Synthesis Report: The state of Agroforestry and Agroecology Integration in Regional Environmental and Development Strategies and Policies

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Abstract

This synthesis report evaluates the integration of agroecological (AE) principles and agroforestry (AF) practices across regional policy frameworks (NUTS 2, NUTS 3, LEADER regions). This review combines qualitative semantic analysis of strategic policy texts with processual policy integration theory. The evaluation focuses on regions and municipalities containing living lab (LL) farms within the framework of the EELAP project across six European countries: Germany, Hungary, Ireland, Slovakia, Slovenia, and Switzerland, involving local government, NGOs and forestry or farming representatives.

The cross-country comparison reveals a fundamental structural divergence across European regional governance mechanisms: while broad agroecological principles – most notably biodiversity conservation, water retention, and soil protection – enjoy robust strategic backing in regional development plans, the explicit operationalisation of AF as an integrated multifunctional land-use system remains severely lagging. Where AF elements are referenced, they are predominantly addressed through traditional landscape features (e.g., field hedges, shelterbelts, scattered orchards) or narrow LULUCF carbon-accounting frameworks, rather than as dynamic drivers of territorial resilience and circular bioeconomies.

Policy frameworks across Europe successfully champion individual AE principles at high strategic levels, but fail to bridge the operational gap to AF. AF remains trapped between rigid agricultural payment codes and strict forestry management laws, requiring urgent administrative harmonization. However, the analysis of existing climate and rural development strategies/policies and regional projects identifies several links and potential opportunities for AE for future policy integration.

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List of Abbreviations

ACRES	Agri-Climate Rural Environment Scheme
AE	Agroecology
AF	Agroforestry
AI	Artificial Intelligence
ANK	Action Programme Natural Climate Protection
APA III	Adaptation Action Plan III (2020-2024)
AÖP	Agro-ecological Programme, Hungary
CAP	Common Agricultural Policy of the EU
CC	Climate Change
CCUS	Carbon Capture, Utilisation and Storage
DAFM	Department of Agriculture, Food and the Marine, Ireland
DAS	German Strategy for Adaptation to Climate Change
DE	Germany
DeFAF	German Association for Agroforestry
EELAP	Enriching European Landscapes with Agroecological Practices
EU	European Union
EURAF	European Agroforestry Federation
FR	France
GAK	Joined Task for Improvement of Agricultural Structures and Coastal Protection
GHG	Greenhouse Gas
HDÚ	National Decarbonisation Roadmap of Hungary
HU	Hungary
IE	Ireland
INRAE	National Research Institute for Agriculture, Food and Environment, France
INTERREG	European Territorial Cooperation
KAnG	German Federal Climate Adaptation Act
KEHOP	Environment and Energy Efficiency Operative Programme
KSK	*Košice* Self-Governing Region
LDP	Landscape Development Plan
LAG	LEADER Local Action Group
LEADER	*Liaison entre actions de développement de l'économie rurale*
LDS	LEADER Development Strategy
LIFE	EU Programme for the Environment and Climate Action
LL	Living Lab
LPIS	Land Parcel Identification System
LULUCF	Land Use, Land-Use Change and Forestry
MAPER	Hungarian Permaculture Association
NAF	National Adaptation Framework, Ireland
NAS	National Adaptation Strategy
NAS CC	Strategy for the Slovak Republic's Adaptation to Climate Change
NCCS-2	Second National Climate Change Strategy
NDV	Non-forest woody vegetation
NEKT	National Energy and Climate Plan, Hungary
NÉS	National Climate Change Strategy, Hungary
NGO	Non-Governmental Organisation
NRW	North Rhine-Westphalia
NUTS	Nomenclature of Territorial Units for Statistics
PSK	*Prešov* Self-Governing Region
RDS	Regional Development Strategy / Concept
SECAP	Sustainable Energy and Climate Action Plan, Slovakia
SFSC	Short Food Supply Chains
SK	Slovakia
SI	Slovenia
SI SKP	Common Agricultural Policy Strategic Plan of Slovenia
SOzP	Strategic Framework for Climate Change Adaptation
SPRS 2050	Spatial Development Strategy of Slovenia 2050
SRC	Short-Rotation Coppice
TOF	Trees outside Forests
ÚSES	Territorial Systems of Ecological Stability, Hungary
WFD	Water Framework Directive
WP	Work Package

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1 Introduction

EELAP (Enriching European Landscapes with Agroecological Practices) supports the transition to agroecology (AE), with a focus on agroforestry (AF) support, across five EU countries and respective organizations: Germany (DeFAF – The German Association for Agroforestry), Hungary (MAPER – Hungarian Permaculture Association), Slovenia (University of Ljubljana Biotechnical faculty's Agronomy department), Slovakia (National Forest Centre), and Ireland (Teagasc Forestry Development), with additional support from Switzerland (Agroscope's Integrative Agroecology group) and modelling input from France (INRAE – National Research Institute for Agriculture, Food and Environment). The European Agroforestry Federation (EURAF) coordinates the EELAP project.

Through multi-stakeholder Living Labs (LLs), biophysical modelling, and spatial planning tools, EELAP supports the transition to AE with a focus on AF, closing knowledge gaps on how it can be integrated into the cultural landscape, from farm to landscape scale, while developing business models that embed the environmental and social benefits of AF into farmers' and landowners' economic decisions.

EELAP's core objectives and work packages (WP) are:

- **Policy Integration & Reform (WP1):** To analyze existing agricultural, forestry, climate, and energy policies in participating Member States and design new public and private incentives that better integrate AE-principles into regional and national frameworks.
- **Knowledge Transfer via Living Labs (WP2):** To establish and operationalize real-world LLs across Germany, Slovenia, Slovakia, Ireland, and Hungary. These act as mutual learning networks for farmers, foresters, NGOs, and local governments to co-create and test practical solutions.
- **Business Models & Value Chains (WP3)**: To identify economically viable business models for AE. This involves assessing socioeconomic impacts to ensure that environmental and social benefits translate into sustainable on-farm income.
- **Biophysical Modeling & Spatial Planning (WP4):** To assess and refine spatial planning tools (with modeling input from France and Switzerland) that accurately quantify the environmental benefits of agroecological practices at the farm level.
- **Landscape-Level Upscaling (WP5):** To scale practices out from the individual parcel and farm levels to the broader territorial landscape, embedding AE into regional land management and rural development strategies

As a multifunctional land use system, agroforestry (AF) generates multiple products and diverse environmental and economic benefits. It is regarded as one of the most important and flexible agroecological practices available in Europe, however its uptake is currently restricted for a variety of reasons. One concerns the need for more local implementation flexibility. While formal CAP rules for Pillar I (area payments) support are decided nationally in all Member States, the regional development (Pillar II) rules are determined at a regional level in six countries (DE, FR, IT, ES, PT, and BE). In the remaining Member States (including EELAP countries of IE, HU, SK, SL) agricultural priorities and incentives are decided at a national level, with little or no regional flexibility. However, even in these countries, there is flexibility for greater use of LEADER action groups and community-led climate action plans.

One aspect of future agricultural planning is the increasing recognition of the importance of AF in the National Climate Adaptation Strategies or Plans of EU Member States. EURAF Policy Briefing #27 (1) concludes that only nine countries now fail to mention AF. This is a significant improvement on the

first version of this Briefing (July 2023), when AF was not mentioned by 16 countries. Inclusion of AF in the national adaptation plans of EELAP countries is shown in Table 1.

Table 1: Mentions of "agroforestry" (or national equivalent) in the national climate adaptation policies of the five countries with LLs in the EELAP project and Switzerland.

Country	Most recent national climate adaptation policy instrument	Publication/ adoption year	AF mentioned & native terms found in strategy	AF mentions
Germany	German Strategy for Adaptation to Climate Change (DAS / APA III & IV), (2, 3) & 2024 Federal Climate Adaptation Law), (4)	2024	*Agroforstwirtschaft, Agroforstsysteme*	Explicitly included as a key measure for soil moisture retention, windbreak protection, and extreme heat mitigation.
Hungary	Second National Climate Change Strategy (NAS II 2018-2030), (5)	2018	*agrárerdészet, Fásítás / Mezőgazdasági védősávok, Fás legelő*	Explicitly listed for agricultural drought adaptation and protective tree-belt establishment.
Ireland	National Adaptation Framework (NAF) – Sectoral Adaptation Plan for Agriculture (6)	2024	agroforestry, *agrafhoraoiseacht*	Explicitly detailed for farm resilience, providing livestock shelter and shade against extreme weather/heat events, improving soil water infiltration, and diversifying farm income.
Slovakia	Strategy for Environmental Policy until 2030 (7) & NAS CC (8)	2018	*agrolesníctvo, Agrolesnícke systémy, Agrolesnícke opatrenia*	Explicitly featured in agricultural adaptation, soil moisture protection, and shelterbelts.
Slovenia	Strategic Guidelines for Adaptation of Agriculture and Forestry to CC (9)	2016	*agrogozdarstvo, agrogozdarski sistemi, agrogozdarske prakse*	Explicitly cited for silvopastoralism, steep-slope erosion protection, and farm-forest integration.
Switzerland	Agriculture and Food Climate Strategy 2050 (10, 11)	2023	*Agroforst, Agroforstsysteme, Agroforstwirtschaft*	Explicitly listed for their carbon sequestration potential. Moreover, mentioned for optimising nutrient and water cycles, soil protection, and protection against heat stress of plants and animals.

Source: (non-public data by EURAF).

There has been a recent trend towards regional planning, climate adaptation, biodiversity protection and bioeconomy. Many EU Member States complement their overarching national laws with regional climate adaptation plans and region-specific goals and guidelines. These plans often offer stronger practical incentives for AF and AE. They offer promising tools for engaging regional and local actors in preparing for climate change.

Integration of AE and AF into regional development marks a strategic shift from treating agriculture as a single-commodity sector to viewing it as a multi-functional regional asset. In the EU, countries manage approximately 40 % of the land area under agriculture. Transforming these spaces is of high importance to regional resilience, economic diversification, and territorial cohesion. Even more, the integration of such practices has evolved from niche farming alternatives into core components of sustainable regional development strategies These ecological frameworks offer a practical pathway to buffer regions against severe climate disruptions while advancing national environmental targets, and at the same time, it increases biodiversity on the agricultural landscapes.

This report presents the results of an analysis within WP5 aiming to understand the level and state of AF and AE integration in regional strategic documents addressing e.g. climate, nature conservation or sustainability in general in the regions of the LLs in five partner countries (DE, HU, IE, SL, SK), complemented by a review of Switzerland, even though it does not host a LL within this project's framework. The 13 principles of AE are shown in Figure 1.

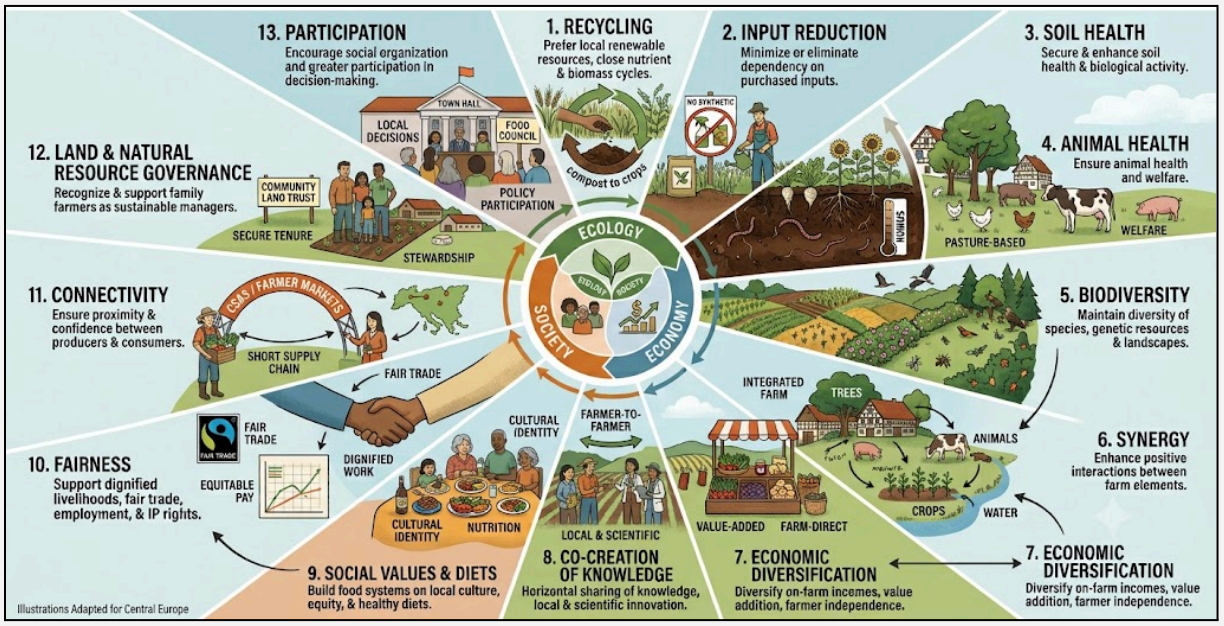


Figure 1: The 13 AE-principles as defined by Agroecology Europe as a pathway to sustainable food systems.
Source: own graphic after (12).

2 Methodology

2.1 Research questions

Four research questions guided the analysis that was undertaken for the six countries and their respective LLs:

- Which AE-principals and -practices have already a high relevance at the regional level?
- Where might readjustment be needed, and in what form?
- To what extent is AF specifically, already integrated into regional strategies and policies, and where are the potential linking or entry points for stronger integration?
- What country-specific recommendations can be made to communities, districts, and other regional or national actors to better support AF implementation?

2.2 Data collection and semantic analysis

Regional policy documents, including regional laws, strategies, and Climate Action Plans, were collected for each of the project's LL regions, along with comparative documents for Switzerland. The complete lists of documents included in the analysis are provided at the beginning of the respective country chapters. These documents were analysed using a narrative synthesis method in the countries' respective language, supported by AI-assisted text analysis conducted using Google's NotebookLM tool, to identify and interpret references to the AF and AE related keywords defined above. This step combined systematic keyword identification with qualitative interpretation of

context, ensuring that references were assessed for meaning and substance rather than treated as simple keyword counts.

2.3 Analytical framework and choice of keywords

The analysis was structured around two complementary keyword sets, developed to capture both AF specifically and the broader agroecological context within which it sits.

The first and most central set consisted of 18 AF-specific keywords (see Appendix A). These were chosen to represent the full range of AF-practices as classified in the EURAF typology (13), (i.e wood pasture, alley cropping, alley coppice, food forest, orchard cropping, orchard grazing, agrosilvopasture, woody landscape features, settlement agroforestry, forest grazing), supplemented by additional keywords judged relevant for identifying AF in the documents and based on the expertise and field experience of the project partners (i.e. agroforest, short rotation, tree fodder/fodder hedge, timber/wood production, trees outside forests (TOF), orchard meadow, fruit/berry/ nut production, and forest gardens).

Table 2: Associations between AE-principles (Figure 1) and -AE practices (see Appendix D).

AE principle / connected practice	Agroecosystem							Food system						
	1 - recycling	2 - input reduction	3 - soil health	4 - animal health	5 - biodiversity	6 - synergy	7 - economic diversification	8 - co-creation of knowledge	9 - social values and diets	10 - fairness	11 - connectivity	12 - land and natural resource governance	13 - participation
1 - Afforestation / reforestation					X								
2 - Animals bred for high nitrogen use efficiency	X	X											
3 - Biochar as fertilizer, feed and disease supressor	X	X	X										
4 - Conversion of arable land to grassland			X		X								
5 - Cover / catch crops	X	X	X										
6 - Crop associations - e.g. N-fixing crops	X	X	X										
7 - Crop varieties bred for improved nitrogen use efficiency	X	X	X										
8 - Farm bioenergy production and energy savings	X	X					X						
9 - Feed supplements and tree / shrub fodder				X			X						
10 - Fertilizer management & nitrification inhibitors	X	X	X										
11 - Forest grazing (e.g. to reduce fire risk)													
12 - Grassland management (legume overseeding)			X										
13 - Grassland management (rotational grazing)			X										
14 - Grazing of cover crops and agricultural crop residues	X												
15 - GHG auditing tools (e.g. OpenFarmCarbonCalculator)							X						
16 - Manure management and application	X	X	X										
17 - New agroforestry fields			X		X		X						
18 - Protection/increase of landscape-features			X		X								
19 - Ramial chipped wood as soil conditioner	X	X	X										
20 - Reduced tillage / direct seeding		X	X										
21 - Soil and nutrient management plans	X	X	X										
22 - Water management (keyline, berms/swales, flood-breaks)			X										
23 - Wetland / peatland conservation / restoration					X								

Note: Orange band for agroecosystem related principle #6 "synergy" and food system related principle #8 "co-creation of knowledge" stands for a relationship across all practices.

The second set consisted of 19 keywords connected to AE (Appendix B). To use keywords that represent AE entirely, in a first step the 13 AE-principles (12) and 23 AE-practices were associated with each other (Table 2).

The AE-practices were associated with one or more AE-principles focusing on the seven agroecosystem principles. For each AE-principle at least one keyword was chosen, considering its direct connection to the agroecological practices (Table 2): biodiversity, carbon, diversification in agriculture, erosion, erosion control, flood, food production, food systems, habitat connectivity, land use, regional added value, renewable resources, regional supply, soil fertility, soil health, soil improvement, value chains, animal welfare, and landscape image / scenery. An exception were the principles "synergy" and "co-creation", which are central to the whole concept and entail aspects of the other principles. Therefore, the described approach was not seen to be feasible for these two principles.

It was also crucial to analyse the AE-principles focusing on the food system, but the list of 23 practices did not cover those. A list of additional keywords was therefore chosen to cover both Agroecosystem and Food-system principles (Table 3).

Table 3: Keywords chosen in connection with AE-principles.

AE principle		Keywords
AgroEco-system	1 – recycling	carbon, renewable resource, soil fertility, soil health, soil improvement, renewable resources
	2 – input reduction	soil fertility, soil health, soil improvement
	3 – soil health	erosion, erosion control, soil fertility, soil health, soil improvement, flood, flood protection
	4 – animal health	animal welfare
	5 – biodiversity	biodiversity, habitat connectivity
	6 – synergy	
	7 – economic diversification	diversification in agriculture, food production, food systems, value chains, regional added value, renewable resources, regional supply
Food system	8 – co-creation of knowledge	
	9 – social values and diets	food production, food systems, value chains, regional supply, landscape image/ scenery
	10 – fairness	diversification in agriculture, value chains, regional added value
	11 – connectivity	food production, food systems, value chains, regional added value, renewable resources, regional supply
	12 – land and natural resource governance	land use, food production, food systems, value chains, regional added value, renewable resources, regional supply, land use
	13 – participation	food production, food systems, value chains, regional added value, renewable resources, regional supply

Note: Grey band for agroecosystem related principle #6 "synergy" and food system related principle #8 "co-creation of knowledge" stands for a relationship across all practices, thus no specific keywords were defined.

Together, these two sets of keywords allowed the semantic analysis to give specific, granular attention to AF-practices themselves, while also situating AF within its broader agroecological context, directly supporting the report's core aim of assessing the extent of AF integration and identifying potential entry points within regional policy frameworks.

2.4 Research design: processual policy integration and quantitative coding

The analysis draws on the "processual understanding" approach to policy integration by Candel and Biesbroek (14). This defines integration not as a binary state but as an ongoing process assessed across four dimensions: 1) policy coherence, 2) coordination, 3) thematic salience, and 4) implementation commitment. This framework allowed the analysis to move beyond simply noting whether AE or AF were mentioned in a document, toward assessing how substantively and operationally they were embedded within it.

Table 4: Classification score reflecting the degree of engagement evaluated for the policy document with respect to agroecology (AE) and agroforestry (AF).

Score	Classification	Description of Integration
0.75 – 1.00	High	Strong policy commitment; high thematic salience; deeply integrated into core objectives.
0.50 – 0.74	Moderate	Moderate commitment; partial inclusion; theme is present but lacks full operationalization.
0.25 – 0.49	Symbolic	Peripheral or reference-level inclusion; mentioned in passing without supporting instruments.
< 0.25	Minimal	Minimal engagement; negligible impact on the overall policy framework.
0	None	No engagement; complete absence of the theme in the policy document.

To enable comparative visualisation across regions, the qualitative textual evidence gathered through the narrative synthesis was translated into a numeric intensity score using a graded ordinal coding scheme, inspired by established benchmarks used in climate policy and ecosystem services integration research. Each policy document was assigned a score reflecting its degree of engagement with AE and AF, according to the scale in Table 4.

2.5 Data sources

Germany: The analysis was mainly conducted on the level of the NUTS 2 and NUTS 3 regions in the two LLs "Lusatia" and "North-NRW". Since the population density between the two federal states differs largely, the association of the NUTS regions to the administrational level differs respectively.

In the Lusatian LL, the federal state of Brandenburg corresponds to the NUTS 2-levelentirely, in Saxony it corresponds with the administrative region of *Dresden*, thus not entirely Saxony. In North-NRW the NUTS 2-level corresponds with the administrational regions of *Münster* and *Detmold*. The NUTS 3 regions in Lusatia correspond to four administrative districts in southern Brandenburg and the *City of Cottbus* and two districts in the East of Saxony (with some additional information extracted from a LEADER region that partly extends to the *District of Meißen*). LL North-NRW corresponds to ten districts.

In the two LLs in Germany, the selection of the analysed documents thus differs to a certain extent in regards to the administrative levels for which the documents exist and to the number of documents analysed. Two maps of the German LLs can be found at the EELAP-project website of DeFAF (15).

Sources for LL North-NRW: The current bioeconomy (16) and climate adaptation strategy (17) for the whole federal state (NUTS 1) was analysed in order to complement the results for NUTS 2 and 3 by considering the general strategy in NRW (Table 5). The biodiversity strategy for NRW was completed in 2015 and is currently being updated, so no analysis has been done. For the medium administrative level (NUTS 2) of the LL North-NRW, the regional plans were analysed for the corresponding administrative districts (*Bezirksregierung*) of *Münster* (18) and *Detmold* (19). On the lower administrative level (NUTS 3), strategies and concepts on climate protection, climate change and biodiversity were analysed for selected rural districts (*Landkreise*), where the documents were into force and/or readily available. These are the districts of *Steinfurt* (20)*, Paderborn* (21), *Borken* (22, 23), *Coesfeld* (24, 25), *Warendorf* (26), *Gütersloh* (27), *Herford* (28, 29), *Höxter* (30), *Lippe* (31–33), *Minden-Lübbecke* (34, 35). The LEADER regional development strategies (RDS) as guiding documents for the LEADER regions included for the LL North-NRW were from 13 regions: *9P Plus Warendorf* (36), *Berkel* (37), *Bocholter Aa* (38), *Hohe Mark* (39), *Steinfurter Land* (40), *Baumberge* (41), *Kulturlandschaft WML* (42), *Kleeblatt* (43), *Tecklenburger Land* (44), *3L in Lippe* (45), GT8 (46),

Kulturland Kreis Höxter (47), *Mühlenkreis / Aueland + Weserland* (48), and *Lippischer Südosten* (49)*, Verein(t) – regional.gesund.digital* (50), *Nordlippe* (51)*, Senne³* (52)*, Südl. Paderborner Land* (53).

Table 5: Strategic documents and corresponding source per NUTS-level in the LL North-NRW.

		Strategic documents and corresponding source				
LL North-NRW	**NUTS Code**	**regional planning**	**climate adaptation**	**climate protection**	**biodiversity**	**bio-economy**
North Rhine-Westphalia	DEA	n.a.	(17)	n.a.	n.a.	(16)
Münster	DEA3	(18)	n.a.	n.a.	n.a.	n.a.
Detmold	DEA4	(19)	n.a.	n.a.	n.a.	n.a.
Steinfurt	DEA37	n.a.	n.a.	n.a.	(20)	n.a.
Paderborn	DEA47	n.a.	n.a.	(21)	n.a.	n.a.
Borken	DEA34	n.a.	(23)	(22)	n.a.	n.a.
Coesfeld	DEA35	n.a.	(25)	(24)	n.a.	n.a.
Warendorf	DEA38	n.a.	n.a.	(26)	n.a.	n.a.
Gütersloh	DEA42	n.a.	n.a.	(27)	n.a.	n.a.
Herford	DEA43	n.a.	(28)	(29)	n.a.	n.a.
Höxter	DEA44	n.a.	n.a.	(30)	n.a.	n.a.
Lippe	DEA45	n.a.	(33)	(32)	(31)	n.a.
Minden-Lübbecke	DEA46	n.a.	(34)	(35)	n.a.	n.a.

Note: n.a. means no topic specific document could be identified at the respective level; dark grey = NUTS 1, medium grey = NUTS 2, light grey = NUTS 3.

Sources for LL Lusatia: The regional planning documents on NUTS 2-level in the Brandenburg part of Lusatia (54) and for Saxony (55, 56) and the landscape plan of Brandenburg (57) and the distinct of *Spee-Neiße* (58, 59) were included (Table 6).

Table 6: Strategic documents and corresponding source per NUTS-level in the LL Lusatia.

		Strategic documents and corresponding source					
LL Lusatia	**NUTS Code**	**regional planning**	**climate adaptation**	**climate protection**	**biodiversity**	**bio-economy**	**Other**
Brandenburg	DE4	(54)	(60, 61)	(61)	(62)	(63)	Landscape programme (57)
District of Dahme-Spreewald	DE406	n.a.	n.a.	(64)	n.a.	n.a.	n.a.
District of Elbe-Elster	DE407	n.a.	(65)	n.a.	n.a.	n.a.	n.a.
District of Oberspree-wald-Lausitz	DE40B	n.a.	(66)	(66)	n.a.	n.a.	n.a.
District of Spree-Neiße	DE40G	(58, 59)	n.a.	n.a.	n.a.	n.a.	Sustainability strategy (67)
City of Cottbus	DE402	(58)	n.a.	n.a.	n.a.	n.a.	Landscape plan (68)
Saxony	DED	(55, 56)	n.a.	(69, 70, 71)	(72)	(73)	n.a.
District of Bautzen	DED2C	n.a.	n.a.	(74, 75)	n.a.	n.a.	Energy concepts (75,76)
District of Görlitz	DED2D	n.a.	n.a.	(74, 75, 77)	n.a.	n.a.	Energy concept (75)

Note: n.a. means no topic specific document could be identified at the respective level; dark grey = NUTS 1, light grey = NUTS 3.

The climate protection and adaptation strategies on NUTS 2-level included Brandenburg (60, 61, 78) and Saxony (69, 70, 71). In this field and on the NUTS 3-level in Brandenburg: District of *Dahme-Spreewald* (64), Model Project District of *Elbe-Elster* (65), District of *Oberspreewald-Lausitz* (66) are analysed. For Saxony: *District of Bautzen* (Upper Lusatia & Lower Silesia), (75, 79, 80) and the

district of *Görlitz* (77), which comprise the two districts of the Saxon part of the LL Lusatia and which developed their concepts together in the past. An updated version is still under development to be expected September 2026 (74). Notably, climate concepts often form a synergy with energy concepts. On NUTS 2-level, the biomass strategy Brandenburg (63) and a formal presentation by Saxony (73) were included in the analysis, but no strategies on the level of districts seem to exist. Furthermore, for *Spree-Neiße* the sustainability concept (67) was looked at, along with the LEADER RDS in Lower Lusatia: *Spreewald-Plus* (81), *Spree-Neiße-Land* (82), *Elbe-Elster* (83) and *Lausitzer Seenland* (84, 85) and the LEADER LDS in Upper Lusatia: *Oberlausitzer Heide- und Teichlandschaft* (86), *Bautzener Oberland* (87), *Östliche Oberlausitz* (88), *Kottmar* (89), *Zentrale Oberlausitz* (90), *Westlausitz* (91), *Dresdner Heidebogen* (92) and the Nature Park *Zittauer Gebirge* (93).

Sources for Hungary: Documents on the national level NUTS 1 for Hungary include the National Climate Change Strategy – NÉS adopted in 2006 (94), with its successor, the Second National Climate Change Strategy – NÉS-2 adopted in 2013 (95), that also contains the National Decarbonisation Roadmap – HDÚ for the period up to 2050, which defines greenhouse gas emission reduction targets, priorities and courses of action. The Second National Climate Change Strategy – NCCS-2 (5) adopted by parliament by way of Decision No. 23/2018 of 31 October 2018 and the National Energy and Climate Plan – NEKT from 2024 (96). On the NUTS 3 administrative level, the analysis includes exemplary for two counties the *Jász-Nagykun-Szolnok* County (97) and the *Fejér* County climate strategies (98), for which the LEADER programme was available too (99).

Sources for Ireland: Documents on the national level NUTS 1 for Ireland include the Climate Action Plan 2025 (100) and the Agriculture, Forestry and Seafood – Sectoral Adaptation Plan 2025 (101). Furthermore all Irish NUTS 2 units (usually the counties) were analysed (102–131).

Sources for Slovakia: The analysis covered 28 strategic and planning documents across municipal, regional (NUTS 3), inter-municipal and cross-border levels, including adaptation strategies, Sustainable Energy and Climate Action Plan-type (SECAP), green action plans and regional development frameworks (132–157).

Sources for Slovenia: The policy analysis was conducted at the national level of Slovenia, rather than focusing on a specific sub-regional LL, since legislative approach in Slovenia is not based on regions, but the entire state level. The assessment of Slovenia's policy landscape regarding AE and AF is based on three foundational strategic documents that govern the country's agricultural, spatial, and climate trajectories toward the mid-century. The Slovenian CAP Strategic Plan (*Strateški načrt skupne kmetijske politike 2023–2027)* – SI SKP (158), serves as the primary operational framework for agricultural funding, prioritizing food security and the transition toward sustainable production methods. The Spatial Development Strategy of Slovenia 2050 (*Strategija prostorskega razvoja Slovenije 2050* – SPRS 2050), (159) is a core strategic act that defines long-term goals for land use and the preservation of national spatial identity. The Strategic Framework for Climate Change Adaptation (SOzP), (9) establishes guidelines for reducing vulnerability and mainstreaming climate resilience across all sectors.

Sources for Switzerland: The analysis was conducted for Swiss national legalisation, since there is no LL region in Switzerland within the EELAP project. It contains eight Swiss policy documents, including Switzerland's Long-Term Climate Strategy (160), the Agriculture and Food Climate Strategy 2050 (11), Biodiversity Strategy (161) and its 2025–2030 Action Plan (162), Sustainable Development Strategy 2030 (163), and the 2026 Spatial Concept Switzerland (164). Furthermore, the analysis includes the Integrated Forest and Wood Strategy 2050 (165) and the document on Integrated Risk Management for Gravitational Natural Hazards (166).

Note: Scope remains not fully like-for-like across countries: Germany and Ireland were analysed at both NUTS 2 and NUTS 3-levels; Hungary at NUTS 1 plus selected counties; Slovakia across municipal, regional, and cross-border documents; Slovenia and Switzerland at the national level only. This means "regional" trends are still not being compared on an equal geographic footing across all six countries.

2.6 Data analysis and validation

Scores were reviewed and validated across the research team to ensure consistency in coding for all regions, enabling a comparative mapping of policy integration and implementation strength between countries and LL regions. For homogenisation, exact scores were attributed to the respective five grade score classification (Table 4).

This mixed-methods approach, combining a principle-based keyword framework, processual policy integration theory, AI-assisted narrative synthesis, and graded ordinal coding, was designed to bridge the gap between rich qualitative understanding of regional policy texts and the need for standardised, comparable metrics across regions. In doing so, it provides a robust evidence base for the recommendations presented later in this report.

While the overall methodological framework, keyword sets, processual policy integration approach, narrative synthesis, and graded ordinal coding, was applied consistently across all regions, partners adapted specific elements of the methodology to reflect national and regional differences in policy landscapes, document availability, and language. Where partners diverged from the shared methodology, this is noted in the relevant country-specific results section below, alongside a brief explanation of why the adaptation was necessary. This ensures the comparative scoring remains transparent and that any differences in interpretation across regions can be accounted for when reading the results.

3 Results

3.1 Germany

3.1.1 LL North-NRW

3.1.1.1 Agroecological principles

Summary: In North-NRW the commitment to AE-principles in connection to the agroecosystem is quite high in the analysed documents. From the NUTS 1 down to the NUTS 3-levels biodiversity, climate and soils are generally highly prioritized in the analysed documents, showing a good regulatory basis for further promoting AE. While on the medium administrative level of the NUTS 2 regions, the highest commitment was mostly found for biodiversity and soil protection, partly connected to flood protection, the commitment on the lower administrative level differs quite a lot between the documents analysed and the specific districts. Generally, the protection of biodiversity, amongst others through better habitat connectivity, is a highly prioritised topic. The protection of soils is often connected with flood protection. One topic that is mainly addressed on the level of the federal state is animal welfare, which is designated to be addressed especially in connection to the impacts of climate change. Going down to the level of NUTS 3, animal welfare is only addressed very superficially showing the gap in theoretical goals and the practical implications.

Regarding the commitment to AE-principles in connection with the food system, the commitment in NRW is generally higher on the more local level. In most of the documents analysed for the NUTS 3-levels and especially the RDS of the LEADER regions, a strong focus is on regional economy, regional supply and also the cultural and natural landscape shaping the regional identity. Generally, the regional plans on the level of the administrative regions focus rather on the agroecosystem-related principles, while some of documents on the level of the district, and here especially the RDS, address the food systems more strongly. The bioeconomy strategy on the level of NRW, which is a federal state with a strong food and wood processing industry, represents a more comprehensive framework with goals for the transition to a renewable economic sector while promoting the functioning of ecosystem functions.

Agroecosystem-related agroecological principles

Biodiversity: In NRW, biodiversity is being addressed in most of the documents analysed. In the climate adaptation strategy and in the bioeconomy strategy as well as in the regional plans of both administrative regions, *Münster* and *Detmold* (19), biodiversity, especially in terms of habitat connectivity and its role for functioning ecosystems, is strongly integrated and a high policy commitment for its promotion exists. While in the climate adaptation strategy a separate action field with specific goals and measures is formulated, the practical implementation of the defined measures and also of the goals in the regional plan is foreseen rather on behalf of the lower administrational levels like the districts.

On the NUTS 3-level, the policy commitment for biodiversity is generally also very high. Habitat connectivity, in contrast, receives almost no relevance in most of the climate protection strategies, while it is mentioned often in combination with biodiversity protection in the climate adaptation strategies and the biodiversity strategies. The RDS of the LEADER regions consider biodiversity and habitat connectivity also as very important topics. In most RDS, biodiversity is a key aspect for conserving or developing the natural landscape as part of the regional identity. E.g. in the LEADER regions *Steinfurter Land* (40), *Lippischer Südosten* and *Verein(t) – regional.gesund.digital,* biodiversity as a natural basis of existence is central to separate actions fields and their goals.

Soils: For the topic of soils, a high policy commitment can be derived in the NUTS 2 regions through specific goals and guiding principles on the sustainable and climate resilient use of soils, the improvement of soils and the reduction of erosion. Also, reducing the risk of floods, which is a topic with high policy commitment in the regional plans, is to some extent connected to this, since a good soil structure is one important approach for decreasing the flood risk. In the climate adaptation strategy of NRW on NUTS 1-level, the planting of strips for erosion control and measures for improving water retention are suggested.

The highest commitment for soil protection and the reduction of erosion on the NUTS 3-level was found in the climate adaptation concepts with a high to moderate policy commitment. This includes also the reduction of the risk for erosion, which is a central aspect in most of the climate adaptation concepts. In most of the climate protection documents, the improvement of soil fertility and soil health had a higher relevance than the reduction of erosion and flood risks, as humus formation was mentioned as an important measure for carbon sequestration. For climate adaptation strategies, in most cases, it seems the other way around. The RDS of the LEADER regions showed quite a diverse picture: in some RDS, soils were quite strongly integrated with a moderate to high or even high commitment and often in the context of sustainable use of resources and soils and in connection with climate change. In other RDS, soils were integrated on a very low level. In all RDS, however, the

reduction of flood was considered at least to a certain extent, while erosion and erosion control was not addressed in most documents.

Climate change mitigation: While climate resilience and climate protection is often mentioned in the regional plans of *Münster* and *Detmold,* carbon and carbon sequestration is also considered as an important aspect in connection with soil management and functions. The analysis thus shows a moderate commitment for carbon sequestration as a specific topic. In the bioeconomy strategy of NRW, the commitment for climate change mitigation is very high and the use of biomass and renewable resources for a climate resilient and sustainable economy is a key measure in this document.

On the level of the administrative districts, the strongest integration for carbon sequestration with a moderate to high policy commitment are the climate protection documents, where clear approaches and measures for decarbonization and stakeholders to be involved are stated. But also the biodiversity strategies show a certain connection to this topic in the context of e.g. carbon sequestration through grassland management and the use of renewable resources. In the LEADER RDS, the reduction of carbon is quite a strong topic, mostly connected to the goals and measures for climate protection and adaptation including the use of renewable resources such as biomass.

Animal welfare: In both regional plans, animal welfare is not directly considered, so that this topic is evaluated with no engagement and minimal engagement respectively. The only section considering it indirectly is the reference to organic agriculture with higher standards for animal welfare. In contrast, the climate adaptation strategy of NRW shows a moderate commitment, emphasizing the need for promoting adaptation measures in animal husbandry to tackle e.g. the heat stress. This is similar on the NUTS 3-level, where the connection to animal welfare is limited to the climate adaptation concepts, which partly mention the impacts of climate change as a challenge for animals.

Food systems-related agroecological principles

Regional economy, regional supply and value chains: In both regional plans, the regional economy plays an important role, but the commitment stays on a symbolic level. The diversification of agriculture is connected mostly to the need for ensuring regional supply and to a certain need for transformation in the agricultural sector. The bioeconomy strategy on the other hand shows high policy commitment for this: The promotion of regional economic cycles, the use of renewable energies and improving the food production and food system are focused on, while the ecosystem functions shall be preserved and enhanced.

On the NUTS 3-level, the commitment to agroecological topics is somewhat stronger. While in the biodiversity strategy and the climate adaptation concepts these topics are integrated on a very low level, a moderate to high policy commitment can be derived from the climate protection concepts. Here, the role of e.g., renewable energy for the regional economy is emphasized. A high commitment can be derived in most of the RDS. In those of the LEADER regions *Berkel* (37) and *Steinfurter Land* (40) for example, the need for more organic and sustainable agriculture is a major aspect in the field of regional economy and value chains, while in the LEADER region *Hohe Mark* (39), the regional economy is strongly connected to tourism due to the existence of a nature park in the area. The keyword “regional supply” was in most cases, however, not solely connected to regional production but also to sectors such as health, education and public services, so that the relevance of the commitment for this cannot be purely connected to AE.

Food systems and socio-cultural value: In NRW and specifically the two administrative regions of *Münster* and *Detmold*, the conservation and development of the cultural landscape is a central topic

in the regional plans and a high policy commitment was identified. This topic is partly connected to the protection of biodiversity, partly to the function of landscapes for recreation and tourism. For the (sustainable) production of food and other (renewable) resources by the agricultural sector, there is moderate to high policy commitment.

The commitment for food systems and socio-cultural values is more concrete on the level of the NUTS 3 regions. In the climate adaptation and the climate protection concepts, the regional production of food and other important resources is integrated quite strongly, so that mainly a moderate to high policy commitment can be derived. In many cases, the shift to more organic agriculture was emphasized, e.g. in the district of *Borken*, where a so-called "eco-model region" was initiated with the share of organic agriculture as indicator for its success. The RDS showed a very high relevance of the topic of food systems and regional supply: in most of the documents, the commitment was moderate to high. For food production as a keyword, in most cases the score results were moderate, so that the general commitment for food systems and regional supply in terms of agricultural production is rather moderate. A moderate to often high commitment, though, was identified for the topic of the landscape image / the scenery, which, in most cases, was strongly connected to the conservation and development of the cultural and natural landscape as part of the identity of a region. Especially in some districts and the LEADER region *Berkel* (37) in the administrative region of *Münster*, the conservation and development of the landscape was often connected to the term *"Münsterländer Parklandschaft"*, which describes a culturally shaped, rather mosaic landscape encompassing agricultural fields with traditional hedges and fruit orchards, little forests and lakes.

3.1.1.2 Agroforestry

Summary: On the strategic level in NRW, the commitment for AF seems very limited in the federal state and the both administrative levels analysed. Traditional systems such as hedges are considered and, to a certain extent, planting of new structures is foreseen, although this is not clearly addressed under the term of AF. While wood production is a major topic, often receiving moderate if not even high policy commitment, AF is not connected to or considered for this. At the level of the districts, AF has been integrated in a very limited number of documents in connection with its benefits or as pilot projects. Looking at the AF-related terms, the commitment is a bit higher especially in connection to timber production, playing a big role in NRW, and also (traditional) fruit production. Next to the benefits AF offers for the sustainability goals described in the chapter below, these sectors thus offer some additional entry points for AF.

Agroforestry: If looking at the different AF-system types (167) and AF as a main concept, the regional plans in the LL North-NRW and also the climate adaptation for NRW analysed barely show any consideration of this form of land use. For woody landscape features, though, which in comparison to other EU countries are officially not defined as AF systems in Germany, the regional plan of *Münster* foresees a high commitment: in the document it is stated that due to its relevance for the traditional landscape in the region, the value of newly planted traditional hedges and of woodland outside forests should be on the same level as newly established forest land, as long as they are designed as windbreaks or traditional hedge as boundaries ("*Wallhecke*"). Also, forest grazing in this region is a land use form that is traditionally being practiced and considered as important to be conserved. In the region of Detmold, the commitment is on a moderate level, as woody landscape features are only emphasized as important to be conserved and promoted. A certain but still symbolic commitment for AF was found in the bioeconomy strategy, considering AF related projects and AF as a measure for multifunctional land use.

On the level of the districts and the LEADER regions, a certain relevance of AF-related land use forms was identified. In the biodiversity strategies and the LEADER regional development strategies as well as in the climate adaptation concepts, woody landscape features was a term for which at least a certain commitment was identified in every document. In some cases, it was connected to the cultural value of traditional landscapes, in some others also to the functions woody structures and a mosaic landscape can fulfil. The planting of new, partly traditional, hedges is foreseen in some regions, such as the district of *Coesfeld* and *Paderborn* or the LEADER region *Hohe Mark* (39). However, in some cases trees and especially TOF refer to city trees or tree alleys along streets. This is for example the case in areas with a higher share of urban areas and higher population densities such as *Gütersloh* (27) and *Minden-Lübbecke*. On a minimal level, wood pastures are also being considered in the climate adaptation concepts and the climate protection strategies (e.g. poplar on pasture land for negative emissions, orchard meadows). A certain consideration of orchard meadows and forest grazing was found in the biodiversity strategies. In some of the RDS of the leader regions, AF as a main concept is already considered as a tool against drought or as a pilot project for carbon sequestration. For AF as a general concept, a certain commitment was identified in a number of regions: In the climate adaptation concept of *Lippe* as well as in the RES of *Hohe Mark* (39) and *Tecklenburger Land*, a moderate to high commitment was found, as AF was mentioned as a promising land use form that should be considered for e.g. future timber production and more climate resilient agriculture (44). In the RES of *Berkel* (37)*, Lippischer Südosten* (49)*, Senne*[3] (52) and *Südl. Paderborner Land* (53), the commitment was found to be on a symbolic level without any pilot projects so far.

Agroforestry-related terms: A much higher commitment was found for AF-related terms. In the bioeconomy and the climate adaptation strategies of NRW as well as in the regional plans, a moderate to high commitment was found addressing timber production. While this was rather connected to forested land, it shows a relatively high relevance of timber production in the regions. As part of the cultural landscape, TOF also play a relatively important role, while this is especially the case in the region of *Münster.* The conservation of orchard meadows and fruit or nut production is considered only on a symbolic or even minimal level.

Similarly to the regional plans, on the NUTS 3-levels several documents showed a commitment for timber production and TOF, ranging from symbolic to high. Also, fruit related land use forms such as fruit orchards and orchard meadows, are considered on a moderate to high level in the biodiversity strategies. In the LEADER RDSs, the results were similar, whereas the commitment was generally a bit higher in most cases. In these concepts, timber and fruit production was often connected to the sector of regional economy and regional added value.

3.1.2 LL Lusatia

3.1.2.1 Agroecological principles

Summary: In general, fewer strategies with respect to climate protection exist in Lusatia compared to LL North-NRW. Within Lusatia, the analysed Landscape Framework Plan *Spree-Neiße* (59) at NUTS 3 integrates agroecological elements (scattered orchards, hedgerows) most deeply as functional components of the natural ecosystem, whereas the Brandenburg's Biomass Strategy (63) views them from the perspective of raw material supply and *Oberlausitz-Niederschlesien* (75) considers them as spatial constraints (e.g. for wind power). Land use and regional value creation are the universal bridges connecting all documents. Whether for biomass, spatial planning, or structural change, land is the resource, and regional profit is the justification. There is a clear tension between biodiversity / landscape scenery as protected goods in the *Spree-Neiße* Landscape Framework Plan (59) and

Brandenburg's Landscape Development Plan (LDP), (168) and renewable resources in energy concepts (75).

The planning documents of *Oberlausitz-Niederschlesien* (75) and the Landscape Development Plan on Berlin-Brandenburg (168) manage this "Nature-Energy Conflict" by using ecology as a "restriction factor". The newer documents (58, 67) show a maturation of agroecological concepts, moving from renewable resources for energy toward food economy and Innovative land use as pillars for the region's future after the fossil era with extensive coal exploitation areas. While soil fertility is a high-level principle for biomass sustainability (63), it is less integrated into the high-level regional economic strategies (58) compared to water management (flood). The analysis of the 13 Regional Development Strategies (RES) for the Lausitz region (81–93) reveals that while AE is not explicitly termed as such, its principles are to some degree embedded as tools for economic restructuring and climate adaptation whilst creating co-benefits for biodiversity and partly landscape aesthetics, with the overarching aim of creation opportunities for tourism and increase livelihood.

Agroecosystem-related agroecological principles

Biodiversity is the most legally anchored principle on NUTS 2-level in the Climate Adaptation Strategy of Brandenburg and in Saxony's Energy and Climate plans represented by the highest ranks (61, 69) and moderate in the Action Plan for Climate and Energy Saxony (70). As expected, biodiversity ranked highest in the NUTS 2-level biodiversity plans (62, 72) and the Landscape Plan of Brandenburg (57). At NUTS 3, for example, biodiversity improvements are mentioned as a secondary effect of alley cropping for the region of *Elbe-Elster* (65). Regional landscape plans *Cottbus* (68), *Görlitz* (169), the Sustainability Concept *Spree Neiße* (67) and the Climate Concept of *Dahme-Spreewald* from 2010 (64), emphasise biodiversity.

Habitat connectivity is more of an issue in Brandenburg, albeit Saxony still ranks high. This is a bit contrary to the NUTS 2-level documents for climate protection strategies and concepts, where Brandenburg receives a lower score (78), but Saxony has this higher up on the agenda (71). Biodiversity as a general term seems of very high relevance in Lusatia (71, 78). Also biodiversity-specific strategies for Saxony (72) and the biodiversity strategy Brandenburg (62), the latter dating back to 2014, but targets an increase in the area of scattered orchards. Nevertheless, biodiversity has the highest thematic salience across all LEADER documents. It is often a mandatory selection criterion for projects under LEADER. The region *Heide & Teichlandschaft* (86) integrates biodiversity at a policy level due to the UNESCO Biosphere Reserve, linking it directly to the German CAP Strategic Plan. *Elbe-Elster* (83) in Brandenburg and *Dresdner Heidebogen* (92) in Saxony also show strong commitment, defining biodiversity as central to a resilient cultural landscape. *Elbe-Elster* (83) specifically targets the preservation and expansion of the orchard meadow landscape ("*Streuobstlandschaft*") in *Hohenleipisch/Döllingen*, using it to link biodiversity with regional processing and as a low-threshold measure to increase biodiversity in residential areas (92). Scattered orchards/meadows also play a role in the landscape framework plan Spree-Neiße (170) with "enormous biotic potential" and new plantings in the *Bagenzer Basin* are being supported. The "*STREUOBST-Perspectives*" report by DeFAF provided a sound resource with that respect (171).

Soils: From the various keywords in the field of "soil", flood protection receives the highest ranks in Brandenburg documents analysed for NUTS 2 (57, 61) e.g. by technical solutions such as creating flood retention spaces, rather than soil related aspects. Soil fertility and soil health are highest in regional planning in Saxony (69). All other documents ranked those high as well, together with soil fertility, soil health and soil improvements. NUTS 3-level documents such as the Climate Concept of *Dahme-Spreewald* (64) and *Elbe-Elster* (65), promoting water retention in the top-soil.

Soil management is primarily addressed by LEADER through the lens of erosion control and physical resource preservation rather than biological soil health. *Zentrale Oberlausitz* (90) and *Dresdener Heidebogen* (92) provide detailed analyses of water and wind erosion risks, promoting soil-sparing cultivation and direct seeding. There is a general lack of focus on soil as a dynamic biological system (e.g., humus build-up for carbon sequestration). Soils are mostly treated as a static "location factor" (soil quality ratings) or a risk to be managed.

Climate change mitigation: A similar picture with respect to soil appears looking at the climate documents at the NUTS 2-level in this respect (71, 78), with flood being very prominent. Brandenburg seems to rank soil fertility, soil health and soil in general somewhat higher than Saxony. Here carbon, biodiversity, flood, are all highly appreciated. On the contrary, carbon obtained a very low score in the document for the Brandenburg strategy for climate adaptation (61). Carbon storage and humus is undergoing a significant shift in newer documents on all levels, for Germany (3), the State of Saxony (72) and e.g. *Elbe-Elster* (65), where soil and moors are no longer just "protected" but are actively managed as technical carbon sinks with reference to the Agricultural Climate Measures (ANK) providing specific funding for AE practices. Also key measure A-I-1 in the *Elbe-Elster* region mentions "alley-cropping" for climate adaptation as it defines rows of trees for improving the microclimate (65). The focus on climate change mitigation in LEADER is heavily weighted toward energy efficiency and renewable energy, with less emphasis on agricultural sequestration. *Lausitzer Seenland* (85) and *Westlausitz* (91) set clear goals for CO_2 and CH_4 reduction. Diversification in agriculture is among the keywords mentioned fewer times, thus with minimal level of engagement. Even more so with respect to animal welfare, which is almost not addressed at all. Similarly, animal welfare is a significant gap across nearly all LEADER strategies. Minimal engagement in LEADER RDPs as it is mostly mentioned only as a citation of overarching EU or national goals (GAP/SDG) without regional implementation measures. Solely the aquaculture sector is characterized by "animal-friendly production" as a regional strength.

Food systems-related agroecological principles

Regional economy, regional supply and value chains: In the more recent concepts on NUTS 1-level (58), the combination of innovative land use (e.g., on post-mining sites) and regional value chains (timber, fish, fruit) is becoming a greater focus of structural change. Diversification in agriculture is rather symbolic in the documents for Brandenburg and Saxony with a moderate emphasis on regional added value and value chains (71, 78). In the Lausitz transformation documents *Görlitz* (169), *Spree Neiße* (67) emphasising to close gaps in the regional food chain (closure of processing plants after the German reunification) and is treated as an essential economic resilience factor, moving AE from a "nature protection" niche to a "regional development" engine, thus a more business-driven approach. With respect to the LEADER strategies, regional economy and -supply and value chains forms the second strongest pillar of the LEADER strategies, and is seen as a driver especially in the post-mining economic transition. *Spreewald* (81) receives high scoring, aiming to evaluate and optimize all established value chains under its "Spreewald" brand. *Elbe-Elster* focuses on building a regional value chain for wood to link forestry with local industry (83). Brandenburg LEADER regions focus more on branding and marketing (e.g., "*Regional Label Elbe-Elster*"), while Saxony LEADER regions emphasize networking and diversification of farm income.

Food systems and socio-cultural value: on the NUTS 1-level, food production is ranked moderate in Saxony, but only symbolic in Brandenburg. Landscape image / scenery is ranked symbolic in both states, except the Landscape Plan Brandenburg dating back to 2000 (57). At the NUTS 3 here foremost Cottbus (68) and Spree-Neiße (170) focus on landscape effects and their fostering role for identity. In LEADER, the socio-cultural value of food is strongly tied to regional identity and tourism,

with a strong focus on “Lusatian fish” production (86, 88, 91). The Spreewald LEADER region (81) uses its “Regionality in Focus” project to involve the agricultural and food industries in broader cultural and creative networks.

3.1.2.2 Agroforestry

Summary: Modern AF systems are in few but newer documents evolving from an ecological niche into a key technical tool for climate adaptation (65) and “natural climate protection” (72). However, mostly, (protected) wooded landscape elements and orchard meadows are – as classic nature conservation topics – firmly anchored in binding plans (57, 72, 170). Specific AF-concepts such as forage leaves or food forests appear hardly at all, or only in symbolic educational contexts (72). A mandatory 10 % target for landscape elements on agricultural land in the Saxony biodiversity strategy (72). Some districts such as Spree-Neiße stand out in their landscape framework plan with respect to their strategic priority in Spree-Neiße for “envelope and fringe structures” (170).

SRC is treated primarily as a source of bioeconomic potential (68, 69) and less as an integrated AF system but shows a high focus on energy topics.

Agroforestry: There is strong consensus on the value of woody landscape elements (hedges, tree-lined avenues) for the biotope network (esp. (59)) and of SRC plantations for the energy strategy (63). AF is transitioning from a theoretical concept to a high-salience measure in climate adaptation (65) and reference to the funding in prospect to the Action Programme Natural Climate Protection (ANK), as measure 6.1 explicitly promotes AF systems through the GAK (3). While AF systems are identified as a strategic opportunity for Brandenburg in the biomass strategy (63), they are almost entirely absent as an explicit technical term in the regional sustainability and development concepts (58, 67). The term AF or specific forms of AF are not mentioned in Saxony, but the document stems from 2014, where this type of land-use was not a common option in Germany. The only specific AF term from Annex A mentioned is woody landscape. This also holds for Brandenburg. The term “short rotation coppice” (SRC) is frequently used in the AF context, albeit it often actually refers to tree plantations. Some regional planning documents explicitly mention SRC and even delineate priority areas in their plans. However, SRC is treated almost exclusively through an energy/bio-economy lens e.g. in the Regional Development Concept *Bautzen-Görlitz* (75, 77, 172) rather than as an AE practice. Based on an analysis of the LEADER documents for the Lusatia regions, the following picture emerges regarding the integration of specific agroecological practices and AF concepts. The Saxony documents (86–93) and those for the *Elbe-Elster* region in Brandenburg (83) show a significantly stronger emphasis on traditional elements (scattered orchards, hedgerows), whilst modern AF concepts feature as topics for innovation and research, particularly in the Brandenburg LEADER strategies. Best Practice for TOF becomes visible in the LEADER documents by *Spreewald* (81) and *Lausitzer Seenland* promote AF (e.g., the “AgroBaLa” project by DeFAF is mentioned) to create climate-resilient land-use systems that also serve as carbon sinks (85). Modern AF systems are addressed almost exclusively in Brandenburg part of Lusatia (i.e. *Spreewald* (81) and *Lausitzer Seenland* (85)) as innovative approaches to climate resilience and for new value chains. “Alley-cropping” for climate adaptation is mentioned in Elbe-Elster (65). Also, Target 65 in the Saxony biodiversity strategy provides a need for the establishment of field hedges/ AF on state-owned land (72). In the Saxon regions, modern concepts are largely absent; there, the focus is more on preserving traditional wooded landscape features (hedges, tree-lined alleys) to reduce erosion. Orchard meadows are the most highly integrated agroecological element. In *Elbe-Elster* and *Spree-Neiße*, it achieves the highest scores, as it

is established there as a defining feature of the cultural landscape, underpinned by specific investment projects and processing objectives (heritage varieties), (83).

Agroforestry-related terms: A bit more promising looks the result for AF related terms. Especially, TOF received considerable attention. In Brandenburg, NUTS 1, the fundamental objective to safeguard the functioning of the ecosystem is connected to several AE-measures related to trees, however, trees should be "protected from grazing" rather than trees being seen as a habitat for grazing animals (57). Woody elements such as hedgerows, TOF, alleys along streets, represent the most robustly integrated AE-feature, anchored in binding state-level quantitative targets in SN: "*At least 10 per cent of agricultural land is to be landscaped with a wide variety of landscape features (buffer strips, fallow land, hedges, field margins, etc.).*" (72). Similar goals exist for BB (78) and spatial landscape plans e.g. for the *City of Cottbus* (68). Here, key areas for enhancing the structure of the agricultural landscape through field copses, rows of trees, etc. are mentioned, situated north-west of *Willmersdor*f, around *Kahren* and near *Groß Gaglow* (68). For *Spree-Neiße* a mandatory protection of avenues and rows of trees along district roads are requested (170). Timber/wood production is a significant type of land use, but discussed in more detail in the Saxony documents, reaching a high relevance in the Energy and Climate Plan from 2022. This is in light of harsh experience with droughts and calamities affecting the spruce forest in the mid-mountain ranges of Lusatia. Forest garden or tree fodder/fodder hedge concepts are not included for NUTS 2 in Lusatia. LEADER strategies of *Bautzener Oberland* (87) and *Dresdner Heidebogen* (92) integrate the planting of field hedges, tree rows, and alleys as structural elements to improve the microclimate and prevent erosion. Erosion control as a driver: In regions such as *Bautzener Oberland* (87) and *Dresdner Heidebogen* (92), the integration of tree lines and hedgerows is directly linked to the problem of the cleared agricultural landscape and the high risk of wind and water erosion, which results in a strong political commitment. Highly specialised AF system terms such as forage hedges, forest gardens, agrosilvopastoral systems, forage foliage appear to be largely absent from the documents, though their practical comp. This suggests that the strategies are strongly oriented towards established agricultural and forestry structures, as well as traditional nature conservation, and that systemic agroecological innovations (except in *Spreewald* (81)) have not yet become mainstream in regional development. Wood production is viewed less in terms of AF or EA-concepts and more as an economic driver for regional value chains (particularly *Elbe-Elster* (83) and *Westlausitz* (91)) and as a contribution to the bioeconomy. Urban systems such as "food forests" or "forest gardens" etc. are currently symbolic or restricted to the educational sector (72). Minimal mention is made of settlement AF, usually in the form of "*Streuobstwiesen*" (traditional fruit orchards) near rural settlements.

3.1.3 Best practice examples for Germany

Best practice example I – Implementing the EU Water Framework Directive with agroforestry *Tauchnitzgraben*: The creek restoration project "*Tauchnitzgraben*" established 2,380 trees and shrubs representing 20 species and varieties, including black alder, bird cherry, european white elm, sycamore, and three hybrid poplar varieties (Figure 2). Designed to reflect the region's potential natural vegetation, it creates a diverse habitat network. By combining ecosystem restoration with renewable energy production, the initiative demonstrates how multiple environmental objectives can be achieved simultaneously. A key strength of the project is its collaborative approach, bringing together the mayors of the local municipalities, farmers, water authorities, the energy sector, conservation organisations, and especially many landowners which had to agree to accept trees on

their land, to develop a practical model for implementing the EU Water Framework Directive (WFD, 2000/60/EC) in agricultural landscapes (173).



Figure 2: Implementing the EU Water Framework Directive with agroforestry Tauchnitzgraben.
Source: S. Schillem.

Best practice example II – Compensation measure for fruit-based agroforestry system in Peickwitz: Located in the LL Lusiatia, farmer Thomas Domin in Peickwitz planted his first AF system in 2015 and has since then extended his systems (174). The farm butchery and the cooperation with a local grain mill and a bakery supports the regional produce and allows for short and regional small value chains. Also, one AF system has been financed by the community of *Senftenberg* through a compensation measure connected to a road construction project within the community (Figure 3). The farmer also maintains strong linkages with the local administration and regional stakeholders: He is envisaging to work together with the municipal utilities for initiating a local heat supply based on AF resources.



Figure 3: Compensation measure implementing a fruit-based agroforestry system in Peickwitz.

Source: R. Hübner.

Best practice example III – Agroforestry for sustainable land use and regional development at LEADER *Münster*: In the administrative region of *Münster* in the LL North-NRW, the RDS of several LEADER regions have integrated traditional landscapes including woody structures as part of their local heritage worthwhile to protect and promote. In the RDS of the regions "*Hohe Mark*" (39) and *"Berkel"* (37), AF as a concrete measure is even mentioned as suitable pilot projects for the context of agriculture and climate protection. In the administrative district *Steinfurt*, two AF projects have been

financed through the LEADER approach: While the AF system of the farmer Jan Große-Kleimann has been co-funded in 2022 (Figure 4), a second project by the administrative district of *Steinfurt* is currently focusing on promoting AF in the region. In the federal state of NRW, LEADER has proven to be a suitable approach also for other AF projects outside the LLs: in the western part of NRW, a key-line AF system for more climate-resilience has been co-funded and the neighbouring district *Euskirchen* is seeking farmers for cooperation on initiating new AF systems.



Figure 4: The AF system at the farm of Jan Große-Kleimann co-funded 2022 by LEADER has a focus on wind protection and apple production.

Source: R. Hübner.

3.1.8 Limitations and potential in Germany

Major potentials in Germany

In both LLs in Germany, AE principles are already addressed to a certain extent through the guidelines and goals laid out in the documents analysed. However, between the LLs the priorities differ slightly due to their diverging historical and demographic characteristics. Across both German LLs, the most relevant trend is that AE principles are considerably better embedded in regional strategies than AF as a specific AE practice. Biodiversity, climate adaptation, soil protection and, to varying degrees, regional value creation provide the strongest existing policy entry points for AF. In the LL North-NRW, biodiversity, climate and soils are highly prioritised from NUTS 1 to NUTS 3, whereas local strategies address regional economy, regional supply and cultural landscapes with a stronger focus. In the LL Lusatia, biodiversity is similarly prominent, but AE is also closely connected to structural transformation and regional economic development.

For LL North-NRW, the strongest connection between AF and AE principles is achieved through biodiversity and habitat connectivity, soil and erosion protection, climate adaptation, and the cultural landscape. Existing woody landscape elements – particularly traditional hedges, TOF and orchard meadows – already fit these objectives, even when they are not explicitly described as AF. The *Münster* regional plan, for example, places substantial importance on newly planted traditional hedges and woodland outside forests because of their contribution to the traditional regional landscape. At NUTS 3, some strategies already go further: AF is discussed as a response to drought, carbon sequestration and climate-resilient agriculture, including in *Lippe* and several LEADER regions. There is also a strong food-system and regional-development connection in North-NRW, which seems to have a greater potential than in Lusatia, as due to the much higher population density in NRW, the urban-rural-connections are much stronger. At NUTS 3, regional economy, regional value chains, sustainable/organic agriculture and the cultural landscape become more prominent. Some regions

(e.g. *Steinfurt*) have no climate concepts, but are very active in the initiative "*Energieland 2030*". This marks potentially a suitable entry point to bring in AE and AF. The *"Münsterländer Parklandschaft"*—with agricultural fields, traditional hedges, orchards, small forests and lakes – is particularly relevant because it already connects productive agriculture, biodiversity and regional identity. AF could therefore be connected to AE through objectives that regional strategies already recognise rather than needing to be introduced as an entirely separate sustainability concept.

For LL Lusatia, the strongest potential lies in connecting AF with climate adaptation, biodiversity, erosion protection, regional value chains and the post-coal structural transformation. Newer strategies increasingly move from a primarily renewable-energy perspective towards food economy and innovative land use. Regional value creation provides a particularly important bridge: land use is repeatedly connected to regional economic development, while LEADER strategies combine AE-related measures with economic restructuring, climate adaptation, biodiversity, landscape identity and tourism. Modern AF systems also appear to be somewhat more explicitly emerging as a technical climate-adaptation instrument in parts of Lusatia, especially in Brandenburg. Alley cropping is mentioned in *Elbe-Elster* as a measure to improve the microclimate, while AF projects in LEADER region *Spreewald* and *Lausitzer Seenland* are associated with climate resilience, carbon sinks and new value chains. In Saxon parts of Lusatia, by contrast, the stronger entry point remains traditional woody landscape elements such as hedges, tree rows, alleys and orchard meadows, particularly for erosion control and landscape structure.

With respect to available finances, the analysis of the DE case studies and documents identify several regional mechanisms that could support AF. At NUTS 3/local level, LEADER is the clearest mechanism demonstrated in the results. In North-NRW, two AF projects in *Steinfurt* were financed through LEADER, including the AF system of Jan Große-Kleimann in 2022. Other LEADER strategies explicitly identify AF as a possible pilot measure for agriculture and climate protection. The Lusatia results show examples of another local mechanism: compensation measures. In *Peickwitz*, an AF system was financed by the municipality of Senftenberg as a compensation measure associated with road construction. This example also links AF to short regional value chains and potential cooperation with municipal utilities for local heat supply. At the broader policy level, the results furthermore refer to the Action Programme Natural Climate Protection (ANK) and AF promotion through the Joint Task for Improvement of Agricultural Structures and Coastal Protection (GAK).

One can conclude that for the practical implementation of AE practices according to the AE-principles, the legal basis is often there. However, AE is not integrated as an overarching concept but rather some of its elements are partly included. This limits the opportunities of realistically integrating AE in all the relevant sectors.

Limitations & Weaknesses in Germany

For AF, the analysis shows that, mainly indirectly through the identified priorities for some of the AE-principles, some entry points for AF as a promising agroecological tool do exist already and in a next step approaches for the practical implementation are needed. The main limitation in both LLs is the gap between several strong commitments to sustainability objectives and weak explicit integration of AF.

North-NRW demonstrates this particularly clearly: biodiversity, soil protection and climate adaptation have high policy relevance, but AF itself is barely considered in the analysed regional plans. Traditional woody structures are recognised, but they are generally not framed as components of modern AF systems. This gap persists at NUTS 3 level. Although several districts and LEADER regions mention AF, many do so only symbolically or as potential pilot projects. AF-related terms such as

timber, TOF and fruit production receive substantially more attention than AF as an integrated land-use system. Also, the value of regional timber production in the forest sector is of high relevance in NRW, due to its strong wood processing industry. Despite its potential for decentral timber production, AF systems are, however, not at all considered as means for alternative timber and wood product sources.

In Lusatia, there is an additional tension between nature conservation and renewable-resource/ energy objectives. Some planning documents treat ecology primarily as a constraint on energy development rather than integrating ecological and productive functions. SRC illustrates this issue: it is relatively prominent, but predominantly understood through an energy/bioeconomy perspective rather than as an integrated AE/AF practice. There are also thematic gaps. In Lusatia, agricultural diversification receives relatively little attention and animal welfare is almost absent from regional strategies. Soil is often approached through erosion, flood management or physical resource protection rather than as a dynamic biological system connected to humus formation and carbon sequestration. Highly specialised AF concepts – including forage hedges, forest gardens, agrosilvopastoral systems and fodder foliage – are largely absent, indicating that regional strategies remain oriented toward established agricultural, forestry and nature-conservation structures. Finally, implementation requires coordination between multiple regional actors and landowners. The *Tauchnitzgraben* example demonstrates that implementation involved municipalities, farmers, water authorities, the energy sector, conservation organisations and numerous landowners who had to agree to trees being established on their land.

Recommendations, opportunities and suggested priorities for Germany

Based on the patterns already present in the results for Germany, AF could be connected more explicitly to the AE principles and sustainability objectives that already have strong regional policy commitment, rather than being treated as a separate topic. In North-NRW no incentive scheme for the establishment of new AF systems has been installed yet, in Saxony it has been introduced in 2023 (175) and in Brandenburg just recently in August 2026 (176). While in Lusatia this is a good start for implementing AF on a larger scale, in North-NRW the establishment of new AF systems can only be realised with private funds or alternative funding concepts such as LEADER. Therefore, considering how available funds for the sustainability sectors analysed can be used for implementing more AF as a multifunctional tool for addressing some of the regional challenges would be beneficial to bring forward AF. Also, stronger and new forms of cooperation between communities and farmers could be another way to identify innovative ways for a more sustainable land use.

For North-NRW, this means primarily connecting AF to strategies on biodiversity and habitat connectivity, soil and erosion protection, flood and water retention, climate adaptation, cultural landscape conservation and regional value chains. Existing concepts provide particularly clear but indirect connections between AF, biodiversity, landscape identity and agricultural production. The existing LEADER experience also provides a concrete route for translating these strategic connections into regional pilot projects. In NRW there is a substantial “drive” and activism amongst stakeholders and PP involved in EELAP.

For Lusatia, AF could be positioned particularly at the intersection of climate adaptation, erosion protection, biodiversity and structural transformation/regional value creation. Traditional orchard meadows, hedges and tree rows provide established entry points, while alley cropping and other modern AF systems already appear in individual Brandenburg strategies as innovative approaches. Regional wood, fruit and other AF-derived value chains correspond particularly well with the existing emphasis on regional economic restructuring. New initiatives that are potentially in the pipeline are needed as many of the strategies and management plans seem outdated with respect to AE and AF.

Saxony is currently drafting its climate adaptation strategy and EELAP PP are involved in the public consultation process.

At NUTS 2 and NUTS 3, the results suggest making stronger use of existing regional policy instruments rather than creating AF-specific structures in isolation. LEADER can support pilot projects and regional development; compensation measures can finance establishment locally; landscape and biodiversity planning can support woody structures; and climate-adaptation measures can provide an entry point where AF addresses erosion, drought, microclimate or water management. The results also show that collaborative approaches involving farmers, municipalities and other regional stakeholders can connect environmental objectives with practical land management.

One major potential in Germany is the sector of climate adaptation. The Länder strategy is to be updated at least every five years. Such updates should more strongly include AE-principles and measures, such as AF, however, it can be recommended for inclusion after five years only. In NRW, a climate adaptation law has been issued and is currently being amended.

Similar on NUTS 1 level. As the German Federal Climate Adaptation Act (KAnG), that came into force in July 2024 (4), requires the federal states to submit a precautionary climate adaptation strategy, including a catalogue of measures, by 31 January 2027. During the initial drafting, EELAP-PP should participate in public consultation events held, to raise awareness for the topic (177).

The results suggest five priorities across the two LLs in Germany:

- *Translate strong AE commitment into explicit AF implementation.* Biodiversity, soil protection and climate adaptation already have substantial policy support, but AF is often missing as an explicit implementation measure. The central opportunity is therefore to integrate AF directly to these established objectives by e.g. naming it as a concrete measure or tool.
- *Target AF strategies according to widely agreed regional priorities.* In North-NRW, the strongest links could be established building on existing strategies and goals for biodiversity/habitat connectivity, cultural landscapes, soil and water protection and regional food/value chains. In Lusatia, climate resilience, erosion control, post-coal structural transformation, innovative land use and regional value creation are particularly prominent in existing strategies.
- *Use NUTS 3 and LEADER as an implementation level.* Local and LEADER strategies generally provide more concrete links to regional economy, identity and value chains than higher-level planning documents. The existing LEADER-funded AF projects in North-NRW demonstrate that this level can move AF from strategic recognition toward implementation.
- *Enhance policies for woody landscape elements integrating modern AF.* Hedges, orchard meadows, tree rows and TOF – which are AF systems in a wider sense – are already strongly embedded in many regional strategies, particularly for biodiversity, cultural landscape and erosion protection. They therefore represent an important bridge between established regional priorities and modern AF approaches, with opportunities for active use and farm diversification.
- *Bring in AE and AF topics at all level public-participation events.* This includes climate adaptation strategies of the federal states, as well as any new draftings on the NUTS 3 level.

Overall, the two LLs show considerable alignment between the functions of AF and existing regional AE/sustainability priorities, but substantially weaker explicit recognition of AF as an integrated land-use approach. The most immediate potential therefore lies in linking AF to policy objectives, funding mechanisms and regional-development structures that are already established rather than introducing AF as an isolated new objective.

3.2 Hungary

3.2.1 Agroecological principles

Summary: The documents for Hungary focus on local adaptation, preservation of county values, and energy efficiency. The National Climate Change Strategy (NÉS), (94) focuses on high drought risk, which could severely impact crop production, and some level of flooding risk; it also sets out Hungary's decarbonisation roadmap. The relevance of the Fejér County Strategy is strongest in the preservation of regional values, water management adaptation (flooding, inland water) and the support of renewable energy sources. Among the ecological aspects, biodiversity protection (NATURA 2000) is an integrated element, while specific soil and food system issues are relegated to the background (94).

The analysis of the National Energy and Climate Plan (NEKT) of Hungary shows a strong focus on energy priorities and quantifiable climate goals, while ecological and in-depth agricultural aspects are relegated to the background (96). The more complex, ecologically oriented elements of AF and sustainable land use – such as soil life protection or diversified agricultural production – have not yet received significant policy weight. The document treats agriculture primarily as an emission source or a source of biomass raw materials, rather than as a complex adaptation system.

The Second National Climate Change Strategy NÉS-2 (95) integrates ecological aspects (biodiversity, landscape, land use) much more deeply than purely energy plans. The highest commitment is seen in the areas of water management adaptation (risk of floods), carbon sequestration (forests and technology), and renewable energy sources. Soil issues and food security receive moderate weight, while market-type concepts (value chains, added value) are relegated to the background (95).

Exemplary for the NUTS 3-level, in the *Jász-Nagykun-Szolnok* County climate strategy the strongest commitment is in the fields of water management and water security (flood protection) and renewable energy sources (97). Ecological aspects (e.g. biodiversity, soil protection) appear primarily as part of sustainable agriculture and landscape management, often linked to national-level goals. Market-focused concepts (e.g. value chains, food system) do not play a significant role in the document.

Agroecosystem-related agroecological principles

Biodiversity receives a moderate integration (0.50–0.74); the NÉS treats the protection of NATURA 2000 and RAMSAR areas and ecological corridors against climate change as a priority objective (94). One of the overarching goals of the strategy is biodiversity protection. It is addressed in a separate chapter under natural resources and appears as a priority research area NÉS-2 (95). It appears as a reference to National Sustainable Development Strategy (NSSD), sometimes termed National Sustainable Development Framework Strategy (NFFS – *Nemzeti Fenntartható Fejlődési Stratégia* in Hungarian), (94) regarding the protection of natural values and the maintenance of species richness. The connection of habitats living places are rather symbolic: the ecological corridors and the protection of green infrastructure appear as horizontal goals at the development trends. In the NEKT, biodiversity surprisingly only received peripheral attention and appears more as a limiting factor for afforestation or as a research area, rather than as a fundamental planning aspect (96).

Soils: Soil fertility is at reference level; good quality topsoil (chernozem) as a basic resource and the soil improvement effect of organic farming are presented. Soil health has minimal relevance; indirectly, it is affected by the protection of the biological state of the soil and organic farming. It is indirectly mentioned in connection with agricultural adaptation technologies. Indirectly affected in

connection with soil degradation and the state of natural resources. Soil improvement is on minimal level; indirectly related to organic matter replenishment and improved water management (95). Soil improvement does not include specific soil improvement or reclamation programs (apart from the reclamation of landfills). The relevance of soil fertility is on a reference level; preserving agricultural land as an element to be protected and the organic matter content of the soil is an important aspect. Erosion is mentioned on 0.25–0.49 reference level; appears in impact assessments as a soil degradation process intensified by climate change. There is no substantive mention of Erosion and Erosion control focuses more on drought and inland water. Erosion control is of minimal relevance; arises as part of water-saving soil cultivation and sustainable landscape use, but has no named program. There is no substantive mention; not included as an independent intervention direction in the strategy. Flooding has high priority; protection against flash floods and inland water is one of the central adaptation pillars of the strategy (AC-1 objective, Ai-6, Ai-8 interventions (e.g. *Vásárhelyi Plan*), (94). Water management (drought, irrigation, water storage) are moderately integrated elements in the NEKT, primarily in the context of climate change adaptation and agricultural production security (96).

Carbon sequestration: Peripheral to moderate integration; refers to forest areas as CO_2-sinks in the GHG inventory balance, but this is not the main intervention direction. Moderate integration; the GHG inventory quantifies the CO_2 absorption of forests and records that the county's absorption capacity currently does not even cover 5 % of emissions. Renewable resources received high priority; a central element of the decarbonisation roadmap (HDÚ), especially in the field of carbon sequestration in forests and artificial technologies (CCS/CLT), (95). There are several interventions utilising solar and geothermic energy sources.

Animal welfare: There mentioning of animal welfare is minimal and animal husbandry / livestock farming is only mentioned from the perspective of GHG emissions (CH_4, manure management) and adaptation (94). Related to the climate sensitivity of livestock farming and improving yields while reducing CH_4 emissions (95).

Food systems-related agroecological principles

Diversification in agriculture has a minimal reference (score <0.25). It is rather a peripherical multipurpose goal and farming indirectly appears like: the connection between "multi-level farming" and improving rural population retention capacity. Food production relevance is in reference to moderate level; appears in connection with the economic weight of agriculture and the vulnerability of the food industry that relies on it. There is often no mention of the food system. Food production shows a moderate integration, however, one of the basic goals of adaptive agriculture is food security and production sustainability. The document handles production and food security, but does not use the system-level approach in this form (95). As for the regional economy and value chains: regional added value has high priority; the protection of "County values" (natural, cultural, built) is a unique, structural element of the strategy. Regional value added can be on a minimal level in certain regions where high value-added production is tangentially related to the KEHOP-objectives[1]. Regional economy on reference level; appears in connection with local energy autonomy and decentralized systems (smart grids).

[1] KEHOP stands for *Környezeti és Energiahatékonysági Operatív Program*, which translates in English to the Environmental and Energy Efficiency Operational Programme. It is co-funded by the EU and finances large-scale national and regional projects aimed at climate change adaptation, renewable energy deployment, energy efficiency, biodiversity preservation, water management, waste management, and environmental protection.

Connected to **renewable resources**, which is a prominent strategic area; several projects and objectives are aimed at solar systems and alternative energies.

Food production appears in relation to the strategic importance of agriculture and the food security-implications of organic farming. **Regional supply** is at moderate reference level. Local energy efficiency (at the municipal, micro-regional level) and infrastructure planning are important aspects. **Value chains** are at minimum; it is referred to in connection with the vulnerability of the industrial "vertical" and processing industry based on agriculture. A moderate level appears in connection with local energy autonomy and decentralized systems (smart grids). No mention of value chains; the document is structured along sectors and verticals, the term is not used. The NEKT emphasized value chains in the context of the green economy and competitiveness, but not necessarily in terms of agriculture (96).

Landscape scenery receives moderate integration. Integrated landscape management and spatial development adapted to landscape characteristics are the stated priorities of the strategy. Landscape integration on reference to moderate level, integration of landscape management, preservation of landscape diversity and floodplain landscape use are key elements of adaptation.

3.2.1 Agroforestry

Summary: The National Energy and Climate Plan – NEKT (96) treats AF systems not as an independent form of management, but as a means of achieving climate goals. It is highly technocratic and decarbonisation-focused. It only highlights those AF elements that directly contribute to improving carbon dioxide absorption statistics. TOF, although important for carbon sequestration, appear more as a statistical factor than as a complex AF system. Other AF and permaculture concepts like fodder trees, forest gardens and food forests are completely missing. This indicates that the strategy does not take into account complex, multi-use ecological systems. Trees in the agricultural landscape are not seen as diversified farming partners that increase production security, but as "other tree stands" that help meet climate commitments. The strategy therefore misses the opportunity to promote meaningful, synergistic cooperation between agriculture and forestry (i.e. true AF).

3.2.3 Best practice examples for Hungary

The most relevant examples of AE and AF in Hungary represent a blend of historical heritage (traditional grazing and flood-plain management) and modern system redesign (regenerative agriculture and alley cropping). The current high-relevance status of these practices is heavily influenced by the Hungarian CAP Strategic Plan (2023–2027), specifically the Agro-ecological Program (AÖP), which has moved these principles from niche experiments into the mainstream subsidy framework.

Best practice example I for traditional silvopastoral systems: Traditional wood pastures (*fás legelő*) are Hungary's most significant AF heritage. High-relevance sites include the *Bakony, Somogy*, and parts of the *Hortobágy*. These systems utilize "Trees for Shelter and Nutrition", where livestock (often native breeds like the Hungarian Grey cattle) graze beneath widely spaced ancient oaks or fruit trees. These are now protected as "High Nature Value" areas. Modern projects focus on restoration to prevent shrub encroachment while providing heat-stress relief for animals.

Best practice example II for regenerative arable farming (system redesign): Leading innovative farms, such as the Berend Farm or those mentored by the Hungarian Research Institute of Organic Agriculture (ÖMKi). "Living Soil" practices include no-till, year-round cover cropping, and crop

diversification (6+ crop cultures in rotation). This is currently the most rapidly growing AE field in Hungary due to the extreme drought sensitivity of the Hungarian Great Plain (*Alföld*).

Best practice example III for shelterbelts and alley cropping: The shelterbelt systems of the *Alföld* and experimental alley cropping (*fasoros köztestermesztés*) sites managed by the University of Sopron. For "Wind and Water Erosion Control", rows of trees (often native poplars, oaks, or fruit trees) are integrated into arable fields to break wind speed and improve the microclimate. Moving from Soviet-era mono-species shelterbelts to multi-functional alley cropping that yields both timber/energy wood and cereal crops.

Best practice example IV for traditional integrated management – the *Nagykörű* Model: The village of *Nagykörű* is a benchmark for the *Erdő-mező-legelő* (forest-field-pasture) system, focusing on traditional fruit varieties integrated into the landscape. "Landscape-scale Synergies" integrates water management (using Tisza river floodwaters), traditional orcharding, and communal grazing. This is typical for ancestral forms of Hungarian farming where trees play an essential role, including wood-pastures and orchard grasslands (178).

Best practice example V – *Jász-Nagykún-Szolnok* County *Nagykörű* floodplan: The farm is established in *Nagykörű* on the *Tisza River* for 25 years, on about 40 hectares, primarily through grazing (cattle, sheep, horses), on the saline grassland on the protected side, and in the Tisza floodplain, where he creates a landscape-identical wooded pasture from the overgrown abandoned arable land, with economic benefit. The main agroecological transformation of arable land into wood pasture, with landscape-identical management with the opportunities offered by succession, summer grazing, winter cleaning, crushing, selective wood utilization. The area concerned, 20 hectares. The owner, Péter Balogh, does not grow species, but the species grow in his area: domestic poplars, white willow; American ash, green maple, false indigo-bush (*Amorpha fruticosa*) – these species bring ecological and economic benefits, for example, organic quality beef is produced, with minimal cost, therefore environmental burden, and the main product is floodplain wood pasture, which should be the main surface cover, cultivation branch, or agricultural utilization of the Great Plain water management reform. The best practice example shows how the local economy is connected to the conceptual policy level (178–180).

Best practice example VI – *Fejér* county *Valaha tanya*: Established in *Vértesacsa* 12 years ago, a cropping system consisting of fruit trees and berry bushes, intercropped with fodder cultivation, composing a more natural, multilevel, diverse meadow. The trees included in the hedgerow provide nectar to bees and other pollinators; by pollarding it gives branch wood, which can be used as firewood and fencing timber. The main activity is orchards, food forest with six hectares of old Hungarian fruit varieties from early cherries to late medlars. There are two hectares of winter-hardy wild fruits in the garden, and plots of experimental Mediterranean fruits cultivation. Animals complete the system, native poultry graze in their orchard, and fallow goats and Carpathian badger cattle utilize the hay and food wastes. Production is integrated in short supply chains through on-farm sales of their own products (99).

In Hungary, wooded pastures (pasture forests) are grove-like forest-grassland mosaics formed by grazing, where old, distant trees can be found next to the grassland. They occur mainly in the Great Plain, and along large rivers (in the so called, *hullámtér*, translated as "wave fields"which refer to the regularly inundated, dike-bounded strip of the broader floodplain) and on former floodplains, as well as in *Bakony, Szatmár-Bereg,* and *Zala* counties. Areas of outstanding nature conservation value ranging from 10-20 hectares to several hundred hectares include, for example, the *Adorjási, Beremendi, Besencei, Csokonyavisontai* or *Erdőbénye* wooded pastures. Work by Anna Varga is the

definitive resource on the ethnography and ecology of Hungarian wood-pastures (181). Bölöni, J. *et al.* (2011) provide the botanical classification for integrated wooded habitats (182).

Further examples for typical wooded pastures in Hungary are:

- *Csokonyavisontai wooded pasture:* a significant area along the *Drava* river, north of *Barcs*, on the western edge of the forest block.
- *Erdőbénye Wooded Pasture Nature Conservation Area:* a 195-hectare area protected since 1990, where traditional farming is typical.
- *Szatmár-Bereg wooded pastures:* Traditional land use type characteristic of the landscape.
- *Adorjási, Beremendi, Besencei, Bogdásai, Bürüsi wooded pastures:* wooded pasture remnants in *Baranya* county.
- *Cserépfalu wooded pasture:* An area dotted with oaks in the *Bükk* Mountains.
- *Tornyiszentmiklós wooded pasture:* Habitat reconstruction area in Zala county.
- *Hollókő wooded pasture:* in *Cserhát*, on the castle hiking trail.

These areas are of particular importance because of the *„hagyásfák"* ("leftover trees", solitary, old trees) that provide habitat for numerous protected species. Good national resources exist, such as the article "An agroecological practice in the light of Ecological Economics", published in *Gazdaság és Társadalom*, explores the alignment of AF with AE-principles in the Hungarian context (183). Examples for AF in the form of wood-pastures (*Bakony/Somogy*) are available focusing on the integration of heritage breeds and old trees (181).

3.2.4 Limitations and potential in Hungary

Major potentials in Hungary

The second National Climate Change Strategy NÉS-2 (95) of Hungary differs significantly from the NEKT, as it reflects a much more comprehensive, ecological and nature-based adaptation approach, in which nature-based solutions are given a greater weight. NÉS-2 thus has a more progressive spirit compared to previous plans, recognizing the importance of nature-based solutions, such as floodplain management, landscape management. The UNESCO project report on "*Agro-ecological Adoption Pathways in Hungary"* (184) analyses the socio-economic barriers to AE transition in Hungary, specifically highlighting the "advisory-dependent" nature of Hungarian farmers. Takács, V. & Frank, N. (2012) analyse the technical effectiveness of shelterbelts in the *Alföld* (185), for which Hungary has long-term experiences.

Limitations & Weaknesses in Hungary

The analysis also turned out the "blind spots" in the NEKT (96) that would be critical for sustainable agriculture, concepts like soil health and soil improvement receive minimal or no attention. AF and permaculture elements, and animal welfare and local food systems. These aspects are not part of the climate strategy; except that animal husbandry is a source for CH_4 emissions and manure management (as a negative externality). Here positive solutions are missing. Besides strong aspects in NÉS-2 (95), AF does not appear as an integrated, complex form of land use. The strategy continues to draw a sharp line between forest and agriculture.

Recommendations, opportunities and suggested priorities for Hungary

The "backbone" of the NEKT (96) is energy and direct emission reduction in the fields of carbon sequestration as the highest priority. Since the core of the strategy is to increase the absorption capacity of the LULUCF-sector, besides technological carbon sequestration (CCUS), there exists a chance to bring in AF in order to achieve the goals of the NEKT. Even more so as renewable resources

resemble a priority area, with a target of 30 % by 2030. Other topics of regional supply and energy security currently focus towards developing infrastructure (for gas and electricity networks). However, locally produced energy from renewable resources as wood grown for energy in AF systems may reduce dependency and are thus of strategic importance.

In Hungary, AE and AF emerge as key priorities for sustainable rural development, climate change adaptation, and soil protection. It is essential to apply a tailored, regional approach and to build strong links with the bottom-up initiatives of the LEADER program. Furthermore, suggested priorities for Hungary are:

- *Water retention and soil protection:* Due to intensive arable farming and recurring droughts, the primary goal is to increase soil organic matter and preserve precipitation locally using agroecological methods (e.g., cover crops, conservation tillage).
- *Agricultural shelterbelts and buffer strips:* Tree lines and shrub rows planted along the edges of arable fields act as AF-systems to reduce wind erosion, mitigate evaporation, and create a favorable microclimate for crops.
- *Wooded pastures and extensive livestock farming:* Combining grassland management with woody systems (silvopastoral systems) provides shade and alternative forage for livestock while protecting biodiversity.
- *Crop diversification and input reduction:* Radically decreasing the use of pesticides and synthetic fertilizers through agroecological companion planting, crop rotation, and biological pest management.

Linking with LEADER Initiatives the Local Action Groups (LAGs) form the ideal bridge between central CAP subsidies and local farmers. Integration through LEADER involves several key steps:

- *Local development strategies (LDS):* LEADER groups must explicitly incorporate environmental sustainability and small-scale agroecological projects (e.g., supporting community gardens, AF pilot plots) into their local strategies.
- *Short Food Supply Chains (SFSC) and Local Labels:* LEADER can support market access for agroecological farms by funding local farmers' markets, processing facilities, and regional eco-branding.
- *Knowledge sharing and networking:* LEADER funding is highly suited for financing farmer clubs, demonstration farm visits, and AF training, directly fostering mindset shifts within local communities.

The Climate Change Adaptation Strategies for Hungary – on County level – provide an essential and highly localized spatial diagnosis, mapping regional vulnerabilities and universally identifying AF and AE-principles – such as soil organic matter restoration, the establishment of protective forest strips, and landscape-level water retention.

3.3 Ireland

3.3.1 Agroecological principles

Summary: The review of the Climate Action Plans of all 29 county councils across Ireland's NUTS 2 and NUTS 3 regions, turned out that AE within the Local Authority Climate Action Plans is primarily framed through environmental governance. Biodiversity is consistently positioned as a central climate objective, often described as a co-benefit of broader mitigation and adaptation actions followed by carbon and flood. Soil-related themes such as soil health, soil quality, soil management, soil structure, and soil organic carbon are frequently referenced in relation to improving water retention (water

quality), land productivity, and carbon sequestration; however, the level of attention varies significantly across counties.

Agroecosystem-related agroecological principles

Biodiversity: Across Ireland, biodiversity is consistently embedded as a core priority within county Climate Action Plans, demonstrating a high level of policy commitment nationwide. Biodiversity protection and enhancement are widely recognised as essential components of climate adaptation, ecosystem resilience, and sustainable land management.

In contrast, habitat connectivity receives more variable attention across the country. While biodiversity objectives are well established, measures to strengthen ecological connectivity and reduce habitat fragmentation are not yet consistently integrated into local policy frameworks. The greater variability in scores for habitat connectivity in the Northern and Western Region, compared with the Southern Region and the Eastern and Midland Region, may reflect differences in landscape characteristics, land management practices, or stakeholder perceptions.

Soil: Soil-related policy demonstrates a mixed but generally positive level of integration across Ireland. Flood risk management is one of the strongest and most consistent policy themes in all regions, reflecting the national priority placed on climate adaptation and resilience. Policy attention to erosion and erosion control is more variable and tends to be concentrated in coastal counties where shoreline instability and land degradation present more immediate environmental challenges. However, these issues are often framed as policy intentions rather than supported by detailed implementation measures. Most county plans align with policies promoting soil quality improvement and soil organic carbon enhancement, although the level of operational detail varies. Overall, soil management remains more strongly focused on flood protection and erosion than on broader objectives such as soil fertility, regenerative land management, and long-term soil health.

Carbon: Carbon reduction is one of the strongest and most consistently integrated themes across Irish climate action policies. County plans place significant emphasis on achieving carbon neutrality, reducing greenhouse gas emissions, supporting carbon sequestration, and implementing decarbonisation measures in line with national climate objectives. However, renewable resources are generally interpreted through a relatively narrow technological lens, with most policies focusing on renewable energy deployment, particularly solar energy, electric vehicles, and energy efficiency. Broader aspects of sustainable renewable resource management, including sustainable biomass, circular bioeconomy approaches, water resources, and ecosystem-based renewable solutions, receive considerably less attention. Consequently, opportunities to better integrate resource efficiency and ecosystem resilience within decarbonisation strategies remain underdeveloped.

Animal welfare: Animal welfare is largely absent from climate action planning across Ireland. References to animals are generally limited to biodiversity, agriculture, or ecosystem management, with little explicit consideration of animal welfare as an independent policy objective. This represents a potential policy gap, particularly where climate adaptation and land-use changes affect livestock systems and animal wellbeing.

Food systems-related agroecological principles

Regional economy and value chains: Policy support for diversification in agriculture varies considerably across Ireland. While several counties demonstrate moderate or strong commitment, particularly in parts of the Northern and Western Region, many plans provide only limited support for diversification as a climate resilience strategy. More notably, policy attention to value chains and regional added value remains weak nationwide. Although value chains are frequently promoted, it is rarely linked to downstream activities such as processing, branding, logistics, marketing, or public procurement. As a result, opportunities to increase local economic resilience and maximise value from agricultural production are not yet fully realised. Strengthening regional supply chains, supporting local processing infrastructure, and promoting circular bioeconomy initiatives would help ensure that farm diversification generates wider economic benefits for rural communities.

Food systems, regional supply and values: Across Ireland, food-related policies remain primarily focused on land use while the broader concept of sustainable food production and food systems receive comparatively limited attention. References to regional supply, food security, food waste, healthy diets, local consumption, and food system resilience are generally symbolic/reference policy support.

Similarly, landscape image / scenery, cultural heritage, and regional identity are acknowledged in many plans but are not integrated into comprehensive food system strategies. Although several counties demonstrate stronger practice through support for local food initiatives and sustainable production, a more holistic systems-based approach remains largely absent.

3.3.1 Agroforestry

Summary: The review across Ireland's NUTS 2 and NUTS 3 regions, turned out that AF as a distinct, multifunctional land-use approach that intentionally integrates trees with crops and/or livestock, is largely absent from county and regional climate/land-use policy documents. The principal exception is a consistent policy emphasis on "trees" as nature-based solutions, most visibly reflected in support for native tree planting and timber/wood production, with some recognition of woody landscape features (hedgerows, shelterbelts, treelines). Beyond that narrow framing, specific AF practices (wood pasture, alley cropping, alley coppice, food forests, orchard cropping, orchard grazing, agrosilvopasture, forest grazing, short-rotation systems, tree fodder/fodder hedges, orchard meadow, forest gardens) are not mentioned in most counties.

References to "trees": The word "trees" (and related generic terms) appears in policy documents for all 29 counties, indicating broad rhetorical recognition of trees and forestry. This is most consistently policy-oriented in the Eastern & Midland region (Wicklow is known as the Garden County), with the notable exception of *Co. Meath* where references are weaker (0.25–0.49). Several climate action plans call for tree mapping and improved tree management data; South Dublin is specifically highlighted as needing tree mapping and management actions. This data gap is a recurrent theme and a practical barrier to planning and implementation.

Agroforestry as a labelled concept is rare. AF is recorded only in a small number of county documents (notably *Kildare* in Eastern and Midland regions, cited as a sustainable agricultural practice within a Decarbonising Zone; and *Tipperary* in the Southern region where it appears as a land-use diversification support). No counties in the Northern & Western NUTS 2 region explicitly name AF or agrosilvopasture.

Fruit/berry/nut production and orchard systems: These keywords register minimal to symbolic policy consideration overall. Eastern & Midland scores are relatively stronger here, followed by Southern; Northern & Western records are effectively zero for these AF themes.

Timber and woody features dominate: Across all NUTS 2 regions, “timber and wood production” receives minimal to symbolic policy consideration, although this support is generally stronger and more consistent than for other AF-related themes. The emphasis on timber and wood products appears to be primarily oriented towards conventional forestry rather than integrated AF systems. Therefore, policy attention to tree-based production does not necessarily translate into support for multifunctional land-use systems that combine agricultural and forestry objectives. “Woody landscape features” also receive minimal to symbolic policy consideration in several counties and may serve as an entry point for more integrated on-farm tree-based approaches. However, policy support for woody landscape features is weaker in the Eastern and Midland, and the Northern and Western, regions than in the Southern region.

3.3.4 Best practice example for Ireland

Best practice example I – Funding grant for a forest garden: One option was to adopt the initiative of providing 300 native trees to a Forest Garden concept by incorporating native fruit and nut trees and other edible species. This would not only enhance biodiversity but also create opportunities for local food production, education, and community participation, while supporting local markets and contributing to long-term environmental and social benefits.

A pilot grant aid scheme for the establishment of forest gardens 14 “Forest Garden pilot” was initiated in the first half of 2026 – Afforestation Scheme FT14. Furthermore, the Department of Agriculture, Food and the Marine (DAFM) Forest Service Afforestation Scheme funds establishment of AF areas in Ireland. Funding for forest Types 8 “Silvopasture” and 13 “Silvoarable pilot” and are available (see (186) for details).



Figure 5: Typical silvopastoral agroforestry practice in Ireland with 5 x 5 m spaced oak, cherry, birch, individually protected by tree tubes and grazed by sheep.

Source: Kilcock, Co. Kildare.

There has been significant interest from organic farmers, which has been recognised by DAFM and encouraged. Farms receiving the Organic Farming Scheme grant can continue to receive the grant together with the grant for establishing AF. To date a significant proportion of the AF established has been based on 400 stems per hectare, planted at 5 × 5 m spacing, and individually protected with tree shelter tubes and two supporting stakes, and grazed by sheep or calves. Recent developments have increased flexibility in the design, such that 400 stems per hectare can be planted in an alley design and protected with fencing (Figure 5).

One specific measure of the Agri-Climate Rural Environment Scheme (ACRES) funds the establishment of traditional fruit orchards consisting of ten traditional fruit trees. The measure does allow the orchard to be grazed by sheep so long as there is no damage caused by the sheep.

3.3.4 Limitations and potential in Ireland

Major potentials in Ireland

Overall, there is considerable scope to strengthen connections between agriculture, landscape management, local food economies, and environmental sustainability within future climate action planning. The strengths in Ireland are in particular:

- Strong national commitment to biodiversity conservation and carbon reduction.
- Flood risk management is consistently integrated across all regions.
- Land use and climate adaptation are well established within local climate policies.
- Most counties support measures to improve soil quality and increase soil organic carbon.

Moderate engagement for Habitat connectivity, soil conservation, agricultural diversification, food production, and regional food supply receive moderate but uneven policy attention. Some examples of stronger practice exist but are not yet consistently mainstreamed across the country.

As a result of grant support, demand for AF has increased significantly over the past decade (approximately 500 hectares planted with many more in the application process), alongside growing interest in organic farming and free-range poultry production.

Limitations & Weaknesses in Ireland

The observed pattern shows a policy environment that favours conventional forestry and symbolic references to trees or hedgerows, while failing to recognise or operationalise AF's multifunctional benefits, including biodiversity enhancement, soil health and carbon sequestration, flood and erosion control, farm income diversification, animal welfare, and landscape connectivity. The absence of explicit AF measures in most counties limits opportunities for farmers and rural economies to benefit from integrated tree-agriculture systems, and reduces policy coherence between climate, biodiversity and rural development goals.

However, emerging trends in AE and AF are not adequately reflected in county climate action documents. Consequently, a best practice would be to promote measures that are not already addressed in existing Climate Action Plans, such as integrating tree planting into free-range egg poultry farms. This approach can enhance the environmental performance of agricultural production by improving carbon sequestration, biodiversity, animal welfare, and climate resilience.

- Limited integration of renewable resource management beyond renewable energy technologies.
- Regional value chains and local economic value creation remain underdeveloped.
- Food systems are largely approached through agricultural production rather than as integrated socio-ecological systems.
- Animal welfare is almost entirely absent from climate policy.

Recommendations, opportunities and suggested priorities for Ireland

To unlock AF's co-benefits for climate, biodiversity and rural livelihoods, counties should move beyond symbolic mentions and explicitly recognise AF in planning documents, pilot demonstrator

projects, and funding mechanisms. Starting with targeted mapping, Agrotourism, advisory capacity and a small suite of incentive-backed pilots will create the evidence base and local champions needed to mainstream AF across Ireland's NUTS 2 and NUTS 3 regions. Suggested priorities for Ireland are:

- Strengthen implementation of habitat connectivity and ecological network measures.
- Expand soil policy beyond flood management to include soil health, regenerative agriculture, and long-term carbon storage.
- Broaden renewable resource policies to incorporate circular bioeconomy principles and sustainable resource governance.
- Develop regional value chains through local processing, procurement, branding, and short supply chains.
- Adopt a comprehensive food systems approach that integrates production, consumption, food security, public health, landscape values, and local economic resilience.
- Introduce measurable indicators, monitoring frameworks, and dedicated implementation resources to improve delivery of climate and sustainability objectives across all policy areas.
- Ensure animal welfare is explicitly integrated into relevant policy documents, recognising its role as a core objective of frameworks such as One Welfare and its links to environmental sustainability, public health, and rural development.

3.4 Slovakia

3.4.1 Agroecological principles

Summary: The semantic analysis of Slovak regional and local planning documents reveals a policy landscape in transition, where agroecological and AF-relevant concepts are increasingly integrated into climate adaptation, landscape planning and regional development frameworks, although often through indirect terminology and fragmented implementation approaches. On the higher regional level in Slovakia, focusing mainly on the regional strategies of the *Prešov* Self-Governing Region (PSK), (139, 148) and *Košice* Self-Governing Region (KSK), (153), a relatively high policy commitment exists for biodiversity, soil protection, water retention, erosion control and landscape stability. In both regional strategies, agriculture is increasingly framed as a climate-sensitive sector requiring adaptation measures, while landscape planning tools such as ecological corridors, non-forest woody vegetation (NDV), windbreaks and multifunctional landscape elements are considered important instruments for strengthening resilience. In contrast to many municipal documents, the regional strategies also include more explicit references to AF or AF-like systems and demonstrate a stronger integration of agricultural landscapes into climate and environmental planning.

Agroecosystem-related agroecological principles

Biodiversity: In the analysed Slovak regional strategies, biodiversity is strongly integrated and a high policy commitment can be identified. Biodiversity protection is closely linked to ecological stability, habitat connectivity, landscape fragmentation and the strengthening of green and blue infrastructure systems. The documents frequently refer to ecological corridors, *ÚSES*-structures (Territorial Systems of Ecological Stability), riparian vegetation, landscape elements and the restoration of ecological functions in agricultural landscapes (Figure 6). Habitat connectivity plays a particularly important role, especially in regional planning frameworks where landscape fragmentation, intensive agriculture and climate vulnerability are recognised as major challenges.



Figure 6: Improvement of water retention capacity, rural area of Abelovát, Banská Bystrica region.

Source: F. Maslen, SystR project.

On the lower regional and municipal level, biodiversity remains one of the most consistently integrated themes across almost all analysed documents. The strongest integration can be observed in newer adaptation and climate action plans such as *Lučenec* (132), *Žilina* (138), *Šaľa* (178), *Snina* (141), *Bardejov* (136) and the *Bratislava*-related documents (144), where biodiversity is operationalised through concrete measures, indicators and implementation mechanisms. Several municipal strategies explicitly connect biodiversity with tree planting, ecological stabilisation, urban greenery systems, riparian buffers and landscape restoration. In some documents, biodiversity is also linked to productive or semi-productive landscapes, including orchards, edible greenery or multifunctional landscape structures.

Soils: For the topic of soils, the Slovak regional strategies demonstrate a moderate to high policy commitment. Soil protection is strongly connected to water retention, erosion control, flood prevention and climate adaptation. The regional strategies particularly emphasise sustainable soil use, anti-erosion measures, increasing infiltration capacity and strengthening landscape retention functions. Reducing flood risks is often directly linked to soil structure, vegetation cover and landscape management.

On the municipal level, the strongest commitment for soils can be found in adaptation strategies and climate action plans that focus on drought vulnerability, erosion and stormwater management. The intensity of integration differs considerably between documents. In strategies such as *Snina, Šaľa,*

Žilina (138), *Dubová* (134), *Trenčín* (147), PSK (139, 148) and KSK (153), soil fertility, soil health and erosion control are integrated relatively strongly, often in the context of sustainable land management and agricultural adaptation. In contrast, more technically focused documents such as Senec or some urban heat adaptation plans frame soils mainly as hydrological infrastructure rather than as living productive systems.

The reduction of erosion and flood risks is one of the most common themes across the dataset. Windbreaks, infiltration strips, stabilisation of slopes, vegetation belts and multifunctional landscape structures are repeatedly proposed as practical adaptation measures. However, despite the relatively strong integration of soil-related measures, the biological dimension of soils, including soil biodiversity and long-term soil fertility, remains less developed than hydrological functions.

Climate change mitigation: Climate mitigation and climate resilience are strongly represented in most of the analysed documents, although carbon sequestration itself is often treated indirectly. On the higher regional level, carbon is mainly connected to landscape vegetation, forests, soil organic matter and climate mitigation targets. The regional strategies increasingly connect carbon sequestration with land use, ecosystem restoration and adaptation functions.

At the municipal level, the strongest integration of carbon-related topics can be identified in SECAP-type climate action plans and mitigation-oriented strategies, such as those of *Karlova Ves* (144)*, Rožňava* (137)*, Banská Bystrica* (140), *Šaľa* (178) and *Malacky* (135). These documents include stronger references to decarbonisation pathways, renewable energy, carbon reduction measures and the role of vegetation in climate mitigation. In several cases, tree planting, urban forestry or NDV systems are indirectly framed as carbon-related adaptation and mitigation tools.

Nevertheless, carbon sequestration as a specific agroecological objective remains less operationalised than biodiversity or water retention. In most documents, carbon is treated as a co-benefit of climate adaptation and vegetation management rather than as a central planning objective.

Animal welfare: Animal welfare and livestock-related agroecological systems are among the weakest integrated themes in the Slovak dataset. At both regional and municipal levels, direct references to animal welfare are rare. Where mentioned, they are usually connected to broader sustainability or agricultural adaptation discussions rather than to concrete measures.

Food systems-related agroecological principles

Regional economy, regional supply and value chains: The integration of regional economy, value chains and economic resilience differs significantly across the analysed documents. In many municipal adaptation strategies, these themes are integrated only weakly or symbolically. However, stronger integration can be observed in climate action plans, green economy documents and regional development-oriented strategies.

The strongest commitment for regional economy and value chains appears in documents such as the *Rožňava* Green Action Plan (137), *Snina* Climate Preparedness Plan (141), PSK (139, 148), KSK (153), and some *Bratislava*-related strategies (144). These documents increasingly emphasise local economic resilience, regional suppliers, circular economy approaches, renewable resources and local production systems. In *Rožňava*, for example, elements related to Farm-to-Fork approaches, green economy transformation and regional food systems are explicitly discussed (137).

Nevertheless, value chains specifically linked to AF or AE remain only partially developed. While the importance of regional resilience and local production is increasingly recognised, implementation

pathways for agroecological markets, farmer incentives and AF-based value chains are still weakly operationalised.

Food systems, and socio-cultural value: The socio-cultural value of landscapes is one of the strongest and most consistent themes across the Slovak dataset. Many documents emphasise the importance of landscape identity, recreation, cultural scenery and the preservation of natural and semi-natural landscape structures. Cultural landscapes are frequently connected to biodiversity protection, tourism, recreation and local identity.

Food systems themselves show a more uneven level of integration. In many municipal adaptation strategies, food production appears only indirectly or symbolically. However, several newer documents, particularly *Snina* (141), *Rožňava* (137), *Karlova Ves* (144), *Bratislava* (144) and some regional strategies, show stronger integration of food systems, edible greenery, orchards, local production and community-based food initiatives. In urban documents, food systems are often framed through edible public spaces, community gardens or multifunctional urban greenery rather than through agricultural production. In regional and rural documents, food production is increasingly connected to climate resilience, soil protection and landscape management. However, compared to biodiversity and water management, food systems remain less systematically operationalised.

The topic of landscape scenery and cultural landscape protection demonstrates moderate to high policy commitment across most documents. Landscape quality is frequently linked to ecological stability, recreation, regional attractiveness and territorial identity. This creates important indirect entry points for AF and multifunctional landscape approaches, even where AF is not explicitly mentioned.

3.4.2 Agroforestry

Agroforestry: Silvopastoral systems, forest grazing and grazed orchards are largely absent from the analysed strategies. Some indirect references appear in discussions on sustainable agriculture, pasture management or biodiversity-friendly landscape maintenance, but these remain on a symbolic level. Compared to biodiversity, water management or erosion control, animal welfare shows low to minimal policy engagement in the Slovak planning context.

3.4.3 Best practice examples for Slovakia

Although explicit regional AF programmes remain limited in Slovakia, several regional and municipal planning documents demonstrate good practices in creating enabling conditions for AF and wider agroecological transition. Rather than supporting AF through dedicated financial schemes, these examples integrate AF-relevant principles into climate adaptation, landscape planning and regional development, thereby providing a favourable policy environment for future implementation.

Best practice example I – The *Prešov Self-Governing Region* (PSK): It represents one of the strongest examples of strategic integration. Its regional development and climate-related strategies recognise the multifunctional role of agricultural landscapes and promote measures such as ecological corridors, non-forest woody vegetation (NDV), shelterbelts, erosion control, water retention and biodiversity enhancement. Although AF is only occasionally mentioned explicitly, these measures correspond closely to the ecosystem services provided by AF systems and create a coherent strategic framework that could facilitate their future implementation.

Best practice example II – The *Košice* Self-Governing Region (KSK): It demonstrates similarly a high level of integration of landscape resilience objectives into regional planning. The regional strategy links sustainable agriculture with ecosystem restoration, climate adaptation and ecological stability, highlighting the importance of maintaining landscape elements that improve soil protection, water retention and biodiversity (Figure 7). Such integrated planning provides an important policy basis for future AF development, even in the absence of dedicated AF programmes.



Figure 7: Building the water retention infrastructure, Tahanovce-Košice region.

Source: M. Kravčik, People and water NGO.

Best practice example III – *Rožňava:* It stands out among municipal examples, through its Green Action Plan, which combines climate mitigation, biodiversity conservation, circular economy principles and local economic development. By connecting landscape restoration with regional value chains and local food systems, the document illustrates how municipalities can create favourable conditions for multifunctional agricultural landscapes and future AF initiatives.

Best practice example IV – *Snina:* Another positive example, whose Climate Preparedness Plan integrates landscape adaptation measures with erosion prevention, ecological stability and sustainable agricultural management. The strategy demonstrates how municipalities can operationalise nature-based solutions through concrete adaptation measures while simultaneously strengthening regional resilience.

Beyond formal planning documents, Slovakia also demonstrates good practice through the establishment of the EELAP LL, providing an institutional platform where farmers, municipalities, researchers, NGOs and public authorities jointly co-create solutions for agroecological transition. It supports policy learning, stakeholder engagement and knowledge exchange, thereby creating an important mechanism for translating regional strategies into practical implementation.

3.4.4 Limitations and potential in Slovakia

Major potentials in Slovakia

The analysis indicates that Slovakia possesses a favourable strategic foundation for integrating AF into regional development. Many analysed strategies already prioritise ecosystem services that AF can deliver, including erosion control, water retention, biodiversity enhancement, carbon sequestration

and landscape resilience. This provides an opportunity to build AF into existing policy priorities rather than introducing it as an entirely new policy direction.

At the same time, stakeholder feedback following the drought conditions in 2026 indicates growing interest among farmers in water-retention measures (Figure 6) and the establishment of trees and other woody vegetation on agricultural land. This growing demand represents an important opportunity for wider AF uptake if appropriate financial and advisory support becomes available.

Limitations & Weaknesses in Slovakia

One of the principal limitations is the predominantly indirect treatment of AF within regional planning documents. Although concepts such as ecological corridors, shelterbelts, non-forest woody vegetation, green infrastructure and landscape elements are frequently promoted, AF itself is rarely recognised as a distinct land-use system or policy instrument. This limits visibility, reduces opportunities for targeted support and makes implementation dependent on broader environmental or climate objectives rather than agricultural development strategies.

A second limitation concerns the gap between strategic objectives and implementation mechanisms. Many regional and municipal documents contain ambitious goals related to biodiversity, soil protection, water retention and climate resilience, but only rarely specify concrete governance instruments, financial incentives or advisory mechanisms that would facilitate the adoption of AF by farmers and land managers. Dedicated regional funding schemes, technical advisory services or monitoring frameworks specifically targeting AF were not identified in the analysed documents.

This gap should partly be interpreted in the context of Slovakia's governance structure, as agricultural priorities and most CAP financial incentives are predominantly determined at national level, leaving regional and municipal authorities with limited direct influence over agricultural support instruments. At the same time, existing opportunities such as LEADER Local Action Groups (LAGs) are not necessarily well known or easily accessible to individual farmers. Stakeholder experience therefore indicates that the challenge concerns not only the availability of funding, but also its visibility, accessibility and the availability of practical advisory support.

The financial capacity of farmers represents an additional barrier, as high establishment costs, uncertain returns and difficulties accessing financial support have already been identified among the principal barriers to AF adoption in Slovakia. This creates a gap between increasing farmer interest in climate-adaptation measures and their ability to implement them.

The analysis also reveals limited integration of socio-economic dimensions. Compared with biodiversity and climate adaptation, substantially less attention is devoted to AF business models, regional value chains or mechanisms for rewarding ecosystem services. Broader agroecological gaps also remain: soil policies focus more strongly on erosion and water management than on biological soil health, while animal welfare and food systems are comparatively weakly integrated.

Recommendations, opportunities and suggested priorities for Slovakia

The emergence of participatory governance approaches through the EELAP LL represents an important opportunity. By bringing together regional authorities, municipalities, researchers, advisory services and land managers, the LL provides a mechanism for testing solutions, identifying practical barriers and developing locally adapted recommendations before wider implementation.

A further opportunity lies in strengthening the link between national recognition and regional implementation. AF is already explicitly recognised within Slovak climate adaptation policy, while regional and municipal strategies frequently support related measures such as non-forest woody

vegetation, ecological corridors, shelterbelts, green infrastructure and water retention. Rather than creating an entirely separate policy framework, these existing measures could progressively be connected with multifunctional agricultural production and explicitly recognised as components of AF systems.

Suggested priorities for Slovakia are therefore:

- Complete the formal introduction and legal recognition of AF in Slovak legislation, including harmonised AF terminology and a clear definition of what constitutes an AF system.
- Improve the visibility and accessibility of funding and advisory support for farmers, including clearer information on LEADER and other national or regional opportunities and practical guidance on eligibility and applications.
- Provide targeted investment support for tree establishment, AF systems and water-retention measures, responding to growing farmer demand for climate-adaptation measures.
- Strengthen broader agroecological integration, particularly biological soil health and the links between animal welfare, extensive grazing and silvopastoral systems.
- Develop regional value chains, local processing, short supply chains and mechanisms for rewarding ecosystem services to improve the economic viability of AF for land managers.

3.5 Slovenia

Summary: The Slovenian analysis focused primarily on national strategic documents (NUTS 1), reflecting the centralised nature of environmental, agricultural and climate policy development in Slovenia. The analysed documents provide the main strategic framework for regional implementation and therefore offer an appropriate basis for assessing the integration of AE-principles and AF-related approaches.

3.5.1 Agroecological principles

The status of AE-principles in Slovenia is characterized by a high degree of implicit integration rooted in the nation's mosaic cultural landscape. With 61 % forest cover and an agricultural sector dominated by small family farms (60 % managing under five hectares), the policy environment is naturally oriented toward diverse, small-scale systems. While AE is rarely used as a technical term, its principles are deeply embedded in spatial mandates and operational agricultural measures.

Biodiversity is strongly integrated into Slovenian strategies, identifying a high policy commitment. The SI SKP designates biodiversity preservation as a core objective, supported by a six-fold increase in funding (11.8 million € annually) and the first-ever implementation of Natura 2000 payments (158). A key target is increasing organic farming to 17 % of agricultural land by 2027. Strategically, SPRS 2050 institutionalizes "stepping stones" (*stopalni kamni*) landscape elements like forest patches and hedges-to ensure ecological connectivity across fragmented habitats (159).

Soils: Slovenian strategies demonstrate a high policy commitment to soil health, primarily through land-use planning. SPRS 2050 sets a legally binding target of "zero net land take" by 2050, prioritizing the renovation of degraded areas over the expansion onto fertile land (159). Operationally, the SI SKP introduces mandatory protection for wetlands and peatlands to safeguard carbon-rich soils (158). While SOzP recognizes the protective role of forests against erosion, a gap exists in the form of dedicated funding for technical soil-stabilization measures on steep-slope farms (9).

Climate change mitigation: There is a high strategic commitment to climate mitigation but a moderate level of farm-level operationalization. SOzP mandates the mainstreaming of climate impacts into all development planning (9). The SI SKP allocates 60 % of its rural development budget

to environmental and climate goals, primarily focusing on renewable energy (biogas, geothermal) and maintaining permanent grasslands (158). However, carbon sequestration as a specific agroecological objective lacks mandatory monitoring indicators for active tree planting on farmland.

Animal welfare: Commitment to animal welfare is among the most robust principles, with clear mandatory requirements. The SI SKP allocates 64 million € for above-standard welfare, including a mandatory 120-day annual grazing requirement for cattle (158). This practice directly supports agroecological nutrient cycling and biodiversity on permanent grasslands.

Food systems related agroecological principles

Regional economy, regional supply and value chains Slovenian policy shows a moderate to high commitment to local supply chains. The SI SKP identifies food security as its key objective, supporting short supply chains and local markets (158). SPRS 2050 directs urban-fringe agriculture toward local food supply to reduce transport costs and support green public procurement (159). A notable gap remains in integrating timber production into diversified agricultural value chains; wood production is still largely viewed as a forestry activity.

Food systems and socio-cultural value: The socio-cultural value of the landscape is a core theme, reflecting a high commitment. SPRS 2050 recognizes traditional orchard meadows (*travniški sadovnjaki*) and mosaic landscapes as essential for national identity and tourism (159). The SI SKP prioritizes generational renewal, aiming to support over 3,600 young farmers. However, broader "food system" concepts, such as waste reduction and urban AF, remain primarily at a symbolic vision level without dedicated implementation tools (158).

3.5.2 Agroforestry

Agroforestry in Slovenia exists in a unique state: while the landscape is structurally AF-oriented due to the "mosaic" of forests and fields, the term is essentially absent as a technical concept from strategic documents. Where "agriculture and forestry" are mentioned, they are treated as separate administrative sectors or as a descriptive spatial characteristic of "interleaving". Silvopasture and wood pasture receive minimal engagement; grazing rules are directed at grasslands rather than the integrated management of trees and livestock. Conversely, hedgerows and multifunctional landscape elements receive high strategic commitment as "stepping stones" for green infrastructure in SPRS 2050, valued for biodiversity and erosion control (159).

Orchard meadows and traditional orchards receive moderate commitment. They are recognized in SPRS 2050 as a "traditional settlement pattern" vital for landscape identity (159). TOF are highly relevant for urban resilience (mitigating heat islands) in SPRS 2050 but receive only symbolic agricultural commitment, lacking specific funding for their establishment on intensified farmland.

3.5.3 Best practice examples for Slovenia

Best practice example I – The "Stepping Stones" (*Stopalni kamni)* approach for landscape connectivity: The approach is a central feature of the *Strategija prostorskega razvoja Slovenije 2050* (MNVP 2023), which institutionalizes the protection of isolated landscape elements – such as forest patches, individual trees, and hedges – to facilitate ecological connectivity. These features are integrated into the national system of green infrastructure, ensuring that agricultural areas do not become fragmented barriers to the free movement of species. This practice is critical for maintaining Slovenia's traditional mosaic landscape identity while providing functional climate adaptation benefits, such as the prevention of wind erosion and the regulation of rainwater runoff. By viewing

TOF as strategic spatial assets, the SPRS 2050 (159) establishes a planning framework that supports biodiversity and landscape resilience at a national scale (Figure 8).



Figure 8: Mosaic landscape with treelines connecting wildlife corridors.

Source: Katarina Denac (187).

Best practice example II – Strategic Safeguarding of Carbon-Rich Soils (Wetlands and Peatlands): Slovenia has established a strategic safeguard for carbon-rich soils by introducing mandatory protection for wetlands and peatlands within the *Strateški načrt skupne kmetijske politike* 2023–2027 (158), effective from 2024. This policy transition from voluntary to mandatory management aims to halt the degradation of these sensitive habitats, positioning them as essential natural infrastructure for climate change mitigation. Beyond sequestering carbon, these protected areas function as critical hydrological buffers that enhance landscape resilience by mitigating downstream flood risks during extreme precipitation events. The integration of these safeguards into the Slovenian CAP Strategic Plan (158) ensures that the preservation of soil health is directly tied to the national agricultural subsidy framework (Figure 9).



Figure 9: Marshes during the flood in Ljubljana Marshes Landscape Park.

Source: Matevž Lenarčič (188).

Best practice example III – Mandatory 120-day grazing requirement for livestock welfare: The programme is implemented under the *Strateški načrt skupne kmetijske politike 2023–2027* (158), and represents a robust operational commitment to animal welfare and agroecological nutrient cycling. Supported by a targeted 98 million € budget for extensive animal husbandry, this mandate ensures that livestock maintain access to outdoor pastures for at least four months of the year. This practice actively preserves the biodiversity of permanent grasslands, which are a dominant feature of the Slovenian countryside, while reducing dependence on synthetic fertilizers. Crucially, the measure

supports the economic viability of Slovenia's 70,000 farms, the majority of which are small-scale family operations managing fewer than five hectares of land (Figure 10).



Figure 10: Grazing sheep in late autumn to extend the grazing season.

Source: Miha Curk, 2025.

3.5.4 Limitations and potential in Slovenia

Limitations & Weaknesses in Slovenia

A major limitation is that traditional systems are not explicitly classified as AF within administrative datasets such as the Land Parcel Identification System (LPIS), which restricts their formal recognition and targeted integration into planning and policy frameworks like the SI SKP (158). While the SPRS 2050 (159) strategically values these elements as "stepping stones" (*stopalni kamni*) for ecological connectivity, a significant operational gap remains: the current framework lacks the specific monitoring indicators and active funding mechanisms necessary to transition from passive landscape conservation toward the active establishment of modern, innovative AF systems.

Recommendations & opportunities for Slovenia

The primary potential for Slovenia's agroecological transition lies in its significant existing stock of AF-like landscapes – including extensive high-stem orchards, wooded pastures, and woody field margins – which demonstrates that the country is "not a blank slate" but possesses a functional legacy foundation. This substantial stock challenges the prevailing policy framing of AF as a novel land-use innovation, suggesting instead that the transition can build upon the evolution of long-standing practices rather than starting from zero.

3.6 Switzerland

3.6.1 Agroecological principles

Agroecosystem-related agroecological principles

Biodiversity: In national strategies, biodiversity plays a key role and is recognised as a fundamental basis for life and a prerequisite for climate resilience across all sectors. There is a strong commitment to preserving biodiversity in Swiss national strategies.

Soils: Soils are considered from two perspectives: soil protection, which aims to reduce erosion, and soil health/vitality. These two perspectives are also reflected in the strategies. For instance, soil health is deemed essential for ensuring food security and safeguarding the climate in the climate and sustainable development strategies, yet it is referenced less frequently in the other strategies. Erosion is primarily considered in the context of natural hazard management and the protective function of forests. Both soil functions are generally mentioned with only moderate commitment.

Climate change mitigation: Climate change, climate protection and carbon management are recurring themes in Swiss agricultural and forestry strategies, as well as in climate protection initiatives. Soil in agriculture and wood in forestry are identified as the most important carbon sinks. Both strategies actively address carbon management by including appropriate measures. There is a strong commitment to store carbon and protect climate.

Animal welfare: The term “animal welfare” is not addressed in the national strategies, meaning this topic is evaluated with no engagement or minimal engagement, respectively.

Food systems related agroecological principles

Regional economy and value chains: Although the strengthening of regional economies is mentioned as a means of enhancing both resilience and economic stability, it is not given as much prominence as the transformation of the food system or closed-loop value chains. Consequently, the issue is only moderately embedded in national strategies.

The consideration of entire value chains is addressed in almost all of the examined strategies. This is particularly the case as a tool to reduce or internalise externalities (environmental costs, ecological footprint). Thus, the scope of “value chains” extends beyond food systems and also encompasses forest value chains. There is a strong commitment in national strategies.

Food systems, regional supply and socio-cultural value: The transformation of the entire food system (Farm-to-Fork) is a central theme of the strategies examined relating to climate, agriculture, and biodiversity. Of the eight strategies examined, only two (“natural hazards” and “forests”) do not mention this topic, or only do so briefly. There is a moderate commitment in the strategies.

3.6.2 Agroforestry

Agroforestry: AF is mentioned in the strategies for climate, forestry and biodiversity. It is generally established in the context of climate adaptation, and to a lesser extent, biodiversity impacts. Both “traditional” systems, such as woodland pasture, and “modern” systems, such as timber trees on arable land, are referenced.

Existing traditional wooded pastures, known as “*Wytweiden*” or “*pasturage boisé*”, are included in the strategies. However, while wooded pastures on agricultural land are permitted and supported by law, forest grazing on forest land is prohibited. The wooded pastures are valued primarily for connecting open land and forest, which is why they are mentioned in both the forest and biodiversity strategies. However, research projects on the biodiversity benefits of animal grazing for forest edges are currently challenging this strict distinction between animals on agricultural versus forest land. TOF are also a key part of the forest strategy, but are not mentioned in any of the others.

3.6.3 Best practice examples for Switzerland

Several strategies published in the last two years in Switzerland have emphasised the close connection between agricultural production and local food systems.

Best practice example I – The Agriculture and Food Climate Strategy: It was published by the Federal Office for Agriculture, but was developed in collaboration with the Federal Offices for Food Safety and the Environment. The title, "Agriculture and Food Climate Strategy 2050", highlights the integrated approach to agriculture and food systems (Figure 11). This is a key element of AE, which seeks to overcome sectorial approaches and promote accounting for local and regional synergies.



Figure 11: Title page of the Swiss Agriculture and Food Climate Strategy 2050.

Source: (11).

3.6.4 Limitations and potential in Switzerland

Major potentials in Switzerland

The concept of TOF, which is mentioned in the Forest and Wood Strategy (165), is novel for Switzerland. The prominent linkage between agricultural production and food systems in several strategies is promising.

Limitations & Weaknesses in Switzerland

Although AE is mentioned in some of the strategies, it is only really addressed in part, rather than as an overarching concept. This means that it is not firmly embedded in them.

4 Synthesis and recommendations

4.1 Status quo of agroecological principles & agroforestry mentions

4.1.1 Integration of agroecological principles

What is the status quo of agroecological principles already integrated in regional concepts / strategies? The systematic review of regional strategic plans across the six target nations highlights clear hierarchies in how the 13 AE principles are integrated. The degree to which these principles are embedded in regional frameworks varies significantly depending on whether they address biophysical landscape functions or socio-economic food systems.

Biodiversity & habitat connectivity: Across all six countries analysed, biodiversity remains the most robustly integrated agroecological principle. Biodiversity protection is anchored in mandatory ecological networks (EU Natura 2000), spatial connectivity plans (e.g., Slovakia's *ÚSES*), and LEADER selection criteria.

- This holds at both NUTS 2 and NUTS 3-levels in Germany's LL North-NRW (22, 23) and also in LL Lusatia, where biodiversity draws the highest rank in both Brandenburg and Saxony planning documents (61, 69), moderate in the Saxon Action Plan for Climate and Energy (70).
- It also holds for Ireland (national),
- Slovakia (PSK/KSK regional strategies and most municipal documents),
- Slovenia (SI SKP (158), attractive funding (159)), and
- Switzerland (national strategies).
- Hungary remains a partial exception: biodiversity is only peripheral in the technocratic NEKT (97), though more integrated in the rather ecologically oriented NÉS-2 (5), and moderately so in the NÉS (95). This overall strength is echoed in Hungary's evaluation of limitations: NÉS-2 (5) is credited with a more progressive spirit than earlier plans precisely because biodiversity and nature-based adaptation are treated as integrated rather than additional factors – even though AF itself is not yet folded into that same integration.

Carbon/climate mitigation: high strategic-level commitment nearly everywhere but is frequently treated indirectly or statistically.

- Hungary remains the starkest case: carbon sequestration is the NEKT's (97) top priority, but is pursued almost entirely through LULUCF/CCUS accounting and "wood selection" statistics rather than integrated tree-based farming systems – even NÉS-2 (5), which is otherwise more ecologically advanced, keeps carbon sequestration siloed from AF. Yet Hungary's own Limitations section turns this into the report's clearest concrete opportunity: because the NEKT's (97) core priority is increasing LULUCF absorption capacity alongside technological carbon sequestration (CCUS), and because renewable resources carry a formal 30 %-by-2030 target, there is a specific, evidence-based opening to position AF-grown wood as a local, dependency-reducing renewable energy source – directly serving the NEKT's own stated regional supply and energy security goals rather than requiring an entirely new policy category.
- Germany's LL Lusatia shows a similar pattern: carbon obtained a strikingly low score in Brandenburg's own climate adaptation strategy (61), despite carbon being highly ranked elsewhere in the same region's documents – an internal inconsistency worth flagging in the final synthesis.

Soil health & water management: Displays high strategic priority in regions suffering severe climate pressures. Drought-prone arable regions – such as the Hungarian *Alföld*, post-coal Lusatia in Germany, and southern Slovakia – explicitly link soil organic matter and water retention to regional climate adaptation strategies. However, soil is often treated as a static location factor rather than a dynamic biological system. Soil-related AE principles are consistently present but skewed toward hydrological/flood-protection framing rather than soil as a living biological system.

- This is explicit in three separate country sections: Slovakia ("the biological dimension of soils... remains less developed than hydrological functions"),
- Germany's LL Lusatia, where soil fertility is a high-level principle for biomass sustainability under the Biomass Strategy (63) but is less integrated into the region's high-level economic strategies (58) than water/flood management, and
- Hungary, where soil health receives "minimal or no attention" in the NEKT (97) and is framed mainly as a medium for afforestation. Hungary's own Limitations section reinforces this: even

in NÉS-2 (5), specific programs aimed at regenerating soil life... are not given independent weight.

Cultural landscape & regional value chains: Cultural landscape preservation provides major policy entry points on local levels (e.g., *Münsterländer Parklandschaft* in North-NRW, Germany, traditional wood pastures in Hungary, and smallholder mosaic landscapes in Slovenia). However, systemic food system approaches (such as public green procurement and short supply chains) remain largely symbolic. Traditional land management is valued for tourism, heritage, and regional identity.

- The specific link of food systems and regional value chain to AE/AF products remains underdeveloped almost everywhere – including in Germany's LL Lusatia, where regional value chains (timber, fruit, freshwater fish, fruit) are only beginning to feature as a focus of structural change in the most recent post-mining related land-use documents, while food production is ranked moderate in Saxony but only symbolic in Brandenburg.
- Slovakia's limitations mark this gap in its own right as substantially less attention is devoted to AF business models, regional value chains, certification opportunities or mechanisms for rewarding ecosystem services, which may constrain the long-term economic viability of AF adoption despite the recognised environmental benefits.
- Ireland's weaknesses concentrate on the same point about regional value chains generally, not AF-specifically, suggesting this is a broader agroecological gap that AF simply inherits rather than one unique to it.

Animal welfare: Remains the weakest or most absent AE principle in nearly every country with a striking level of consistency across every dataset analysed, with Slovenia being a notable exception due to its grazing scheme. This strengthens the case for treating this as a genuinely systemic EU-wide gap rather than a country-specific quirk.

- Germany's LL Lusatia data reveal that diversification in agriculture and animal welfare are both described as among the keywords mentioned fewer times, with animal welfare almost not addressed at all.
- Hungary continues to mention animal husbandry only as a source of GHG emissions.
- Slovenia remains the clear outlier, with its mandatory grazing requirement.

Socio-economic & food system gaps: Socio-economic principles – including circular economy loops, public green procurement, short food supply chains, and social equity – are rarely operationalised in regional land-use policies.

4.1.2 Mentions and operationalisation of agroforestry

Despite growing scientific consensus on the climate resilience benefits of integrating trees with crops or livestock, explicit references to modern AF (silvoarable alley cropping, silvopasture, agrosilvopastoral systems) remain exceptionally sparse in regional regulatory documents. AF is not officially/legally defined as a distinct land-use category in several countries (Table 7).

Germany: In northern NRW and Lusatia, explicit AF terms appear mainly in recent regional climate adaptation concepts (e.g., alley cropping in District *Elbe-Elster* or AF pilot initiatives in LEADER regions *Steinfurt* and *Spreewald*). Otherwise, traditional elements – such as field hedges (*Wallhecken*) and orchard meadows (*Streuobstwiesen*) – are protected under nature conservation acts without being recognized as integrated production systems. Woody landscape features are officially not defined as AF systems in Germany. In northern NRW, agroforestry is in some form acknowledged for contributing to bioeconomy.

Hungary: The National Energy and Climate Plan (NEKT) frames tree integration technocratically through statistical LULUCF carbon sinks. In contrast, historical wood pastures (*fás legelő*) and floodplain systems on the Tisza River are deeply rooted in cultural tradition and supported under the CAP Agro-ecological Program (*AÖP*).

Ireland: The analysis of all 29 County Climate Action Plans reveals that while generic references to trees, woodlands, and commercial forestry are ubiquitous, explicit AF is mentioned in only two county plans (*Kildare* and *Tipperary*). Modern AF implementation is confined almost entirely to national Department of Agriculture, Food and the Marine (DAFM) grant schemes.

Slovakia: Regional strategies (e.g., *Prešov* and *Košice* Self-Governing Regions) embed AF functions through non-forest woody vegetation (NDV), windbreaks, and Territorial Systems of Ecological Stability (*ÚSES*), but rarely employ formal AF terminology.

Slovenia: Slovenia features an inherently AF-oriented landscape dominated by smallholder mosaic farms and wooded pastures. However, the term "agroforestry" does not officially exist within national LPIS databases.

Switzerland: Wooded pastures ("*Wytweiden"*) in the Jura region and TOF are legally recognized and subsidized under agricultural quality schemes, though rigid statutory boundaries strictly separate forest land from farmland.

Table 7: Overview of national policy entry points for agroecology (AE) and integration status of agroforestry (AF).

Country	Main AE Policy Entry Points	AF Integration Status
Germany	Biodiversity, Soil, Flood Protection, Post-Coal Transition	Hedges & traditional elements strong; Modern AF emerging in climate plans
Hungary	Water Retention, Drought Mitigation, CAP AÖP Subsidies	Wood pastures & shelterbelts historic; AF narrow/technocratic in NECP
Ireland	Biodiversity, Flood Risk, Carbon Neutrality Roadmaps	"Trees" widely referenced; AF explicitly rare outside DAFM grant schemes
Slovakia	ÚSES Corridors, Water Retention, Regional Spatial Plans	Indirect AF via non-forest vegetation; Limited regional agri funding
Slovenia	Mosaic Landscape, "Stepping Stones", Livestock Welfare	Structurally AF-oriented landscape; Term absent from LPIS datasets
Switzerland	Integrated Food/Climate 2050, Trees Outside Forests	Wood pastures (*"Wytweiden"*) supported; Strict forest/agri legal boundary

Overall, explicit references to modern AF systems (such as alley cropping, silvoarable, or agrosilvopastoral arrangements) are rare in regional strategies.

4.2 Policy and governance gaps for agroforestry

Asymmetric CAP governance & regional flexibility: Under the CAP, EU member states manage Pillar I direct payments nationally, for instance the EcoSchemes support of AF (e.g. Germany). However, priorities in the instruments of Pillar II (rural development) are decided on regionally, enabling tailored regional AF incentive schemes and leading to a very heterogeneous landscape of AF support. While in Ireland, Hungary, Slovakia, and Slovenia, agricultural priorities are centralized at the national level, regional and municipal authorities in these countries lack direct control over agricultural budget

allocations. This may force local authorities to rely solely on LEADER LAGs or municipal climate budgets to support AF.

Institutional & sectorial silos between agriculture, forestry and the environment: A persistent legal and administrative barrier is the rigid separation between the agricultural and forestry sectors. For instance, in Switzerland, while silvopastoral grazing on agricultural land is incentivized, forest grazing on official forest land remains legally prohibited. In Hungary, the national climate framework draws a sharp boundary between agriculture (viewed as an emission source) and forestry (viewed as a carbon sink), ignoring integrated multi-use landscapes. Hungary's NEKT (97) treats trees primarily as carbon-accounting units rather than agricultural system components. Germany's LL Lusatia data shows a milder version of the same pattern, where short-rotation coppice is the closest domestic analogue to AF but is often actually meant as conventional tree plantations rather than integrated systems.

Land administration & data deficits: The absence of dedicated AF classifications in official spatial and administrative databases restricts implementation. Slovenia's national strategies treat "agriculture and forestry" as separate administrative sectors, and – critically – Slovenia's Limitations section confirms this extends to the administrative data layer itself (LPIS), not just strategy language, which is a harder barrier to fix than wording alone. Traditional silvopastoral elements are not categorized as AF within the LPIS, excluding farmers from targeted maintenance funding. In Ireland, local climate plans repeatedly highlight a critical data gap regarding tree mapping and canopy inventories, preventing target-setting for trees outside forests.

Strategy-practice implementation gaps: Slovenia shows high strategic commitment but a moderate level of farm-level operationalisation. Ireland shows the inverse gap (real uptake outpacing policy documentation). Slovakia's Limitations section names this as a structural, dataset-wide finding rather than an isolated observation: no dedicated AF funding, advisory, or monitoring instruments were identified in *any* of the analysed documents.

Narrow, infrequent policy revision windows: Germany's KAnG-mandated five-year Länder strategy revision cycle means AE/AF advocacy has a defined but limited window of influence – worth flagging as a distinct timing barrier, separate from the definitional and implementation barriers above.

Animal welfare's weak integration structurally limits silvopastoral systems specifically: reconfirmed by Germany's LL Lusatia data, where animal welfare is almost not addressed at all alongside a similarly minimal treatment of diversification in agriculture – reinforcing the pattern already seen in Germany's LL North-NRW, Hungary, Ireland, and Slovakia.

4.3 Connecting agroforestry to regional sustainability goals

Multifunctional AF systems directly support regional sustainability targets across four main domains:

- *Water management & WFD compliance:* Trees integrated into agricultural catchments increase soil infiltration, reduce surface runoff, and filter nutrient leaching. Establishing riparian buffer strips along watercourses helps municipalities comply with the Water Framework Directive (WFD).
- *Soil protection & climate resilience:* In regions vulnerable to wind and water erosion (such as Lusatia in Germany and the Hungarian *Alföld*), tree lines and shelterbelts reduce wind speeds and decrease evapotranspiration.

- *Biodiversity & ecological connectivity:* AF systems act as ecological stepping stones (*stopalni kamni*) and territorial corridors (*ÚSES*), connecting fragmented forest patches across intensive agricultural landscapes.
- *Regional bioeconomy & structural transformation:* In industrial transition regions, AF offers decentralized biomass, high-value timber, and specialty food products, supporting short food supply chains (SFSCs).

4.4 Governanace level-specific policy recommendations

4.4.1 National / NUTS 1 level recommendations

- *Harmonize legal definitions & land registries:* Formally aim for definitions of AF in national legislation and update the LPIS so that arable or pasture land containing trees remains 100 % eligible for CAP direct payments.
- *Align national climate frameworks with CAP strategic plans:* Explicitly insert AF into upcoming updates of National Climate Adaptation Strategies – such as Germany's Federal Climate Adaptation Act (KAnG) federal state-level plans due by January 2027, Hungary's NÉS-2/NEKT revisions, and Ireland's Sectoral Adaptation Plans.
- *Dismantle institutional silos:* Amend forestry legislation to permit regulated silvopastoral forest grazing and integrate AF into national advisory frameworks. Include AF in environmental strategies and legislations.
- *Translate strong AE commitment into explicit AF implementation.* Biodiversity, soil protection and climate adaptation already have in several countries substantial policy support, but AF is often missing as an explicit implementation measure. The central opportunity is therefore to integrate AF directly to these established objectives by e.g. naming it as a concrete measure or tool.

4.4.2 NUTS 2 level recommendations

- *Target AF strategies according to widely agreed regional priorities:* Identify the strongest links that could be established building on existing strategies and goals.
- *Set binding targets:* Incorporate quantitative targets for AF into regional spatial plans, mirroring e.g. Saxony's regional mandate requiring at least 10 % of agricultural land to consist of ecological landscape features.
- *Embed AF into regional structural transformation:* Position AF as a core funding pillar within regional bioeconomy and post-coal landscape transition frameworks, leveraging transformation funds for regional timber, fruit, and energy value chains.
- *Leverage eco-compensation mechanisms:* Establish regional pooling mechanisms that direct eco-compensation funds from municipal infrastructure projects toward funding farmer-led AF establishment, such as production integrated compensation (PIC).
- *Enhance policies for woody landscape elements integrating modern AF.* Hedges, orchard meadows, tree rows and TOF – which are AF systems in a wider sense – are often to various degrees embedded in regional strategies, e.g. for biodiversity, cultural landscape and erosion protection. USe this as an important bridge between established regional priorities and modern AF approaches, with opportunities for active use and farm diversification.

4.4.3 NUTS 3 / LEADER / municipal level recommendations

- *Win LEADER LAGs as implementation hubs:* Explicitly include AE pilot projects and AF establishment into LEADER Local Development Strategies (LDS) to gain funding to de-risk initial capital investments.

- *Build Short Food Supply Chains (SFSCs):* Connect regional AF production (fruits, nuts, biomass, animal products) to municipal green public procurement, local processing hubs, and regional branding initiatives.
- *Integrate AF into municipal climate adaptation plans:* Incorporate windbreaks, shelterbelts, alley cropping, and retention planting into municipal plannings.
- *Bring in AE and AF topics at all level public-participation events.* This includes climate round table discussions, farm festivities/fairs, etc.
- *Strengthen Living Lab demonstration networks:* Support local LL demonstrator farms to provide peer-to-peer farmer training, practical management advice, and administrative guidance, lowering the barrier to adoption.

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Appendices

A: List of agroforestry keywords

No.	English	German	Hungarian	Slovenian	Slovak
#1	wood pasture	*Weide unter Bäumen*	*Fás legelő*	*Drevesno-pašna raba*	*Dreviny na trvalom trávnom poraste*
#2	alley cropping	*Gehölzstreifenanbau*	*Fasoros köztestermesztés, Szántó köztes*	*Drevesno-poljedelska raba*	*Línie drevín na - ornej pôde, - trvalom trávnom poraste*
#3	alley coppice	*Gehölzstreifenanbau im Kurzumtrieb*	*Agroerdészeti sarjvágásos köztestermesztés*	*Drevored panjevca*	-
#4	food forest	*Waldgarten**	*Erdőkert/Élelmiszererdő*	*Gozdni vrt*	*Lesná záhrada, Jedlý les*
#5	orchard cropping	*Streuobstacker*	*Köztestermesztéses gyümölcsös*	*Njivski sadovnjak*	*Sadová lúka (a ďalšie polykultúry v ovocných sadoch)*
#6	orchard grazing	*beweidete Streuobstwiese*	*Legeltetett gyümölcsös*	*Paša v sadovnjaku*	*Pasený sad*
#7	agrosilvopasture	*Agrosilvopastorale Systeme*	*Erdő-mező-legelő rendszer*	*Poljedelsko-drevesno-pašna raba*	-
#8	woody landscape features	*gehölzbasierte Landsschaftselemente (Hecken, Knicks, Einzelbäume, Feldgehölze)*	*Fás tájképi elemek*	*Lesnate krajinske značilnosti*	*Krajinný prvok, nelesná drevinová vegetácia*
#9	settlement agroforestry	*Urbane Agroforstsysteme*	*Települési agroerdészet*	*Naselbinska kmetijsko-gozdarska raba*	*Urbánne agrolesníctvo*
#10	forest grazing	*Waldweide / Hutewald*	*Erdei legeltetés*	*Gozdna paša*	*Pastva v lese, pasienkový les*
#11	agroforest	*Agroforst**	*Agroerdő*	*kmetijski gozd*	*Agrolesníctvo*
#12	short rotation	*Kurzumtrieb*	*rövid vágásforduló*	*ozek kolobar*	*Krátkodobá rotácia*
#13	tree fodder, fodder hedge	*Futterlaub, Futterhecke*	*Takarmányfa*	*drevesna paša*	*Listy krmovín, živý plot z krmovín*
#14	timber / wood production	*Holzproduktion*	*Fűrészárú termelés*	*pridelava hlodovine*	*produkcia dreva*
#15	tree/s outside forests	*Bäume außerhalb von Wäldern*	*fa/fák az erdőkön kívül*	*drevo/drevesa*	*Strom / Stromy mimo lesa*
#16	orchard meadow	*Streuobstwiese*	*Gyümölcsöskert*	*travniški sadovnjak*	*sadová lúka*
#17	fruit, berry, nut production	*Obst- / Beeren- / Nussanbau*	*gyümölcs-, bogyós gyümölcs-, diótermés*	*pridelava sadja, jagodičevja, oreščkov*	*produkcia ovocia, bobúľ a orechov*
#18	forest gardens	*Nahrungswald / Waldgartensystem**	*Erdőkert/Élelmiszererdő*	*gozdni vrt*	*lesné záhrady*

Notes: keywords #1 to #10 retrieved from EURAF terminology of AF systems (blue), (167), keywords #11 to #18 are additional AF related terms and country specific terms.

B: List of agroecology keywords

Sector	No.	English	German	Hungarian	Slovenian	Slovak
AES	#1	biodiversity	*Biodiversität / Artenvielfalt*	*Biodiverzitás*	*biotska pestrost*	*biodiverzita*
AES	#2	carbon	*Kohlenstoff**	*Szénmegkötés*	*odvzem ogljika*	*sekvestrácia uhlíka/ ukladanie uhlíka*
AES	#3	diversification in agriculture	*Diversifizierung in der Landwirtschaft*	*Diverzifikáció a mezőgazdaságban*	*diverzifikacija v kmetijstvu*	*diverzifikácia v poľnohospodárstve*
AES	#4	erosion	*Erosion*	*Erózió*	*erozija*	*erózia*
AES	#5	erosion control	*Erosionsschutz*	*Erózió kontroll*	*preprečevanje erozije*	*kontrola erózie*
AES	#6	flood	*Hochwasser*	*Áradás*	*poplava*	*záplava/y*
FS	#7	food production	*Nahrungsproduktion*	*Élelmiszertermelés*	*pridelava hrane*	*produkcia potravín*
FS	#8	food systems	*Ernährungswirtschaft*	*Élelmiszerrendszer*	*prehranski sistemi*	*potravinové systémy*
AES	#9	habitat connectivity	*Biotopverbund*	*Élőhelykapcsolat*	*povezljivost habitatov*	*konektivita habitatov*
FS	#10	land use	*Landnutzung*	*Földhasználat*	*raba tal/raba prostora*	*využitie krajiny*
FS	#11	regional added value	*Regionale Wertschöpfung*	*Regionális értéktöbblet*	*regionalna dodana vrednost*	*regionálna pridaná hodnota*
AES	#12	renewable resources	*nachwachsende Rohstoffe*	*megújuló erőforrások*	*obnovljivi viri*	*obnoviteľné zdroje*
FS	#13	regional supply	*Regionale Versorgung*	*Regionális ellátás*	*regionalna preskrba*	*regionálny dodávateľ*
AES	#14	soil fertility	*Bodenfruchtbarkeit*	*talajtermékenység*	*rodovitnost tal*	*pôdna úrodnosť/ úrodnosť pôdy*
AES	#15	soil health	*Bodengesundheit*	*talajegészség*	*zdravje tal*	*pôdne zdravie/ zdravie pôdy*
AES	#16	soil improvement	*Bodenverbesserung*	*talajjavítás*	*izboljševanje tal*	*zlepšenie/vylepšovanie pôdy*
FS	#17	value chains	*Wertschöpfungskette**	*értékláncok*	*vrednostne verige*	*hodnotové reťazce*
AES	#18	animal welfare	*Tierwohl*	*Állatjólét*	*Dobrobit živali*	*Dobré životné podmienky zvierat*
FS	#19	landscape image / scenery	*Landschaftsbild*	*táj*	*Krajina*	*Krajina*

Notes: keywords marked in green are from the agroecological systems sector (AES), keywords marked in beige stand for the food system (FS).

C: List of EURAF agroforestry terminology as used in various countries

Language	1 Wood pasture	2 Alley cropping	3 Alley coppice	4 Food forest	5 Orchard cropping	6 Orchard grazing	7 Agro-silvo-pasture	8 Woody landscape features	9 Settlement agro-forestry	10 Forest grazing
Bosnian	rvena pašnjaka	Uzgoj usjeva u prolazima	Prolazna rezidba	Prehrambena šuma	Uzgoj usjeva u voćnjaku	Ispaša u voćnjaku	Iturno-šumska pašnjaka	Drvenasti pejzažni elementi	rokultura u naseljima	astva u šumi
Serbian	Шумска пашњака	згој усева у пролазима	Копсис у пролазима	Храна-шума	Узгој усева у воћњаку	Пасање у воћњаку	Агро-сиво-пашња ка	Шумски пејзажни елементи	марство у насељима	ање у шуми
Bulgarian (Български)	Горско пасище	Алеина система	Алейна система с издънково възобновяване на дърветата	Горско фермерство	Отглеждане на култури в овощни градини	Паша в овощна градина	Горско-пасищна система	Дървесни ландшафтни елементи	Аролесовъдс тво в населени места	Горска паша
Catalan (Català)	Pastura arbrada / Devesa	Arbres i cultius intercalats per fileres	Arbres de rebrot i cultius intercalats per fileres	Bosc d'aliments	Conreu sota fruiters	Pastura sota fruiters	Sistema agro-silvo-pastoral	Elements llenyosos del paisatge	Sistemes agroforestals urbans	Pastura forestal / Silvopastoralism e
Croatian (Hrvatski)	Šumski pašnjak	Uzgoj u redovima	Izdanački panjevi u redovima	Prehrambena šuma	Uzgoj usjeva u voćnjaku	Ispaša u voćnjaku	Agrošumsko-pašnja čki sustav	Drvenasti elementi krajolika	Agrošumarstvo u naseljima	Šumska ispaša
Czech (Čeština)	Lesní pastvina	Liniová výsadba	Výmladkově pěstovaná liniová výsadba	Jedlý les	Polní sady	pasené sady	Agrosilvopastevní systémy	Dřevinné krajinné prvky	Sídelní agrolesnictví	Lesní pastva
Danish (Dansk)	Savannagræsn ing	Allédyrkning	Stævningeskov i Allédyrkning	Skovhave	Dyrkning af afgrøder i frugtplantage	Græsning i frugtplantage	Agro-silvo-pastoralt system	Levende hegn	Urbant skovlandbrug	Skovgræsning
Dutch (Nederlands)	Bosweide	Rijenteelt	Hakhout in rijen	Voedselbos	Teelt onder fruitbomen	Begrazing in boomgaard	Agro-silvo-pastoraal systeem	Houtige landschapselement en	Agroforestry in stadslandbouw	Bosbegrazing
Estonian (Eesti)	Puiskarjamaa	Puittaimedega ribapõllundus	Energiavõsa ribapõllundus	Toidusalu	Viljakasvatus viljapuuaias	Karjatamine viljapuuaias	Agrometsakarjandu s	Puittaimestikuga maastikuelemendid	Asula põllumetsandus	Metsas karjatamine
Finnish (Suomi)	Metsälaidun	Riviviljely	kujanneviljely	Metsäpuutarha	Hedelmätarha	Hedelmätarhoje n laidunnus	Metsälaidun	Puustoinen maatalousympäristö	Puustoinen kaupunkiviljely	Metsälaidunnus
French (Français)	pré-bois	Agroforesterie intraparcellaire	Bande ligno-cellulosique	Forêt-jardin	Culture sous verger	Pré-verger	Agrosylvopastoralis me	Éléments ligneux paysagers	Agroforesterie urbaine/périurbai ne	Pâturage en forêt
German (Deutsch)	Weide unter Bäumen	Gehölzstreifenan bau	Gehölzstreifenan bau im Kurzumtrieb	Waldgarten	Streuobstacker	beweidete Streuobstwiese	Agrosilvopastorale Systeme	gehölzbasierte Landschafts-elemente (Hecken, Knicks, Einzel-bäume, Feldgehölze)	Urbane Agroforst-systeme	Waldweide / Hutewald
Swiss German (Schweizer-deutsch)	Weide unter Bäumen	Gehölzstreifen	Gehölzstreifen im Kurzumtrieb	Waldgarten	Hochstamm-Feldo bstacker	Hochstamm-Fel dobst beweidet	Agro-Silvo-Pastorale Systeme	gehölzbasierte Landsschaftseleme nte (Hecken, Knicks, Einzelbäume, Feldgehölze)	Urbane Agroforstsysteme	Waldweide / Hutewald
Austrian German (österreich. Deutsch)	Weide unter Bäumen	Gehölzstreifen	Gehölzstreifen im Kurzumtrieb	Waldgarten	Streuobstacker	beweidete Streuobst-wiese	Agro-Silvo-Pastorale Systeme	gehölzbasierte Landsschaftseleme nte (Hecken, Knicks, Einzelbäume, Feldgehölze)	Urbane Agroforst-systeme	Waldweide / Hutewald
Greek (Ελληνικά)	Δασολίβαδο	-	Καλλιέργεια πρεμνοφυών δέντρων σε λωρίδες	Δάσος τροφίμων	Καλλιέργεια σε οπωρώνα	Βόσκηση σε οπωρώνα	Αγροδασολιβαδικό σύστημα	Ξυλώδη χαρακτηριστικά τοπίου	Αγροδασοπονία οικισμών	Βόσκηση σε δάση
Hungarian (Magyar)	Fás legelő	Fasoros köztestermesztés , Szánó köztes	Agroerdészeti sarjvágásos köztestermesztés	Erdőkert/Élelmis zererdő	Köztestermesztése s gyümölcsös	Legeltetett gyümölcsös	Erdő-mező-legelő rendszer	Fás tájképi elemek	Települési agroerdészet	Erdei legeltetés
Irish (Gaeilge)	féarach coille	barrfhás chaolbhealaigh	búnscoitheadh chaolbhealaigh	Coill bhia	barrfhás úlloird	Innilt úlloird	Coillfhéarach	Fiodhghnéithe tíre	Fiodhthalmhaíoch t lonnaíochta	Innilt Choille
Italian (Italiano)	Pascolo arborato	Sistema silvoarabile	Arboricoltura da legno in filari	Foresta commestibile	Coltivazione promiscua in frutteto	Pascolo in frutteto	Sistema agro-silvo-pastorale	Elementi arborei del paesaggio	Agroforestazione urbana	Pascolo in bosco
Latvian (Latviešu)	Kokāju vai parkveida pļavas un ganības	Alejveida agromežsaimnie cības sējumi / stādījumi	Atvasāju aleju sējumi / stādījumi	Meža dārzs	Citu kultūraugu audzēšana augļu dārzā	Ganīšana augļu dārzā	Agromežsaimniecīb as-dārkopības-lopko pības sistēma	Kokaugu ainavas elementi	Apdzīvotu vietu agromežsaimniec ība / Piemājas dārzi/ Mazdārziņi	Meža ganības
Lithuanian (Lietuvių)	Miško ganykla	Auginimas alėjose	Žemakrūmių auginimas alėjose	Maisto miškas	Auginimas sode	Ganymas sode	Agromiškininkystės-gyvulininkystės	Šumedėję kraštovaizdžio elementai	Gyvenviečių agromiškininkyst ė	Ganymas miške

Continued

Language	1 Wood pasture	2 Alley cropping	3 Alley coppice	4 Food forest	5 Orchard cropping	6 Orchard grazing	7 Agro-silvo-pasture	8 Woody landscape features	9 Settlement agro-forestry	10 Forest grazing
Maltese (Malti)	*Mergħa fl-imsaġar*	*Kultivazzjoni f'korsiji*	*Bosk imħawwel f'korsiji*	*Foresta tal-ikel*	*Kultivazzjoni f'ġonna tal-frott*	*Raġħa f'ġonna tal-frott*	*Sistema agro-silvo-pastorali*	*Karatteristiċi tal-pajsaġġ bis-siġar*	*Agroforestrija f'żoni residenzjali*	*Raġħa fil-foresta*
Polish (Polski)	*Pastwisko leśne*	*Uprawa alejowa*	*Uprawa alejowa z zagajnikiem krótkiej rotacji*	*Las żywnościowy*	*Uprawa współrzędna w sadzie*	*Wypas w sadzie*	*System rolno-leśno-pastwiskowy*	*Zadrzewienia śródpolne*	*Agroleśnictwo na obszarach zabudowanych*	*Wypas leśny*
Portuguese (Português)	*Montado (Pastoreio em floresta)*	*Cultivo em faixas*	*Talhadia em faixas*	*Horta Floresta*	*Cultivo em entrelinhas de pomar*	*Pastoreio em pomar*	*Sistema agro-silvo-pastoril*	*Elementos lenhosos da paisagem*	*Agrofloresta urbana*	
Romanian (Română)	*Pășune împădurită*	*Cultură pe alei*	*Crâng pe alei*	*Pădure comestibilă / grădină-pădure*	*Cultură în livadă*	*Pășunat în livadă*	*Sistem agro-silvo-pastoral*	*Elemente lemnoase peisagistice*	*Sistem agroforestier în așezări*	*Pășunat în pădure*
Slovak (Slovenčina)	*Dreviny na trvalom trávnom poraste*	*Línie drevín na - ornej pôde, - trvalom trávnom poraste*	-	*Lesná záhrada*	*Sadová lúka (a ďalšie polykultúry v ovocných sadoch)*	*Pasený sad*	-	*Krajinný prvok, nelesná drevinová vegetácia*	*Urbánne agrolesníctvo*	*Pastva v lese, pasienkový les*
Slovenian (Slovenščina)	*Drevesno-pašna raba*	*Drevesno-poljedelska raba*	*Drevored panjevca*	*Gozdni vrt*	*Njivski sadovnjak*	*Paša v sadovnjaku*	*Poljedelsko-drevesno-pašna raba*	*Lesnate krajinske značilnosti*	*Naselbinska kmetijsko-gozdarska raba*	*Gozdna paša*
Spanish (Español)	*Dehesa / Pasto arbolado*	*Cultivo con arbolado en hileras*	*Cultivo con arbolado de rebrote en hileras*	*Bosque de alimentos*	*Cultivo bajo frutales*	*Pastoreo bajo frutales*	*Sistema agro-silvo-pastoral*	*Elementos leñosos del paisaje*	*Sistema agroforestal urbano*	*Pastoreo en bosque*
Swedish (Svenska)	*Skogsbete*	*Alléodling*	*Alléodling med stubbskott*	*Matsskog*	*Odling i fruktträdgård*	*Bete i fruktträdgård*	*Agro-silvo-pastoralt system*	*Träd- och buskrika landskapselement*	*Bebyggelse-agroforestry*	*Skogsbete*

Notes: EURAF terminology of AF systems as of 11.08.2026 (167).

D: List of agroecological practices

#	Agroecology Practice	Arable	Pasture
1	Afforestation / reforestation	*	*
2	Animals bred for high nitrogen use efficiency		*
3	Biochar as fertilizer, feed and disease suppressor	*	*
4	Conversion of arable land to grassland	*	
5	Cover / catch crops	*	
6	Crop associations - e.g. N-fixing crops	*	
7	Crop varieties bred for improved nitrogen use efficiency	*	
8	Farm bioenergy production and energy savings	*	*
9	Feed supplements and tree / shrub fodder		*
10	Fertilizer management & nitrification inhibitors	*	*
11	Forest grazing (e.g. to reduce fire risk)		*
12	Grassland management (legume overseeding)		*
13	Grassland management (rotational grazing)		*
14	Grazing of cover crops and agricultural crop residues	*	*
15	GHG auditing tools (e.g. OpenFarmCarbonCalculator)	*	*
16	Manure management and application	*	*
17	New agroforestry fields	*	*
18	Protection/increase of landscape-features	*	*
19	Ramial chipped wood as soil conditioner	*	*
20	Reduced tillage / direct seeding	*	
21	Soil and nutrient management plans	*	*
22	Water management (keyline, berms/swales, flood-breaks)	*	*
23	Wetland / peatland conservation / restoration	*	*

Notes: EURAF terminology of AE-practices.

E: List of best practice examples

Country	Governance Level	Project / Policy Name	Agroecological & Agroforestry Mechanism	Policy Contribution
Germany	Municipal / NUTS 3	*Tauchnitzgraben* Water Restoration	Planting 2,380 native trees and shrubs along stream buffer strips.	Implements EU Water Framework Directive (WFD) via stream shading, nutrient filtering, and wood biomass energy.
Germany	Municipal / Local	*Peickwitz* Compensation AF	Fruit-based AF system financed by municipal road compensation offset funds.	Links road construction eco-offsets to local butchery, bakery, and municipal heat grid planning.
Germany	NUTS 3 / LEADER	LEADER District *Steinfurt*	LEADER grant co-funding for private farm agroforestry establishment.	Demonstrates LEADER as an effective de-risking financial mechanism for climate-resilient agriculture.
Hungary	Local / Regional	*Nagykörű* Floodplain Model	Traditional floodplain wood pasture (*Erdő-mező-legelő*) along the Tisza River.	Restores ancestral flood management, producing organic beef and timber with zero synthetic inputs.
Hungary	Local / NUTS 3	*Valaha Tanya (Vértesacsa)*	6 ha multi-level food forest with heritage fruit varieties and livestock.	Integrates pollinators, wild fruits, branch-wood, and direct farm sales into short supply chains.
Ireland	National / Local	Teagasc FT14 Forest Garden Pilot	DAFM grant aid scheme supplying 300 native fruit and nut trees per project.	Establishes community food forests enhancing local biodiversity, public education, and food security.
Ireland	National / Farm	DAFM Silvopasture Scheme (FT8)	400 stems/ha silvopastoral tree planting integrated with sheep grazing.	Combines organic farming subsidies with afforestation support for carbon, shelter, and soil health.
Slovakia	Regional / NUTS 3	*Prešov & Košice* Regional Strategies	Regional plans embedding non-forest woody vegetation.	Integrates ÚSES ecological corridors and water retention into regional spatial development frameworks.
Slovakia	Municipal	*Rožňava* Green Action Plan	Municipal strategy linking landscape restoration to local food systems.	Connects climate mitigation with circular economy principles, Farm-to-Fork, and local suppliers.
Slovenia	National / NUTS 1	Spatial Strategy 2050	Legal protection of landscape 'Stepping Stones' (*stopalni kamni*).	Prevents habitat fragmentation by protecting forest patches and hedgerows across farmland.
Slovenia	National / NUTS 1	SI SKP 120-Day Grazing Mandate	Mandatory 120-day annual outdoor grazing scheme.	Drives agroecological nutrient cycling, soil health, and livestock welfare across small farms.
Switzerland	National / NUTS 1	Agro & Food Climate Strategy 2050	Inter-departmental framework (FOAG, FSVO, FOEN) linking food and climate.	Overcomes sectorial boundaries by managing food production and consumption as an integrated system.