

Farmers Join Forces Against Drought and Waterlogging

– An area-based approach of using weirs for optimizing the water system in agricultural areas



Photo: Boerennatuur Vlaanderen

I Overview



Name	Climate-resilient agriculture by using weirs – Sint-Gillis-Waas Weir Project
Country	Belgium
Biogeographical Region	Atlantic
Region	Sint-Gillis-Waas, East Flanders, Belgium
Landscape/ Eco system type / protected area	Agricultural landscape; polder-type lowland with field ditches and drainage canals in Sint-Gillis-Waas
Size / Scope	53 weirs installed in field and roadside ditches covering an agricultural area in Sint-Gillis-Waas; 17 farmers participating; total project cost € 177,736.90
Type of farm	Mixed farms: arable/horticulture (maize, grass), fruit growing (pears), market gardening. Small to medium-sized family farms.
Agricultural Use	Arable land (maize, vegetables), grassland, fruit orchards (pears). Intensive farming in a climate-stressed landscape prone to both drought and flooding



Best-practice / main idea	Area-based, participatory installation of weirs in field ditches and roadside channels to retain rainwater in the landscape, raise groundwater levels, reduce drought stress for crops, and prevent downstream flooding. Farmers manage the weirs collectively with minimal external regulation.
Involved Stakeholders/ Partners	Boerennatuur Vlaanderen (Landcare Association, project lead); Viaverda (research center, effectiveness monitoring); Municipality of Sint-Gillis-Waas (co-funder, permitting); 17 participating farmers; local contractor WB Projects (weir design and installation); and Boerenbond (Farmers' Union, support and communication).
Duration	2023 – 2025 (PDPO project 'Klimaatrobuuste landbouw door stuwen,' 01/01/2023 – 30/06/2025). Weir installation completed in May 2025 and ongoing farmer-managed operation thereafter.
Goals	1. Retain rainwater in field ditches to maintain soil moisture and reduce crop drought stress. 2. Recharge groundwater reserves to build a 'water savings buffer' for dry periods. 3. Slow downstream water flow to reduce flood risk in residential areas. 4. Quantify the hydrological effect of weirs (water infiltration, ditch water levels, and groundwater rise). 5. Build a framework for collaboration and shared management among neighbouring farmers. 6. Scale up successful pilots across the wider East Flanders region.
Activities	1. Mapping all field ditches in the Kloputweg agricultural project area to identify bottlenecks and opportunities. 2. Participatory planning meetings with farmers to determine optimal weir locations and heights. 3. GPS surveying of all weir locations and determination of maximum impoundment heights.



	4. Installation of 53 weirs, with 25 adjustable weirs, and 28 fixed weirs and repair of 5 corner wells by contractor WB Projects. 5. Organization of a launch event with the mayor, project partners, landowners, and farmers. 6. Hydro-logical monitoring by Viaverda. 7. Establishment of an agro-management group to support ongoing farmer self-management. 8. Knowledge dissemination to farmers, farm organizations and water managers across East-Flanders.
Measures addressing water and/or soil management	• Installation of 53 weirs in field ditches and roadside canals to retain rainwater and repair of 5 corner wells (hoekputten) to allow whole-field water-level control from a single point. • Weir methodology ensures impoundment affects only the 2 adjacent parcels, giving farmers control over water depth per field. • The use of adjustable weirs allows farmers to regulate flow volume by inserting/removing plastic boards, and an emergency overflow ensures water stays 10–15 cm below ground surface to prevent waterlogging.
Measures addressing biodiversity, climate	• Reduced soil drying benefits soil biodiversity and micro-organisms. • Higher and more stable groundwater levels support wetland-associated flora and fauna in and around field ditches. • Reduced need for irrigation lowers energy use.
Funding / Financing	• The total project cost is € 177,736.90. The project is co-funded by EU/ELFPO via the Flemish PDPO Rural Development Programme. • The cost of weirs on private farm ditches is covered via the VLIF non-productive investments scheme. • Municipality of Sint-Gillis-Waas covered installation costs for roadside ditches and for farmers ineligible for VLIF support



	• Boerennatuur Vlaanderen and Viaverda were responsible for the project coordination, permitting, and monitoring. • No individual farmers were paid for their participation in the project.
Transferability	The collective approach of using weirs in agricultural areas as a way to enhance groundwater levels is applicable in any flat or gently sloping agricultural landscape with a network of field and/or roadside ditches. The model's key success factors are area-based planning, collective farmer engagement, simple low-cost weir technology, and administrative support by a Landcare Association. These factors can be transferred to other municipalities and regions. Boerennatuur intends to roll out the pilot to other sites in East Flanders and holds it up as a showcase for similar initiatives elsewhere in Flanders and beyond. The main barrier to replication in Flanders is the administrative burden of obtaining weir permits.
Tip / suggestion from the farmer	Tip: Don't be put off by worries about neighbourly disputes. In practice, water demand within a single area is very similar, and agreements come naturally.
Role of Landcare Associations	Boerennatuur Vlaanderen plays a central coordinating role: initiating and managing the project, organizing participatory meetings with farmers and landowners, preparing and submitting the complex permit applications (392 documents in total), assisting farmers with VLIF non-productive investment applications, liaising with the municipality and research partners, facilitating the formation of the agro-management group for ongoing farmer self-governance, and disseminating results and knowledge to other regions.
Further information	Project page in Dutch: https://www.boerennatuur.be/klimaatrobuuste-landbouw-door-stuwen/
Contact information	Boerennatuur Vlaanderen info@boerennatuur.be





“Water retention is becoming more and more important. We’re seeing more extremes in the weather: sometimes too dry, sometimes too wet. Now the stream is dry, but last year it nearly overflowed. With weirs we can respond to both situations.”

— Fruit grower, Sint-Gillis-Waas

II Detailed Description

Farmers and Authorities Join Forces Against Drought and Flooding

Sint-Gillis-Waas, a municipality in East Flanders in Belgium, has launched one of the largest area-based weir projects in Flanders to date. Seventeen farmers, covering approximately 70% of the active agricultural land around the Klokputroad, signed up to a collective project to install 53 weirs in fields and roadside ditches. The initiative was driven by growing concern about the consequences of climate change: increasingly severe droughts alternate with periods of intense rainfall that cause downstream flooding in residential areas. By working at the level of a whole drained catchment rather than individual farms, the project integrates problems and optimizes the entire water system in one go. A weir temporarily retains rainwater, giving it time to infiltrate the soil – recharging groundwater reserves and reducing the need for crop irrigation during dry spells.

Pilot monitoring by research center Viaverda in a nearby location, had already demonstrated the effectiveness of the approach: a single weir retained 43 cm of water in the ditch, raising groundwater levels by 26 cm at up to 10 meters from the weir. The drought-stress threshold for maize was reached 8 days later than without the weir: eight extra days of growth that can significantly reduce irrigation costs and yield losses.

Weir Design and Farmer Self-Management

Of the 53 weirs installed, 25 are adjustable weirs and 28 are fixed. Adjustable weirs use a stainless-steel frame with a central slot into which plastic and rubber boards can be inserted or removed (figures 1 and 2). This lets each farmer adjust the water level and flow rate to match the precise needs of their crop and season. Five corner wells were also repaired, enabling the water level of an entire field to be managed from a single control point. The methodology ensures that impounding water behind a weir can only directly affect the two adjacent parcels, so each farmer retains control without imposing unwanted waterlogging on neighbours. An emergency overflow built into every weir guarantees that water never rises higher than 10–15 cm below the ground surface.



Figure 1: The adjustable weir is closed when you want the ditch to have an infiltration function.



Figure 2: When you want the weir to have a draining function (i.e. during field work to prevent soil damage), you open the weir.

Once the weirs were in place, Boerennatuur Vlaanderen established an agro-management group so that farmers can support each other, share best practices, and develop further collective projects in the future. Boerennatuur also helped farmers submit applications to the Flemish Agricultural Investment Fund (VLIF) for non-productive investment subsidies – a bureaucratic step that would have been insurmountable for most individual farmers, as the project required uploading 392 documents to obtain the necessary permits.

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