

NETHERLANDS

Farm's performance, restructuring & modernisation

Location

Walcheren

Programming period

2014 – 2020

Priority

P2 – Competitiveness

Measure

M16 - Cooperation

Funding (EUR)

Total budget 915 000

EAFRD 347 500

National/Regional 347 500

Private 220 000*

Project duration

2017 – 2020

Project promoter

Stichting Waterhouderij

Walcheren

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Website

<http://waterhouderij.nl/>

* Additional investments by farmers

Setting up collaborative water system measures and a governance approach to increase self-sufficiency of freshwater availability for agriculture.

Summary

In the 'Water Holding' project - 'Waterhouderij' in Dutch - a group of seven farmers, research institutes and policymakers work together on sustainable freshwater buffering and distribution in the province of Zeeland in the Netherlands. By cooperating, they are building a collaborative and practical water governance approach to increase self-sufficiency and sustainable agricultural land use, in an area where salinisation is a problem.



The farmers participating in the project take actions such as setting up underwater storage facilities and irrigation channels to increase freshwater storage. By conserving and storing water during periods of heavy rainfall, farmers can extract water during periods of drought. These practices are adapted to find a balance between the risks of raising the water levels and the benefits of more fresh water during the growing season.

Results

The surface water level has been raised structurally by between 0.1 to 0.4 metres without negative results for agriculture or the environment.

The project has been successful in isolating saline water bodies.

An increased fresh water supply in the creek ridge (ca 60 000 m³), which is expected to double in volume in the future.

A new policy has been designed for the storage and usage of freshwater.

Lessons & Recommendations

It took several years for the farmers to change their behaviour through knowledge transfer and simple actions. It took more than eight years to build awareness, trust, experience and knowledge.

Farmers get designated water level ranges per area of influence. They actively preserve fresh water in several water buffers during both the dry and wet season and they can decide the local surface water level and the extent of the water storage as a group, in collaboration with the Water Authority and their neighbours. These changes in local water management will be combined with biodiversity and sustainable soil management experiments.

Context

The Water Holding project is situated on the peninsula of Walcheren. On this peninsula farmers grow vegetables, potatoes and fruit crops on good and fertile soils. For irrigation they depend mainly on rainfall and, during drought spells, groundwater. Fresh ground water is limited to local water lenses in creek ridges and coastal dunes. Freshwater lenses are convex bodies of fresh groundwater that sit on top of groundwater with a significantly higher salinity and varying from just a few metres in depth to several tens of metres. However, these fresh surface water resources are not sufficiently available during the growing season to meet irrigation demands.

This part of the Netherlands does not have access to external freshwater from rivers. Furthermore, in the Netherlands, Walcheren is one of the areas with the lowest annual precipitation (ca 750 to 800 mm). There is a limited rainfall surplus in autumn-winter and the biggest deficit is in the summer (ca 150 to 200 mm).

Therefore, proper optimisation of the water system (separating fresh from saline water) and management of the freshwater lenses is important to ensure sustainable agriculture in Walcheren.

Over the past centuries/decades, the regional Water Authority and farmers have tended to focus on rainwater discharge and flood prevention. This has resulted in large parts of the Netherlands becoming vulnerable in dry periods (like in 2018 and 2019) and demand exceeding supply.

In 2015, a group of seven farmers, who between them manage over 300 hectares/750 acres, founded the Water Holding in the northern part of Walcheren. The Water Holding consists of organic and conventional dairy farmers, organic and conventional apple/pear growers and outdoor vegetable growers, with crops such as onions, potatoes, broccoli, cauliflowers and Brussels sprouts. As well as the farmers, who are water users, the Water Holding includes a number of other interested parties. These include the province of Zeeland and the Scheldestromen Water Authority, as water managers; along with the research institutes Aequator, Deltares, the HZ University of Applied Sciences and the Louis Bolk Institute. The farmers interest group (ZLTO) also participated in the collaboration.

This collaborative approach of the Water Holding and the rural development support resulted in the further development of:

- The adaptive and resilient climate management of the freshwater system;
- The monitoring and quantification of the actions taken;

and

- A governance model that supports practical decision-making for water storage and distribution

Objectives

The objective of the Water Holding is to promote substantive knowledge, sustainable water management and social innovation to encourage sustainable agriculture in the area.

Activities

From 2007 to 2009, the Water Holding's innovation process focused on developing its concept and its business model. In 2009, activities focused on finding pilot areas and an ambassador farmer in the area.

In 2010, the group was formalised. Participative monitoring was carried out on how farmers use water resources, combined with knowledge transfer and simple measurements in the water system. This process aimed to identify the best options to separate fresh and saline water and locate fresh water sources. This resulted in a better understanding of the water system and an increase in the water supply in the area.

At the same time, a pilot research project started on the sub-irrigation of fresh water in the local water lenses in creek ridges. This activity led to more interest from farmers in the region and the preparation for the EAFRD-funded project.

Between 2015 -2018, despite the differences in their business models, the farmers as a group had an intrinsic motivation and were convinced of the potential of freshwater buffering. They invested in their own water sources and improved local water management in the area. Activities were focused on how to increase the water supply by enhancing the local buffer capacity. This was done by building and testing:

- Simple actions like constructing iron dams on surface water to separate fresh and saline water.
- Increasing the water basin (capacity: 4 000 m³) with salinity dependent water intake from surface water.
- Regulating creek ridge infiltration (6 hectares/60.000 m³ + future extension) again according to the salinity dependent intake.
 - Redistributing or isolating saline surface water.
 - Participative monitoring and knowledge sharing.
- Collaborating with policymakers to develop policy for the storage and sustainable use of fresh water in the area.

2018-2021 (EAFRD funded)

The Water Holding will focus on building sustainable measures, further optimising the water management, developing the governance model and building a Decision Support System. Project activities include:

- Carrying out 20 actions (construction of weirs, valves and dams) on surface water with the aim to:
 - increase flexibility in the surface water level
 - control fresh and saline water flow
 - regulate infiltration in two more creek ridges (10 hectares)
 - buffer more fresh water and restore fresh groundwater (6 000 m³)
 - develop sustainable soil management and biodiversity
- Building a monitoring network to support the innovative water management and to measure the effects on water, soil and agricultural management.
- Setting up the Decision Supporting System.
- Establishing a policy on the usage and storage of fresh water in the area in collaboration with policymakers.
- Upscaling the concept to other areas.

The project is divided into four phases:

Phase 1 - Between January 2019 and March 2020, the project focused on preparation, acquiring permits and the implementation of promising 'non-productive measures' (under M4.4) and on developing a monitoring network for a sustainable water system and the Decision Support System.

Phase 2 – From July 2019 to September 2021, a feasibility study will be conducted on water and soil quality to improve freshwater availability, integrate agricultural management and increase biodiversity.

Phase 3 - Between March 2020 and December 2021, the Decision Support System (software development) will be elaborated to optimise water management based on the monitoring network, other data and system knowledge.

Phase 4 - From June 2019 to March 2020 and between October 2020 to March 2021, activities will concentrate on strengthening the cooperation between farmers and water managers and promoting self-sufficiency.

Main Results

So far, specific results include:

- The surface water level has been raised structurally by

between 0.1 to 0.4 metres with no negative consequences for agriculture or the environment. In fact, positive effects are expected.

- The project has been successful in isolating saline water bodies.
- Increased fresh water supply in the creek ridge (ca 60 000 m³) which is expected to double in volume in the future.
- Farmers invested 150 000 EUR in works in their fields with a further 100 000 EUR committed for future actions.
- More farmers will join the Water Holding in the future (4-5 are expected).
- A new policy has been designed for the usage and storage of fresh water.

As a 'social return', the farmers want to share their experiences with the province of Zeeland, the Scheldestromen Water Authority and other agricultural entrepreneurs and interested parties. In this way they will contribute to a transition to a more climate-proof water management in combination with more sustainable agriculture. The Water Holding is a concept that can be successfully transferred to other areas of the Netherlands or Europe when there is a general water surplus during the year.



Main lessons

It took several years for the farmers to change their behaviour through knowledge transfer and simple actions. Furthermore, the actions taken led to a collaborative increase in the water supply and buffer capacity, as well as improving communication between farmers and the water authorities. Building awareness, trust, experience and knowledge on both sides was pursued over the last eight years.

Farmers get designated water level ranges per area of influence. They actively preserve fresh water in several water buffers during both the dry and wet seasons and they can decide the local surface water level and the extent of the water storage as a group, in collaboration with the water authority and their neighbours. These changes in local water management will be combined with biodiversity and sustainable soil management experiments.

Project partners & their roles

The **Zuidelijke Land- en Tuinbouw Organisatie (ZLTO)** is the project leader. Together with Aequator, they are responsible for the preparation and reporting to the Paying Agency, as well as the project group consultations and communication with other agricultural entrepreneurs.

Aequator Groen & Ruimte is the process supervisor and project manager. It takes care of the communication between partners as well as the governance and policy preparation and the Decision Support System.

Deltares contributes as an expert to the development of the monitoring network and the data analysis. They also participate in the design of the Decision Support System.

The **Louis Blok Institute** handles the soil quality and biodiversity components of the project.

The **HZ University of Applied Science** participates in the project by providing lecturers and students. Specific knowledge about monitoring water quality and data processing is provided by the lecturers. The students perform part of the measurements and processing of the data.

The **Scheldestromen Water Authority** supports the partners in the project by supplying data from the existing monitoring network. The Water Authority acts as a tester for the results and, if necessary, translates the results into new policy.

The **Province of Zeeland** is actively participating in the project due to its interest in sustainable and climate-proof freshwater management. It also tests the results against the provincial objectives as described in the conditions of the Rural Development Programme (RDP).



Additional sources of information

www.zeeland.nl/water/zoet-water

https://youtu.be/wJiR_-yUTY4