional farming are greater for more intensive farming

... If so, Organics is particularly valuable for eco-functional agricultural intensification
Earthworms: a prime example of ‘agricultural biodiversity’

P < 0.001

![Bar chart showing earthworms per sq m for different land uses and management systems. The chart indicates a significant difference (P < 0.001) between organic, conventional, and integrated management systems for sheep/beef and dairy land uses. Kiwifruit land use shows the least earthworms.](chart.png)
Conclusions (1)

- Many differences in outcomes between farming systems
- These differences are often small and insufficient on their own to build resilience to the major threats to farming sustainability ... so Organics or IM are not silver bullets or major game changers on their own
- There is huge variation in outcomes between farms within each farming system
- ... so the main way of lifting sustainability is to incentivize individual farming families to change no matter which farming system they use
The New Zealand Sustainability Dashboard

- a participatory, farmer-led approach to measuring and reporting sustainability
- turning compliance into a learning tool
- incentivising individual farming families to improve sustainability performance
What is the NZ Sustainability Dashboard?

- Online tool and network
- Mainly self-assessed KPIs reported annually
- Instant benchmarking
- Trend analysis, Targets, Trigger points
- Upscaling
- Automated reporting
- Cultural authenticity and sustainability credentials
SAFA: Sustainability Assessment of Food and Agriculture systems
Four Pillars of the Sustainability Dashboard

GOOD GOVERNANCE
Ensures sound decision-making and implementation

ECONOMIC RESILIENCE
Sustains a well functioning and resilient economy

AGRO-ENVIRONMENTAL INTEGRITY
Sustains natural capital, enhances natural heritage values and meets global environmental obligations

SOCIAL WELL-BEING
Ensures livelihood opportunities and respects social and cultural principles of all society
Agro-environmental integrity
National outcome for NZ production lands

‘The state which sustains the full potential of land and its natural capital, ecosystem processes and services to efficiently and indefinitely produce healthy, high quality food and fibre, while enhancing natural heritage values and meeting global environmental change obligations.’
Organic Standards vs. SAFA

36% Congruence
SAFA vs. Organic Norms

Getting beyond the standards to match with the four IFOAM Principles: Ecology, Health, Fairness, Care

Gap analysis cf. Common Objectives and Requirements of Organic Standards (COROS)

Congruence scored as 100%, 75%, 50%, 25%, 0% or ‘Not Applicable’ for each subtheme

.... If a farm was successfully following the SAFA guidelines, what would it score on the according to the organic norms?
SAFA vs. IFOAM Norms 2014

1. Organic Management is long-term, ecological and systems-based
2. Soil fertility is long-term and biologically-based
3. Synthetic inputs are avoided/minimized
4. Pollution and degradation are minimized
5. Unproven, unnatural and harmful technologies are excluded from the system
6. Animals are treated responsibly
7. The natural health of animals is promoted and maintained
8. Fairness, respect and justice

74% Congruence
SAFA vs. IFOAM Norms 2014

- 3.4. Contamination: all systems
- 4.1 Farm Production and Beekeeping
- 5.1 Genetically Modified Organisms
- 5.2 Irradiation
- 5.3 Breeding Techniques
- 5.4 Nanotechnology
Conclusions (2)

- Organic has a market and performance edge
- However the difference is slight and restricted in scope
- Green Market Assurance programmes are rapidly catching up and eroding the organic difference
- Organic principles and COROS broaden beyond the standards but still do not cover many of the broader dimensions of sustainability
Conclusions (3)

Can organic standards and norms alone secure ecosystem services?

No!
... if you agree, how should the Organic movement respond?

- Broaden the standards to encompass missing dimensions in certification?
- Monitor and demonstrate performance in these missing dimensions .. Perhaps using a Sustainability Dashboard approach?
- ORGANIC PLUS assurance schemes where current lead and points of difference are celebrated, but added dimensions of sustainability are monitored and codified?
Thanks!

- OECD and organisers of this workshop
- NZ’s Ministry of Business, Innovation and Employment (principle funder of NZ Sustainability Dashboard project)
- NZ Wine, Zespri & kiwifruit Packhouses, BioGro, Ngāi Tahu