OPTAIN : Petite Glâne River Basin [Switzerland]

Year of issue

2025

Summary

The case study area “Petite Glâne” belongs to the Broye catchment in the southwestern part of the Swiss Plateau. The river Petite Glâne is about 30 km long, repeatedly crosses borders between the cantons of Vaud and Fribourg, and has a catchment area of 94 km2. Its upper reaches have remained fairly natural and are lined with forest, whereas its lower reaches in the Broye plain have been canalized and straightened. The soils and climate here are highly suitable for arable farming. Overall, the catchment of the Petite Glâne is strongly characterized by agriculture: nearly three quarters of its area consists of pastures and cropland. However, the region is increasingly experiencing water shortages in summer, and there is often not enough water in the Broye and Petite Glâne to irrigate the fields. Climate change will further aggravate the situation. Farmers are therefore considering new options to mitigate the increasing drought events – for example an irrigation project using water from Lake Neuchâtel.Against this background, OPTAIN explores efficient land use and land management strategies as well as technical measures that increase the capacity of soils to absorb and store water while improving nutrient retention and decomposition. These natural and small water retention measures (NSWRMs) are discussed and evaluated jointly with regional stakeholders.

Based on model calculations, OPTAIN works to determine the maximum possible water and nutrient retention potential that can be achieved with NSWRMs if they are optimally combined and positioned in the catchment. Although the focus is on the Petite Glâne, the case study extends to the entire Broye catchment when it comes to modelling and stakeholder involvement.

The OPTAIN project supported the case study team with identifying and developing efficient land management strategies and small technical solutions to improve the soils’ infiltration and water holding capacities as well as its capacity to filter, buffer and transform pollutants.

Photo Gallery



Location

46.83664, 6.8997

Project

OPTAIN

National ID

CH_04

Sector

Agriculture

Installation Date

OPTAIN project: 2020-2025

Implementation status

Modeled

Overview

Location of the project

Swiss Plateau

Country

Switzerland

NUTS2 Code

Espace Mittelland

Sponge measures implemented in the case study

Minimum tillage

Strip cropping along contours

Intercropping

Buffer strips and hedges

Involved partners

Authority type	Authority name	Authority role	Comments
Research institute / University	Centre for Development and Environment	Determination of design details of the measure	In coordination with the following stakeholders: Authorities of the agricultural sector, authorities of the environment sector, famer associations, local farmers, NGOS, and AGRIDEA

Documents

2_Petite_Glane_Poster_CDE.pdf (1.69 MB)

Site Information

Climate Zone

Cool temperate moist

Precipitation

1100.00 mm

Temperature (°C)

9.00 °C

Evapotranspiration

650.00 mm

Runoff

350.00 mm

Elevation range

Petite Glâne: 429 – 820 m.a.s.l. Broye: 429 – 1513 m.a.s.l.

Slope range

moderate (6 - 10%)

Soil type

Cambisols

Luvisols

Vegetation class

The predominant vegetation in the catchment area comprises grass turf and dryland grasses.

WFD Ecological status

Moderate

WFD Chemical status

Unknown

Water quality status

Moderate: Some deviation from natural conditions, but functional.

Design and Implementation

Project scale

Micro

Project scale specifications

Micro and Meso-scale

Project area

Petite Glâne: 94 km2 Broye: 602 km2

Project area specifications

Agriculture, pasture

Financing

Total cost

1263155.13 €

Policy and Governance

Land ownership

Most land is owend by local farmers

Policy targets

Improved Biodiversity

Part of a wider plan

Yes

Public consultation

No

Consultation activities

Activity stage	Activity type	Key issues
Screening phase	MARG workshop	The project involves a Multi-Actor Reference Group (MARG) composed of farmers, local and regional authorities, NGOs, and researchers to co-develop realistic solutions tailored to regional challenges. Engagement with local communities and stakeholders.

Has contractual arrangements

No

Impacts and Monitoring

Maintenance

Maintenance requirements

Reforestation and afforestation projects along the river Water quantity (permanent) and quality (single samples). Drought Resistnat Crops: Maintenant Costs (for 0.22ha: CHF 1450.- per year)