OPTAIN : Cherio river basin [Italy]

Year of issue

2025

Summary

The Cherio River basin is located in the eastern part of Bergamo province, Lombardy region. It extends from the pre-alpine reliefs to the irrigated plain area, down to the confluence of Cherio River into Oglio River. The catchment area is about 153 km2, broken down mainly into forest (42%) and agricultural (39%) land. The territory is vulnerable to overflows and flooding events, which requires constant reclamation activities. Moreover, the increasing water withdrawals from Cherio River for industrial and agricultural purposes compromises the possibility to ensure environmental flows, especially during summer and drought periods. Pollution from nitrogen, phosphorus and wastewaters finally contributes to deteriorate the overall water quality.

OPTAIN seeks the involvement of local actors to identify strategies and solutions for an efficient water management, aimed at ensuring quali-quantitative standards to safeguard natural and aquatic habitats and to support an agricultural system deeply dependent on water resources.

Photo Gallery













Location

45.7, 9.85

Project

OPTAIN

National ID

IT_05

Sector

Agriculture

Implementation status

Modeled

Contact

University of Milan, Dept. of Agricultural and Environmental Science

Overview

Location of the project

Cherio River Basin

Country

Italy

NUTS2 Code

Lombardia

Sponge measures implemented in the case study

Traditional terracing

Natural bank stabilisation

Basins

Buffer strips and hedges

Cover crops

Objectives

Hopefully, the overall results of OPTAIN can serve as a decision support tool to stimualte the (wider) implementation of measures, overcoming bottlenecks and current weaknesses in this direction, and to contribute in drafting/providing policy guidelines

Involved partners

Authority type	Authority role	Comments	Authority responsibility
Farmers	Initiation of the measure	Potentially: agricultural measures implemented and managed mainly and directly by farmers; interventions on river restoration are of initiative of other subjects (land mangers, water managers, public authorities). Ponds may be realized at single farms, collectively by a group of farmers and/or land managers	Responsible

Documents

9_Cherio_UMIL_for website.pdf (1.09 MB)

Site Information

Climate Zone

Warm temperate moist

Precipitation

1200.00 mm

Temperature (°C)

14.00 °C

Evapotranspiration

532.00 mm

Runoff

733.00 mm

Elevation range

232-1380 m a.s.l.

Slope range

3.16% (agricultural land) - 47.04% (forest land). Average 22.27%

Soil type

Cambisols

Luvisols

Groundwater level

not applicable, few data available

Vegetation class

The case study area is mostly covered with forest vegetation in its upper part, while cropland dominates the lower (plain) part of the basin. Most of potential NSWRM are implemented on cropland or in marginal areas along watercourses, while terraces are concentrated in hill and mountain areas currently covered with forest/woodlands because they are largely abandoned and not well maintained. Vegetation cover changes thus depend on the type of NSWRM activated: it does not changes in case of drought-resistant crops; it changes to grassland in case of river restoration (i.e. wetlands) and to grass/shrubs/deciduous trees in case of riparian buffers, and assumed to change to permanent crops in the case of terraces. In case a pond is implemented, arable land changes to a pond

WFD Ecological status

Poor

WFD Chemical status

Failing to achieve good

Design and Implementation

Project scale

Meso

Project scale specifications

catchment scale modelling

Project area

153 km2

Project area specifications

Rural/agricultural area covers nearly 40% of the catchment, forests covers ca. 42%

Policy and Governance

Land ownership

Potential sites for the implementation of measures are on agricultural land (arable land), forest areas and marginal lands along watercourses. Land ownership varies across potential sites (either individually-owned (farmers/landowner)or collectively-owned

Policy targets

Pollutants Removal

Improved Biodiversity

Groundwater Recharge

Requirement directive

Requirement directive
Water Framework Directive (WFD) 2000/60/EC

Policy challenges requirements

There has been an increase in severe droughts and extreme rainfall events, leading to floods in both urban and agricultural areas. The area is also suffering from pollution of both urban and agricultural origin.

Part of a wider plan

No

Public consultation

Yes

Consultation activities

Activity stage	Activity type	Key issues	Comments
Screening phase	MARG workshop	Stakeholders were involved throughout the project: farmers (represented by farmers union), land and water managemers (e.g. local reclamation and irrigation board), regional authorities (various DGs), local communities/associations.	Discussions about the POTENTIAL implementation of measures only

Has contractual arrangements

No

Impacts and Monitoring

Maintenance

Maintenance requirements

N/A, no single measures are implemented at real sites.

Biophysical impacts: Water & Soil Quality

WFD ecological status obj quantity

Natural surface waters (river and lake): poor or moderate

Lessons Learned

Barriers

Barrier type	Barrier role	Comments
Attitude of relevant stakeholders	Main barrier	Generally speaking, main barriers to implement agricultural measures relate to the reluctancy of farmers in changing their habits/mindsets.
—	Secondary barrier	To the relatively high implementation and maintenance costs to sustain (some measures may not be adequately subsidized or financed).
Other	—	The amount and quality of technical means and training at disposal

Drivers

Driver type	Driver role	Comments
Organisation committed to it	Main driver	Support availed and advisory services, farm structure and characteristics, farm ownership