Social learning about whole farm sustainability on the basis of indicators

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December 27, 2013
Endure workshop Co-innovation
Social learning

Group discussion with peers & advisor
… on the basis of indicators

Group discussion with peers & advisor

Indicators as starting point for the discussion
Extension ↔ social learning

Extension

Farmer n

Farmer 1

adviser

Farmer 2

Farmer 3

Farmer ...

Social learning

Farmer n

Farmer 1

adviser

Farmer 2

Farmer 3

Farmer ...

ILVO
Experience with the use of indicators and social learning

1. Monitoring tool MOTIFS: development, implementation & evaluation

2. Dairy farm sustainability

3. Crop protection sustainability

4. Fruit farm sustainability

5. Quick scans
Monitoring Tool

SHORT HISTORY

• 2001: vision document “On tomorrow's grounds”

• 2002-2006: Stedula
  – Make “sustainability” concrete for agriculture
  – Develop indicators ≡ MOTIFS

• 2007: ILVO – Social Sciences
  continued work on indicators & learning instruments

• 2012-13: ≡ toolbox indicators & experience
  ≡ evaluation and self-reflection
Goals:

• to communicate about sustainability
• to measure and monitor sustainability
• to motivate farmers and support them in their farm management
MOTIFS

MONITORING TOOL FOR INTEGRATED FARM SUSTAINABILITY
MOTIFS

Level 1
MOTIFS Overview

Level 2
MOTIFS Environmental

Level 3
Theme ‘Use of inputs’

Level 4
Indicator Values
Dairy farms

- “Strong with milk” *(Sterk met melk)* (2006-2008)
- “Dairy Café” *(Melkvee-café)* (2009-2010)
- Private farm accountancy groups (2009-2010)
- Cows put out to pasture ↔ zero grazing (2012)
LESSONS LEARNT FROM DEVELOPMENT PROCESS
Lessons learnt from development process

Communication instrument

- Visual representation: power of the image!
- Enables comparison between farms
- Time consuming

Shown to be a useful aid in farmers’ discussion groups and learning processes
Monitoring instrument

- Indicators for measurement of most aspects
- Not for all aspects quantitative measures available! (especially social aspects)

Individual indicators can be used for monitoring
Management instrument

- Highlights a farm’s strengths and weaknesses
- Does not provide actual recommendations for innovation
- Advisor / expert coaching remains necessary

Supplemented with an advisor’s knowledge it can be used as a decision support system
LESSONS LEARNT FROM DEVELOPMENT PROCESS

1. MOTIFS

Communication instrument
- All themes!
- Aggregated representation

Monitoring instrument
- Aggregation
- Individual indicators

Management instrument
- Farmers need
  - Background info
  - Advisor input

Ownership!
- Social setting!

⑤ Quick scans
③ DISCUSS
② Dairyman
④ Sustainable fruit farms
DISCUSSION GROUPS EXPERIENCES REINFORCED

Themes determined with stakeholders

Indicators to be discussed next with farmers

Enhances feeling of ownership
Implementation in social setting

www.interregdairyman.eu
Discussion groups experiences reinforced

Discussion groups organised on farms
**Discussion Groups Experiences Reinforced**

Individual indicators, e.g.
Conclusions from implementations on dairy farms

• Farmers thought using indicators in discussion groups provided an added value

• They value the presence of an advisor
  – to help them with interpretation
  – to dig into background information and to relate indicators to each other
  – to suggest possibilities for improvement

• They would prefer more support from the advisor when executing innovations on their farms afterwards
DISCUSS

Dual Indicator Set for Crop protection Sustainability Surveys
3 DISCUSS

DESIGN

- Literature review
- Individual interviews with experts

Participatory
- Framework
- Indicator selection

Desk-top
- Focus group validation & prioritisation

Participatory
- Indicator development
- Inquiry

Desk-top
3 DISCUSS

• Avoid chemical crop protection

• Choose the least harmful PPPs

• Comply with PPP legislation

• Avoid PPP resistance

• Take safety precautions

• Avoid point pollution

• Avoid diffuse pollution

PIAS

POCER

Questionnaire

Dual indicator set

Drivers D

Response R

Pressure P

State S

Impact I

DISCUSS
DISCUSS: Indicator types

CROP PRODUCTION
- Chemical use
  - PPP use
    - PPP choice
    - PPP application rate
  - Precautions
- Other crop protection techniques

mitigation
- Operator health
- Worker health
- Beneficial arthropods

inquiry
- Bees
- Terrestrial biota
  - Earthworms
  - Birds
  - Mammals
- Soil
  - PPP concentration
    - Deposition
      - Persistence
  - Groundwater
    - PPP concentration
      - Drinking water
    - Aquatic biota
      - Algae
      - Daphnia
      - Fish

Air
- PPP emissions
  - Pest, disease, weed resistance
  - Residues

Society
- Increasing demand for food
- Demand for "spotless" food
- Demand for residue-free food

POCER
- Risk

DPSIR
- D: Demand
- P: Policy
- S: Society
- I: Innovation
- R: Research
### DISCUSS: specific indicators

<table>
<thead>
<tr>
<th>POCER (Pressure)</th>
<th>QUESTIONNAIRE (Respons)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>HUMAN HEALTH</strong></td>
<td></td>
</tr>
<tr>
<td>Operator</td>
<td>Knowledge &amp; info acquirement</td>
</tr>
<tr>
<td>Worker</td>
<td>Awareness environmental effects</td>
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<tr>
<td>Bystander</td>
<td>Attitude towards pollution paths</td>
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<tr>
<td>Resident</td>
<td>Prevention diseases/pests/weeds</td>
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<tr>
<td>Consumer</td>
<td>Monitoring &amp; risk-evaluation</td>
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<tr>
<td><strong>ENVIRONMENT</strong></td>
<td></td>
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<tr>
<td>Persistence</td>
<td>Alternative crop protection</td>
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<tr>
<td>Groundwater</td>
<td>Choice of chemical pesticides</td>
</tr>
<tr>
<td>Aquatic organisms</td>
<td>Resistance management</td>
</tr>
<tr>
<td>Earthworms</td>
<td>Safety of operator &amp; others</td>
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<tr>
<td>Bees</td>
<td>Infrastructure &amp; equipment</td>
</tr>
<tr>
<td>Beneficial arthropods</td>
<td>Point pollution prevention</td>
</tr>
<tr>
<td>Birds</td>
<td>Diffuse pollution prevention</td>
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In farmers’ discussion groups
Preferably in collaboration with an extension research centre
~ advisors
**Applied Scientific Research (TWO)**

- Zoology (pests)
- Mycology (diseases)
- Pomology (plant growth)
- Environment and Technology

**Experimental Garden (PPS)**

- Variety testing
- Crop management

**Services Companies (DAB)**

- Proof of principles
- Development trials
- Official efficacy testing (GEP)
- Phytotoxicity
- Resistance monitoring

**Services to Growers (DAT)**

- Individual support on crop protection, IPM, nutrition, irrigation, pruning

**Experimental Garden for strawberry and small fruits (PAH)**

- Variety testing
- Crop management
PCFruit – DAT: Independent advise for growers

Individual farm counselling apple, pear, cherry

Leaf and fruit analysis for fertilisation and storage advise

Group meetings on farms

Prediction & warning
Sustainable fruit farms

Determining factors - indicators - hot issues

- Which factors determine sustainability on fruit farms?
- How can we assess them?
- Do they provide leads for improvement?
4 Sustainable fruit farms

Selection sustainability themes
<table>
<thead>
<tr>
<th>Economy</th>
<th>Environment &amp; ecology</th>
<th>Social aspects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Productivity</td>
<td>Crop protection</td>
<td>External social sust.</td>
</tr>
<tr>
<td>Risk</td>
<td>Energy</td>
<td>Internal social sust.</td>
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<tr>
<td>Selling price</td>
<td>Water</td>
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<tr>
<td>Profitability</td>
<td>Biodiversity</td>
<td>Entrepreneurship</td>
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<tr>
<td>Stability</td>
<td>Waste</td>
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<td></td>
<td>Nutrients</td>
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<td></td>
<td>Soil quality</td>
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## Sustainable fruit farms

### Indicators

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Theme</th>
<th>Indicators</th>
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</thead>
<tbody>
<tr>
<td>Environment &amp; ecology</td>
<td>Crop protection</td>
<td>Pressure from PPPs, Crop protection management</td>
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<td></td>
<td>Energy</td>
<td>Energy efficiency, Energy sources</td>
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<tr>
<td></td>
<td>Water</td>
<td>Water efficiency, Water sources, Water quality</td>
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<tr>
<td></td>
<td>Biodiversity</td>
<td>Associated biodiversity</td>
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<tr>
<td></td>
<td>Waste</td>
<td>Waste prevention, Waste handling</td>
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Entrepreneurship

• **Full scan** = 24 p. questionnaire on 7 themes
  1. Vision – strategy,
  2. Planning – organisation – monitoring – evaluation,
  3. Information searching - networking – collaboration,
  4. Risk management,
  5. Recognizing and making use of opportunities,
  6. Innovation,
  7. Technical craftsmanship

• **Quick scan** = 4 questions on 2 main themes

| Have you got a clear **long term vision and strategy** for your farm? | yes | partly | no |
| Have you got a **short or medium term planning** for implementing measures to improve your farm’s economic performance | | | |
| measures to improve your farm’s environmental performance | | | |
| measures to improve your farm’s social performance | | | |
Quick scans

BOERENBOND

- Developed with stakeholders, i.e. the farmers’ union
- Communication instruments! raise awareness about sustainability
- Needs to be shown whether they point in the same direction as full scans
Conclusions

- We have a toolbox of indicators ready for use
- ≠ indicators for ≠ purposes
- Useful tools in social learning about sustainability