Floodplain reconnection in the Vallei van de Grote Nete, Belgium

Year of issue

2025

Summary

This scheme is part of the long-term SigmaPlan in Flanders, designed to increase flood storage in the Scheldt catchment while restoring natural habitats. On the Grote Nete, the project reconnects the river with its floodplain, previously cut off by dykes. In the middle reach, controlled flood storage areas (GOGs) are being developed, while in the upper and lower reaches free connections are restored, creating opportunities for wetlands, grasslands, and riparian forests.

Since 2015, planning has advanced through a spatial implementation plan (GRUP) and a subdivision into three sub-areas: Zammelsbroek, Tussen Hellebrug en Herenbossen, and Ter Borght–De Merode. Works are ongoing in Zammelsbroek and Hellebrug–Herenbossen, with dike modifications, creation of winter beds, reconnection of tributaries, and restoration of wetlands. The Ter Borght–De Merode section is progressing administratively, with environmental procedures under way. By 2024–2025, public information points and guided visits confirmed the transition to implementation on site.

The project is managed by De Vlaamse Waterweg nv and the Agency for Nature and Forest (ANB), within the broader valley programme “Het Grote Net(e)werk” led by the Province of Antwerp. This coalition aligns flood protection, water quality, and ecological objectives across about 900 ha along 30 km of river. Funding is supported by the SigmaPlan and the Flemish Blue Deal (2025–2029). Implementation requires addressing sediment and water quality constraints but is expected to deliver multiple benefits: improved flood safety, reconnected habitats, and increased resilience of the Grote Nete valley.

Photo Gallery



Location

51.05243, 4.44343

Project

NWRM

National ID

Belgium_02

Sector

Hydromorphology

Installation Date

2005-2012

Implementation status

Completed

Contact

Heather Williams and Chris Binje, AMEC

Overview

Location of the project

The measure is located along the floodplain of the Grote Nete, between the towns of Oosterlo and Nijlen, in northern Belgium.

Country

Belgium

NUTS2 Code

Prov. Antwerpen

Sponge measures implemented in the case study

Wetland restoration and management

Floodplain restoration and management

Stream bed re-naturalisation

Objectives

Increase storage from 6.6 to 8.4 Mm^3; create ~850 ha of wet nature; re-establish river–floodplain connectivity (free upstream/downstream; controlled in mid-reaches). Land acquisition of ~650 ha anticipated in early plan phase.

Involved partners

Authority type	Authority name	Authority role	Comments
Other	Waterwegen en Zeekanaal NV	Implementation	As steward of the waterways WenZ has overall responsibility for the project, from initiation of the measures and development of the plan to the actual implentation.
Other	Agentschap voor Natuur en Bos	Other	Involved in the development of new nature areas and wetlands.
Other	Vlaamse Landmaatschappij (VLM)	Other	Consulted in relation to changes to agricultural activities.
Other	Departement Ruimtelijke Ordening, Woonbeleid en Onroerend Erfgoed (RWO)	Other	Supports the spatial implementation of the project.

Site Information

Climate Zone

Cool temperate moist

Precipitation

800.00 mm

Temperature (°C)

10.90 °C

Elevation range

5 m

Vegetation class

Valley wetlands: extensive marsh and reedbeds, wet meadows, willow scrub; alluvial alder–ash forests (Habitat 91E0) and open-water/pond mosaics (notably in Zammelsbroek).

WFD Ecological status

Bad

WFD Chemical status

Failing to achieve good

Water quality status

Legacy heavy metals (As, Cd, Hg, Co) in sediments/dykes; radiological legacy (Grote Laak: radium; Molse Nete: americium/polonium); nutrient loads; past channelisation/dykes degrade hydromorphology.

Design and Implementation

Project scale

Large

Project scale specifications

A river-valley project across multiple municipalities, combining controlled flood areas and free reconnection measures at sub-basin scale.

Project area

1,700 ha

Area subject to Land use change or Management/Practice change (ha)

898.00 ha

Size

898.00

Size unit

ha

Principles

Multifunctionality: flood-safety + nature restoration. Measures include floodplain reconnection (free & controlled GOGs), dike lowering/removal, winter bed creation, reconnection of tributaries, and wetland/forest restoration.

Constraints

The implementation of restoration measures in the Grote Nete valley is constrained by factors such as altered hydrology from past drainage systems, specific soil and water conditions required for target habitats, flat topography that affects water flow, past land use impacts, and seasonal weather patterns that influence the timing and effectiveness of restoration works.

Favourable preconditions

Only very limited development in the concerned area.
The areas to be included were originally the floodplain of the Grote Nete, so are well suited to restoration to their original purpose
Flat Kempen sand valley with river-dune features favours space for water; widespread historic dykes/drainage and mixed ownership complicate works; contaminated sediments/radiological legacy require strict controls during earthworks.

Financing

Total cost

2450000.00 €

Total cost information

An early estimate put the Oosterlo–Itegem reconfiguration at 2005 prices. Cost includes costs for infrustructural changes and land purchase.
SigmaPlan was ~€1.5 billion (2020 estimate).

Costs operation maintenance information

The measure will reduce the recurring costs for dyke maintenance, but the cost for nature conservation will rise.

Economic costs, income loss

2000.00

Economic costs, income loss - unit

€/ha

Information on Economic costs - income loss

The overall Sigmaplan foresees in a compensation of 2000 euros per ha for land users directly affected by the measures and compensation of 1000 euros per ha for land users not directly affected by the measure but who voluntarily make their lands available within the framework of the NWRM (for example as part of land exchange schemes with directly affected farmers). The land owners will get an allowance of atleast 20%. When the land owner and land user are the same, both compensations can be cumulated.

Financing authorities

Type of funding	Comments
Sub-national funds	Funds provided by the Flemish government.

Compensations

Yes

Compensations scheme information

The accompanying agricultural support measures are set under the framework of the Sigmaplan: - Support with identifying of exchange lands or company relocations
- Extra time to transform the company by phasing the works
- Border corrections to assure the liveability of companies by for example excluding lots with construction - Appealing retirement scheme
- Financial support for changing land-use from arable to pasture

Policy and Governance

Policy description

This project aims at the large-scale restoration, development, and sustainable management of alluvial forests (90%), primarily through natural reforestation, as well as smaller areas comprising high-value open habitats (10%). Within SigmaPlan (flood protection + ecosystem restoration). Spatial planning via GRUP (Startnota 17 Dec 2021; public consultation Jan–Mar 2022). Delivery led by De Vlaamse Waterweg & ANB, embedded in the Province of Antwerp's strategic project "Het Grote Net(e)werk". Core problem: high flood risk + degraded river–floodplain habitats; obligations under WFD/Natura 2000.

Land ownership

Mixed tenure: Flemish public bodies (ANB & De Vlaamse Waterweg) own/manage key parcels; NGO Natuurpunt holds reserves. Many plots remain private : ANB is acquiring remaining private lands in Zammelsbroek.

Policy targets

Increase Water Storage

Improved Biodiversity

Target remarks

Main targeted problem is the high flood risk in the area.

Part of a wider plan

Yes

Wider plan

Wider plan type	Wider plan focus	Name	Comments

Catchment-based	Water	SigmaPlan	The SigmaPlan is a catchmentbased program for the river Scheldt. It was initially intended to mitigate the problems for tidal related floodings, but has since evolved to also include overall water safety measures.

Public consultation

No

Consultation activities

Activity stage	Activity type	Comments
Design phase	Meetings during planning phase	Meetings have been organized with all interested parties, including information provided through local city halls.
Implementation phase	Newsletters for residents	Regular newsletters have been made to inform interested parties of the progress of the project.
Implementation phase	Comprehensive website	On the website detailed animated videos can be found about what is going to happen including reasons for actions taken.
Implementation phase	Individual consultation with landowners	Individual consultation is held with each landowner to develop the best solutions

Has contractual arrangements

No

Impacts and Monitoring

Impact Assessment Methodology

Performance impact assessment method

Laboratory

Performance impact estimation information

The scheme performance has been modelled.

Socio-economic Impacts

Direct benefits information

The social benefit of obtaining a self-maintaining estuary of the Scheldt and reducing flood risk.

Ancillary benefits information

Social benefit of creation of a natural area of a significant size (recreational value) ; indirect positive outcome to the economy through creation of recreation opportunities. Tourism is promoted in the area.

Biophysical impacts: Hydrology

Hydrological effects

The project reconnects floodplains, slows water flow, boosts infiltration, and filters pollutants—reducing floods, improving water retention, and enhancing water quality.

Information on retained water

The retention capacity of the floodplain will be 8.4 million m3.

Information on increased water storage

The retention capacity of the floodplain was previously 6.6 million m3, so the implementation of the scheme represents an increase of 1.8 million m3.

Runoff reduction

27.00

Runoff reduction unit

% Percent

Information on runoff reduction

Predicted by hydraulic modelling.

Biophysical impacts: Biodiversity

Improved biodiversity

Yes

Information on improved biodiversity

Yes, new wetlands will be created on formerly agricultural land. Vegetation will change, with associated changes to soil and habitats for plants and animals

Biophysical impacts: Water & Soil Quality

Water quality overall improvements

Neutral impact-no change in WQ status

Information on water quality overall

This has not been considered in detail in the study, although some effects on water quality may be expected through the creation of wetland habitat, in relation to sediment deposition and pollutant retention.

Soil quality overall improvements

Neutral impact-no change in SQ status

Information on soil quality overall improvements

The lands that will be made accessible to the water in the future have a higher probability of being influenced by pollutant deposition from the river. However, this has not been quantified.

Biophysical impacts: Others

Ecosystem impact climate regulation

No information available

Lessons Learned

Key lessons

Integration of the project under the larger Sigmaplan enabled the project communication to go smoother and inter-agency communication was already established through the overarching plan.
Allowing long timescales is important and allows for the optimal outcome to be achieved, by allowing landowners greater flexibility.

Barriers

Barrier type	Barrier role	Comments
Attitude of the public	Main barrier	There are limits to the social support for large infrastructural changes with local communities, nearby residents, farmers etc. However the scale and government-backing of the Sigmaplan programme allows for extensive consultation to take place, as well as a compulsory purchase scheme if a voluntary agreement cannot be reached
Other	Secondary barrier	Time consuming, due to the wide variety of studies (very multidisciplinary)

Drivers

Driver type	Driver role	Comments

Past flooding events	Main driver	Re-evaluation of flood risks (including expected climate change)
Other	Secondary driver	Reinstatement of the estuary of the Scheldt as a self-sustaining ecosystem

Success factors

Success factor type	Success factor role	Comments
Successful coordination between authorities	Main factor	As this project is part of the Sigmaplan, overarching consulting pre-existed prior to the project within the sectoral consultation bodies (agriculture, nature, government, ...). This enabled to get all local stakeholders involved as well in an early phase to successfully coordinate any issues during the design phase.
Conducted assessments (incl. economic)	Main factor	Although time consuming, the preceding studywork (reports regarding effects on agriculture and nature development, details of ground- and surface waters, ...) lead to a complete development plan which enhanced coordination greatly.
Specific incentives for stakeholder involvement	Main factor	The Sigmaplan has a comprehensive approach to consulting with stakeholders and finding solutions to allow the measures to progress on their land

Transferability

The restoration measures used in the Grote Nete valley are transferable to other lowland river systems with similar conditions, such as altered watercourses, degraded wetlands, and historical land use pressures.

Sources

Sources

Projectbrochure Vallei van de Grote Nete

Sigmaplan - Vallei van de Grote Nete

Project Nieuwsbrief - Vallei van de Grote Nete

Flankerend landbouwbeleid: Begeleiding van actieve landbouwers in Sigmagebieden.

Vallei Grote Nete Leaflet

LIFE Grote Nete

Environment and Climate: Commission invests EUR 281.4 million in new environment and climate projects

Zin om samen met een bevlogen gids de vallei te bezoeken?

Netebekken – Wateruitvoeringsprogramma