Agro-ecological transition pathways in arable farming

Suitable strategies and incentive mechanisms for agro-ecological transitions are co-constructed with a local Multi-Actor Platform (MAP), putting a particular focus on result-oriented approaches. Participatory decision support tools are applied to assess the current environmental, economic and social situation of arable farms in Lower Saxony. The outcome is used to identify potentials for agro-ecological improvements.

Summary

In intensive arable regions like the Nienburg district in Lower Saxony the uptake of current agri-environment schemes is low and their performance unsatisfactory.
Nine arable farms are assessed using the participatory decision support tools SMART, Cool Farm Tool and COMPAS to better understand current sustainability issues and barriers in implementing agro-ecological approaches. A local Multi-Actor Platform (MAP) is established to identify possible pathways of agro-ecological transitions and to co-construct practice-validated strategies and incentives for the promotion of improved agro-ecological practices. Agro-ecological practices are adopted on specific parts of the farm if and where such practices fit best with the business plan of the farm. Result-oriented approaches will be developed on an experimental basis to foster farmland biodiversity and water protection using the toolkit to assess the environmental, economic and social performance of the innovative strategies at farm level (part of the German case study of H2020 project UNISECO).

Objectives

A local Multi-Actor Platform (MAP) is set up to:

- improve understanding of barriers and drivers of agro-ecological transitions
- co-construct novel and effective market mechanisms and policy instruments to improve the sustainability of intensive arable farming systems
- design result-oriented agro-ecological practices allowing to improve biodiversity and water quality while minimizing negative impacts on the economic viability

Problem description

In the district of Nienburg, Lower Saxony a high pressure on ecological sustainability in general and biodiversity loss as well as water pollution in particular persists. Land use is dominated by highly market-oriented farming with a high share of rented land. The experience with demanding agro-ecological practices is very limited. Cover crops are grown as greening measure and some farmers have established flowering strips, extensive field margins.

Data and Facts - Contract

Participation: 9 arable farms with 140 ha on average (100 – 200 ha, some with minor pig husbandry). Around 70% of the land is rented, in many cases on a short term. The farmers provide data for the sustainability assessment of their farms and engage in the local Multi-Actor Platform together with other local actors.

Further participation: The Thünen Institute of Farm Economics is coordinating the UNISECO project. It has the lead for this case study and is supported by the Chamber of Agriculture Lower Saxony. Further MAP members are farmers, value chain actors, advisory services, NGOs, and representatives of local and regional administration.

Cooperation & Result-oriented

Preparation of a result-oriented approach in collaboration with local actors to foster biodiversity and water protection based on the outcomes of the sustainability assessment.

PUBLIC GOODS

Biodiversity

Water quality

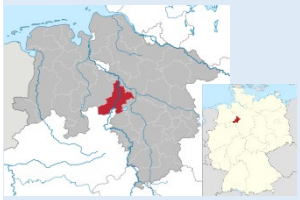
as well as environmental sustainability in general

Further PGs

Rural viability and vitality

LOCATION

GERMANY



The case study region is the district of Nienburg located in Lower Saxony, in the northwest of Germany. It is characterized by intensive arable farming and a high share of rented land.

CONTRACT

No contracts are signed.

Instead:
Participants engage in sustainability assessment and contribute to the co-development of strategies for an agro-ecological transition benefitting from result-based approaches.

Payment:
The participating farmers aren't paid by the project.

Project financing:
EU Commission (Horizon 2020 project UNISECO - grant agreement No 773901)

Project start: 1.05.2018
Project end: 30.04.2021

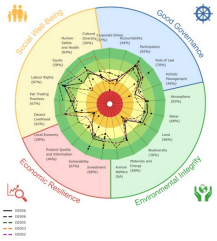
Duration of case study activities:
Local project activities started in spring 2019 and last for UNISECO until autumn 2020. But the experimental testing of result-oriented approaches will be explored beyond project time life.

Agro-ecological farming

- is based on the sustainable use of local renewable resources
- benefits from local farmers' knowledge and priorities
- uses wisely biodiversity to provide ecosystem services and resilience
- looks for solutions that provide multiple benefits (environmental, economic, social) from local to global

The participatory decision support tools:

SMART Farm Tool (Sustainability Monitoring and Assessment RouTine):



- multidimensional sustainability tool used to assess ecological integrity, economic resilience, good governance and social wellbeing
- enabling the scoring of very different farm enterprises in a comparable manner through standardised collection of farm specific information
- allows to considers trade-offs and synergies between sustainability aspects

Cool Farm Tool:

- an online decision support tool to estimate the environmental impacts of food production
- started as an on-farm GHG emission calculator allowing farmers to gain insights into the potential emission reductions resulting from changes in farm management practices
- provides a simple, yet comprehensive GHG footprint for a broad range of farms
- today it contains also a water (quantity) and since recently a biodiversity module

COMPAS (Comparative Agriculture System Model):

- an economic performance assessment tool developed by the Thünen Institute of Farm Economics
- allows to analyse economic and technological changes of agricultural production at farm level in detail.
- output consists of various economic indicators including total output, labour productivity, net farm income
- in a first step used to analyse the status-quo of the farm; in a second step, specific model parameters can be changed and the outcome compared with the status-quo.

Controls/monitoring: There are no controls. The farming activities are monitored complementing the farm assessment with the decision support tools. Special attention is given to fertiliser, crop protection and soil management (e.g. precision application of fertiliser, cover/catch crops, flower/buffer strips, tillage practices, crop diversification). Therefore detailed documentation of one representative field for each crop grown including quantitative information about plant protection, fertilisation is required from each participating farm.

Criteria for farm selection: The focus was put on specialized conventional arable farms with 100 – 200 ha (some with minor pig farming). Half of the farmers aren't engaging in any agri-environmental measure, the others implement some agro-ecological practices like flowering strips, extensive field margins.

Risks/uncertainties: One uncertainty was about time required for the interviews for the sustainability assessment and for engaging in the MAP. The result-oriented approaches are still to be developed, thus participating farmers are not sure to be able to benefit from them.

Contract features combination: Some farmers and other MAP members have experience with water protection and biodiversity measures financed under the rural development programme of Lower Saxony (on minor farm area).

Framework conditions

Landscape and climate: The study area Nienburg in Lower Saxony belongs to the North German Plain, a flat region that was formed by glacial action characterized by intensive agricultural land use. The climate is maritime with considerable precipitation and mild winters. The river Weser flows from south to north through the district that comprises an area of approximately 83,100 hectares. 63% of it is agricultural land (83% arable), mainly with loamy or sandy-loamy soils. There are 1500 farms, 560 cultivating more than 50 ha.

Farm system: The case study targets arable farming and the average size of the participating farms is 140 ha. Around 70% of their land is rented. Some of them practice minor pig husbandry. The case study area is adjacent to intensive livestock regions with severe issues in manure management leading to issues regarding biodiversity loss and water pollution threats. The land (rental) prices are high. The crop rotation comprises cereals, rapeseed and maize.

SUCCESS

It could be proved that using the participatory decision support tools allows benchmarking the farms regarding their sustainability and to identify entry points for agro-ecological improvements. The willingness to engage in the MAP is core for a successful second step allowing the co-development of suitable agro-ecologic strategies adapted to local specificities. How far the outcomes of the participatory process can be used to develop result-oriented approaches benefiting water quality and biodiversity without harming the economic viability of the farms will be assessed in the forthcoming activities.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Reasons for success:

- Recognition of the influential role of land owners for a agro-ecological transition in regions with high shares of rented land
- Reflection of the farm specific assessment to identify possibilities for environmental improvements
- Commitment and diversity of involved actors facilitating co-learning on how to effectively support agro-ecological transition

SWOT analysis

Strengths

1. Awareness of specific local environmental, farming and value chain initiatives
2. Integration of local knowledge to promote agro-ecological transitions
3. Co-learning and collaboration in the MAP builds trust amongst the actors

Weaknesses

1. Strong commitment and considerable amount of time required from participating farmers and MAP members
2. Consumers currently not directly represented in the Multi-Actor Platform

Opportunities

1. Reduced pressure on ecological sustainability
2. Possibility to build upon previous projects, MAP structures
3. Integration of information, knowledge and evidence strengthening the science-practice-policy dialogue

Threats

1. Missing remuneration; income foregone / additional cost rule for AECMs
2. Land rental agreement conditions and high land prices

Horizon 2020
European Union Funding
for Research & Innovation

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 817949. The results presented reflect only the authors' view, the Agency is not responsible for any use that may be made of the information it contains.