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Agroforestry and Water Management: An overview of current frameworks, strategies and key actors

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AFaktive

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Abbreviations

AECM	agri-environment and climate measure (sing./plur.)
ANK	Aktionsprogramm Natürlicher Klimaschutz (Action Programme for Natural Climate Protection) [Germany]
ANN	Agroforestry Netwerk Nederland (Agroforestry Network Netherlands) [Netherlands]
AWAF	Association pour l'agroforesterie en Wallonie et à Bruxelles (Association for the Promotion of Agroforestry in Wallonia and Brussels) [Wallonia]
BLS	Aanplant Boslandbouwsystemen (Investment scheme for the planting of agroforestry systems) [Flanders]
CAP	Common Agricultural Policy (of the EU)
CIW	Coördinatiecommussie Integraal Waterbeleid (Coordination Committee on Integrated Water Policy) [Flanders]
CoDT	Code de Développement Territorial (Territorial development code) [Wallonia]
DeFAF	Deutscher Verband für Agroforstwirtschaft (German Association for Agroforestry) [Germany]
DPRA	Deltaprogramma Ruimtelijke Adaptatie (Delta Programme for Spatial Adaptation) [Netherlands]
EC	European Commission
EU	European Union
EURAF	European Agroforestry Federation
FRMP	Flood Risk Management Plan (sing./plur.)
GAK	Gemeinschaftsaufgabe Verbesserung der Agrarstruktur und Küstenschutz (German national funding scheme to support agriculture and forestry, develop rural areas and improve coastal and flood protection) [Germany]
GAPDZV	GAP-Direktzahlungen-Verordnung [Germany]
GDR	German Democratic Republic (1949-1990)
GWB	groundwater body (sing./plur.)
LBI	Louis Bolk Institute [Netherlands]
NAS	Nationale Klimaatadaptatiestrategie (National Climate Adaptation Strategy) [Netherlands]
NRR	Nature Restoration Regulation (Regulation (EU) 2024/1991 of the European Parliament and of the Council of 24 June 2024)
NSP	national strategic plan (of the CAP) (sing./plur.)
RBD	river basin district (sing./plur.)
RBMP	river basin management plan (sing./plur.)
SPGE	Société Publique de Gestion de l'Eau (Public Water Management Company) [Wallonia]
SWB	surface water body (sing./plur.)
SWDE	Société Wallonne des Eaux (Walloon Society of Waters) [Wallonia]
WFD	Water Framework Directive (Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000)

1. Objective of this document

The policy framework for the widespread practical adoption of agroforestry remains inadequate. Despite agroforestry being integrated more frequently into strategies, policies and funding, it is unclear whether these efforts are sufficient to establish agroforestry in practice or remunerate farmers for the public benefits these systems provide. Furthermore, legal and policy frameworks for land use and water management are, in most cases, neither interlinked nor transparent, resulting in conflicting objectives and incoherent instruments. It is unclear whether new legal frameworks will provide more efficient support instruments or improved policy coherence.

This Deliverable 7.1 briefly outlines the most relevant political and regulatory elements at the European level. It then provides an overview of the agroforestry-water nexus within the regional context of the AFaktive project: Rhineland-Palatinate and Saxony-Anhalt in Germany; Flanders and Wallonia in Belgium; and the Netherlands. Regional chapters address the projections of expected climate change, the 'agroforestry status quo' and provide insight into the state of water bodies. They also highlight national and regional legislation and political regulations in the relevant policy areas. The extent to which the topics of agriculture and water management (or water balance) are dealt with jointly and the extent to which synergy effects are exploited is of interest. In addition, the extent to which aspects of agroforestry are considered in agricultural policy and the implementation of the Water Framework Directive is explained. Furthermore, this deliverable examines the role of authorities, government agencies, NGOs and research institutions, and discusses the challenges and opportunities of better aligning agroforestry and water management – in the AFaktive project and beyond.

2. The European context

In the European Union (EU), the themes of agriculture and water management are guided by interconnected instruments that integrate agricultural practices, water quality, climate resilience, and ecosystem health. In terms of agriculture, the cornerstone is the Common Agricultural Policy (CAP), which addresses agricultural productivity and efficiency while supporting sustainable farming practices. The Water Framework Directive (WFD) establishes binding targets ecological and chemical status in surface water and groundwater and is supported by monitoring programmes and integrated river basin management. The EU Water Resilience Strategy addresses emerging challenges such as climate change and water scarcity by promoting efficient water use, risk management and nature-based solutions to ensure the long-term resilience of water systems. Furthermore, the Nature Restoration Regulation (NRR) aims to restore degraded ecosystems to enhance biodiversity and the provision of ecosystem services, including water retention, flood mitigation and improved water quality.

These instruments establish an environment in which agricultural practices, water management, and ecosystem restoration can be mutually reinforcing and set the European context of the AFaktive project.

2.1. Common Agricultural Policy

The CAP is a key part of the EU's agricultural framework. It is designed to support farmers, ensure food production and security, and promote sustainable agricultural practices across the EU. Its key objectives are to provide financial assistance to stabilise farmers' incomes, encourage environmentally friendly farming practices that contribute to sustainable resource management and climate action, and promote rural development by maintaining landscapes, creating jobs, and supporting communities. Direct payments to farmers and rural development programmes adapted to local needs form the core of CAP implementation, since 2023 summarised in National Strategic Plans (NSP). The responsibility for the NSPs lies with the EU Member States, which design measures to their given geographical conditions. To support environmental and climate objectives, typical measures include eco-schemes and agri-environment-climate schemes, which reward farmers for sustainable management practices, e.g. through enhancing carbon sequestration, reducing soil erosion or maintaining soil fertility. Furthermore, the NSPs usually include investment measures. At the discretion of the Member States, these may for example comprise water management aspects (e.g. enhancing irrigation efficiency, flood mitigation) or one-off payments for the establishment of agroforestry systems. Together, the NSP's measures encourage sustainable farming practices that benefit biodiversity, water, soil and the climate, while supporting rural livelihoods.

2.2. European Water Framework Directive

The European Commission (EC) recognises the vital importance of sustainable water management for the EU's resilience, describing it as "at the heart of the response to the triple planetary crisis of climate change, biodiversity loss, and pollution" (EC 2025c).

The European Water Framework Directive (Directive 2000/60/EC, or the WFD) establishes the overarching legal framework for water protection in Europe. The protection and restoration of water bodies form the core of the WFD, which aims to achieve good ecological and chemical status in all water bodies (surface and groundwater). The Directive also highlights the need to further integrate the protection and sustainable management of water into other policy areas, such as agriculture, and aims

to provide a basis 'for continued dialogue and the development of strategies towards further integration of policy areas'. The WFD's central strategic planning instruments are the River Basin Management Plans (RBMPs) and Flood Risk Management Plans (FRMPs)[1].

Progress is evaluated every six years, with the RBMPs being updated most recently in 2021. The original deadline of 2015 for achieving the targets has already been missed, and it is now considered highly unlikely that they will be met by the WFD's final deadline of 2027. This is due to a lack of ambition in terms of funding, measures and integration with other policy areas, as well as excessive exemptions (EC-DGENVI 2021).

2.3. European Water Resilience Strategy

Although Europe currently lacks legally-binding targets for water scarcity, drought or flood risk management, the EU recognizes the pressures human activities and climate change pose on Europe's water resources (EEA 2025). Given that climate change is expected to cause significant warming in Europe and that extreme weather events such as heavy rainfall, heatwaves and droughts are already increasing in frequency and severity, leading to floods, forest fires and crop losses, the EC presented its **European Water Resilience Strategy** (EC 2025b) in June 2025. Although the issue of water quantity ultimately falls within the national remit of Member States, the sustainable use of water resources across Europe is becoming an increasingly important issue. In this context, it is crucial to integrate water resilience into various policy areas and economic sectors in order to prevent future water scarcity, improve water management and, last but not least, protect livelihoods. To do so, the strategy focuses on three core objectives:

- **Restoration and protection of the water cycle**: The existing regulatory frameworks of the WFD and the Nature Restoration Regulation (NRR), amongst others, are being built upon, with the aspects of water scarcity and droughts becoming more prominent in environmental policies and regulations (e.g. drought management plans, water and climate resilience in national restoration plans). The strategy also states that *"we need to give priority to using the full potential of our ecosystems to store, purify, release, and restore water on land […]"* (EC 2025b). Given that water management actions should prioritise nature-based solutions, the Commission *"intends to incentivize and support farming practices […] such as organic farming and agroecological approaches […]"* (EC 2025b), as well as focus on preventing unsustainable land use and management, in order to restore and optimise the natural sponge function of landscapes and increase water retention. Furthermore, a 'sponge facility' will be developed to provide a coherent framework. Other aspects of the strategy regarding the water cycle include marine waters and inland waterways, as well as technical solutions for water storage. However, these aspects are of less importance in relation to the AFaktive project.
- **Building a water-smart economy**: At the heart of this objective is the reduction of water consumption and improvement of water efficiency. The strategy explicitly states increased supply/abstraction as a last resort only (EC 2025b). As agriculture accounts for 51% of the EU's total water consumption, the Commission plans to promote the reuse of water as well as sustainable agriculture and forest management within the CAP framework. This involves to *"ensure that Member States […] promote water resilient farming practices, such as […] water reuse, improved soil management and pesticide use, landscape features and more climate*

[1] These link to the EU Floods Directive (2007/60/EC).

resistant crops" (EC 2025b). Furthermore, this objective addresses the clean industrial and digital transformation and the energy production and industrial sectors more broadly.

- Secure clean and affordable water and sanitation: While the strategy does not explicitly link to agriculture here, agricultural pollution is already significantly impacting water supplies, including drinking water (EC 2025b). Objectives 1 and 2 therefore include measures that should ultimately also improve access to clean, affordable water. These efforts address issues such as over-abstraction and inefficiencies in water utilisation, as well as water pollution, which is primarily associated with agriculture, industry, mining and waste management (EC 2025b).

To achieve the objectives set, the EU strives for structured governance, increased investments, digitalisation, innovation, and improved security. Key measures include dialogues with Member States, boosting public and private funding, launching digital and AI-based water management tools, promoting research and skills (amongst others via a Water Resilience Research and Innovation Strategy), and strengthening early warning systems for floods and droughts (EC 2025a).

While the long-term impact of the European Water Resilience Strategy on land use and regional planning remains to be seen, it has laid the foundation for sustainable and future-adapted water management. The strategy clearly emphasises the importance of protecting and restoring natural landscape functions alongside promoting sustainable land management, as well as nature-based solutions. In this newly established framework, agroforestry has the potential to serve as a key component. At the very least, there are numerous avenues that could be explored to establish and utilise agroforestry as a tool for water management.

2.4. Nature Restoration Regulation

According to the comprehensive report published by the European Environment Agency in September 2025, the future of European ecosystems and their biodiversity is bleak (EEA 2025). Significantly more effort is and will be needed to ensure the ecosystems remain in good condition and/or are restored to the desired state.

The EU Nature Restoration Regulation (Regulation (EU) 2024/1991; NRR) came into force in mid-2024 with the aim of restoring degraded ecosystems, habitats, and species. This includes restoring soils and water systems and making farming more resilient to droughts, floods, and other climate-related shocks. In agriculture, the NRR encourages the adoption of sustainable agroecological practices such as agroforestry. Additionally, the regulation is intended to support food security and help achieve climate mitigation and adaptation goals, as well as meeting international environmental obligations. Its central aim is to restore at least 20% of the EU's land and sea areas by 2030[2] and beyond. To achieve this, Member States must develop National Restoration Plans by mid-2026, setting out how they will achieve the established targets. The NRR also introduces new monitoring requirements, amongst other things for landscape features such as hedgerows and trees.

Annex IV of the NRR refers to high-diversity landscape elements, including productive trees as part of sustainable agroforestry systems, trees in extensively managed old orchards on permanent grassland, and productive elements in hedges. These can be considered high-diversity landscape features provided there are no fertiliser or pesticide applications (except solid manure), and harvests do not compromise high biodiversity levels. Lawson et al. (2025) criticise that there is no mechanism to quantify or delineate 'sustainable agroforestry systems', and that the regulatory meaning of woody

[2] Priority is given to Natura 2000 areas under the EU Habitats/Birds Directives.

landscape features remains unclear. They give the example of 'woody landscape features' relating to the tree-covered area, whereas 'agroforestry' is the total area of a pilot, including grass and crops areas (Lawson et al. 2025).

As with the European Water Resilience Strategy, the effects of the NRR remain to be seen, as first initial indications may be included in the National Restoration Plans due to be published in 2026. Although the NRR may present initial challenges, such as potential short-term disruption and the need for substantial investment, it also offers opportunities for innovation and collaboration. By aligning agricultural practices with ecological restoration, the regulation aims to create a more sustainable and resilient agricultural landscape in Europe.

3. Rhineland-Palatinate / Saxony-Anhalt (DE)

3.1. Introduction

3.1.1. Geography

Geographically diverse, Germany combines coastlines, plains, low mountain ranges and high mountains within a comparatively small area. It stretches from the North Sea and Baltic Sea in the north to the Alps in the south. The northern part of the country is dominated by flat plains criss-crossed by numerous rivers, such as the Elbe, Weser and Ems. The low mountain ranges of the Harz, the Thuringian Forest and the Black Forest are divided by rivers such as the Rhine, the Main and the Saale. The Alpine foothills and the edge of the Alps are characterised by lakes and glacial landscapes. Germany's soil types are as varied as its geography, ranging from highly fertile to rather poor.

3.1.2. Climate

The German regions Rhineland-Palatinate and Saxony-Anhalt have a temperate climate with precipitation year-round and warm summers (Köppen-Geiger Cfb). Saxony-Anhalt (9,8°C / 683 mm) receives less precipitation than Rhineland-Palatinate (9,7°C / 840 mm) and has a slightly more pronounced seasonal pattern: Summer months bring most rain (Figure 1, Figure 3).

For both regions, projections for the 2040-2059 time period[3] show increased temperatures, especially in the summer months, and a stronger seasonal distribution of precipitation, with wetter winters and dryer summers (Figure 2, Figure 4). Generally, the same trends can be expected to continue or increase in the further future. For both German states, the number of days with maximum temperatures over 25 °C will increase markedly by over five days in the month of August alone. The maximum numbers of consecutive wet days are expected to slightly increase in the winter months and to slightly decrease in the summer. In contrast, the maximum numbers of consecutive dry days will decrease in winter but increase in summer. Strong precipitation events of over 20 mm in one day become more likely year-round in Rhineland-Palatinate and in summer in Saxony-Anhalt.

Water availability is expected to decrease across Germany during the growing season, while agriculture-relevant droughts will most affect the south-east of Germany, especially Rhineland-Palatinate and Saarland (Thober, Marx and Boeing 2018). In these regions, a significant reduction in plant available water is expected, which indicates an urgent need for adjustments in agricultural practices.

[3] The scenarios here considered are the SSP2 (“middle of the road”) and SSP3 (“regional rivalry”) Shared Economic Pathways (see Riahi et al. 2017). All data from the Climate Change Knowledge Portal (World Bank 2025).

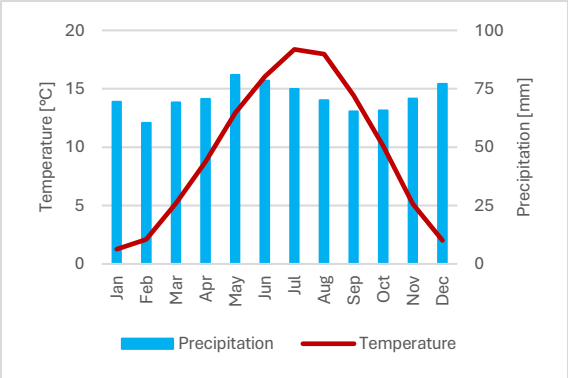

Figure 1: Climate Rhineland-Palatinate (DE); reference period 1995-2014
Data: World Bank (2025).

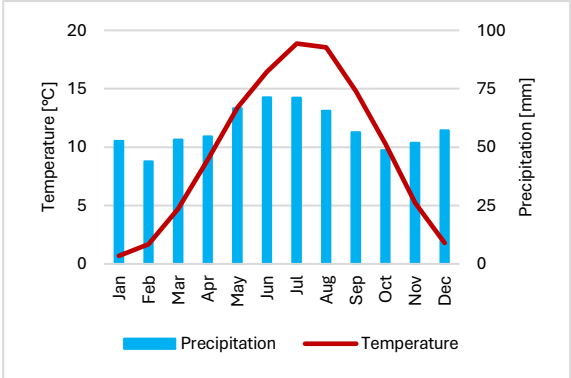

Figure 3: Climate Saxony-Anhalt (DE); reference period 1995-2014
Data: World Bank (2025).

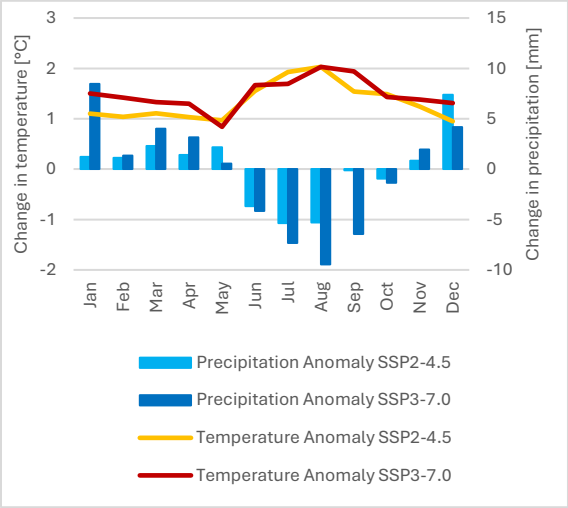

Figure 2: Projected Anomaly 2040-59 for Rhineland-Palatinate (DE), compared to reference period 1995-2014
Data: World Bank (2025).

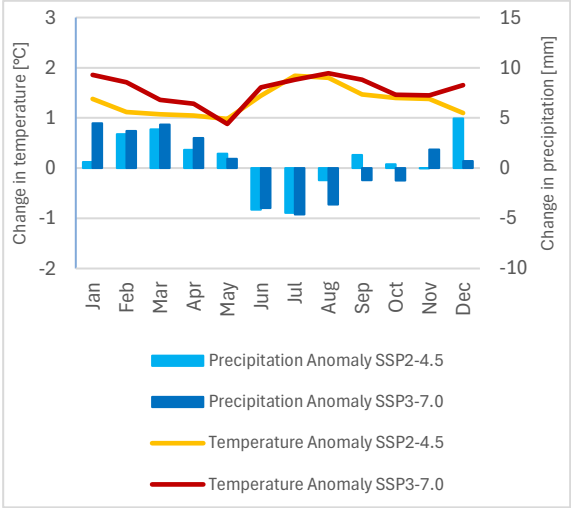

Figure 4: Projected Anomaly 2040-59 for Saxony-Anhalt (DE), compared to reference period 1995-2014
Data: World Bank (2025).

3.1.3. Agriculture

German agriculture is one of the four largest in the EU, so it is hardly surprising that around half of its land is used for farming. The structures and types of farming vary greatly, ranging from highly intensive land use to specialized or conservation-focused farms. Arable farming is predominant, accounting for 70% of the area, while just under a third is used as permanent grassland (BMEL 2022). Nevertheless, considerable regional disparities prevail, owing to historical as well as natural factors (e.g. relief, climate). For example, the average farm and field size in the former German Democratic Republic (GDR, eastern Germany) is generally much larger than in the other federal states. Comparing the two regions of the AFaktive project – the federal states of Rhineland-Palatinate and Saxony-Anhalt – reveals these differences in land use. In small-scale structured Rhineland-Palatinate (Ø farm size (2020): 44 ha), wine and fruit production are important, with permanent crops and wooded areas accounting for almost 20% of agricultural land (Figure 5). Conversely, some of the largest agricultural holdings in Germany can be found in Saxony-Anhalt (Ø farm size (2020): 268 ha). The consolidation into 'agricultural production cooperatives' in the GDR, alongside continuous technical development, led to large-scale agricultural plots and, in some cases, cleared landscapes devoid of features such as hedges and trees. Over 80% of the agricultural land here is used for arable farming, permanent

grassland and wooded areas are far less common and the percentage of permanent crops is negligible (Figure 6).

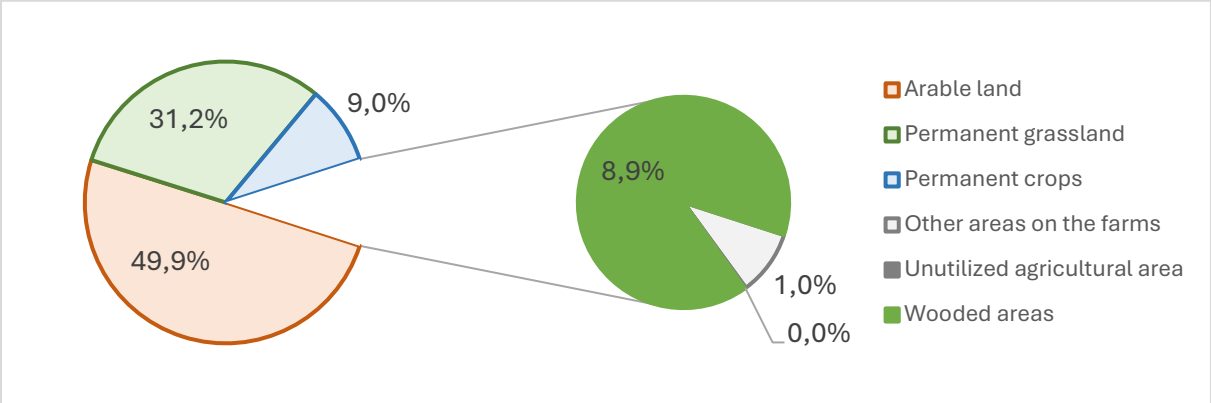

Figure 5: Main farm land use in Rhineland-Palatinate (DE) in 2020.
Data: Eurostat (2025).

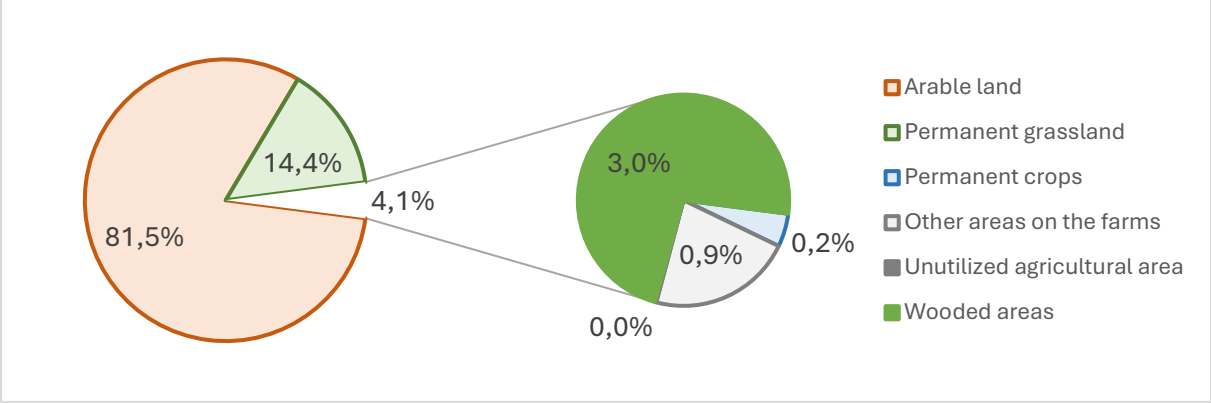

Figure 6: Main farm land use in Saxony-Anhalt (DE) in 2020.
Data: Eurostat (2025).

3.2. Agroforestry-Water-Nexus

3.2.1. Agroforestry

As traditional agroforestry systems, various forms of "Knicks" or hedgerow structures between agricultural parcels and meadow orchards with fruit trees ("Streuobstwiesen") were widespread in Germany. Many traditional systems have disappeared, due to technical progress and decreasing rentability. Therefore, modern agroforestry systems ought to be more compatible with current farming systems and practices: Alley cropping and silvopastoral systems with tree rows or scattered trees for wood, leaf, fruit or nut production (DeFAF 2020; Heyen 2024). Chalmin et al. (2022) state the most relevant utilizations of agroforestry systems in Germany as timber, fruit or nut production as well as in the form of wood chips for energy production.

There are no exact figures for the area covered by agroforestry systems in Germany. Rubio-Delgado, Lavado-Contador and Schnabel (2025) estimate the total area of common agroforestry systems to be around 140,000 hectares, predominantly silvopastoral systems and grazed permanent crops (see Annex); silvoarable systems are not mentioned in the study. In contrast, the online agroforestry map enables the voluntary entry of agroforestry systems. Most recently, just under half of the registered systems were silvoarable and around 40% were silvopastoral; a total of only 1,700 hectares were

recorded (DeFAF 2025a). While this certainly does not include all agroforestry systems, it highlights the significant discrepancy in estimates of the total area of agroforestry systems in Germany.

3.2.2. Water

Germany has ten river basin districts (RBDs), the largest being the Rhine (105.420 km^2), Elbe (96.269 km^2), and Danube (56.184 km^2). There are around 11,000 bodies of water in total, most of which are rivers (approx. 8,900), lakes (approx. 700) and groundwater bodies (approx. 1,300) (BMUV and UBA 2022). As most RBDs span neighbouring and downstream countries, they are managed within the framework of European river basin management plans (RBMPs).

In 2021, 52% of German surface water bodies (SWB) were classified as 'heavily modified' or 'artificial'. These were mostly located in the intensively farmed agricultural regions of northern Germany, as well as in parts of the major river systems. The RBMPs for these water bodies consider natural water retention measures as one of many possible options. In contrast to water abstraction for irrigation, the most frequently mentioned influence on these water bodies was 'drainage for farming purposes', i.e. the removal of water from the landscape into the aquatic system (BMUV and UBA 2022).

Concerning the natural SWB, 13% are in a good ecological state[4], however, only 4.9% of modified water bodies achieve good ecological potential[5]; combined, only 9% of all German SWB are in good ecological condition. The main factors for this low percentages are diffuse nutrient pollution from agriculture and physical alterations to the water bodies for agricultural use and flood protection (EC 2025d).

Around two-thirds of groundwater bodies (GWB) achieve good chemical condition. Poor chemical status mostly results from pollution with substances attributable to agricultural land use, such as nitrogen compounds or pesticides and their degradants (BMUV and UBA 2022). Most of Germany's GWB are in a good quantitative state, and compared with other European regions, water abstraction for agricultural use (i.e. irrigation) is relatively low in Germany; however, there is a rising trend (EC 2025d). While the country does not currently experience widespread water scarcity, some regions have suffered water shortages in recent years, leading to the recognition of water scarcity and drought as emerging issues (EC 2025d).

3.3. Policies, Institutions, and Support Systems

3.3.1. Agroforestry

Common Agricultural Policy

In 2023, the German National Strategic Plan (NSP) for the first time acknowledged agroforestry as part of eligible agricultural land. The legal implementation of the CAP, the 'GAP-Direktzahlungen-Verordnung' (GAPDZV)[6], regulates the definition of agroforestry systems: agroforestry systems on arable land, in permanent crops or on permanent grassland are given if woody plants are cultivated on an area with the primary objective of raw material extraction or food production. The regulation includes a negative list of tree/shrub species, including black locust, which are not eligible within its

[4] Ecological state indicates the 'health' of a natural water body, relative to its undisturbed reference.
[5] Ecological potential refers to how close a modified or artificial water body is to its optimal ecological state, given that achieving full natural status is impossible.
[6] GAP-Direktzahlungen-Verordnung vom 24. Januar 2022 (BGBl. I S. 139, 2287), die zuletzt durch Artikel 1 des Gesetzes vom 4. Dezember 2024 (BGBl. 2024 I Nr. 396) geändert worden ist

framework. The woody plants may occupy at least two strips and no more than 40 percent of the respective agricultural area or may be scattered with 50 to 200 woody plants per hectare. Regarding conditionality, no further requirements are formulated for agroforestry systems. In a move towards simplification, the GAPDZV was revised for 2025, rescinding the requirement for a utilisation concept[7] for agroforestry systems.

On a national level, Germany does not provide incentives for the establishment of agroforestry systems but supports the maintenance of agroforestry systems via the eco-scheme "maintenance of agroforestry management" (DZ-0403) – if in accordance with the GAPDZV. The conditions set out for the eco-scheme limit the support to agroforestry systems of at least two wooded strips with a maximum width of 25 meters and a maximum distance between strips of 100 meters[8]. For agroforestry systems with scattered trees/shrubs however, no support is possible under this eco-scheme. The annual payment has been increased from initially 60 EUR/ha to 200 EUR/ha of woody plants, and will be further increased to 600 EUR/ha by 2026 (DeFAF 2025d). The area eligible for these payments refers solely to the area occupied by trees and shrubs. Other parts of an agroforestry system, e.g. such areas used for growing arable crops like wheat, do not qualify for support under the eco-scheme, but remain eligible for the basic income support under the CAP. The eco-scheme intendeds to respond to needs related to the water balance: e.g. humus build-up, climate change adaptation, wind protection, reduction of water consumption and increased water storage capacity of the soil, promotion of microorganisms and soil life (BMEL 2024).[9]

The **'GAK Rahmenplan' (2024-2027)** (BMEL 2025) is a national support programme supplementary to the CAP and proposes investment support for the establishment of agroforestry systems, indicating premia of up to about 5.000 EUR/ha, depending on the operational objectives of the agroforestry system. The 'GAK Rahmenplan' provides guidance at national level, while its administrative implementation is carried out in the federal states. It is therefore at the discretion of the individual states to develop and offer support for the establishment of agroforestry systems. At present, however, only a few federal states include agroforestry measures in their investment support programs (Chalmin 2025). The initiative 'Agroforst Jetzt!' provides a detailed overview of the current funding public landscape (Burckhardt 2025).

Further funding opportunities for agroforestry

In addition to the funding programs at federal and national level within the CAP, there exist funding opportunities through tree sponsorships, crowdfunding, foundations, associations and companies (Chalmin 2025). There are also financing models for agroforestry systems that are based on CO_2-certificates, on investments by Regionalwert AG as a citizens' joint stock company, or on municipal energy consumers or value chains.

Other legislation

Outside of the CAP and GAK, agroforestry is only partially embedded within German legislation; however, there are links to various laws and political strategies.

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[7] The intention was to prove the objective of raw material extraction or food production.
[8] Strict eligibility criteria regarding the proportion of woody plants, the minimum width of strips and the minimum distance to the field edge were adjusted or simplified in 2024 to increase the uptake of the eco-scheme.
[9] Further summarized information on the promotion of agroforestry systems under the CAP: DeFAF 2024.

For instance, §5 of the Federal Nature Conservation Act[10] addresses the roles of agriculture, forestry, and fisheries. The long-term viability of the land must be ensured, and its natural characteristics must be considered in site-specific management. In particular, 'the landscape elements necessary for the interconnection of biotopes must be preserved and, where possible, increased' (BNatSchG, §5 (2,3)). Special attention must be paid to the establishment of agroforestry systems in protected areas[11] and their potential impact on existing ecosystems; for example, on species of open habitats (Binder et al. 2024). Notwithstanding the fact that nature conservation provides a foundation for agroforestry, there remain recurring points of discussion between the two disciplines. The long-term viability of the land must be ensured, and its natural characteristics must be considered in site-specific management. In particular, 'the landscape elements necessary for the interconnection of biotopes must be preserved and, where possible, increased' (BNatSchG, §5 (2,3)). Notwithstanding the fact that nature conservation provides a foundation for agroforestry, there remain recurring points of discussion between the two disciplines.

The Federal Forest Act[12] defines agroforestry systems as 'areas with trees that are also used for agricultural production' (BWaldG §2 (2,2)), meaning they are not considered forests under the Act. This is important because, unlike forests, agroforestry systems do not require approval in case of removal or conversion.

The 'Klimaschutzplan 2030', explicitly highlights agroforestry as a measure for maintaining soil fertility and building up humus, respectively for carbon sequestration (BMEL 2019)[13]. Moreover, Germany is currently developing a national long-term strategy for negative emissions (BMWK 2025), in the context of which the firm integration of agroforestry on account of its carbon sequestration potential is advocated for (DeFAF 2025b). The Action Programme for Natural Climate Protection ('Aktionsprogramm Natürlicher Klimaschutz'; ANK) bundles various funding programs, such as for promoting measures to adapt to the consequences of climate change or for natural climate protection in rural communities. In July 2025, the Scientific Advisory Board for Natural Climate Protection unequivocally recommended introducing a distinct funding guideline for agroforestry in the ANK (Herold et al. 2025), while various sources confirm a budget of EUR 100 million allocated to support for agroforestry systems. Relevant associations therefore see the ANK as an opportunity for additional impetus for agroforestry (Arbeitsgemeinschaft bäuerliche Landwirtschaft et al. 2023).

Without providing a detailed account, the German biodiversity strategy briefly touches on the benefits of agroforestry systems, highlighting their role in preventing soil erosion, regulating the water balance and nutrient cycle, and functioning as a CO_2 sink (BMUV 2024).

Agroforestry is also mentioned several times in the continued development of the German Sustainability Strategy, for example in the context of climate change resilience and sustainable land management, and recommends strengthening of the corresponding systems (Die Bundesregierung 2025).

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[10] Bundesnaturschutzgesetz vom 29. Juli 2009 (BGBl. I S. 2542), das zuletzt durch Artikel 48 des Gesetzes vom 23. Oktober 2024 (BGBl. 2024 I Nr. 323) geändert worden ist.

11 E.g. water protection areas in the WFD context or the Special Areas for Conservation of the Habitats Directive (Council Directive 92/43/EEC), Special Protection Areas of the Birds Directive (Directive 2009/147/EC) in the Natura 2000 context.

[12] Bundeswaldgesetz vom 2. Mai 1975 (BGBl. I S. 1037), das zuletzt durch Artikel 112 des Gesetzes vom 10. August 2021 (BGBl. I S. 3436) geändert worden ist.

[13] As the programme focuses on climate protection rather than climate adaptation, it prioritises greenhouse gases over the water balance.

All in all, agroforestry is emerging within Germany's administration and slowly being integrated into its land use planning and policy toolbox, especially in light of EU policies and international climate commitments.

3.3.2. Water

Water Framework Directive and Floods Directive

In the German RBMPs, the need for action and measures to achieve good ecological and chemical status of water bodies in the area of agricultural use relate in particular to a reduction in critical substance inputs, while water abstraction is also partly addressed (e.g. FGG Elbe 2021a). Supplementary measures for water retention on agricultural land are generally not addressed or explained in more detail. However, the Elbe RBMP lists a few measures, e.g. to promote natural water retention, but, these are particularly related to retention areas, habitat development and wetlands (FGG Elbe 2021a). The international FRMP for the Rhine RBD explicitly addresses the effects of water retention and agricultural extensification measures for improving flood prevention (ICPR 2021).

In Germany, the implementation of the WFD is a matter of the federal states and is carried out through their respective operational programs of measures. For example, the Moselle-Saar RBMP aims to improve the area's hydromorphological conditions by enhancing natural water retention and creating synergies with the Rhineland-Palatinate flood protection concept (SGD Nord 2021). Together with other German federal states, the state of Saxony-Anhalt is drawing up a framework program of measures, which – at present – does not include specific measures for natural water retention (FGG Elbe 2021b).

Climate Adaptation Act

The Climate Adaptation Act[14] obliges the federal states to take more effective precautions against the effects of the climate crisis at local level, which is to be improved by drawing up municipal climate change adaptation concepts. These should consider heavy rainfall and flood hazard maps, open space concepts as well as landscape and green space plans and may include natural water retention measures. In the framework of the ANK, the funding guideline for measures to adapt to the consequences of climate change[15] supports the development and implementation of municipal concepts for climate change adaptation and natural climate protection as well as selected nature-based solutions and innovative model projects (ZUG 2025).

National Water Strategy

Protecting and restoring natural water balances, ensuring water-compatible, climate-adapted land use, and protection against extreme weather events such as droughts and heavy rains while ensuring water supply are some of the goals of the National Water Strategy (BMUV 2023). Regarding water retention, the strategy highlights the importance of soil and land management, as site-appropriate land management and intact vegetation preserve natural soil functions, reduce erosion and enhance water infiltration as well as water storage capacity. To retain water in the area the strategy mentions catchment-specific management and utilisation concepts that require close cooperation between all sectors and stakeholders. The implementation of the National Water Strategy involves the

[14] Bundes-Klimaanpassungsgesetz vom 20. Dezember 2023 (BGBl. 2023 I Nr. 393).
[15] Förderrichtlinie "Maßnahmen zur Anpassung an die Folgen des Klimawandels"

'Aktionsprogramm Wasser', which proposes 78 measures to be implemented step-by-step until 2030 (BMUV 2023).

Other regulations and operational programs

The regulations of the WFD have been incorporated into federal legislation as well as state laws and ordinances. The Water Resources Act explicitly recognises the importance of maintaining a near-natural water balance for the sustainable use of water resources, thereby extending beyond the scope of the WFD, which barely considers the water balance (UBA 2021). In addition, the federal states have their own strategic plans, concepts and programs for water, which are linked to the planning and implementation of the WFD.

In Rhineland-Palatinate, the **'Zukunftsplan Wasser'** addresses the strengthening of water retention in the landscape as a field of action (MKUEM RP 2024). This includes, for example, the development of a targeted agricultural support programme to reduce runoff rates, protect against erosion, and improve the landscape's water balance and ecological value. Given its compatibility with the CAP, support should be provided to private recipients. In addition, the **'Aktion Blau Plus'** program combines all water management activities relating to flood prevention and heavy rainfall as well as the water balance in Rhineland-Palatinate (SGD Nord 2025).

The **'Sachsen-Anhalt Klima III'** programme (MWU ST 2025a) enables local authorities to promote both investment and non-investment measures to strengthen resilience and improve risk prevention for climate related hazards, such as heavy rainfall, heatwaves and droughts. For instance, measures will be taken to increase the capacity for water retention during or after heavy rainfall, as well as to promote the infiltration of precipitation water. The '**NaturWasserMensch**' direct funding programme[16] may include projects aimed at maintaining and developing water bodies, as well as promoting water retention in the landscape (MWU ST 2025b). Hence, municipal measures for water retention and rainwater infiltration are explicitly eligible for funding.

3.4. Stakeholders and actors

3.4.1. Agroforestry

The non-governmental **German Association for Agroforestry** (Deutscher Fachverband für Agroforstwirtschaft; DeFAF; agroforst-info.de) is committed to promote agroforestry in Germany. Among others, it strives to optimize the legal definition and integration of agroforestry in agricultural funding. A further DeFAF task is the motivation of farmers as well as to enhance social participation and interdisciplinary dialogue (DeFAF 2025c).

Within the "**Agroforst Jetzt!**" (agroforst.jetzt) campaign, relevant stakeholders jointly address politicians with an assessment of the current political framework conditions for agroforestry and recommendations for improvement. They recognize the added value of agroforestry in building resilience to extreme weather events and draw attention to the fact that the current political and economic framework conditions are insufficient to enable their broad implementation (Agroforst Jetzt! 2024; Agroforst Jetzt! 2025).

[16] No financial resources are available for new projects in 2025 and 2026.

A range of private and public projects, initiatives and companies are active in the fields of agroforestry and the land-use/water nexus. Some of these are presented below, although this list is by no means exhaustive.

- Thanks to long-term collaborations and partnerships with other agroforestry institutions, **Lignovis GmbH** (lignovis.com) offers comprehensive services, including planning, concepts, seedlings and planting, especially for the establishment of fast-growing poplar agroforestry systems.
- Many organisations offer advisory services. The **'Agroforst Beratungsnetzwerk'** (agroforst-beratungsnetzwerk.de), for example, is an alliance of independent consultants that aims to provide an overview of the wide range of advisory services available.
- The **'Baumland-Kampagne'** (baumland-kampagne.de) aims to increase the number of trees and shrubs in the cultural landscape, making cleared landscapes a thing of the past. Based on the principle of 'public money for public goods', the campaign advocates for attractive agroforestry support programmes and professionally designed framework conditions.

3.4.2. Water

There are numerous **water and soil associations ('Wasser- und Bodenverbände')** tasked with water and soil management in the public interest. Their members are typically landowners, particularly farmers, as well as municipalities. While individual associations mainly deal with local waterbodies and catchment areas, regional associations ('Landesverbände') – typically on the level of the federal states – take on tasks at higher administrative levels. The associations' tasks include, improving agricultural and other land use systems, regulating soil and water balances, and protecting the natural environment, soil and landscapes. They are also responsible for promoting cooperation between agriculture and water management, and for further developing water, soil and nature conservation.

- In Rhineland-Palatinate, so-called **flood partnerships ('Hochwasserpartnerschaften')** bring municipalities together within a catchment area. Although they mainly focus on technical flood protection, they are key stakeholders in the landscape-level implementation of water management approaches.
- The **German Association for Water, Wastewater and Waste Management** (dwa.de) and the **Association of Engineers for Water Management, Waste Management and Land Reclamation** (bwk-bund.de) are working on the interface between water bodies and soil, including how to organise water retention on a landscape level.
- **VSR Gewässerschutz e.V.** (vsr-gewaesserschutz.de) is an environmental organisation dedicated to improving water quality. It promotes agroforestry, particularly due to its potentials to reduce nitrate pollution and increase in groundwater recharge, as well as its effects on the need for irrigation.
- In terms of water management and legislation, the **Federal/State Working Group on Water** (lawa.de) deals with cross-state issues and develops solutions as well as national and international recommendations. Moreover, there are other federal/state working groups, such as the Working Group on Soil Protection and the Working Group on Nature Conservation, Landscape Management and Recreation. The groups comprise representatives of state authorities and the federal government, and their primary focus is generally on protecting the respective resources from negative impacts, with land management playing a more subordinate role.

- As part of the **'boden:ständig' initiative** (boden-staendig.eu), the Bavarian Administration for Rural Affairs promotes action by local stakeholders to address the challenges related to heavy rainfall, erosion and water scarcity, thereby improving the regional water balance. The individually tailored measures focus amongst other on land management and water bodies.
- The 'Wasser-Boden-Agroforst' project aims to strengthen the resilience of the southern Black Forest through nature-based solutions, creating a climate-resilient cultural landscape in the process. From the outset, the project focusses on close collaboration with farmers, municipalities, and experts to implement innovative measures in three key areas: water retention, humus-building land management, and agroforestry.

3.5. Challenges and Opportunities

Although the attractiveness of the eco-scheme on agroforestry is rather low and registration of agroforestry systems remains complex, since the start of the current CAP period, the funding framework conditions for agroforestry have improved. Still, deficiencies exist that hamper the adoption of agroforestry: i) systems where trees are not organized in rows are not eligible for funding under the eco-scheme, ii) the availability and design of further support measures and expert advice varies considerably between the federal states (Agroforst Jetzt! 2025).

In its NSP, Germany acknowledges the diverse and interdependent impacts of agroforestry systems which include contributions to carbon sequestration, the production of renewable energy, the efficient use of natural resources and the conservation of biodiversity and habitats (BMEL 2024). This also results in a diverse range of stakeholders with a shared interest, including those from the fields of agroforestry, agriculture, nature conservation, water management, regional development, renewable energies, climate protection and science. In this context, the 'Agroforst Jetzt!' initiative is calling for future support measures to be stronger and more closely aligned with the multifunctional benefits and services of agroforestry, while considering the practical requirements of agricultural enterprises. This interdisciplinary and cross-sectoral dialog at multiple levels represents a key opportunity as well as challenge in the development of agroforestry. In particular water management should be more closely integrated into this dialog. According to the initiative, the promotion of agroforestry systems should be designed in a more integrated manner, and include municipalities, associations and cooperatives as potential funding recipients.

In the context of the resource water, agricultural use is currently considered almost exclusively in terms of the pollution it causes, and, as a result, the operational funding programs are primarily aimed at measures to reduce pollutant inputs. Agroforestry systems, on the other hand, could be given greater consideration as a nature-based solution in the future. The first corresponding approaches already exist at a higher planning level: the catalogue of measures of the LAWA (2020) includes measures for natural water retention. Increased implementation of natural water retention measures would also be in-line with the Commission's call for *"expanding [the] efforts on nature-based solutions"* (EC 2025f) and the potential of agroforestry systems could be strengthened by an increased commitment to *"further improvement of governance and a better coordination between the different administrative levels and authorities dealing with the implementation of the WFD and other related pieces of legislation"* (EC 2025f).

4. Flanders (BE)

4.1. Introduction

4.1.1. Geography

Flanders, the northern region of Belgium, is characterized by a predominantly low-lying and gently sloping landscape. Its physical geography is defined by fertile alluvial soils, particularly in the valleys of the Scheldt and Lys rivers, which have historically facilitated intensive agricultural activity. Coastal areas are distinguished by dune systems and polders – tracts of land reclaimed from the sea through drainage and embankment – whereas the inland territory is marked by a mosaic of arable fields, meadows, and scattered woodland.

The soils range from sandy deposits in the Campine region to richer loams in central Flanders, producing varied agricultural conditions across the region. This largely flat terrain, devoid of significant elevation, contrasts sharply with the upland relief of the Ardennes and has contributed to Flanders' role as both an important agricultural region and a corridor of economic and cultural exchange in northwestern Europe. Despite the relatively flat character, soil erosion is a major issue in the hillier areas, particularly on loamy soils.

4.1.2. Climate

With an annual average temperature of 11,1°C and average annual precipitation of 818 mm, the Belgian region of Flanders has a temperate maritime climate with frequent precipitation and warm summers (Köppen-Geiger Cfb) (Figure 7).

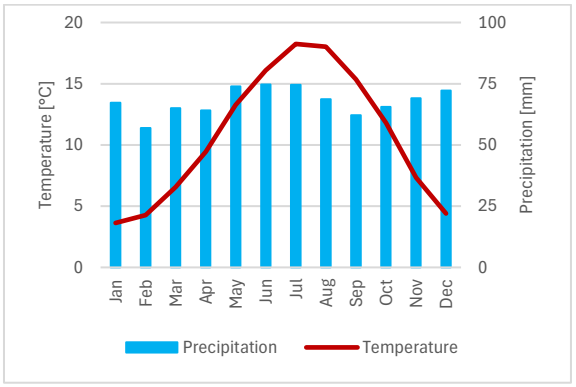

Figure 7: Climate Flanders (BE); reference period 1995-2014.
Data: World Bank (2025).

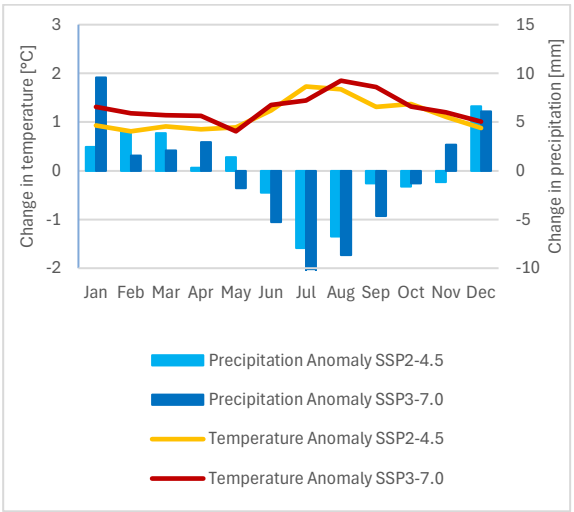

Figure 8: Projected Anomaly 2040-59 for Flanders (BE), compared to reference period 1995-2014
Data: World Bank (2025).

Projections for the 2040-2059 time period[17], however, show that dryer summers and wetter winters are to be expected, along with increased temperatures, especially in the summer months (Figure 8). Generally, the same trends can be expected to continue or increase in the further future. Given these

[17] The scenarios here considered are the SSP2 ("middle of the road") and SSP3 ("regional rivalry") Shared Economic Pathways (see Riahi et al. (2017)). All data from the Climate Change Knowledge Portal (World Bank (2025)).

scenarios, the number of days with maximum temperatures over 25 °C will increase by nearly five days in the month of August alone. In addition, the maximum number of consecutive wet days are expected to slightly increase in the spring and winter months and to decrease in the summer and autumn, while the maximum number of consecutive dry days will increase in all seasons but winter. Strong precipitation events of over 20 mm in one day become more likely, especially in the SSP2 scenario in the autumn months.

4.1.3. Agriculture

Flanders can be described as densely populated and largely urbanised. In conjunction with a strong economy and a high rate of industrialisation, this results in a relatively intensive and specialised agriculture. According to the Agriculture Report 2024 (LV 2024), agriculture accounts for 46% of the land area in Flanders and is primarily focused on livestock and arable farming, with horticulture and mixed farming playing smaller roles. Livestock farming is of particular importance in the regions of West Flanders and Antwerp, while arable farming and the cultivation of fruits, vegetables and flowers is more prevalent in the south-eastern parts of Limburg and Flemish Brabant (LV 2024). Overall, around half of the agricultural area is used for fodder production, which includes pastures and fodder maize. The main arable crops are cereals, maize and sugar beet. Agricultural plots are fragmented within a mosaic of different land uses and often within a peri-urban context. However, wooded areas on farms are virtually non-existent (Figure 10).

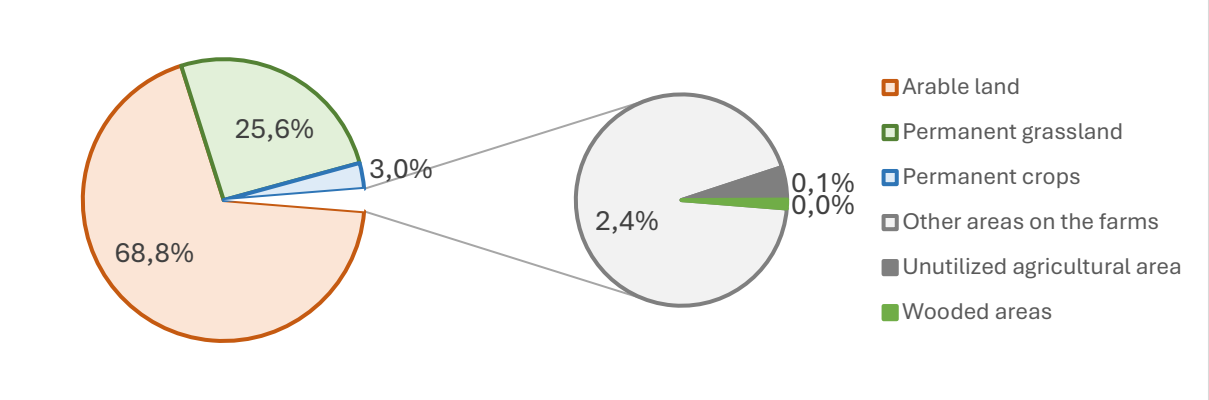

Figure 9: Main farm land use in Flanders (BE) in 2020.
Data: Eurostat (2025).

4.2. Agroforestry-Water-Nexus

4.2.1. Agroforestry

Flanders has been home to traditional forms of agroforestry for generations. Examples include standard fruit orchards, poplar meadows used for grazing, and rows of pollarded willows along the edge of a plot. Other features include hedges and wooded areas used as cattle fences. However, in recent decades, the presence of these cultural landscape features has systematically declined. Conversely, other forms of 'modern' agroforestry, such as alley cropping systems, have gradually emerged over the past 15 years, alongside the introduction of agroforestry subsidy measures (Reubens et al. 2024a). Food forests are also clearly on the rise in Flanders, albeit often still in a private, hobbyist context. Examples include standard fruit orchards, poplar meadows used for grazing, and rows of pollarded willows along the edge of a plot. Other features include hedges and wooded areas used as cattle fences. However, in recent decades, the presence of these cultural landscape features

has systematically declined. Food forests are also clearly on the rise in Flanders, albeit often still in a private, hobbyist context.

Between 2011 and 2023, the government subsidies helped to establish 280 hectares of agroforestry, comprising more than 30,000 trees. Plant production farms accounted for about half of the projects, while a third of the projects involved livestock farms. Over 50% of the plantings were on grassland, with the remainder used for growing crops such as cereals, silage maize, root vegetables etc. at the time of planting (Reubens et al. 2024a). Newly established systems typically include multiple tree species (average: 5). Also, it is estimated that a further 250 hectares of agroforestry has been planted in the same period, but outside the subsidy scheme. Plant production farms accounted for about half of the projects, while a third of the projects involved livestock farms. Over 50% of the plantings were on grassland, with the remainder used for growing crops such as cereals, silage maize, root vegetables etc. Newly established systems typically include multiple tree species (average: 5). Also, it is estimated that a further 250 hectares of agroforestry has been planted in the same period, but outside the subsidy scheme.

Nevertheless, the implementation of 'new' agroforestry remains relatively modest compared to the 675,000 hectares of agricultural land in Flanders.

4.2.2. Water

In Belgium, the Meuse and Scheldt RBDs are divided between the administrative regions of Wallonia and Flanders (as well as Brussels). By far the largest part of Flanders lies within the RBD of the Scheldt; only the easternmost parts, which border the Netherlands, fall within the Meuse RBD. River basin assessments reveal differences due to topographical and agricultural conditions. The ecological, chemical and quantitative status of water bodies is adversely affected by various negative pressures, some of which are linked to population density, climate change and agriculture.

Given the high density of livestock and intensive agriculture in Flanders, agriculture is the main source of nutrient pollution in SWBs (mainly nitrates and phosphates). Barely a single SWB in Flanders achieves good ecological status, none of the SWB have achieved good chemical status, and similarly, 50% of GWB are in a poor chemical state (EC 2025e). The presence of nitrate in groundwater has been a persistent concern in Flanders. Unfortunately, recent data (2020-2023) show a rise in nitrate levels in about two-thirds of the region's GWB, with only around 10% of GWBs registering a decline (VMM 2024). Nine out of the ten Belgian GWBs that are in a poor quantitative state are located in Flanders, and in more than 80% of all GWBs in Flanders, water abstraction, including that from agriculture, is considered a significant pressure. As a result, Flanders launched new programmes such as the Blue Deal, which encourages a shift in the mindset towards locally adapted water retention and focuses on three main themes: smart and sustainable water use, restoration of wetlands, and nature-based solutions (EC 2025e).

4.3. Policies, Institutions, and Support Systems

4.3.1. Agroforestry

Common Agricultural Policy

For the current programming period 2023-2027, the NSP of Flanders highlights the potential benefits of agroforestry. Besides suitable investment schemes, it includes a specific measure for maintaining agroforestry systems.

In the NSP, an agroforestry system is defined as the combination of agriculture and trees on the same parcel of land. There is no distinction between arable land, permanent crops or permanent grassland, and the tree density is typically 30–200 trees per hectare in a homogeneous distribution (Ruigrok et al. unpublished). The term 'homogenous' distribution allows tree lines and, to some extent, clusters of trees as clarified in a separate document (LV 2018).

Within the framework of the CAP, GAEC-8 (Non-productive areas or features) aims to preserve existing landscape elements. In this context, the Flanders NSP flags hedgerows, lines of trees, groves and individual trees for protection, i.e. these features must not be removed. However, unlike in Wallonia, the NSP does not provide any further information on whether agroforestry systems or trees thereof fall under this category.

Flanders offers farmers investment support for agroforestry plantings (Aanplant Boslandbouwsystemen) (BLS). This investment aid is aimed at active farmers with land in the Flemish region of Belgium. Up to 75% of the planting costs are eligible, including tree seedling purchase, machine and labour costs, as well as reinforcement and protection materials. In the case of plantations done by the farmers themselves, a lump sum of 8 EUR per tree applies. The size of the plot must be at least 0.5 hectares, with a planting density of 30 to 200 trees per hectare[18]. Trees must be maintained for at least 10 years, including mandatory replanting of dead trees. The intervention focuses on indigenous and multifunctional tree species and excludes low-stem fruit trees, conifers or invasive species. The agroforestry system will be automatically included in the farmer's annual application for subsidies.

Beside planting, support is also available for the maintenance of agroforestry systems (Onderhoud Boslandbouwsystemen) (BLO). To qualify, the agroforestry system must meet the BLS (Investment Support Scheme) requirements. The annual payment is 270 EUR per hectare of the agroforestry system[19] and the payment application is automatically loaded into the subsidy system. Compulsory maintenance includes regular pruning – with a ban on pruning during the bird nesting season – as well as the management of strips / inter-tree areas and wildlife/livestock protection measures. The maintenance support may not be applied for in the same year planting support is applied for on the same parcel.

Other legislation

The following paragraphs summarise the information available from Agroforestry Vlaanderen (Agroforestry Vlaanderen 2021) and provide an overview of other relevant legislation for planting and maintaining trees. Please note that, as these paragraphs are not based on any additional references, they do not include any separate source information.

Field Code of Law (Veldwetboek)

The legislation stipulates the minimum distances from plot boundaries for the planting of woody plants. For trees measuring over 2 metres in height, a minimum distance of 2 metres is mandatory, while for smaller trees, a distance of 0.5 metres from the plot boundary is permitted. The Field Code explicitly states that no permit is required for planting agroforestry systems.

Flemish Code of Spatial Planning (Vlaamse Codex Ruimtelijke Ordening)

[18] Projects with a higher tree density might be approved given clear motivation and reasoning.
[19] This includes areas occupied by trees, as well as the surrounding crop or grassland.

The spatial planning code specifies the requirement for an environmental permit for any felling of trees with a diameter >0,3m, circumference of 1m, at 1m stem height, outside designated forests. Such permits must be requested at the municipal level or, should trees pose a public danger, a note from the mayor's office is sufficient. While the regulations are important for the management of hedges and similar arrangements, they do not apply in case of registered agroforestry systems.

Nature Decree (Natuurdecreet)

The Nature Decree provides, among other things, for the protection of small landscape features and may affect both the planting and maintenance of trees. Note that the legislation does not yet specifically address agroforestry systems. It is therefore the nuances of this framework that are crucial in considering agroforestry systems or their trees as small landscape elements. While their standard maintenance is not subject to approval, the removal or alteration of such elements requires authorisation and may be subject to certain restrictions and conditions, such as obligations to plant new trees.

The Nature Decree also covers aspects of the EU Habitats and Birds Directives and other protected areas, including historic or traditional cultural landscapes. Permits are usually required in these areas and changes to vegetation are generally prohibited, although exemptions are possible in certain circumstances.

Land Lease Act (Pachtwet)

As in other European Member States, in Flanders tenancy law plays an important role regarding agroforestry systems. It is the tenant's responsibility to obtain written permission from the landlord before planting any trees and failure to comply may result in the termination of the lease agreement. The exception is the preservation of the original condition of the leased land, although this is not defined in detail. Also, the landlord might not plant trees (without consent of the tenant), unless replacing trees necessary for the preservation of the property. The parties may be entitled to compensation, in case planting leads to an increase or decrease of property value.

More legislation

Only unregistered agroforestry systems or agroforestry systems established before June 2012 may be subject to the Forest Decree (Bosdecreet). The decree may impose restrictions on the use of such plantations if they develop into forests (for criteria, see the Forest Decree).

The Heritage Decree (Onroerenderfgoeddecreet) refers, amongst others, to protected cultural-historic landscapes or protected town or village views and may affect the planting or removing of trees.

Other options

In addition to CAP support, there are multiple other options for financial support from public agencies/authorities. However, these measures' requirements or eligibility criteria for planting or managing trees may differ between regions. Please refer to the relevant document for more information: Agroforestry Vlaanderen (2023).

4.3.2. Water policy

Water Framework Directive and Floods Directive

The Flemish Decree on Integrated Water Policy, first adopted in 2003, provides the general framework for implementing the European water-related directives in Flanders.

Under the Water WFD, the main rivers Scheldt and the Meuse are subject to management plans approved by the riparian states. In Flanders, the Coordination Committee on Integrated Water Policy (CIW) *"oversees the functioning of the integrated water management on the level of the sub-basins and is responsible for the implementation of the decisions on integrated water policy of the Flemish government"* (CIW 2025). The CIW brings together administrative entities (environment, transport, spatial planning) with regional and local water managers and water companies, with advisory votes from agriculture and economy.

In its third Water Policy Note, the CIW highlights five critical issues in water management. Beside pollution and the hydromorphology of water bodies, the note emphasizes the predominantly sectoral origin of measures[20] and the limited potential for customization and refinement targeting individual water bodies (CIW 2020). Furthermore, given the importance of water across multiple sectors, the extent to which the WFD's objectives are achieved will depend on effective and close cooperation at all relevant levels and over policy areas, such as spatial planning and agriculture (CIW 2020). The programme of measures accompanying the current RMBPs categorises the measures into several groups, which are then translated into concrete actions. As many of the measures relate to specific water bodies or areas, a detailed description would exceed the scope of this report. Instead, reference is made to the individual RBMP available through the CIW website. Still, it is noteworthy that the various benefits of nature-based solutions for increasing water availability are mentioned in conjunction with adapted land management to increase organic carbon and water retention. Stimulating agricultural holdings to increase green-blue investments, including non-productive investment support, should reduce the risk of water scarcity (CIW w.d.). Considering the problems caused by erosion, the pollution of ground and surface water with nutrients as well as pesticides and their metabolites, agriculture is identified as a focus area in 'De Grote Stroomversnelling', as part of the RBMPs. This programme focuses on optimising cultivation on sensitive plots, buffer strips and small landscape features, as well as implementing technical measures where necessary. Furthermore, land managers may be held responsible for serious soil erosion.

Other legislation

Flanders exhibits low water availability per inhabitant due to its limited surface and groundwater bodies, industrialisation and high population density. Given the expected impacts of climate change, the risk of water scarcity is likely to increase. The Flemish Drought Committee (De Vlaamse droogtecommissie[21]) convenes during periods of persistent drought to discuss additional reactive measures regarding the use of water resources. Launched in 2020 by the Flemish government, the Blue Deal features a multitude of actions (interlinked with the RBMPs) to tackle drought and water scarcity focusing on water availability and efficient water use. As an example, the 'Water-Land-Schap' programme aims to establish multi-stakeholder coalitions consisting of local authorities, associations, farmers and researchers. These coalitions (currently 15) strive for area-based approaches that combine liveable, sustainable agriculture with climate-robust landscapes and watercourses. Furthermore, to develop and experiment with new ideas, 'Water-Land-Schap' brings together young people, schools, citizens' initiatives and researchers, currently within eight projects (VLM 2025). In

[20] For example, the Manure Action Plan focuses on nitrates and overlooks phosphorous due to its origin in the Nitrates Directive. Similarly, conservation policies focus on the Natura 2000 network, not necessarily on watersheds.
[21] The Drought Commission (est. June 2018) became the executive body for reactive drought management in May 2021.

addition, the Blue Deal stipulated that municipalities must have an ambitious rainwater and drought plan in place by the end of 2024 to maintain their eligibility for water-related subsidies.

The **Flemish Climate Adaptation Plan 2030** (Vlaams Klimaatadaptieplan) underlines the significance of water availability and utilisation, the necessity to allocate space for water, as well as the restoration and climate-resilient management of nature. Aspects of its implementation include water infiltration, reducing erosion and climate-intelligent agriculture, amongst others, to ensure adequate protection against the effects of climate change, as well as ensuring crop yields and soil quality (DOV 2022).

4.4. Stakeholders and actors

4.4.1. Agroforestry

The **Consortium Agroforestry Vlaanderen** (Agroforestry Flanders; agroforestryvlaanderen.be) is an informal association for the research and promotion of agroforestry in Flanders and currently consists of the members ILVO, Inagro, Boerennatuur Vlaanderen, Bodemkundige Dienst van België, Bosplus vzw, Ghent University, Wervel vzw and Praktijkpunt Landbouw Vlaams-Brabant. By the end of 2025, two more organisations will join: INBO (Institute for Nature and Forest Research) and Regionale Landschappen. Besides policy actors at different levels as well as farm advisors, tree nurseries and other suppliers, the consortium constitutes the key players in regarding agroforestry in Flanders and strive *"to explore the possibilities of agroforestry in Flanders, address challenges, provide opportunities, and promote its adoption"*.

In close collaboration with a multitude of stakeholders, Agroforestry Flanders developed the road map 2.0 "Towards an enabling environment for agroforestry in Flanders", which includes five crucial development pathways to achieve the future vision: science and technology, economy, policy, education, and society (Reubens et al. 2024b).

Following the recommendations within the policy path, a **policy working group on agroforestry** was installed in September 2025, bringing together policy actors from different domains at Flemish level (agriculture, forest and nature, environment, land management, …). The objective of the working group is to create an overview of policy-related barriers as well as potential stimulators for agroforestry implementation. Furthermore, to prioritize and tackle them one by one by bringing together the right people, in order to create a more stimulating environment for agroforestry. The working group is coordinated by the Flemish Agency of Agriculture and Fisheries and has two representatives of the Consortium Agroforestry Flanders.

4.4.2. Water

The **Coordination Committee for Integrated Water Policy** (integraalwaterbeleid.be) is the central hub for the coordination of water policy and management and plays a role at river basin level. The management of watercourses is distributed along administrative levels. As such on the level of the Flemish government**,** De Vlaamse Waterweg manages navigable watercourses (rivers and canals) while the **Vlaamse Milieumaatschappij** (Flemish Environment Agency; vmm.vlaanderen.be) manages non-navigable watercourses of category 1 and is chairman of the CIS. The management of category 2 and 3 non-navigable watercourses lie with provinces and municipalities, respectively. 'Polders' and 'wateringen' independently manage the watercourses and canals in their category 2 area. Unclassified water bodies, such as ditches, are managed by the owners of the adjacent land.

AquaFlanders represents the interests of the Flemish water companies and sewer managers. There are also civil society bodies providing advice to the Flemish government of water-related topics, such as the Environment and Nature Council of Flanders (Minaraad; minaraad.be), Social and Economic Council of Flanders (serv.be) or the Strategic Advisory Council for Agriculture and Fisheries (salv.be).

4.5. Challenges and Opportunities

Agroforestry initiatives are commonly pioneer work in Flanders. These pioneers, with their diverse products and production methods, often find themselves in an uncertain context in terms of both the economy and rules and regulations. The uncertainty surrounding profitability and the absence of a coherent regulatory framework prevents farmers starting agroforestry with confidence (Reubens et al. 2024b). Also, agroforestry requires knowledge of both forestry and agriculture; however, the available knowledge remains fragmented. Therefore, agroforestry pioneers develop the necessary interdisciplinary knowledge based on existing research and other sources, while experimenting with new products resulting from the diversity of agroforestry systems (Reubens et al. 2024b).

As from a policy perspective, agroforestry is linked to a number of Flemish policy frameworks and offers a multitude of opportunities for contributing to achieving politically envisaged agricultural and sustainability goals (Reubens et al. 2024b). However, despite Flanders' comparatively long history of supporting agroforestry, available budgets are often underutilised, and complex application procedures, controls and other regulatory aspects have led to a recent decrease in the number of applications. Nevertheless, the Agroforestry Roadmap 2.0 (Reubens et al. 2024b) emphasises the *"noticeable will [of administration] to support agroforestry for the better"* and mentions the use of 'regulation-free zones' as a mean to enable pioneering farmers to experiment with agroforestry without the concern of legal repercussions. In line with the context of the AFaktive project, the authors Agroforestry Roadmap 2.0 advocate for the incorporation of agroforestry into regional planning procedures, for example, the Flanders Spatial Policy Plan ("Beleidsplan Ruimte Vlaanderen").

In Flanders, the issue of water is high on the political agenda and water availability, and water quality are key political priorities, as reflected in the RBMPs, the ambitious Blue Deal and the Climate Adaptation Plan. At the same time, agriculture is seen as a sector that both influences and is influenced by these issues. There are various regional approaches that offer opportunities and entry points for agroforestry. The biggest challenge being the introduction of agroforestry as a concept, and promoting the understanding thereof within relevant policy areas, thereby integrating it across coherent policy programmes.

5. Wallonia (BE)

5.1. Introduction

5.1.1. Geography

The topography of Wallonia, Belgium's southern region, ranges from plains in the north to the Ardennes massif and plateaux in the south. The Walloon landscape is characterised by distinct agro-geographical zones shaped by the region's agricultural history.

The rivers Sambre and Meuse mark the transition from the plains of the north to the plateaux and the Ardennes Massif in the south. Industrialisation and intensive agriculture are more prevalent north of the Sambre-Meuse valley. Similarly, population density is higher along the rivers and in the north, while it is more dispersed in the south with its more rural areas and smaller urban centres.

The northern low-lying plains are characterised by deep, silty soils that are predominantly farmed. In contrast, the shallower, more acidic soils of the Ardennes are primarily used as grasslands and forests.

5.1.2. Climate

Wallonia has a temperate climate with year-round rainfall and warm summers (Köppen-Geiger Cfb). Due to its topography, however, the region's climate varies noticeably from north-west to south-east. From 1996 to 2015, the average mean temperature was 9,7 °C (11°C NW vs. 7,5°C SW). When considering Wallonia as a whole, precipitation is distributed fairly equally throughout the year (Figure 9), with an annual mean of 959 mm. However, there are substantial variations throughout the territory: The northern bioclimatic zones Plaines et Vallées Scaldisiennes and Hesbino-Brabançon are characterised by relatively uniform averages of around 700-900 mm per year. In contrast, the rest of Wallonia receives higher rainfall, ranging from 900-1.400 mm per year.

Still, projections for the 2040-2059 time period[22] indicate dryer summers and wetter winters, along with increased temperatures. Especially in the summer months, the average monthly mean temperature is likely to increase up to two degrees, compared to the 1995 – 2014 period (Figure 10). Generally, the same trends can be expected to continue or increase in the further future. The number of days with maximum temperatures over 25 °C will increase by nearly five days in the month of August alone. The maximum monthly number of consecutive wet days is expected to decrease in the summer and autumn and to increase in the winter or spring, depending on the scenario. The maximum monthly number of consecutive dry days will increase except in winter, and most strongly in summer. Strong precipitation events of over 20 mm in one day become more likely, especially the autumn or winter months, depending on the scenario.

[22] The scenarios here considered are the SSP2 (“middle of the road”) and SSP3 (“regional rivalry”) Shared Economic Pathways (see Riahi et al. (2017)). All data from the Climate Change Knowledge Portal (World Bank (2025)).

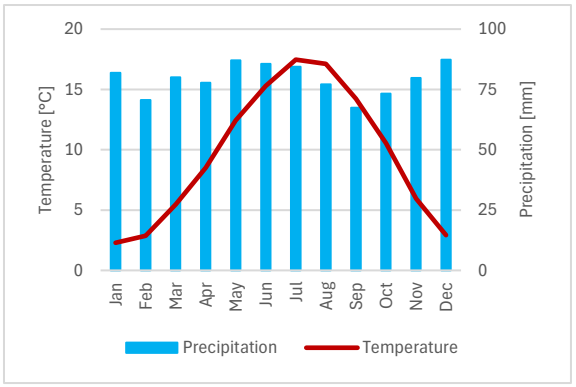

Figure 10: Projected Anomaly 2040-59 for Wallonia (BE), compared to reference period 1995 – 2014
Data: World Bank (2025).

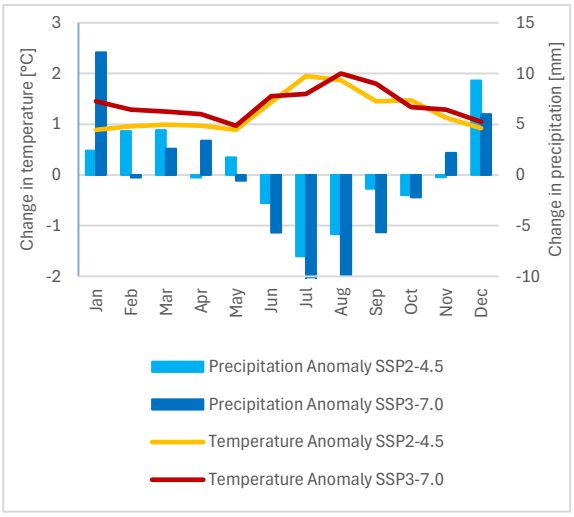

Figure 11: Climate Wallonia (BE), Historical Reference Period 1995-2014.
Data: World Bank (2025).

5.1.3. Agriculture

According to land registry data from 2023, agricultural land (51%) and woodland (29%) make up most of Wallonia's territory, though two geographical regions should be distinguished. The main rivers, the Meuse and the Sambre, mark the natural boundaries of relief, soil types and agricultural land use in Wallonia. The higher population density and marked industrialization to the north leads to predominant intensive arable farming of wheat, fodder maize, potatoes and sugar beet, while the plateaus and hills to the south and east are dominated by permanent pastures and woodland (DEE, DEMNA and SPW ARNE 2024). Arable land and permanent grassland make up most of the agricultural area in Wallonia, with a few permanent crops or wooded areas (Figure 12).

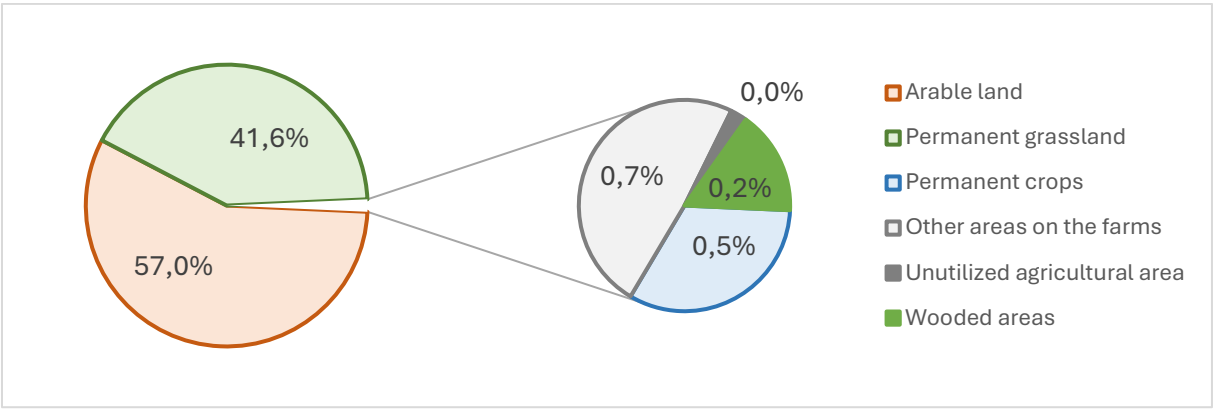

Figure 12: Main farm land use in Wallonia (BE) in 2020.
Data: Eurostat (2025).

5.2. Agroforestry-Water-Nexus

5.2.1. Agroforestry

As part of the initial stages of developing a strategic plan for agroforestry, an inventory of existing agroforestry systems was conducted for the first time using GIS (de Streel and Baudry 2023). Although the analysis continues, preliminary results show the high prevalence of woody elements in the Walloon agricultural landscape. With almost 23,000 km of hedgerows detected, this corresponds to about 30 m per hectare in the area of interest, with the majority of hedgerows usually < 50 m in length. Intra-

plot tree lines, typical of modern agroforestry systems, corresponded to a total area of 183 ha of agroforestry systems (de Streel and Baudry 2023). However, these analyses do not allow to determine the utilization of hedges and rows of trees. In particular, the hedgerow structures at field or plot margins presumably qualify as landscape features, and therefore as non-productive. The extent to which this is consistent with utilization in the context of agroforestry systems remains unclear.

5.2.2. Water

Although the Walloon Environment Report (DEE et al. 2024) does not yet indicate water stress[23], it does forecast adjustments in water use. At present, most consumptive are the production of energy, drinking water production and the industrial sector (DEE et al. 2024). Currently, water abstraction for agriculture is marginal (0.2 %), but underestimated. However, given the predicted increase in dry periods during the growing season, irrigation as an adaptation option is likely to become more relevant, especially for high-value crops such as potatoes (DEE et al. 2024). Seasonal droughts and/or heavy rainfall events are both considered to become more influential, e.g. in terms of reduced oxygenation, nitrogen leaching and nitrate pollution or erosion events such as mudslides.

Although there is a clear disparity between the two agricultural distinct regions in Wallonia, more than 40% of the SWB are in good ecological condition. While the majority of SWB in the south-eastern part of Wallonia, the RBD of the Meuse, are in good or very good condition, the ecological status of most SWB in the north-western region, or the RBD of the Scheldt, remains poor or very poor. Thus, the water bodies in poorer condition lie in areas with higher human pressures (DEE et al. 2024), such as intensive agriculture. This largely overlaps with the chemical status of the GWB, as those with poor status are all located north of the Meuse and Sambre, with nitrate and pesticide pollution being the common denominator (DEE et al. 2024).

5.3. Policies, Institutions, and Support Systems

5.3.1. Agroforestry

Common Agricultural Policy

The NSP for the CAP 2023-2027 of the Walloon region has multiple mentions regarding agroforestry, resp. trees and hedges on agricultural land and landscapes.

The Walloon NSP defines agroforestry as a land-use system combining forestry and agricultural activities on the same land, where forestry is defined as the production of wood or other tree products, with the exception of non-agricultural products. On arable land and permanent grassland, an agroforestry system may consist of rows of trees or isolated trees, allowing only species adapted to the local climate and soil conditions. The planting density must be between 30 and 100 trees per hectare, with a minimum height of 1.2 metres. Short rotation coppices are considered as agroforestry in the Walloon NSP, while other permanent crops such as orchards are not included.

Within the standards for good agricultural and environmental condition of land, GAEC-8 is of particular interest, as it provides for the preservation of existing landscape elements (e.g. hedges, field shrubs). It should be noted that the EU previously envisaged each farm devoting a minimum of 4% of its arable land to non-productive areas and features. However, this obligation was removed in 2024 via the “CAP

[23] Over the period 2000-2020, Wallonia's water exploitation index (WEI+) was ~5%. The European threshold for water stress is 20%.

Simplification Regulation" (Regulation (EU) 2024/1468), while GAEC-8 remained for the **maintenance of topographical features and prohibition of cutting hedges and trees during nesting and breeding of birds**. In this context, hedges, isolated and aligned trees as well as agroforestry (starting from the year of planting) are among these topographical features (SPW ARNE 2025). As GAEC-8 aims to maintain these characteristics, it also clarifies pruning, e.g. no pruning during bird nesting season, no cutting below 1 meter, and no uprooting or mechanical/chemical destruction. Although agroforestry systems may fall within the scope of GAEC-8, it is not clear how they relate to the notion of 'non-productive'/landscape element or to the eventual removal of the agroforestry system.

In compliance with GAEC-8 regulations, the one-year commitment of the **eco-scheme** (intervention 143, "maillage écologique") of the Walloon NSP intends to establish and retain biodiversity areas and ecological grids within the agricultural landscape and includes restrictions in the use of pesticides near the elements (DGARNE and CREA 2025). It explicitly names trees, hedges and alignment of trees, including high-stem arboriculture and comes with a premia of 450 EUR per hectare, which might increase in Natura 2000 or other areas of high biological interest.

However, Wallonia's NSP does not include a support measure specifically targeted at agroforestry, either in terms of investment, e.g. for planting, or in the context of continuous support for the management of agroforestry systems.

The agri-environment and climate measure (AECM) **"Prairie à haute valeur biologique (MC4)"** targets grasslands, whereby grassland with perennial high-stem fruit trees is eligible. The high biological value of each parcel is subject to an expert opinion. In theory, this measure could support agroforestry, although due to the specificity of the measure, only already established systems may benefit.

The Wallon NSP (Gouvernement Wallon 2024) includes multiple support measures for investments although it is not clear to what extent this includes support to agroforestry and/or water retention actions:

Aid for productive investments in agricultural holdings (#351): The Walloon NSP links this very broad investment measure to, among other aspects, the status of surface waters, the use of plant protection products, soil organic matter content and biodiversity-related indicators. In this context, it is considered necessary to support agricultural practices that contribute to the objectives of green architecture, such as organic and/or conservation agriculture, as well as the protection and sustainable use of resources and the promotion of agricultural diversification to increase economic resilience in the face of climate change. However, there is no specific mention of nature-based solutions or agroforestry. So, while this measure could eventually be used for agroforestry, experts are not currently aware of any funded agroforestry projects. It is assumed that farmers prefer the regional subsidy offered by the 'Yes We Plant' campaign (see below) as it is easier to access, albeit mutually exclusive.

Aid for non-productive investments in agricultural holdings (#352): This intervention directly relates to erosion rates as well as to the pollution of surface waters and their consequent poor ecological status. The objective is "the construction of infrastructure on agricultural land with the main objective of improving the environment by reducing erosion and strengthening the water framework". The investments eligible are of a technical nature and include, among others, ditches, retention basins and drainage outlets. While the measure refers to agricultural practices as well as the objectives of the WFD, it does not go far enough to specifically include nature-based solutions such as agroforestry. It remains unclear whether and to what extent agroforestry systems are eligible.

Aid for non-productive investments in rural areas (#355): This nature conservation measure refers to the restoration or improvement of ecosystem services. It partly involves natural regeneration or replanting of native species in line with the Walloon Forest Regeneration Policy and, although there is no clear link to land management or agroforestry, the rationale refers to the potential to "improve water availability in times of drought and mitigate the effects of floods due to run-off in water catchment areas downstream of the forests concerned". However, this measure is closely linked with areas of high nature value, rendering it eventually unsuitable for the establishment of new agroforestry systems.

Other regulations

Non-agriculture related regulations mention amongst others the felling of trees; however municipal planning guides (Guides Communaux d'Urbanisme) might include agroforestry related aspects as well. This complicates comparisons and uniformism of regulations, as there might be differences between these on the municipal level – this would be especially hindering when thinking about larger approaches for agroforestry, e.g. on catchment, landscape, multi-municipal or regional scales.

Territorial development code (Code de Développement Territorial, CoDT):
The max. 100 trees per hectare for agroforestry systems of the Walloon NSP also reflects the threshold in the CoDT, after which plantings would be defined as afforestation and require permission. Still, it remains unclear if the NSP's and the definition in the CoDT align properly: While there are no issues when the system's tree density remains below the 100 trees threshold, in theory, agroforestry systems with more than 100 trees per hectare would fall under the CoDT as afforestation and therefore would not only require planning permission, but also, the parcel would not necessarily retain the status of agricultural land, with the corresponding consequences for CAP payment eligibility. However, the CoDT also explicitly refers to a width of more than 10 meters, which leaves room for interpretation. Whether an imaginative agroforestry system consisting of strips less than 10 metres wide and with more than 100 trees per hectare would be classified as afforestation remains debatable. In the CoDT, deforestation refers to the permanent removal of trees and requires permission, while hedges with a width of less than 10 m are excluded here. Similarly, the extent to which this definition of deforestation also reflects the removal of trees in agroforestry systems remains unclear.

In view of the different regulations, pruning should always be compatible, provided that it does not endanger the survival of the tree/bush. However, at present this may be in breach of Article R.IV.4-10 CoDT.

Tree protection including for the preservation of traditional and historical structures
In order to protect historic and traditional structures and landscape features such as alleyways[24], tree felling and hedge trimming are regularly subject to authorisation. Agroforestry systems are explicitly exempted from this requirement (CoDT Art. R.IV.1-1 §2). However, distinguishing agroforestry systems from "hedges and trees of other origin and use", resp. traditional and historical structures, on the ground may prove difficult, and ongoing legal and administrative reforms may lead to inconsistencies and overlaps between definitions. In this regard, de Streel and Baudry (2023) mention e.g. agroforestry systems planted before 2017, for which it is not clear whether these would be considered as such or fall under the term natural/traditional elements and thus be subject to the relevant regulation, resp. authorization for felling and trimming.

[24] Alleyway definition: tree line of min. 10 trees, min. 100 m length, min. 4 trees visible simultaneously; mainly intended for typical alleys of old trees leading to historic buildings such as manors and castles.

Framework on farm lease decree (Dècret Bail à ferme art. 24)

In general, the Farm Lease Decree protects existing features such as landscape elements, traditional hedgerows and ecological structures and essentially maintains the leased property as it is. In addition to the above, Article 28 states that the landlord may replace existing vegetation without the tenant's consent, without a clear definition of what is meant by this term. In any case, new planting requires the consent of the landlord or, vice-versa, of the tenant.

"Yes We Plant" campaign

The "Yes We Plant" campaign reached its objectives of planting 4,000 km of hedges and 1 million trees in Wallonia in 2024 (Gouvernement Wallon 2025). The programme remains still available for plantation projects to this day and is another example of the favourable conditions for planting trees in Wallonia. The main objective of the campaign was and is to improve biodiversity and habitat connectivity. Benefits such as mitigating flood risks, limiting erosion as well as animal welfare are also explicitly mentioned, and possible productive uses include fodder, timber/wood or fruits. The programme includes lump sum payments for planting and maintaining of tree lines, orchards, hedges and linear coppices – without specifically mentioning agroforestry ("agroforesterie"). It includes specifics such as minimum number of species, spacing, height, etc. for each of the available options. In order to ensure the compatibility of a species with the macroclimate, permissible tree species are differentiated according to bioclimatic zones defined by climatic, geomorphological and lithological criteria (DEE, DEMNA and SPW ARNE 2017). Therefore, only species from a positive list and adapted to the natural conditions of the regions are eligible, and the establishment rate should be > 80% in a good vegetative condition. Typically, the grant is valid for two years from the date of approval and covers up to 80% of the invoiced costs. Plantations must be maintained for at least 30 years, representing a long-term commitment and potentially limits the design of agroforestry systems.

However successful the campaign might be, it currently finds itself at a crossroads. While the current government does mention supporting agroforestry development in the Declaration of Regional Policy, it has yet to present a strategy for agroforestry, nature restoration and conservation (see also Agroforestry-Water-Nexus). Consequently, the future of the "Yes We Plant" campaign remains uncertain. In conjunction with the "Yes We Plant!" campaign, Wallonia started the process of establishing a strategic plan for the development of agroforestry under its previous government. However, as the current government has not yet taken steps to actively pursue this process, the availability of resources for its finalisation and implementation remains uncertain.

5.3.2. Water policy

Water Framework Directive and Floods Directive

In Belgium, the legislation of water-related policies, including the WFD and the Floods Directive remains at the regional level. Authorities prepare RBMPs and FRMPs, regulate water supply, oversee water quality, set water quality standards and monitor drinking water. The Regional Water Resource Plan (Schéma Régional des Ressources en Eau) is an investment programme that addresses water management in a holistic way, considering environmental challenges and long-term objectives at the regional level in Wallonia. The Walloon Society of Waters (Société Wallonne des Eaux; SWDE) is tasked with its implementation.

The Meuse and the Scheldt are the main river basins in Wallonia, and their management and preservation is subject to the respective international or regional RBMP. The 3rd RBMP for the Walloon RBDs (SPW ARNE and DEE 2023a) lists basic and complementary measures for the agricultural

sector, mostly targeting the reduction of critical substances. Noteworthy in the context of agroforestry is the specific reference to the "Yes we plant!" campaign for the establishment of riparian strips (planted with hedges) (SPW ARNE and DEE 2023b). The basic requirement is a mandatory riparian strip of 6 m; the campaign allows these to be designed or used in other ways. The eco-schemes and AECM of the CAP are considered to be potentially effective, although lacking specific targeting regarding water protection (SPW ARNE and DEE 2023a). A complementary measure aims to assess inputs through soil erosion from agricultural land and subsequently develop potential farming practices and measures to address the issue of erosion (SPW ARNE and DEE 2023b).

Regarding the Drought Strategy (see below), Walloon RBMP explicitly refer to nature-based solutions as well as rainwater management, runoff control, natural water retention areas or the presence of riparian vegetation (SPW ARNE and DEE 2023b) - all of which offer a link to agroforestry.

However, it is striking that the RBMP (SPW ARNE and DEE 2023a) refer almost exclusively to blue water, i.e. water in surface and groundwater bodies, and the pressures associated therewith, e.g. agricultural pollution with nitrogen, phosphorous and/or pesticides. Green water on the other hand, i.e. water retention in the landscape as a result of precipitation and thus associated with agricultural production, is barely touched upon.

Flood risk management plans indirectly address more sustainable land use and increased water retention. The Walloon rural development programme includes the measure ‘flood meadows’ for controlled flooding, which should enable the temporary retention of water during flood events (SPW ARNE and DEE 2023a).

At the local level, authorities implement legislation and manage small and non-navigable water bodies. In Wallonia, local authorities collaborate with stakeholders through 14 so-called river contracts (Contrats de Rivière) to manage river sub-basins effectively (EU-CoR 2025). These participatory structures are aimed at restoring watercourses and preserving water resources within a sub-catchment area. They organise consultations between various stakeholders in the water sector in Wallonia, including municipalities, provinces, the Walloon public service and local actors such as fishermen, farmers, local associations and businesses. They are considered an important tool for the implementation of the objectives of the WFD at a local level. A 3-year ‘Action programmes’ of the river contracts brings together public and private stakeholders and encourages the contracting parties to take participatory action and to implement projects targeting the protection, restoration and use of Walloon water resources.

Comprehensive Drought Strategy

Wallonia adopted a comprehensive drought strategy ("Stratégie intégrale sécheresse") in July 2021. Water use, regeneration of water resources and adaptation of the rural and natural environment are addressed as part of this strategy, which combines a variety of existing approaches and uses synergies to the extent possible. The actions of the strategy are aimed at increasing the resilience of rural and natural areas to the effects of drought in general, provide administrative guidance or lead to the adoption of legislation (SPW ARNE and DEE 2023a). The strategy focuses on water from aquifers and rivers and supports nature-based solutions such as revegetation or wetland restoration. It comprises measures across three axes and includes objectives such as raising awareness of agri-environmental and climate issues. Although this could be considered an initial step towards climate-adapted agroforestry systems, the strategy primarily addresses water storage and usage on farms

(e.g. water tanks and irrigation techniques) and pays limited attention to rainwater infiltration or the resilience of agricultural systems.

5.4. Stakeholders and actors

5.4.1. Agroforestry

The "Association pour l'agroforesterie en Wallonie et à Bruxelles" (AWAF; awaf.be) is the umbrella organisation at the forefront of the promotion and maintenance of agroforestry throughout Wallonia. It is a multi-stakeholder organisation, representing farmers, researchers, entrepreneurs and administrators, and promotes knowledge transfer, e.g. through exchange visits, conferences and training, but also works closely with political bodies to embed and strengthen agroforestry in legislation and regulation.

In addition to AWAF, other associations provide farmers with advice and support for planting trees and hedges in agricultural areas. Below is a non-exhaustive list of the key players in the development of agroforestry in Wallonia:

- **Natagriwal** (natagriwal.be) is an advisory agency active throughout Wallonia, focusing on agri-environmental and Natura 2000 matters. The tree plantation and anti-erosion units provide advice on tree and hedge planting and support farm owners with subsidy requests.
- The environmental association **Faune et Biotopes** (faune-biotopes.be) aims to preserve fauna and flora and improve their habitats by working with rural stakeholders such as farmers, municipalities, hunters and businesses. A dedicated team of planting and hedgerow advisors offers personalised support, from design to implementation, and provides advice on administrative procedures.
- The **Centre de Développement Agroforestier de Chimay** (cdaf.be) works towards the future of forestry and agroforestry. It experiments with new forestry techniques and replants trees and hedges in fields. It also provides training programmes, among other things.
- **Diversifruits** is a non-profit organisation uniting fruit-sector stakeholders to share knowledge and support sustainable practices. It provides tools, trainings, and services while promoting orchard diversity, fruit heritage, and preserving high-stem orchards and biodiversity.

In addition to these associations, several companies, including **Dryades**, **Sylv'Agro** and **Plant C**, specialise in providing consultancy services, developing concepts and offering support for establishing or maintaining agroforestry systems.

5.4.2. Water

Beside the SWDE and river contracts, there are numerous associations involved in the management and preservation of water and soil in agricultural areas in Wallonia. Their members are usually landowners, particularly farmers. The most relevant of these actors are:

- **Natagriwal**: as well as being relevant to agroforestry, their Soil Protection Unit advises farmers on soil and water conservation and management.
- **PROTECT'eau** (protecteau.be) offers advice and services relating to water quality and the prevention of risks associated with the use of nitrogen and plant protection products. This non-profit organisation primarily targets farmers and other users of plant protection products in the Walloon region.

- **Hydrologie Régénérative Belgique** (hydrologieregenerative.be) is an umbrella organisation for regenerative hydrology, aiming to improve resilience to water-related issues such as drought, flooding, erosion, soil fertility and biodiversity.

While these individual associations mainly operate within the context of local water bodies and catchment areas, regional institutions undertake tasks at a higher level, including providing advice to relevant authorities, such as municipalities.

- **Groupe Transversal Inondations**: This cross-cutting body provides consultation, analysis, expertise and advice to public authorities on flooding in Wallonia. It is also responsible for monitoring and implementing the Flood Directive.
- **The Gestion Intégrée Sol Erosion Ruissellement (GISER)** unit of the SPW-ARNE assists municipalities with flood runoff management and prevention by conducting analyses and making recommendations for adjustments, as well as monitoring the various stages of implementation. The GISER unit also advises on certificates and permits for areas prone to natural runoff.
- **Watercourse managers (Gestionnaires de cours d'eau)**: Each public watercourse in Wallonia has a dedicated institution responsible for its management. This institution must be consulted before any works or actions that may impact the watercourse, or its management are undertaken. For non-navigable watercourses, these institutions are: SPW Environment (DCENR) for the first category river system, the province for the second category, the municipality for the third category.
- **Société Publique de Gestion de l'Eau** (SPGE; spge.be): As a public company, SPGE plays a key role in protecting groundwater resources by coordinating and financing the activities of various stakeholders involved in groundwater management. Virtually all water producers have signed a protection service contract with SPGE. SPGE also works with farmers to protect the resource around sensitive areas.

Additionally, there are two noteworthy research projects focusing on improving water management in agricultural areas through nature-based solutions.

- MODREC project (2022–23): In addition to creating a hydrological and hydraulic model of the Vesdre catchment area in the north-east of Wallonia, one of the project's main objectives was to evaluate the impact of landscape hydrological restoration measures such as keyline design, hedgerows and farming practices.
- The project, 'Gestion quantitative de l'eau en agriculture en Wallonie Picarde' (2023-2027), is overseen by the Directorate for Rural Development (Direction de l'Aménagement Foncier Rural). The project's objective is to evaluate water management practices in agriculture and develop improvement strategies to enhance the resilience of farming areas. This includes identifying a pilot area in which to develop practical solutions, paying particular attention to the new challenges brought about by climate change.

5.5. Challenges and Opportunities

Although there is a generally positive view of trees, woody elements and/or agroforestry systems in Wallonia, there is still a long way to go regarding the different laws and regulations. This is particularly true for the rationalisation of the definition of agroforestry systems, which must encompass the multiple regulations mentioned above. There is clearly a need to distinguish between trees and hedges intended for agroforestry and those that are not. A definition must be clear, consider all relevant

regulations and include the use and eventual removal of agroforestry systems while maintaining the status of agricultural land.

Wallonia does not currently offer a specific support programme for the maintenance of agroforestry systems. Although the "Yes we plant!" campaign does not specify agroforestry, it seems to be successful and offers lump sums for the initial investment for planting. However, following the most recent change in government, the future of the 'Yes We Plant!' campaign, and the development of an independent agroforestry strategy, remains highly uncertain.

Agriculture is often mentioned in the context of the implementation of the WFD, but almost exclusively in terms of the pollution and emissions it causes to surface and groundwater. Water retention in the landscape is largely absent from the programmes. However, proposed measures such as planted riparian buffer strips including hedges provide some scope for agroforestry practices, which offer additional potential for improving water retention on agricultural land and could therefore be given greater consideration as a nature-based solution in the future. Another positive aspect is the drought strategy, which recognises the risks and challenges associated with climate change and also provides potential entry points for agroforestry in terms of water retention.

6. The Netherlands

6.1. Introduction

6.1.1. Geography

The Netherlands is known for low-lying and flat landscape. The highest point, Vaalserberg, reaches just 322 meters above sea level; over a quarter of the land area lies below sea level. This topography is partly the result of land reclamation from the sea, forming polders that are protected by dikes and coastal dunes and drained by canals, sluices and pumps (Heslinga et al. 2025).

Soils in the Netherlands reflect this history, with marine clays, peat, and fine sands dominating the surface in the low-lying west, north, and central river districts, while the higher east and south feature loamy sands, gravels, and, in some areas, loess (Huisman 2004). The country's fertile soils, especially in reclaimed polders and river deltas, support intensive agriculture, but ongoing drainage has caused subsidence and soil oxidation, increasing vulnerability to flooding and salinisation (Huisman 2004).

Due to high land use competition and for historical reasons, the Netherlands is rather forest-poor (Figure 15). Only 15% of the Netherlands are woodlands.

6.1.2. Climate

Like the other project regions, the climate of the Netherlands is temperate maritime (Köppen-Geiger Cfb) with frequent precipitation and warm summers (10,5°C / 802 mm). Precipitation is slightly lower in the late winter to early spring, compared to the rest of the year (Figure 13).

Moreover, projections for the 2040-2059 time period[25] show that dryer summers and wetter winters are to be expected, along with increased temperatures, especially in the summer months (Figure 14). Generally, the same trends can be expected to continue or increase in the further future. The number of days with maximum temperatures over 25 °C will increase by over three days per month in the hottest months. Compared to the other regions in the project, temperature increases in the Netherlands are expected to be more moderate. The maximum number of consecutive wet days likely will decrease in most of summer and autumn but increase in winter and spring. Conversely, the maximum number of consecutive dry days will increase in summer and autumn. Strong precipitation events of over 20 mm in one day become more likely, especially the autumn and winter months.

[25] The scenarios here considered are the SSP2 ("middle of the road") and SSP3 ("regional rivalry") Shared Economic Pathways (see Riahi et al. (2017)). All data from the Climate Change Knowledge Portal (World Bank (2025)).

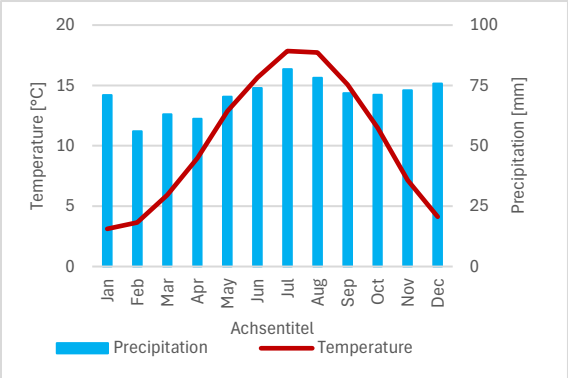

Figure 13: Climate Netherlands, Historical Reference Period 1995-2014.
Data: World Bank (2025).

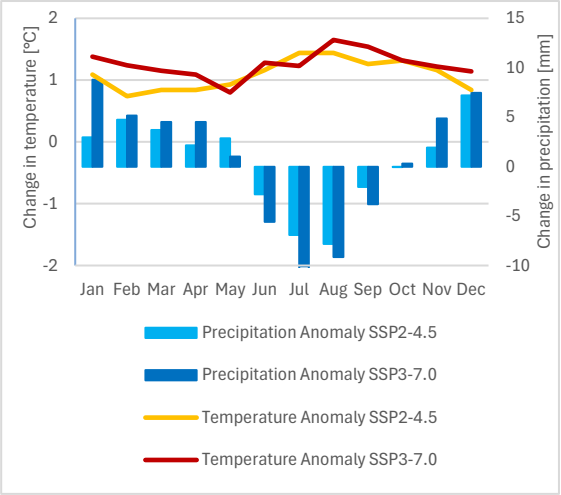

Figure 14: Projected Anomaly 2040-59 for the Netherlands, compared to reference period 1995 – 2014.
Data: World Bank (2025).

6.1.3. Agriculture

Despite its relatively small size, the Netherlands has a strong export-oriented agricultural sector due to its high-intensive and technologically advanced farming systems. Key areas include dairy farming and arable crops such as potatoes, sugar beets and cereals. The country is also renowned for its horticultural produce, including tomatoes, cucumbers and flowers, which are mainly cultivated in South Holland and Flevoland. Dairy farming is concentrated in Friesland, North Brabant and Gelderland, where high-density cattle herds supply milk for cheese and other dairy products. Such intensive agriculture leaves little room for wooded areas within farms (Figure 15).

The Netherlands has a unique relationship with water, shaped by its history of reclaiming land from the sea and the fact that large parts of the country now lie below sea level. As a result, the approach to agriculture and water management in the Netherlands differs somewhat from that in the other regions of the AFaktive project. Flooding, summer droughts and saltwater intrusion threaten crop yields and the availability of freshwater, while the intensive agriculture leads to nutrients leaching into surface water and groundwater. Climate change only exacerbates these pressures further.

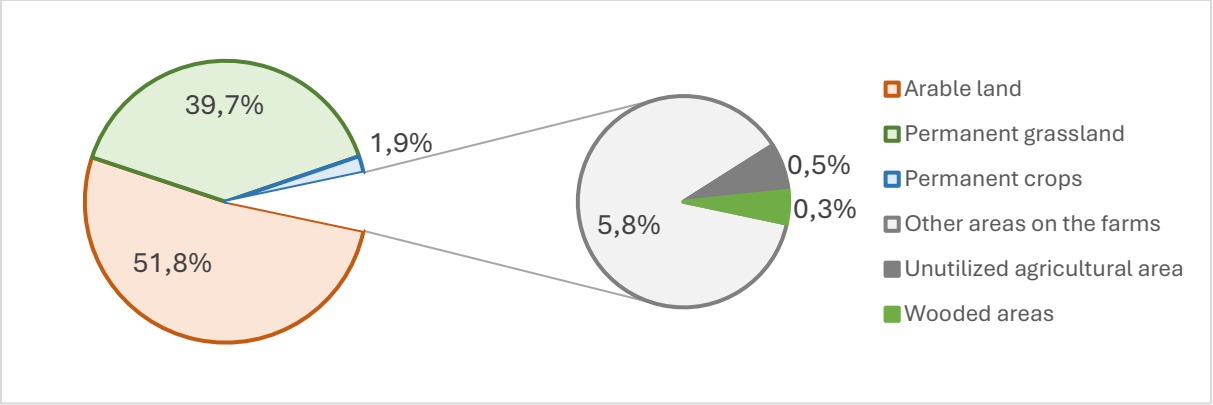

Figure 15: Main farm land use in the Netherlands in 2020.
Data: Eurostat (2025).

6.2. Agroforestry-Water-Nexus

6.2.1. Agroforestry

Silvo-pastoral systems with cattle, alley-cropping systems and food forests constitute the main types of agroforestry currently practiced in the Netherlands (EURAF n. d.). Prins and Fuchs (2024) describe eight agroforestry systems in the Netherlands, without information on their current extent: Functional hedgerow, large-scale alley cropping, small-scale alley cropping, grazed orchard, alley cropping on grassland, fodder trees, trees in poultry free range area, agricultural food forest.

Rubio-Delgado et al. (2025) recently estimated the area of common agroforestry in the Netherlands to be 22,900 hectares. This includes for example silvo-pastoral and silvo-arable systems, grazed permanent crops and kitchen gardens (see Annex). The researchers also estimated an additional 105,400 hectares of small woody features, such as hedgerows, avenue trees, woodlots, and riparian buffer strips, which often form field boundaries (Rubio-Delgado et al. 2025).

Food Forests, planted forests with a variety of edible plants in all layers of the forest (Wendel, Rooduijn and Disselhorst 2023), are a form of agroforestry that receives particular attention in the Netherlands. The masterplan for food forests aims at 1,000 ha of food forests until 2030, mentioning the good water retention properties of forest soils as a benefit (Buiter and Waard 2020). A specific crop code for food forests exists, and requires that no fertilisers or pesticides are used (Prins and Fuchs 2024).

A further important system are high-stem fruit trees in grassland that has traditionally been grazed. Poplar and alder with grass in-between, grazed or mowed, are also traditional. Oosterbaan and Kuiters (2008) found forest grazing, the grazing of cattle or other animals in forests, to be relatively widespread too.

Official data on the extent of agroforestry in the Netherlands is currently unavailable, since there is no single crop code that encompasses all its forms. While some crop codes exist for specific systems, such as food forests, fodder hedges (voederhagen), and traditional high-stem orchards, however, many systems are counted either as plantations or as the underlying land use (RVO 2024). This obscures the actual extent of agroforestry in the Netherlands and prevents comprehensive statistical accounting. In an annual mandatory registration carried out by the Netherlands Enterprise Agency, farmers can indicate whether they practise agroforestry. Based on these records, it was found that, in 2024, 1,500 Dutch farmers reported practising agroforestry.

6.2.2. Water

The largest RBD in the Netherlands is the Rhine, followed by the Meuse, the Schelde and the Ems. Almost all surface water bodies in the Netherlands are classified as artificial or heavily modified, and in ecological terms they must meet the objective of good ecological potential rather than good ecological status (EC 2025g). The ecological potential of surface water bodies in the Netherlands remains challenging: none reach good ecological status/potential; two thirds are in a moderate state; and the remaining third is in poor or bad condition. However, over time there has been a gradual shift from poor to moderate ecological status/potential (EC 2025g). The chemical status of SWB deteriorated during recent reporting periods of the WFD as that of now only about 10% of SWB are in good chemical state. While there is a positive trend, pesticide and nutrient pollution from agriculture remains high, and supposedly far more costly and far-reaching measures in agriculture are needed to reach the targets (NOS 2024).

The effects of the 2018 drought resulted in one of the GWB (Meuse RBD) being in a poor quantitative state, two more GWB are at risk of falling into a poor quantitative state by 2027 (EC 2025g). As a result, drought management is a central aspect in the 3rd RBMPs, and drought management plans are in place and include recommendations and measures regarding resilience against drought. Although the GWB in the Netherlands are largely in good chemical status, it is solely agricultural compounds that cause failures, e.g. nitrates, pesticides or phosphorus.

Hydromorphological pressures stem from a large part of the country being under the sea level, as well as agriculture, and "the RBMP includes 'win-win' measures to achieve objectives of the WFD and Floods Directive and address drought management in the form of 'Natural Water Retention Measures'", which might be an entry point for agroforestry (EC 2025g). Water abstraction largely depends on local regulations and national-level permit regimes only relate to large-scale abstraction (SWB > 50 m^3 per hour and GWB > 150,000 m^3 per year). Although water abstraction has not been identified as a significant pressure, water consumption for public water supply and agriculture has increased in recent years (EC 2025g).

6.3. Policies, Institutions, and Support Systems

6.3.1. Agroforestry

Common Agricultural Policy

The Netherlands' NSP defines agroforestry as the intentional combination of trees and shrubs with existing agricultural activities, such as livestock farming, arable farming or vegetable production, on the same plot of land. The aim is to create synergies between crops, animals and woody plants while enhancing the farm's income. Food forests that meet the crop code Voedselbossen also fall under this definition, allowing for three main categories of agroforestry systems :

- Livestock with trees and shrubs (silvo-pastoral) include chicken runs with trees, goats in orchards and cattle among forage bushes. Here, trees and shrubs may be planted in rows or scattered, and high-stem orchards are included.
- Arable/vegetable crops with trees and shrubs (silvo-arable), where productive or non-productive woody plants are grown alongside crops or vegetables.
- Food forests are agricultural systems comprising at least three layers of vegetation (e.g. lower trees, shrubs and underground crops) which produce edible products such as fruits, seeds, leaves and stems, either now or in the foreseeable future.

It is important to note that the Dutch definition includes shrubs as well as trees (Prins et al. unpublished), in order to allow for systems where shrubs are more feasible. This helps to avoid the negative effects of tree planting in open landscapes, which are important for meadow birds. It also prevents confusion over species that can be either trees or shrubs (e.g. Corylus avellana).

The Netherlands has a unique eco-scheme, which offers farmers a choice of 22 activities. The scheme uses a points system that reflects the contribution of each activity to one or more of the environmental objectives set out in the NSP: climate, soil and air, water, landscape and biodiversity (Jongeneel and Gonzalez-Martinez 2023). Farmers must score points in all five areas to qualify. The farms are ranked depending on the total number of points and the corresponding financial value, resulting in different premia: bronze rank receives 60 EUR per hectare, silver rank receives 100 EUR per hectare, and gold rank receives 200 EUR per hectare. It is important to note that the requirements and financial point values differ by region to account for the variety of agricultural activities and challenges across the

country (Jongeneel and Gonzalez-Martinez 2023). In theory, agroforestry contributes to all five environmental objectives. However, agroforestry is not listed as one of the 22 available activities[26] and most systems are registered under crop codes for individual crops, agroforestry is not (yet) properly represented through this eco-scheme (Prins et al. unpublished). For example, since organic farms are automatically attributed the highest rank, they may be less inclined to plant trees as this would not improve their score. Additionally, food forests do not earn points through the eco-scheme.

The Netherlands does not offer any specific agroforestry schemes under the second pillar of the CAP, whether for agri-environmental or investment measures. Nonetheless, agroforestry could potentially align with measures such as 'agricultural nature and landscape management' or 'non-productive investments on farms' (Prins et al. unpublished).

Registration of agroforestry systems

Currently, there are multiple options for registering agroforestry, which adds complexity. On the one hand, up to 100 scattered trees per hectare may be included in grassland or arable land, without separate registration. Strips of trees or shrubs that alternate with crops or grassland, on the other hand, must be registered separately. Orchards and fodder hedges, meanwhile, have their own crop code. Features such as hedges, hedgerows and rows of trees are registered as landscape elements and might count towards 'non-productive areas'. Food forests are classified as permanent crops and must adhere to the conditions for using the crop code for 'food forestry' (see Section 4.1.2.2 of the NSP). In cases where the tree density is greater than 100 trees per hectare, the plot is no longer considered arable or grassland. However, tree rows can be registered as strips, and where this is not possible, the main crop may be registered instead.

Other legislation

The **Dutch Agroforestry Masterplan** (Luske et al. 2020) was developed on behalf of the Ministry of Agriculture, Nature and Food Quality. It is an advisory report designed to support the upscaling of agroforestry in the Netherlands. While it does not reflect a formally established ambition, it sets the goal of 25,000 ha agroforestry by 2030, of which at least 1,000 ha should be food forests[27]. The masterplan links agroforestry to various environmental goals, such as improving water retention, restoring landscapes and biodiversity, and closing nutrient cycles. It was developed based on a SWOT analysis and stakeholder involvement at all levels, resulting in a holistic guidance document.

Agroforestry plays a role in the **National Adaptation Plan**, where it is seen as having potential for climate change adaptation, but still requiring research (IenW 2024).

In 2016, organisations from the forestry sector released the **Forest and Wood Action Plan**, which was endorsed by the Prime Minister. The plan mainly proposed measures to sequester carbon and provide more renewable woody materials.

The **Climate Adaptation Platform Netherlands** (klimaatadaptatienederland.nl) provides a wealth of information on climate adaptation, as well as the relevant policies and programmes, the centrepoint being the National Climate Adaptation Strategy and the National Adaptation Plan (IenW 2024).

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[26] Activity #20 'Wooded banks (hedge, hedges and trees)', and activity #21 'Wooded banks (others)' (Jongeneel and Gonzalez-Martinez 2023) might qualify for agroforestry systems.
[27] Further information on food forests can be found in the accompanying masterplan for food forests Buiter and Waard 2020.

6.3.2. Water

The Netherlands implements the WFD through its National Water Programme 2022-2027 (IenW, LVVN and BiZa 2022), combining the management plans of the four RBDs as well as the National Water Plan and the Management and Development Plan for National Waters in a single document. The programme includes the themes climate adaptation, water safety, water distribution as well as water quality and nature. Beside the National Water Programme, the national approach regarding adaptation to the effects of climate change includes further elements such as the Delta Programme and the National Climate Adaptation Strategy ('Nationale Klimaatadaptatiestrategie'; NAS).

In the context of water and climate change the central administrative and political element in the Netherlands is the **Delta Programme** (IenW, LVVN and VRO 2024), which is regularly revised and updated since 2011. It consists of a multitude of interlinked strategies and programmes[28]. However, the programme's core message is clear: the approach to water as well as land use must change. It therefore focuses on flood protection, the supply of fresh water and climate-resilient spatial planning and aims to make the Netherlands water resilient and climate proof by 2050, addressing issues such as heat stress, drought, water logging and flood impacts. The Delta Programme involves collaboration at multiple levels between municipalities, water boards, provinces and the national government, as well as research institutions, the general public and private businesses (IenW et al. 2024). Recognising that the issues in question cannot be solved in the water domain alone, but require a multi-sectoral approach, the Delta Programme identifies water and soils as leading factors and guiding principles; with a set aside budget for its implementation[29]. In view of the various hydrological regions of the Netherlands, the Delta Programme frequently highlights the challenges of freshwater availability, water storage capacity and drinking water, in addition to sea level rise. It also states vulnerability regarding excessive water as well as water shortages, especially for rivers, Central Holland and the high-lying areas in the eastern parts (IenW et al. 2024).

The Delta Programme includes sub-parts on spatial adaptation ('Deltaprogramma Ruimtelijke Adaptatie'; DPRA) or freshwater ('Deltaprogramma Zoetwater'; DPZW). The DPRA includes the **Delta Decision on Spatial Adaptation**, which establishes national policy for planning water-resilient and climate-proof areas, paying particular attention to vital and vulnerable functions. The DPRA included an incentive scheme for local and regional governments, but this has not been extended beyond 2023.

Other legislation

The **National Climate Adaptation Strategy (NAS)** (IenM 2016) with its elements must be considered alongside the Delta Programme. It adopts a multi-sectoral approach to policy areas such as the building sector, agriculture and the environment. The **National Implementation Programme for Climate Adaptation** (IenW 2024) is in place to support the implementation of the NAS[30].

The **Action Programme for Climate Adaptation in Agriculture** (LNV 2020) does not include agroforestry. However, its second pillar on soil systems covers multiple aspects relating to agroforestry as a sustainable management practice, such as the soils' function for 'climate adaptation' and 'better water buffering in case of extreme drought and precipitation'. In this context, the **National Programme**

[28] An in-depth view would be too extensive for this report. Readers are referred to the relevant Delta Programme documents.
[29] Although the funds budget is estimated at 28 Bn. EUR for the period 2015-2050, the cost of measures currently estimates to 41 Bn. EUR, leaving a funding gap of around 13 Bn. EUR.
[30] Currently works are underway for the NAS'26.

for Agricultural Soils (NPL) and the Soil and Subsoil Implementation Programme could provide potential avenues for the integration of agroforestry.

The National Spatial Policy Document feeds into the National Programme for Rural Areas (NPLG). The NPLG includes objectives for the themes of nature, water and climate and provides the framework for the provinces and their Provincial Programmes for Rural Areas (PPLGs) to elaborate on measures for the *"development of agriculture, new forests and nature, creating space for the water system, developing the sponginess of the areas further and establishing a priority sequence for using groundwater"* (IenW et al. 2024).

6.4. Stakeholders and actors

6.4.1. Agroforestry

The Agroforestry Network Netherlands (ANN; agroforestrynetwerk.nl) is a national umbrella organisation that brings together 40 independent organisations. ANN acts as an information hub, collecting and distributing knowledge, and supporting provincial networks with research and legislative matters. The ANN organises national working groups and represents agroforestry in the Dutch and European political contexts.

To develop agroforestry from the ground up, twelve provincial agroforestry networks have been established in the Netherlands[31] – mainly financed by the provincial governments, which are in big parts responsible for policy implementation. These networks are organised regionally and are practice oriented. They organise field visits, demonstrations and training sessions, and connect farmers with provincial authorities, water boards, advisors and NGOs. They regularly collaborate with ANN by co-hosting events and linking to each other's activities.

There is a rich landscape of agroforestry organisations and initiatives in the Netherlands. Below is a non-exhaustive list of some of these:

- Stichting Voedselbosbouw Nederland (voedselbosbouw.org): Established in 2016, the Dutch Food Forestry Foundation aims to develop profitable food forests in the Netherlands to provide local food and vital nature, as well as an attractive landscape. Its core activities include designing, planting and sustainably managing food forests, as well as developing and disseminating knowledge and skills about them.
- The Louis Bolk Institute (louisbolk.nl) is a research organisation specialising in sustainable agriculture, nutrition and health. As a leading player in scientific research, practical innovation and knowledge dissemination, it is both a precursor and driver of the agroforestry movement in the Netherlands. Together with Agroforestrysupplies, the LBI supports the Agroforestry Blueprint: an experimental location that aims to connect practice and research and provide repeatable, scalable examples. Activities range from designing agroforestry systems and ensuring good management and maintenance to successful harvesting, processing and creating value chains.
- Originally a tree nursery, Agroforestrysupplies (agroforestrysupplies.com) has expanded its operations to foster the tree planting on a larger scale. Aside from providing seedlings, they offer planning advice for food forests and agroforestry systems.

[31] Some of these networks are formal organisations, while others are collaborations hosted by provinces, environmental federations or regional projects. For an overview of the individual networks and their contacts, please refer to https://www.agroforestrynetwerk.nl/provinciale-netwerken.

- The **Forest and Wood Coalition** (Coalitie Bos & Hout; coalitiebosenhout.nl) is an informal network that promotes and supports the expansion, revitalisation and use of the forest in the Netherlands. It aligns itself with the ambitions of the Forest & Wood Action Plan.
- The Van Hall Larenstein University of Applied Sciences is actively engaged in agroforestry research and education. Similarly, the University of Wageningen is a central player and supporter in research on agroforestry in the Netherlands

6.4.2. Water

In the Netherlands, the overall national responsibility for the water management system lies with the **Rijkswaterstaat** authority (rijkswaterstaat.nl). **Relative autonomous water boards** ('Waterschap'; waterschappen.nl), which are organised by catchment area, oversee water management and surface waters. Their focus is on water quantity, quality and structure of the water bodies, and amongst others, they are responsible for flood and erosion control as well as ensuring a sufficient water supply for agriculture – hence are important stakeholders regarding agroforestry and water management. The **municipalities** are responsible for rainwater and groundwater management, as well as local regulations, e.g. relating to water abstraction.

In view of more frequent droughts and ensuing economic losses, the WUNDER project[32] aims to evaluate strategies for agricultural and natural ecosystems to adapt to drought events. The project engages with farmers, water managers, and other decision-makers to develop practical use cases for daily drought monitoring and prediction. This supports the development of climate-robust agricultural production systems and water management.

6.5. Challenges and Opportunities

In the Netherlands, numerous programmes, strategies and approaches exist with regard to climate change mitigation and adaptation, water resources and the impact of agriculture. Agroforestry can provide valuable opportunities to improve water management in the Netherlands, supporting the objectives of both the Delta Programme and the National Climate Adaptation Strategy. The presence of frameworks such as the Agroforestry Masterplan, CAP eco-schemes and provincial programmes, as well as active knowledge networks (e.g. ANN) and regional research institutions, facilitates knowledge sharing, demonstration projects and practical guidance. This in turn enables the scaling up and integration of agroforestry into water management strategies.

Despite the multiple entry points, agriculture and water are often viewed separately. Thus, integrating agroforestry into these approaches remains a challenge. Moreover, adoption rates of agroforestry are still relatively low, which constrains its overall impact on landscape-level water management. Effective implementation ultimately requires coordination across multiple sectors and governance levels, including water boards, municipalities, provinces and farmers.

[32] Water Use and Drought Ecohydrological Responses of Agricultural and Nature Ecosystems in the Netherlands: Towards Climate-Robust Production Systems and Water Management

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Annex

Adapted extract of the supplementary material to:

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Annex table 1: Area (km²) occupied by agroforestry types in 2022.

Country	AF_C							AF_{SWF}				
	GPC	IPC	SIL-A	SIL-P	ASP	KG	Sum AF_C	AC	UG	GG	PC	Sum AF_{SWF}
Germany	372	8	0	1,054	0	1,704	**3,138**	8,770	8,429	2,564	666	**20,430**
Netherlands	10	0	0	138	0	81	**229**	367	329	329	29	**1,054**
Belgium	25	4	0	260	0	92	**382**	273	244	307	25	**848**

AF_C	Common agroforestry systems
AF_{SWF}	Agroforestry systems with small woody features
GPC	Grazed permanent crops
IPC	Intercropped permanent crops
SIL-A	Silvoarable
SIL-P	Silvopastoral
ASP	Agrosilvopastoral
KG	Kitchen gardens
AC	Arable crops
UG	Ungrazed grasslands
GG	Grazed grasslands
PC	Permanent crops