COST Action CA15206

PESFOR-W

Payments for Ecosystem Services Forests for Water

Factsheets

Selected Case Studies on

Woodlands-for-Water Payments for Ecosystem Services

Executive summary

This report includes 6 factsheets for selected case studies where woodland planting has been applied as a tool to increase the water quality, with a focus on case studies where Payments for Ecosystem Services have been used to facilitate tree- and forest-based interventions for improved water quality.

The information in the factsheets has been collected within the framework of the COST action PESFOR-W (CA15206).

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Rennes—Acquiring land for planting protection forests

Site description and management

Land purchase and woodland planting is funded by the Eau du Bassin Rennais (water management board of Rennes' metropolitan area) to create a protective forest cover near agricultural plains. The goal is to protect local water sources by preventing chemicals from nearby agriculture to reach the water.

Since the introduction of the scheme, more than 70 ha of land have been afforested for water protection, with a cost of 6 300 €/ha (14 700 €/ha including land purchase). The nitrate concentrations in the water was successfully lowered by 20% as a result.

Over 10 years:

Protection costs (including agricultural measures)

= 0.16 €/m3 (1/4 due to woodland planting)

Costs avoided (changing the catchment)

= 1.50 €/m3

PES Scheme description

Service providers targeted: Private land owners or landholders

Who pays: Local Authority

Beneficiaries of the services: Local communities and farmers

Beneficiaries of the payments: Private land owners or landholders

Degree of voluntariness: Voluntary with free and informed negotiation (negotiated payments)

Type of ecosystems targeted

Natural forest

Uses of water targeted

Drinking Water

Water issues targeted

Water pollution

Management measures paid

Land purchase and afforestation

Status: Pilot
Established: 2013
Catchment: Rennes
More information: https://www.eaudubassinrennais-collectivite.fr
Link to repository: PESFOR-W Spatial Repository

Icons from www.icons8.com

Große Dhünn Talsperre

Große Dhünn-Talsperre, Foto: Peter Sondermann 2017

Site description and management

The Dhünn Talsperre reservoir is mainly used for drinking water extraction. Surrounding agricultural operations threaten the drinking water quality by nitrate and pesticide discharge draining into the reservoir. A belt of coniferous trees has been planted along the riperian edge of the water reservoir. Afforestation and reforestations were made with deciduous trees, mostly oak trees. An additional focus has been set on developing a dense forest edge for biodiversity reasons, but also to prevent pollution by wind erosion.

The area of the forest planted for water protection covers 760 ha of riparian forest.

PES Scheme description

Service providers targeted: Communal land or public and private land owners

Who pays: Public utilities company

Beneficiaries of the services: Local communities and households

Beneficiaries of the payments: Private land owners

Degree of voluntariness: Regulated and mandatory

Type of ecosystems targeted

Riparian and plantation forest

Uses of water targeted

Drinking Water

Water issues targeted

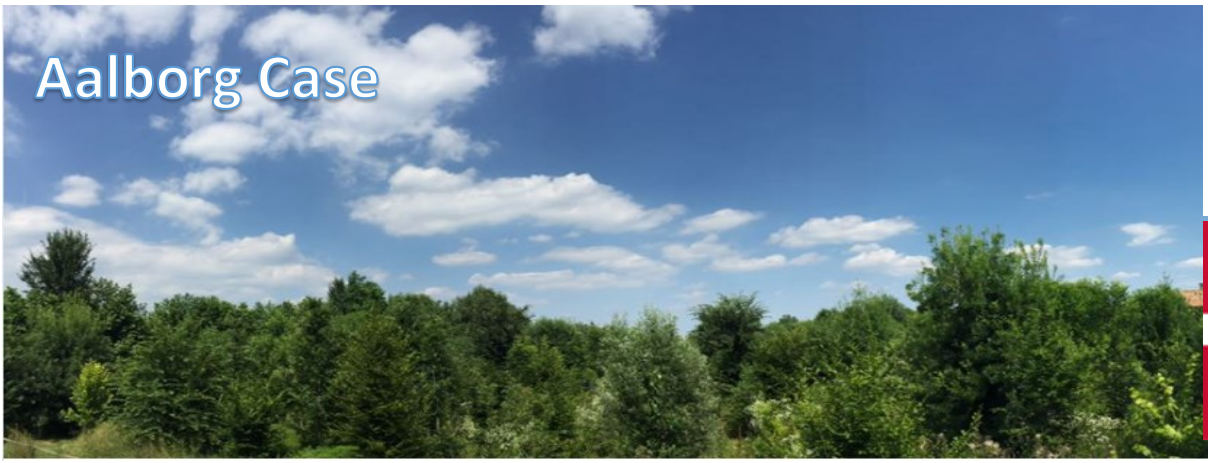
Nitrate/pesticide pollution

Management measures paid

Afforestation

Status: Active
Established: 1998
Catchment: Steinbachtal
More information: Große Dhünn Talsperre
Link to repository: PESFOR-W Spatial Repository

Icons from www.icons8.com



Site description and management

Drinking water in Denmark is 100% based on groundwater extraction. The groundwater near Aalborg had high levels of nitrate, caused by nearby intensive agriculture and resulting in a number of extraction wells having to close.

To reduce nitrate pollution of groundwater supplies, the local water company Aalborg Water Ltd has been making a one-off payment to farmers to refrain permanently from intensive farming and from the use of fertilisers and pesticides on land most vulnerable for groundwater recharge. Afforestation is used as permanent land use change to stop agricultural land use on areas close to water extraction points and to allow forests to take up nitrate from the soil.

Agreements with the water company are voluntary, but the water service has the possibility to impose regulatory restrictions if there is a significant threat of nitrate pollution of the groundwater aquifer.

Total land covered: 1500 ha

Total cost of payments: 21 € million

PES Scheme description

Service providers targeted: Private land owners or landholders

Who pays: Public water company

Beneficiaries of the services: Local communities and farmers

Beneficiaries of the payments: Local land owners

Degree of voluntariness: Voluntary with a regulation framework

Type of ecosystems targeted

Crop land

Uses of water targeted

Drinking Water

Water issues targeted

Nitrate pollution

Management measures paid

Afforestation

Status: Active
Established: 2002
Catchment: Interrim of Denmark East and West coast
More information: Aalborg water case study
Link to repository: PESFOR-W Spatial Repository

Icons from www.icons8.com

Brylle Water Forest

Site description and management

Drinking water in Denmark is 100% based on groundwater extraction. In order to protect the groundwater acquifers from agricultural pollution, the local water company of the Odense municipality, VCS Denmark, initiated a partnership with a private company, Hedeselskabet.

Their aim is to purchase farm land within vulnerable areas and implement afforestation measures. The costs of land purchase and afforestation measures are shared between VCS Denmark (60 %) and Hedeselskabet (40 %). The afforested land has to remain forest land in perpetuity according to Danish law and is managed by Hedeselskabet.

Since its establishment in 2017, 156 ha farm land has been acquired for afforestation. The forest is established with both water protection, recreation, amenity values and timber production in mind.

PES Scheme description

Service providers targeted: Private land owners or landholders

Who pays: Public-private partnership

Beneficiaries of the services: Local communities and farmers

Beneficiaries of the payments: Local land owners

Degree of voluntariness: Voluntary with free and informed negotiation (negotiated payments)

Type of ecosystems targeted

Crop land

Uses of water targeted

Drinking Water

Water issues targeted

Pesticide pollution

Management measures paid

Afforestation

Status: Active
Established: 2017
Catchment: Borreby wellfield, South-west of Odense
More information: Brylle—VCS Link
Brylle—Hedeselskabet
Link to repository: PESFOR-W Spatial Repository

Icons from www.icons8.com

Site description and management

Drinking water in Denmark is 100% based on groundwater extraction. In order to protect the groundwater acquifers from agricultural pollution, the local water company of the Odense municipality, VCS Denmark, initiated a partnership with the Odense municipality and the Nature Agency (Ministry of Agriculture and Food).

The afforestation projects involve a voluntary process of 'land consolidation', buying up agricultural land near vulnerable zones for groundwater recharge and swapping land purchased with local farmers for land within the vulnerable zones.

The costs of land purchase and afforestation measures are shared between the three partners with the majority taken up by the local water company VCS Denmark. The afforested land has to remain forest land in perpetuity according to Danish law and is managed by Hedeselskabet.

Since the establishment of the land consolidation process in 2001, 380 ha of land for afforestation has been acquired. The forest is established with both water protection, recreation, amenity values and timber production in mind.

PES Scheme description

Service providers targeted: Private land owners or landholders

Who pays: Public partnership

Beneficiaries of the services: Local communities and farmers

Beneficiaries of the payments: Local land owners

Degree of voluntariness: Voluntary with free and informed negotiation

Type of ecosystems targeted

Crop land

Uses of water targeted

Drinking Water

Water issues targeted

Pesticide pollution

Management measures paid

Afforestation

Status:	Active
Established:	2001
Catchment:	Borreby wellfield, South-west of Odense
More information:	Case study presentation
Link to repository:	PESFOR-W Spatial Repository

Icons from www.icons8.com

Bosco Limite Woodland Infiltration Area

Site description and management

Private land with an extension of 2.5 hectares which was previously used to grow maize was turned in to a Forested Infiltration Area (FIA) project called Bosco Limite, which comprises approximately 2,300 native plants. FIA is a method to recharge groundwater aquifers by channelling surface waters during times of excess into designated areas that have been planted with various species of trees and/or shrubs.
After identifying some land near underground water resources, a trench system is dug to channel the water during periods of heavy rainfall.

Objectives:

+ Promote water conservation by saving ~12,000 m3 of water per year
+ Improving adaptation to droughts and water scarcity of climate change
+ Increase the biodiversity by encouraging the settlement of autochthonous plants and animals of the region
+ Capture 50 t of carbon dioxide per year in 30 years

PES Scheme description

Service providers targeted: Private land owners or landholders

Who pays: Public-private partnership

Beneficiaries of the services: Local communities and farmers

Beneficiaries of the payments: Forest owners

Degree of voluntariness: Voluntary with free and informed negotiation (negotiated payments)

Type of ecosystems targeted

Riparian forest

Uses of water targeted

Irrigation Drinking Water

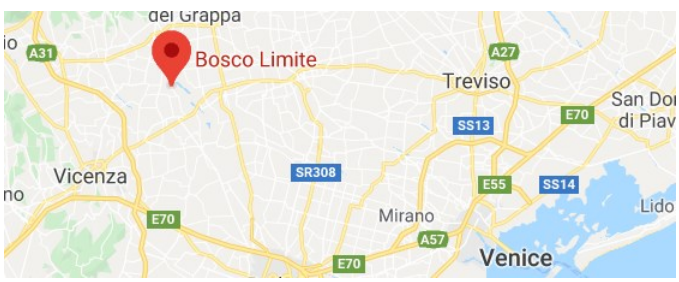
Water issues targeted

Water shortage

Management measures paid

Afforestation (planting trees on land with another land use)

Status: Pilot
Established: 2013
Catchment: Benta River
More information: climate-adapt.eea.europa.eu
Link to repository: PESFOR-W Spatial Repository



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