

COST Action CA15206



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](#)



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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 riparian 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](#)



Aalborg Case



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](#)



Brylle Water Forest



Site description and management

Drinking water in Denmark is 100% based on groundwater extraction. In order to protect the groundwater aquifers 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.

Type of ecosystems targeted



Crop land

Uses of water targeted



Drinking Water

Water issues targeted



Pesticide pollution

Management measures paid



Afforestation

PES Scheme description

Service providers targeted: Private land owners or landholders

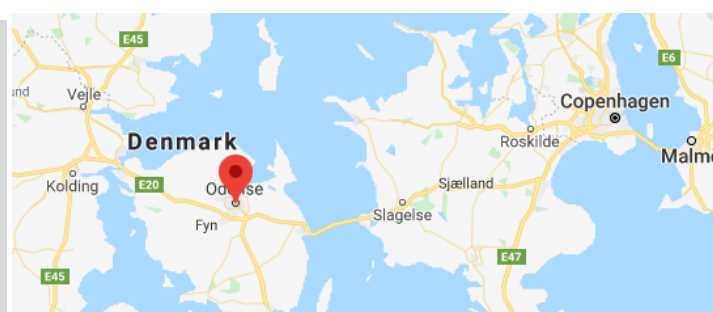
Who pays: Public-private partnership

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)

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](#)



Elmelund Forest



Site description and management

Drinking water in Denmark is 100% based on groundwater extraction. In order to protect the groundwater aquifers 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](https://www.pesfor-w.eu)



Icons from www.icons8.com

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