Reconstruction of the hedgerow on the Léguer basin

Year of issue

2025

Summary

The Léguer River catchment is one of the most hedged areas in Brittany, but has suffered a decline in its hedgerow mesh as a result of agricultural mechanization and land consolidation operations. Faced with the degradation of the Leguer's water quality observed in the 1990s, elected officials in the watershed became aware of the need to preserve the hedgerow, and to consider its restoration to improve water quality. Since 1999, the Leguer's watershed committee undertook awareness-raising of the watershed population, before experimenting with the restoration of hedges and embankments in several pilot basins.

This work was then extended to the entire watershed, leading to the restoration of hundreds of kilometers of hedges and embankments. This action is still ongoing today (with new hedges planted every winter), however no longer managed at the whole basin scale but by different intermunicipalities.

It aims in particular to ensure the sustainability of existing linear thanks to urban planning tools and the promotion of hedged farmland.

A complementary action comes with the river management (as the Léguer is labellized "Wild River"), which includes riparian forest restoration to create shade on the river and reduction of the risk of water heating, purification processes, biodiversity of the watercourse, etc.

The developpment of agroforestry and intercropping is also being studied to further the agricultural practices evolution in the basin.

Photo Gallery














Location

48.5865, -3.392

Project

NWRM

National ID

France_15

Sector

Agriculture

Installation Date

1999-ongoing

Implementation status

Ongoing

Overview

Location of the project

The Leguer is a coastal river of the Côtes d'Armor that flows into the Bay of Lannion, and whose basin has a historically dense hedgerow mesh.

Country

France

NUTS2 Code

Bretagne

Sponge measures implemented in the case study

Buffer strips and hedges

Agroforestry

Intercropping

Forest riparian buffers

Objectives

The main objective of the project was to improve water quality and control erosion. Limiting runoff allows water to stay longer before reaching the watercourses, giving time to natural processes to occur to purify the water by soil microorganisms or light.
Secondly, the restoration of hedged land is of interest for biomass supply, biodiversity conservation, carbon sequestration, renewable wood production, for the wind-breaking role of hedges, livestock protection and landscape restoration.

There has been some quantified objectives (eg. linear length of hedges planted) but not for the whole project.

Involved partners

Authority type	Authority name	Authority role	Comments	Authority responsibility
Local water authority	Lannion Trégor Communauté (LTC)	Implementation	A mutli-municipality administration, common organisation in France to gather resources to manage technical topics such as water, waste and other topics.	Responsible
Local water authority	Comité bassin versant du Léguer (CBVL)	Initiation of the measure	Former authority on this project.	Responsible

Authority type	Authority name	Authority role	Comments	Authority responsibility
Architects / Engineers	—	Implementation	Various civil engineering and forestry companies	Supporting
Local water authority	Guingamp Paimpol Agglomération (GPA)	Implementation	A mutli-municipality administration, common organisation in France to gather resources to manage technical topics such as water, waste and other topics.	Responsible

Site Information

Climate Zone

Cool temperate moist

Temperature (°C)

11.40 °C

Elevation range

167 m

Vegetation class

This is a highly hedged landscape ("bocage"), with approximately 150 linear meters of hedges per hectare.

WFD Ecological status

Good

WFD Chemical status

Failing to achieve good

Water quality status

Eutrophication issues due to agricultural activity.

Design and Implementation

Project scale

Large

Project scale specifications

The project is covering the entire Léguer river basin and specific research were conducted on sub-catchments.

It also initiated a 'Hedgerow' label, certifying the proper management of hedgerows within a territory, with a national recognition.

Project area

50 000 ha

Project area specifications

More than 300 km of planted or restored hedges and embankement, actively growing every year.

Principles

A voluntary collaboration with farmers. Co-developing a hedgerow management plan with them.

Favourable preconditions

The landscape is historically hedged. There is a cultural commitment among farmers, and we know that hedges will be effective.
The planting of hedges helps to fight against erosion and improve the quality of surface water. The many co-benefits of this measure have contributed to the progressive extension of the restoration program to the entire watershed.

Financing

Total cost information

Total hard to stimate as it depends every year and spans accross different institutions.

Local fundings provided by water providing authorities and complemented by external sources (European, national, regional).

Financing authorities

Authority name	Type of funding	Comments	Financing share
European Union	EU-funds: Rural development funds	Contributes to the external subventions of about 70% (varying % each year)	70%

Authority name	Type of funding	Comments	Financing share
Conseil général des côtes d’Armor (Department)	Sub-national funds	Contributes to the external subventions of about 70% (varying % each year)	70%
Loire-Bretagne Water Agency	—	Contributes to the external subventions of about 70% (varying % each year)	70%
Bassin Versant Vallée du Léguer (BVVL)	Local funds	Former local catchment water authority that implemented the measures	30 %
Intermunicipalities (EPCI Lannion Trégor Communaté (LTC) and Guigamp Paimpol Agglomération (GPA)).	—	Currently carrying out the measures.	30 %

Compensations

No

Compensations annual information

There was no need for compensations as there were no actual loss for the occupied surfaces, which remain under CAP fundings.

Policy and Governance

Policy description

The Léguer River catchment area is one of the most hedgerow territory in Brittany, with an average 150 meters of hedge per hectare. However, this hedgerow has been gradually eroded as a result of agricultural mechanization and land consolidation, as well as the phasing out of hedge and slope maintenance seen as a cost without any benefit. This decline was estimated at a loss of 3 linear meters per hectare per year.

In Brittany, 80% of drinking water comes from surface water pumping, which makes this resource fragile and sensitive to diffuse or point pollution. Several water intake points were closed in the mid-1990s due to significant water quality degradation. Due to the positive influence that hedgerow can have on the quality of surface water, policies for the preservation and restoration of hedgerow have emerged in the region.

Land ownership

Mostly private farmland (farmers/landowners); plus public roadside hedges managed by communes.

Policy targets

Pollutants Removal

Erosion Control

Runoff control

Peak-flow reduction

Oher Societal Benefits

Target remarks

Improve water quality and curb erosion; restore hedges/embankments basin-wide (~300 km restored since 1999).

Pressure remarks

Water quality issues and the loss of cultural history of the landscape were the main pressures that motivated the project.

Part of a wider plan

Yes

Wider plan

Wider plan type	Wider plan focus	Name	Comments
Regional	Environment & Biodiversity	"Breizh bocage"	The programme aims at the Brittany region level to enhance protection and restoration of hedgerow landscapes.

Public consultation

No

Has contractual arrangements

Yes

Contractual arrangements

Arrangement type	Responsibility	Role	Comments

Contractual agreement	Agreement between the land owning farmer and the implementing authority.	The implementation authority takes care of the maintenance the first 3 years after plantation of a hedgegrow in the farmer's land. The farmer continues after that. He is the owner of the biomass produced (wood).	The maintenance of the hedgrowth follows an official Sustainable Hedgegrowth Management Plan (Plan de Gestion Durable des Haies or PGDH), which is concieved for the farmer by the public authority for free.

Impacts and Monitoring

Monitoring System

Monitoring requirements

The project does not implement monitoring of the flow and water level of the Leguer.

Monitoring parameters

Only short studies, limited in time and space were carried out/

Betwenn 2000 and 2002, the Comité du Bassin Versant du Léguer (CBVL) conducted a study of the Kervulu watershed (pilot basin) to assess the effect of hedgerow restoration and changes in practices on water quality.

The Leguer hedgerow project, led by INRA (UMR BAGAP), aimed to evaluate the role of the hedge as a shelter for auxiliary fauna, both through the in situ assessment of hedge biodiversity at the hedge and farm levels, and through the analysis of the ecological connectivity of the landscape and the establishment of ecological networks in planning documents.

Maintenance

Maintenance requirements

Clearing out seedlings so that smaller ones can grow without being buried. Pruning growing trees to match desired growth.

Impact Assessment Methodology

Performance impact assessment method

Catchment outlet

Performance impact estimation information

A pre-configuration study was conducted to assess the effect of hedgerow restoration and practice changes on water quality.

Cost assessment method

No cost assessement was studied, no other measures were considered.

Socio-economic Impacts

Direct benefits

An economic benefit comes from the sale of wood, purchase and drying to sell in wood chips to equipped communities.

Energy-wood production in the basin was estimated in 2019 as € 980,000 yearly, 39 % of which is from the bocage part.

Ancillary benefits information

Carbon storage in the bocage elements of the Léguer basin as an ecosystemic service was estimated in 2018 as € 54 millions + € 1.2 million for annual additional captation.

Biophysical impacts: Hydrology

Hydrological effects

The hydrological response to rain event seems longer than river basins with no action on hedgerows. Farmers also report complete stop of mud flows in lower areas of the fileds which were previously common problem.

Information on runoff reduction

Runoff is slowed down by the bocage landscape.

Information on reducing flood risks quantity

During floods, it was observed that the hydrological behaviour of the Leguer appeared less reactive than that of other nearby rivers that had not been the subject of such a restoration program.
In addition, farmers report that they have noticed the disappearance of mud flows on the lower part of their fields following the creation of hedges that break the slope.

Biophysical impacts: Biodiversity

Improved biodiversity

Yes

Information on improved biodiversity

Monitoring (Léguer Bocage Project) has demonstrated the role of hedgerows as refuge habitats for biodiversity. Urbanistic plans include the hedgegrowths as ecological corridors (Trame Verte & Bleue).

Biophysical impacts: Water & Soil Quality

Water quality overall improvements

Positive impact-WQ improvement

Information on water quality overall

The study carried out in the Kervulu basin showed that the sub-basins that had been the subject of restoration of the hedgerow coupled with the adoption of rationale weed control practices contributed less to pollution (in particular phosphorus and pesticides) of surface water than the other basins.

Overall, a reduction of chemical and nutrient pollution has been found.

Information on water quality Improvements (N)

Since the 2000s, an improvement has been observed on the nitrate parameter, while it was increasing in the 1990s.

Information on water quality improvements (W T°)

Water heat is limited with the shading provided.

Biophysical impacts: Others

Information on ecosystem impact GHG soil carbon

Hedgegrowth annual captation : 19,982.99 tons eq.CO_2

Hedgegrowth annual stock : 713,829.98 tons eq.CO_2

Lessons Learned

Key lessons

The area was primarily the subject of consolidation actions to increase size of fields by agriculture authorities. This led to an important destruction of hedgerows and some farmers were therefore reluctant to replant hedges shortly after.

The fact a wood energy sector using wooden chips elaborated using recovered wood from the maintenance of hedges has helped convince local stakeholders to engage at such a large scale. About 100 farmers out of 600 in the basin are volonteers in this project.

More than 300km of hedgerows and embankments have been restored in the basin, with around 20km more every year. The hedges reconstitutions are slowing down each year, but the volontary farmers are more motivated than ever.

A reduction of pollution has been found. The habitat role of hedgerows for agriculture auxilaries, made possible in oparticular with a diverse and good stratified hedge

The project has created a common dynamic towards preservation and restoration of hedges and embankment beyond farmers, including citizen and elected officials and created a territorial identity.

The project leader underline is important to watch not only the increase of the hedgerows but also their maintenance.

Barriers

Barrier type	Barrier role	Comments
Attitude of relevant stakeholders	Secondary barrier	Some farmers are reluctant to plant hedgerow lines soon after participating in land consolidation actions.
Attitude of relevant stakeholders	Secondary barrier	The increasing legal protection status of hedgegrowth causes increasing reluctance for farmers to create hedges on their land.
Other	Secondary barrier	Climate change provide more droughts events, which causes higher costs and difficulty to create hedges (young plants mortality).
Other	Secondary barrier	"Bocage" agricultural landscapes suits better livestock activities than cereal production. But the economic context is in favor of cereal planting.

Success factors

Success factor type	Success factor role	Comments

Attitude of relevant stakeholders	Main factor	High motivation of some farmers to participate in this project.Their sensitivity to biodiversity preservation and/or to bocage culture valorization.
Financing possibilities	Main factor	Access to various funds allowed this expensive measure to continue.

Transferability

Hedgerows are transferable to other agricultural landscapes, even those with few hedgerows, which offer a great opportunity to quickly create long linear lengthes of hedges.

Sources

Sources

Rapport de présentation, état initial de l’environnement

Retour d'expérience - Le programme Breizh Bocage au service de la restauration de l’eau

L’eau en Loire Bretagne, les trophées de l’eau en Loire Bretagne 2009

Le suivi de la qualité de l’eau

Bocage

Bocage et cultures : un mariage harmonieux sur le Kervulu

Le projet Léguer Bocage

Connaissance de la biodiversité liée au complexe bocager et applications pratiques sur le bassin versant du Léguer

Stratégie bocagère sur le bassin versant du Léguer période 2015-2020

Label Haie

Évaluation de la biodiversité des paysages bocagers et validation des outils de diagnostic

Lannion Trégor Communauté activity report 2023

Carnet de gestion d'une haie bocagère

Bassin-versant du Léguer : écosystèmes forestiers et bocagers Service écosystémique de séquestration du carbone

Bassin-versant du Léguer : écosystèmes forestiers et bocagers Service écosystémique d’approvisionnement en bois-énergie