

AGROFORESTRY

Case study on improved carbon storage in soils and trees in the Netherlands

Benefits from agroforestry

Afforestation of agricultural land is supported by agricultural policy to make agriculture more environmentally friendly. Both production forests – aimed at generating wood – and food forests - directed at producing food – can be realised. Integrating forestry and agriculture into delivers certain benefits over the conventional way of land use such as:

1. Increase in spatial diversity and biodiversity

Agroforestry allows for a more attractive habitat for insects, birds and other animals.

2. Increase of soil structure and health

Planting trees and shrubs into annual cropping systems can protect the otherwise exposed land and its soil from wind stress and strong precipitation. Additionally, agroforestry increases root diversity that feeds the living organisms within the soil.

3. Carbon sequestration

Agroforestry increases the absorption of CO₂ permanently from the atmosphere in soil organic matter and thereby stores it effectively, which contributes to climate change mitigation.

4. Alternative sources of income

Agroforestry may generate an alternative income source for land users if benefits exceed costs. These benefits may originate from both product revenues and reimbursements for carbon storage.

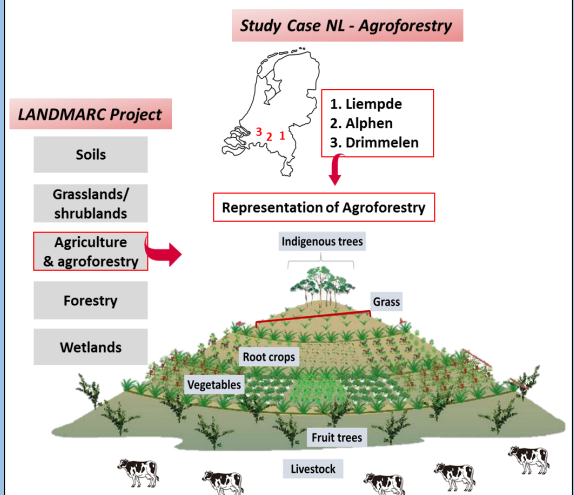


Figure 1: Pilot on agroforestry in North Brabant

Case study: Agroforestry pilot in North Brabant

Recently, a pilot project on agroforestry has been started at three locations in North Brabant (Fig. 1). In these locations, several layers of agriculture and forestry are integrated like: canopy trees (nuts, oil, timber, nitrogen fixation species and fruit species), smaller trees (fruit and forage species), higher shrubs (nuts, fruit and forage species), lower shrubs (fruit species), climbers (fruit species), herbs, annual crops and livestock.

This case study has cooperation with the **FARM LIFE project** (<https://www.farm-life.eu/>). The Farm Life project contributes to a climate-resilient Europe by developing and demonstrating innovative adaptation technologies and approaches to facilitate the transition from a landscape with conventional monoculture systems to a resilient landscape with diversified agricultural production systems, such as agroforestry. **LANDMARC** builds upon the pilot project from FARM LIFE to: (1) **measure impacts of agroforestry on soil health and climate change** and (2) **explore whether agroforestry can be scaled up to the national level**. The case study covers a range of activities

Contact us

Eline Keuning (Bioclear Earth B.V.) – e.a.Keuning@bioclearearth.nl
 Afnan Suleiman (Bioclear Earth B.V.) – suleiman@bioclearearth.nl

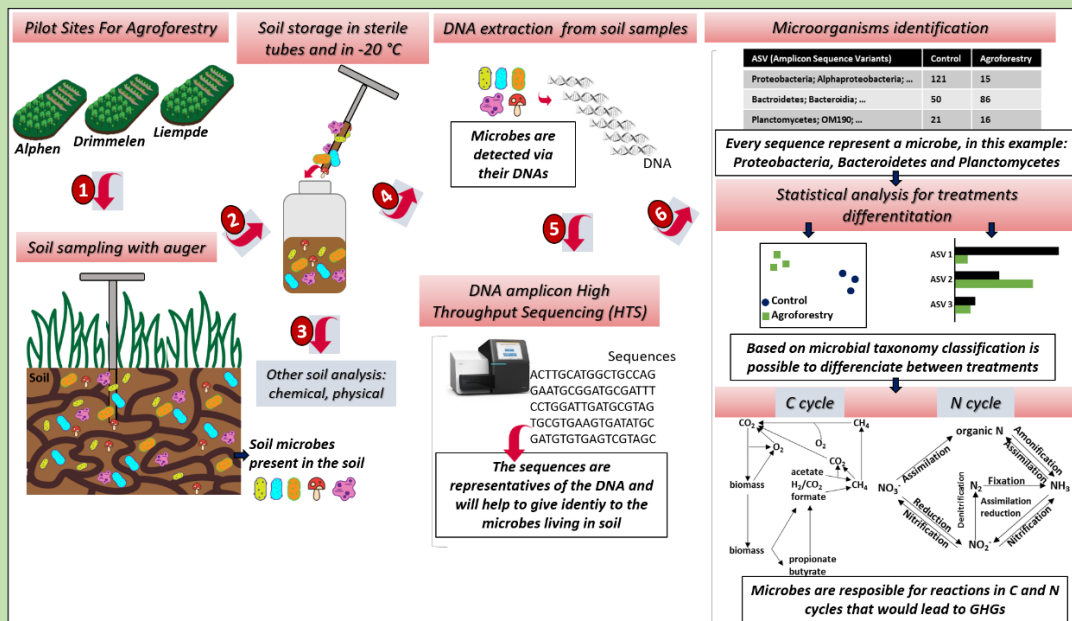
Ida Terluin (JIN Climate & Sustainability) – ida@jin.ngo
 Malte Renz (JIN Climate & Sustainability) – malte@jin.ngo

geared towards further developing and promoting agroforestry business models, agroforestry transition roadmaps and toolkits.

Within this LANDMARC case study we will perform a series of activities to achieve those goals:

- **Measuring**

We are going to take soil samples on the three sites in North Brabant. Additionally, earth observation technologies such as images from satellites will support the determination of the carbon storage potential of agroforestry practices. Analysing soil and satellite data together generate knowledge concerning soil health, climate change, plant development, and response to environmental stress (Fig. 2).



- **Analysing socio-economic aspects**

We also look at the socio-economic side of agroforestry by collecting data about costs, markets, policies, social acceptance, and land use competition. This will help us to develop new carbon mapping and monitoring tools and to investigate additional income streams e.g. via carbon offset schemes.

- **Investigating the possibilities to scale up agroforestry in the Netherlands**

Interactions with local and national stakeholders will provide information to run simulations to test a nationwide scaling-up of agroforestry technologies and practices. Consequently, attention will also be paid to climate risk assessment.

- **Sharing our knowledge**

A detailed description of the specific agroforestry technologies applied in North Brabant will be included in an international database - the WOCAT Global Sustainable Land Management database - which allows communities around the world to benefit from the Dutch experiences.

Case study in North Brabant is one of the 16 case studies in the LANDMARC project

In LANDMARC (2020-2024) practices on negative emission solutions in 16 case studies all over the world are studied. The experiences from these case studies will be used for scaling up negative emission solutions to the national, continental and global level. By doing so, it is hoped to get insight to which extent these solutions might contribute to meeting the Paris Agreement on global climate goals.

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Eline Keuning (Bioclear Earth B.V.) – e.a.Keuning@bioclearearth.nl
 Afnan Suleiman (Bioclear Earth B.V.) – suleiman@bioclearearth.nl

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 Malte Renz (JIN Climate & Sustainability) – malte@jin.ngo