Monitoring sustainability of Dutch agriculture – Lessons learned

Koen Boone, ICAS V, Kampala, 15 October
Content

- Project
- Process
- Themes and indicators
- Results
- Lessons learned
Project definition

- **Project goal:**
  - Monitor sustainability of Dutch agriculture
  - Evaluate Dutch policy on sustainability animal husbandry (follow up project)

- **Clients:** Netherlands Environmental Assessment Agency, ministry of ANF, ministry of HSPA

- **Main contractor:** LEI

- **Results:** 200 pages methodological report and 350 pages report with results
Monitoring sustainability of Dutch agriculture

- Dutch
- Agriculture
- Quantitative
- Long term development *(1990 – most recent)*
- Structural development *(long year averages for volatile indicators)*
- Linking to government policies and goals
- Next to quantitative monitor: monitor 3 transitions
Structure report

- Chapters for 7 main farm types in the Netherlands and total Dutch agriculture
- Chapters split in Introduction, Profit, Planet, People and Integration
- Profit, Planet and People split in 25 sustainability themes
- Per theme:
  - Why relevant
  - Goals government and/or sector
  - Description indicator
  - Development of indicator in relation to goals
  - Explanation of development of indicator
Data sources

- Tens of different data sources
- Intensive use of Farm Accountancy Data Network:
  - Split into farm types
  - Split into organic and diversifying farms (other gainful activities)
  - Next to averages per indicator, spread in results available
    - % of farms with income levels below poverty threshold
    - % of farms that reach environmental goals of government
- Linkage between themes
  - Relation between economic and environmental performance
Proces

- Group of 12 sector specialists identifies main sustainability problems and challenges
  - Policy documents (ANF, HSPA), farmers organizations, NGO’s
  - Research and monitor reports
- List of themes discussed with about 30 specialists
- Per theme literature study on indicators
- List of indicators discussed with about 50 specialists
- Specialist on data, themes and farm types write report
- Concept chapters discussed with farm type specialist
- Concept report commented by about 30 people
People involved

- Ministry of Agriculture, Nature and Food quality
  - Specialist farm types
  - Specialist themes
  - Specialist policy
- Ministry of Housing, Spatial planning and the Environment
  - Specialist themes
  - Specialist policy
- NGO’s
- Farmers organizations
- Research
  - WUR: LEI, Alterra, ASG, PSG, Rikilt, CVI (farm type specialist, database/indicator/monitor specialists, theme specialists)
  - Centre for agriculture and environment
  - Netherlands Environmental Assessment Agency
## Themes

### Introduction
- Geographical distribution
- Number of (specialized) farms, area
- Organic agriculture
- Multifunctionality

### People
- Spatial quality
- Image/Reputation
- Labour
- Succession
- Animal welfare and health
- Food Safety

### Planet
- Energy use
- Climate change
- Nutrients
- Water use
- Crop protection
- Biodiversity
- Animal feed
- Soil quality
- Plant health
- Fine particulate matter

### Profit:
- Income
- Financial position
- Investment
- Innovation
- Competitiveness
Criteria used to select indicators

- Completeness
- Structural availability
- Representativity
- Quantitativness
- Stakeholder support
- Simplicity
- Solidness
- Reliability
- Costs
- Comparability

- Preciseness
- Timeliness
- Clarity
- Possibility to link micro (farm) and macro (sector, country, region) level
- Availability on farm level (measure variation)
- Availability per sector/farm type
- Reproducibility
## Example of indicators

### Income:
- Family farm income per family labour unit
- % of farms with a total household income below poverty threshold
- Output divided by total costs (including unpaid costs for own labour and own capital)

### Nutrients:
- Nitrogen and Phosphate balance
- Nitrogen concentration in surface water split into soil type
- Organic and artificial manure applied per ha
- Soil balance (Nitrogen and Phosphate) per ha
- Ammonia emission split into sources
Theme: Geographical distribution

indicator: ESU per ha
Theme: Farm Income

indicator: percentage of dairy farms with total income (including off-farm) below poverty threshold
Theme: Innovation

*indicator: percentage of innovations and innovators in greenhouse horticulture*

<table>
<thead>
<tr>
<th>Type of Innovator</th>
<th>2003-2005</th>
<th>2005-2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Innovator</td>
<td>10%</td>
<td>15%</td>
</tr>
<tr>
<td>Early Adapter</td>
<td>5%</td>
<td>5%</td>
</tr>
<tr>
<td>Late Adapter</td>
<td>5%</td>
<td>5%</td>
</tr>
<tr>
<td>Product Innovation</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Process Innovation</td>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>

% Farms

- 2003-2005
- 2005-2007

- Product- and process innovation
- Process innovation
- Product innovation
- Innovator
- Early adapter
- Late adapter
Theme: Nutrients

indicator: nitrate concentration in upper groundwater
Theme: Crop protection

Indicator: Pesticides use and environmental impact points for arable farms

- Surface water
- Ground water
- Soil
- Kg active substance

Year:
- 2002-2004
- 2003-2005
- 2004-2006
- 2005-2007
- 2006-2008

Activities:
- Kg active substance
Do integral sustainable farms exist?

- Select homogeneous group of farms: Dairy farms
- Calculate 3-year average score for all farms on all themes
- Identify per theme the 25% best performing farms
- Select the farms that are most often part of this 25% group
- Compare the performance of these farms with average farm
- Identify the characteristics of these farms
Comparison of the scores of the most sustainable farms with the average farm

- Family farm income per family work unit
- Solvability (%)
- Cost of production per 100 kg of milk
- Energy use per ESU
- Water use per ESU
- Level of education
- Pesticides use per ha
- N-surplus per ha
- P-surplus per ha
- Number of pasture days
## Characteristics

<table>
<thead>
<tr>
<th></th>
<th>All farms</th>
<th>Sustainable farms</th>
<th>Less sustainable farms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size (Dutch size units)</td>
<td>102</td>
<td>121</td>
<td>80</td>
</tr>
<tr>
<td>Labour (AWU)</td>
<td>1,6</td>
<td>1,5</td>
<td>1,5</td>
</tr>
<tr>
<td>Area (ha)</td>
<td>45,7</td>
<td>49,5</td>
<td>36,1</td>
</tr>
<tr>
<td>- grassland</td>
<td>37,1</td>
<td>39,6</td>
<td>29,5</td>
</tr>
<tr>
<td>Number of dairy cows</td>
<td>73,9</td>
<td>88,2</td>
<td>57,6</td>
</tr>
<tr>
<td>Total milk production</td>
<td>592.197</td>
<td>686.779</td>
<td>467.080</td>
</tr>
<tr>
<td>- per cow</td>
<td>8.014</td>
<td>7.785</td>
<td>8.109</td>
</tr>
<tr>
<td>- per hectare</td>
<td>12.954</td>
<td>13.880</td>
<td>12.928</td>
</tr>
</tbody>
</table>

Source: FADN.
Lessons learned

- Very complex project
- Necessary to consult large group of specialists
- Integrated data assembling on micro level has large advantages
- How to get more integrated conclusions?
  - Integrated analysis on farm level
  - Qualitative research (workshops/interviews)
Lessons learned

- Need for good indicators/data on some themes (animal welfare, biodiversity, soil quality, plant health, food safety)
- Internet site next to report?
  - Always latest numbers available
  - More possibilities to add more detailed data
  - Links to government policy and methodology
  - Links to sites where data is already reported
- International comparisons
More Information

Report:
webdocs.alterra.wur.nl/WOT/rapporten/WOTrapport_105.pdf
(in Dutch with English summary)

Koen Boone, koen.boone@wur.nl
Thank you for your attention