Timonchio site, Italy

Year of issue

2026

Summary

The Timonchio Retention Pond was implemented in 2019 within the LIFE BEWARE project as an innovative response to increasing drought risk and climate variability in an agricultural landscape. The intervention consists of a retention pond covering approximately 0.295 ha and connected to a watershed of around 110 ha.

The pond was designed to store runoff during wet periods and make water available for agricultural uses during drought conditions, while simultaneously reducing flood risks and creating new ecological habitats. The measure directly benefits approximately 16 ha of agricultural land through improved irrigation reliability.

The project emerged from strong cooperation among public authorities, farmers and water managers, demonstrating how collaborative governance can facilitate the implementation of nature-based solutions in agricultural areas.

Photo Gallery



Location

45.695, 11.405833333333

Project

SpongeScapes

Sector

Hydromorphology

Installation Date

2019

Implementation status

Completed

Overview

Location of the project

The Timonchio site (see case studies "Municipality of Santorso sites, Italy" and "Agripolis site, Italy) is located near the Venetian Pre-Alps, crossed by the Leogra and the Timonchio rivers and artificial channels crucial for historical manufacturing, irrigation, and runoff control. The case study is located in the Veneto region that signed the Mission Charter of the EU Mission on Climate Adaptation.

Sponge measures implemented in the case study

Basins

Ponds and scrapes

Objectives

The main objective of these case studies is to analyse the impacts of the widespread adoption of the sponge measures in such a heterogeneous, anthropised environment. The co-benefits and trade-offs associated with these interventions will also be analysed, taking into account their economic implications for local stakeholders.

Involved partners

Authority type	Authority name	Authority role	Comments
Other	Municipality of Marano Vicentino	—	-> Which benefits from the hydraulic risk reduction service. -> Project promoter.
Other	Alta Pianura Veneta Reclamation Consortium	Implementation	-> Which manages the sponge measure. -> Construction management and maintenance.
Other	The Veneto Region Agency for Innovation in the Primary Sector (Veneto Agricoltura)	—	-> Which designed and realised vegetation planting.
Research institute / University	University of Padua	—	Department of Land, Environment, Agricultura and Forestry
Private property owners	Local farmers and landowners	—	—

Financing

Costs investment information

Initial investment: €184 000 for construction.

Annual expenses: €17 190 =
-> Routine vegetation maintenance: mowing costs 12 690 €/year
-> Ordinary maintenance: cleaning and sluice management 3 500 €/year
-> Extraordinary cleaning: cleaning interventions 1 000 €/year

Long term expense: There is a long-term extraordinary maintenance cost of €25,000 every 30 years for geomembrane replacement.

Ongoing costs: Regular monitoring costs are expected to be high but have not yet been quantified.

Policy and Governance

Part of a wider plan

Yes

Public consultation

No

Has contractual arrangements

No

Impacts and Monitoring

Monitoring System

Monitoring parameters

The basin has been monitored since 2020 to analyse its effectiveness in flood mitigation.

Socio-economic Impacts

Benefits and co-benefits

The Timonchio retention pond provides approximately 2,288 m³ of storage capacity and supplies water to around 16 ha of agricultural land, thus enhancing agricultural resilience. By increasing water availability during drought periods, the intervention reduces farmers' vulnerability to climate extremes and helps maintain agricultural productivity. Some estimates (source: Project LIFE) claim that avoided drought-related losses may exceed €250,000 during severe drought events, highlighting the significant economic value of water retention measures.

The retention pond has generated substantial ecosystem services, including ecological improvements alongside its water management functions.
The measure has generated substantial biodiversity improvements through the creation of aquatic and riparian habitats. Monitoring activities documented the establishment of eight new bird species and four amphibian species, together with the planting of more than 2,200 native plants. These results demonstrate the capacity of water retention measures to support habitat restoration and biodiversity conservation.
The intervention also contributes to flood risk reduction by temporarily storing runoff during heavy rainfall events, providing benefits to downstream communities and agricultural land.

Biophysical impacts: Biodiversity

Information on improved biodiversity

-> Aquatic Habitat Restoration: Restored habitat area (0.295 ha)
-> Riparian Habitat Restoration: Included in project area
-> Biodiversity Enhancement: + 12 species
-> Vegetation Restoration: 2,200 plants of 8 species

Lessons Learned

Barriers

Barrier type	Barrier role	Comments
Lacking financing sources	Main barrier	The principal challenge was the relatively high upfront investment required for construction. Long-term monitoring activities also require dedicated resources that are often difficult to secure after project completion. Experience gained during implementation suggests that some vegetation species could have been better adapted to local conditions.

Drivers

Driver type	Driver role	Comments
Past flooding events	Main driver	In Veneto, Italy, floods, landslides, and erosion have significantly affected the region. Municipalities face increased flood risks due to rising land consumption, more in northern Italy. Santorso and Marano Vicentino, in Vincenza's north, use sponge measures to counter pluvial flooding and improve rainwater management.

Success factors

Success factor type	Success factor role	Comments
Attitude of relevant stakeholders	Main factor	The most important success factor was the strong collaboration established among farmers, the Municipality of Marano Vicentino and the Alta Pianura Veneta Reclamation Consortium. Clear agreements regarding land availability, construction responsibilities and long-term management enabled the intervention to be implemented efficiently and accepted by local stakeholders.

Transferability

Recommendations for Replication:
Future projects should prioritise stakeholder engagement from the earliest planning stages and establish clear maintenance responsibilities before implementation. Particular attention should be devoted to ecological design and species selection, as these decisions strongly influence long-term performance and maintenance requirements.

Policy Recommendations:
Dedicated funding schemes are needed to support post-project monitoring and maintenance. Policy frameworks should also encourage collaborative governance arrangements involving farmers, municipalities and water authorities, which proved essential for the success of this intervention.