NUTRINFLOW

Good practice examples of environmentally friendly drainage systems were introduced.

Summary

The project aimed at establishing good practical examples of win-win measures for agricultural producers in water management for the retention of nitrogen and phosphorus. Through working with farmers and landowners, the project promotes and demonstrates with concrete investments the benefits gained from holistic planning and coordinated implementation of water retention and on-farm drainage management measures. To show good practice examples on the Ailes stream a project was developed and contracts with landowners signed. The overall project was lead by Proagria (Finland). Union "Farmers Parliament" (Latvia) was one of the project partners.

Problem description

The project responded to the common pan-Baltic challenge to implement more effective and acceptable measures to reduce nutrient inflows to the surface waters and the Baltic Sea from agriculture. It is evident from recent history of implementing on-farm agri-environment measures, that they have not yielded the results needed in terms of reduced nutrient losses and that complementary measures in the drainage network and landscape are needed. In part, this is due to the multifaceted hydro-morphological, physical and biochemical processes in the soil and the aquatic environment, which also makes the effect of these individual measures difficult to measure. Through addressing water flow, water storage and retention it is possible to tackle the problem of nutrient losses outside the growing season when there is no uptake by the crops. According to studies and estimates, up to 90% of nutrients are lost outside growing season which indicates great potential for nutrient loss reductions by the above mentioned measures. At the same time, there is great potential to be gained for agricultural production, but also for the production of ecosystem services for the society from measures targeting water flows and retention in the landscape. Through a holistic catchment level management, an optimal combination of measures in the landscape, the stream network and on farm could ensure sustainability and viability of agriculture while reducing the external nutrient loading to the sea.

COLLECTIVE

All 72 landowners along the Ailes stream were contracted.

PUBLIC GOODS

Water quality – to reduce nutrient inputs in the Baltic Sea and to have increased attractiveness and feasibility of a holistic water management approach for agricultural catchments across the Central Baltic Region.

INDIRECT EFFECTS

Local innovation and action groups stimulating voluntary action and entrepreneurship in water management.

LOCATION

LATVIA

NUTS 3, LV009 (Zemgale)

Regional/Local contract, but could be applied to the whole country

CONTRACT

Contracts with landowners for the introduction of the environmentally friendly elements on the drainage systems connected to the Ailes stream. Landowners agreed that they allow access to the Ailes stream and manage the coastline (buffer zones) of their land near the Ailes stream for construction of pilot (4) elements.

Public – private – civil society contract
State – landowner - NGO

Contract conclusion:
Written agreement

Payment mechanism:
Tender and/or price comparison for the implementation of construction work

Financing party:
Government (with EU-funding), Union "Farmers Parliament" (10% for the design of technical project)

Length of participation in scheme:
2 years

Start of the program:
2016 spring
End: 2018 autumn

Objectives

1. Control and reduce nutrient inputs into natural watercourses and water bodies;
2. Control soil erosion;
3. Enrich oxygen content in water;
4. Promote natural self-purification processes in water;
5. Increase awareness among farmers, advisors and municipal authorities and services on drainage techniques and approaches to integrate field and basic drainage measures while lowering the barriers for the execution of sustainable drainage management and combination of environmental and production benefits.

Data and Facts - Contract

Involved parties: Landowners/managers with agriculture production and their land lying next to the Ailes stream. State Limited Liability Company "Real Estates of Ministry of Agriculture", which are responsible for maintenance of the drainage systems in Latvia. Union Farmers Parliament, with the objective to educate farmers.

Management requirements for farmers: The contract solution was foreseen for collaboration between landowners and the company contracted by Union "Farmers Parliament" to develop the construction plan.

Controls/monitoring: The results are controlled and monitored by State Limited Liability Company "Real Estates of Ministry of Agriculture" staff of the Zemgale Region. They control functionality and physical presence of demo elements (stones, plants etc.) on the spot. For 5 years State Limited Liability Company "Real Estates of Ministry of Agriculture" is responsible for removal of overgrowth, removal of beaver dams, cutting of shrub shoots. The State Rural Support Service is the control authority. In case of complaince, building board implement on site control to prevent illegal construction activities. Fine can be assigned to the landowners in case of law infringement.

PARTICIPATION

- Landowners - 72
- Catchment area- 35,6 km2
- Agriculture land - 90%
- Length of the stream - 14,2 km

Conditions of participation: All 72 landowners along the Aile stream were contracted. The demonstration areas were chosen on the places where landowners agreed to allow access to the stream with the construction machinery. The protocol (agreement) was developed professionally by the construction plan developer. There are no consequences planned for the landowners at the agreement. State Limited Liability Company "Real Estates of Ministry of Agriculture" staff does the follow up that the drainage systems are managed properly. If requirements are not respected, landowners can be penalized which can lead to reduction of direct payments.

Risk/uncertainties of participants: Financial risks, regarding the management of the environmental elements to be financed in the long term;
Administrative risks - Objects are publicly accessible on a national watercourse, but adjacent areas are privately owned and the question is how the shores will be managed?
Knowledge and understanding of the public so that objects are not destroyed.
Natural Risks – damaged by beaver and other invasive species.
Water Analysis - effectiveness of measures.

Funding/Payments: The demonstration area technical project was financed by Union "Farmers Parliament" (ZSA) partner budget (75% Central Baltic Sea Region programme 2014-2020, 5% Latvian state and 10 % ZSA). ZSA contracted the company for the design of the technical project. The implementation of the construction works was done by the company contracted by State Limited Liability Company "Real Estates of Ministry of Agriculture".

Context features

Farm structure: Traditionally, the most important specialization in Latvia are arable farming (42.6% of the total number of farms), dairy farming (15.1% of the total number of farms), as well as mixed crop and livestock farming (14.8% of the total number of farms). Farms in Latvia are mainly family-owned businesses. In 2016, 69,000 or 98.7% of farms belonged to one natural person, of which 31,400 or 45.5% of the farms were owned by women. Cereal farming is one of the most important agricultural sectors in Latvia - it provides the population with both food and feed in the livestock sector. Almost no livestock sector can survive without grain. Recently, cereal production is increasingly being used in other sectors, such as for energy.

SUCCESS OR FAILURE?

The NUTRINFLOW case is successful in terms of environmental elements demonstration. Good practice examples stated by Latvian Agriculture policy are presented and tested «on the ground». The investments demonstrate a holistic, cooperative approach and lead to reduced nutrient losses from agricultural land to the watershed. The investments will decrease nutrient load to rivers on the pilot territories, and this is a concrete improvement to the water quality of those water bodies and coastal regions, but wider objective is to spread the results to the whole Baltic Sea Region. Reduction of nutrient flows from agricultural lands is a complex issue, and the holistic approach to flow and nutrient management on fields, soils and waters aims to develop and assess the most effective measures and practices for this. To scale up the impact of the project in leading to nutrient loss reduction and nutrient retention measures in other areas, the project communicates actively about the process of designing the measures and their results across the Baltic Sea Region.

Reasons for success:

- The results and experiences are sustained.
- The experiences are shared internationally and the project will transfer the experiences from the practical measures and the planning process across the national advisory service operations

SWOT analysis

Main Strengths

1. The combination, the holistic approach, should allow continuation of effective agricultural production with less nutrient load to natural waters.
2. More effective use of nutrients, better nutrient balance, causes less mineral nutrients used for production of the same amount of crops.
3. The dialogue between agricultural producers and environment protection authorities to find the best ways into develop production to environmentally friendly and sustainable direction, finding mutual benefits for ecology and agriculture: cooperation instead of confrontation.

Main Weaknesses

1. They have not yielded the expected results in terms of reduced nutrient losses, thus complementary measures in the drainage network and landscape are needed. In part, this is due to the multifaced hydro-morphological, physical and biochemical processes in the soil and the aquatic environment, which also makes the effect of these individual measures difficult to measure.
2. Effectiveness will be evaluated in the long term period
3. The contracts for the surrounding farmers were not signed for the maintenance

Main Opportunities

1. Great potential to be gained for agricultural production, but also the production of ecosystem services for the society from measures targeting water flows and retention in the landscape
2. Attention to sustainable drainage management is especially critical in the foreseeable climate change with increased precipitation and on the other hand increased summertime water shortages
3. Continue monitoring water quality and show good practice examples in other projects
4. Good water quality demo site open for public.

Main Threats

1. Some of the investments need periodical maintenance, for example, sedimentation ponds need to be dredged with intervals of some years, and dams and other constructions should be investigated annually and renovated if needed.
2. The loss of interest and termination of support and cooperation by landowners and land managers as a result of the above circumstances.

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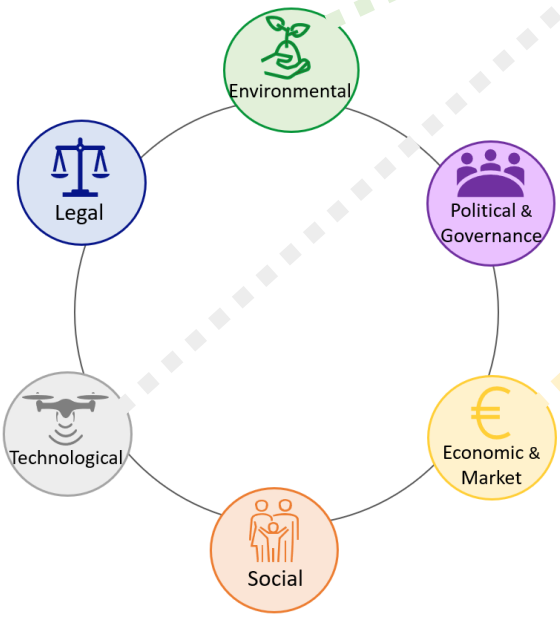
Main external factors influencing success

Political/governance, economic/market, social, technological, legal and environmental factors can all have a strong impact on the success of contract solutions. In this case study an in-depth analysis found that the following, selected factors were of specific importance.

The right timing:

The fact that the project's partner countries are **faced with the need to renovate agricultural drainage infrastructure**, provides an ideal ground to introduce new, more sustainable measures to meet the needs of agricultural production and the aquatic environment.

Attention to sustainable drainage management is especially critical against the background of the foreseeable climate change with, on the one hand, increased precipitation and, on the other hand, increased summertime water shortages.



Win-Win Situation: drainage systems have been altered, and management systems have been introduced to become more secure against leaching under the premise to keep up arable management.

The project builds on the knowledge and understanding that measures to improve water quality in the agricultural context have to be integrated with the farm management and field drainage.
In particular, it provides a setting to combine both:

(1) **environmental** and
(2) **productive goals**, with the possibility of expanding the scope of measures in the adjacent landscape.

Developments in the Program since 2020:

1. The State Limited Liability Company "Real Estates of Ministry of Agriculture" maintains the Ailes stream pilot site. The state funding is dedicated for:
   - cutting the grass on the slopes and cleaning the bottom of the river;
   - cutting and removing bushes;
   - destroying and removing the beaver dam.
2. Latvia University of Applied Sciences and Technologies is considering to take water samples and analyze them.
3. The pilot site is used for training and demonstration activities for the national and international specialists, like scientists, advisors, students, farmers and others.