

**WP4: GREEN NUDGES AS A POLICY INSTRUMENT  
FOR CAP POST 2027 AND EGD POLICIES**

## **D4.6: POLICY ANALYSIS**



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## List of abbreviations

AECC - Agri-Environment-Climate Commitments
ANC - Areas under Natural or other area-specific Constraints
CAP - Common Agricultural Policy
CFP - Common Fisheries Policy
CSP - CAP Strategic Plan
EC – European Commission
EEA - European Environmental Agency
EGD - European Green Deal
EIP-AGRI - European Innovation Partnership "Agricultural Productivity and Sustainability"
ENVCLIM - Environmental, Climate-related and other Management Commitments
EP – European Parliament
ESR - Effort Sharing Regulation
EU - European Union
EUDPR - EU Data Protection Regulation
F2F - Farm to Fork Strategy
FADN - Farm Accountancy Data Network
FSDN - Farm Sustainability Data Network
GA – Grant Agreement
GAEC - Good Agricultural and Environmental Conditions of land
GDPR – General Data Protection Regulation
GHG - Greenhouse Gas
IED - Industrial Emissions Directive

INMAP - Integrated Nutrient Management Action Plan  
IPM - Integrated Pest Management  
JRC - Joint Research Centre  
LULUCF - Land Use, Land-Use Change and Forestry  
MAP - Manure Action Plan  
Mt CO<sub>2</sub>e - Million tonnes of Carbon Dioxide equivalent  
PAN - National Action Plan (for pesticides)  
PDO - Protected Designation of Origin  
PGI - Protected Geographical Indication  
PRUDENT - Promoting Green Nudging for Sustainable Agriculture and Forestry  
SDG - Sustainable Development Goals  
SFM - Sustainable Forest Management  
SMR - Statutory Management Requirements  
SSM - Sustainable Soil Management  
UAA - Utilised Agricultural Area  
UC – Use Case  
UN - United Nations  
VLIF - Vlaams Landbouwinvesteringsfonds (Flemish Agricultural Investment Fund)  
VLM - Vlaamse Landmaatschappij (Flemish Land Agency)  
WP – Working Package  
ZPAP - Zero Pollution Action Plan

# 1. Executive summary

PRUDENT (Promoting Green Nudging for Sustainable Agriculture and Forestry) is a Horizon Europe project (GA No 101134051) that seeks to transform agricultural and forestry practices towards sustainability through behavioural insights. The project aims to identify and evaluate effective “green nudges” – subtle behavioural interventions – that encourage farmers and private forest owners to adopt more sustainable practices. These nudges are tested in both experimental settings and real-world contexts (including digital tools like web/mobile applications) to assess their impact alongside actual policy measures that target diverse farming and forestry systems across Europe (from arable crops and perennial crops to livestock and boreal forests) to capture a wide range of contexts. The insights gained will inform the development of social innovations, business models, and policy recommendations, contributing to the European Green Deal (EGD) and Common Agricultural Policy (CAP) objectives for sustainable agriculture and forestry. Work Package 4 (WP4) within this framework focuses on positioning green nudges as a policy instrument in future CAP and Green Deal strategies. Task 4.1 (the focus of this deliverable) examines the current policy landscape and stakeholder perspectives to lay the groundwork for those policy innovations.

This Deliverable D4.6 (Policy Analysis) reports the findings of Task 4.1. The purpose of D4.6 is to analyse how existing European Union (EU) and national policies support sustainable agriculture and forestry, and to identify gaps and opportunities for integrating behavioural approaches. The analysis includes a broad review of the EU’s policy framework, covering the CAP 2023–2027 and key EGD initiatives, such as the Farm to Fork Strategy, Biodiversity Strategy 2030, Forest Strategy 2030, Fit for 55 package, etc., as well as relevant national policies in selected member states. Methodologically, the report combines an integrative policy review with stakeholder consultation. A total of 50 semi-structured interviews were conducted with policymakers and land managers (farmers and private forest owners) at the EU level and across the four case study countries. The interview data were thematically analysed to uncover perceived strengths and weaknesses of current sustainability policies, and to assess how behavioural tools could address existing implementation challenges.

The findings show that significant obstacles remain while EU policies provide ambitious sustainability objectives and mechanisms, such as eco-schemes and agri-environmental commitments. These include administrative complexity, weak alignment between EU and national goals, low clarity or accessibility of measures for farmers and private forest owners, and a lack of trust and support networks. Economic uncertainties and generational divides further limit the willingness and ability of land managers to adopt more sustainable practices.

Green nudges—subtle, low-cost behavioural interventions—are seen as a promising complement to traditional policy instruments. Examples include timely reminders, default eco-friendly options, comparative feedback, and peer learning incentives. If appropriately embedded, such measures could help overcome cognitive, informational, or social barriers to sustainable behaviour without removing freedom of choice.

Based on the findings, the report recommends simplifying policy design and communication, increasing support and advisory services, reinforcing economic incentives, promoting collective and peer-based approaches, and integrating behavioural insights systematically into future CAP and EGD policies. These recommendations will directly inform Task 4.2 and Task 4.3 of WP4, which will focus on co-creating policy recommendations and tools. The ultimate aim is to improve EU sustainability policies' effectiveness, fairness, and usability in agriculture and forestry through evidence-based behavioural innovation.

## 2. Introduction

Sustainable development is a core principle of the European Union, embedded in the EU Treaties and guiding internal and external policies. The United Nations 2030 Agenda and its 17 Sustainable Development Goals (SDGs), adopted in 2015, provide a global blueprint for achieving sustainable economic, social and environmental progress. The European Union has committed itself to this agenda, making the SDGs and the Paris Climate Agreement objectives central to its strategic priorities. In recent years, the EU has launched an ambitious policy program, led by the European Green Deal (EGD), to drive the transition towards sustainability across all sectors. This includes bold targets for climate neutrality, biodiversity conservation, circular economy, zero pollution, and sustainable food systems. Agriculture and forestry are pivotal in this effort: they are not only vulnerable to climate change and environmental degradation, but also key to achieving climate mitigation, healthy ecosystems, and food security goals.

The European Green Deal, announced in 2019, sets the vision for a climate-neutral Europe by 2050 and substantial emissions cuts by 2030. Under the EGD's umbrella, initiatives like the Farm to Fork Strategy and the EU Biodiversity Strategy for 2030 specifically address sustainable agriculture and the protection of natural ecosystems. These strategies call for transforming EU food systems to be fair, healthy, and environmentally friendly, and for ambitious actions to preserve and restore biodiversity (including forests). Meanwhile, the EU Forest Strategy for 2030 outlines pathways for sustainable forest management and afforestation aligned with climate and biodiversity objectives. At the heart of agricultural policy, the Common Agricultural Policy (CAP) – one of the EU's oldest and most influential policies – has undergone reforms to better integrate environmental and social sustainability goals. The current CAP (2023–2027) introduces greener and fairer measures: for example, enhanced conditionality for environmental practices, dedicated eco-schemes that reward farmers for climate- and eco-friendly practices, and greater flexibility for Member States to tailor interventions to local needs. The existing policy framework shows a broader shift where sustainability is increasingly mainstreamed across various EU policies. Notably, “sustainable agriculture” per se is not defined in a single legal text; instead, it is an integrated concept that underpins legislation and strategies ranging from the CAP to the Green Deal and sectoral regulations. In the forestry realm, sustainable forest management (SFM) is guided by criteria established since the 1990s (e.g., the Helsinki principles), focusing on managing forests in a way that maintains their biodiversity, productivity, regeneration capacity, and vitality in the long term. In the absence of an EU-wide forestry regulation, Member States implement SFM through national laws and voluntary certification schemes, while aligning with EU and international commitments.

Farmers and private forest owners ultimately make daily decisions that impact soil health, water quality, greenhouse gas emissions, and biodiversity. Thus, achieving the Green Deal and SDG targets in agriculture and forestry requires not only robust policies and financial incentives but also effective engagement and empowerment of these land managers. Here is where the PRUDENT project is particularly relevant. PRUDENT is a research and innovation project funded by the EU's Horizon Europe programme, aimed at “promoting green nudging for sustainable agriculture and forestry.” In essence, PRUDENT focuses on how behavioural insights can complement traditional policy tools to accelerate the adoption of sustainable practices. The project recognises that human factors, such as habits, perceptions, knowledge gaps, or risk aversion, can significantly influence outcomes even when policies and incentives exist. PRUDENT seeks to design and test interventions (green nudges) that gently steer behaviour without mandating it, thereby bridging the gap between policy incentives and actual practice on farms and in forests. The project works across four case-study systems (arable farming, perennial crops, livestock, and forestry in different European regions) to ensure that solutions are adaptable to varied contexts. It also actively involves stakeholders (farmers, private forest owners, advisors, policymakers, etc.) in a co-creation process, ensuring that the proposed nudges and policy recommendations are grounded in real-world experience. By its conclusion, PRUDENT will deliver a set of tested social innovations, decision-support tools, and evidence-based policy recommendations to foster a more sustainable and climate-resilient European agriculture and forestry sector.

Within PRUDENT, Work Package 4 (WP4) is dedicated to the policy dimension, exploring how green nudges can be integrated as policy instruments to support the CAP post-2027 and Green Deal initiatives. Task 4.1, in particular, is the foundational step of WP4. According to the project plan, Task 4.1: “Identification and analysis of current policy framework that stimulates more sustainable behaviour and practices” (scheduled in the first project year) lays the groundwork by examining existing policies and their influence on sustainable practices. The findings from Task 4.1 are intended to inform the subsequent tasks in WP4 – notably Task 4.2, which will formulate policy recommendations for incorporating green nudges into future policy frameworks, and Task 4.3, which will involve the development of policy tools for adopting green nudges.

This document, Deliverable D4.6: “Policy Analysis”, presents the results of Task 4.1. In the chapters that follow, **Section 3** provides a comprehensive policy framework analysis. It reviews key EU policies and strategies that shape sustainable agriculture and forestry (including the CAP and European Green Deal-related initiatives) and examines how these are translated at the national level in the project’s focus countries. It establishes the institutional context and identifies existing policy instruments and objectives. **Section 4** then presents stakeholder perspectives, drawing from the interviews conducted with policymakers, farmers, and private forest owners. Qualitative thematic analysis distils the main themes and concerns voiced by stakeholders. Next, **Section 5** “Discussion - Synthesis of the results” synthesises the findings from the policy review and stakeholder input. It discusses the common challenges and gaps that emerge, as well as differences across national contexts or sectors, and opportunities and positive examples identified, providing a bridge toward solutions. **Section 6**, “Conclusion – Policy Recommendations”, outlines preliminary recommendations based on the analysis. The deliverable concludes with a list of sources and references.

Overall, D4.6 is a crucial stepping stone in the PRUDENT project. Grounding the project’s subsequent work in a clear understanding of the current policy context and stakeholder needs ensures that the forthcoming co-created solutions are relevant and targeted.

## 3. Policy Framework for Sustainable Agriculture and Forestry

### 3.1. Introduction

Sustainable agriculture and sustainable forest management are cornerstones of the EU's climate and environmental objectives under the European Green Deal (EGD) and related strategies. The EGD aims to ensure climate neutrality by 2050 and explicitly positions agriculture and rural areas at the heart of this transition. The Common Agricultural Policy (CAP) – one of the EU's oldest and largest policies – has been reformed to better integrate environmental, climate, and social goals, aiming to support farmers' livelihoods while promoting eco-friendly practices ([CAP 2023-2027 - European Commission](#)).

This policy framework analysis reviews the existing policy landscape for sustainable agriculture and forestry. It examines EU and national-level policy instruments in Italy, Belgium, Lithuania and Finland, including regulations, strategic plans and incentives that shape sustainable land management practices. By mapping key objectives and governance structures (e.g., CAP strategic plans, national forest strategies), we highlight synergies and barriers that affect the transition to sustainability. The analysis therefore reveals where small changes (nudges) in policy design could overcome obstacles and reinforce EU sustainability goals.

The methodology employs a multi-level document review informed by stakeholder insights in the next stage. We systematically extract the goals and implementation mechanisms of relevant policies – from CAP strategic plans to Green Deal roadmaps – and assess their implications for farmers' and private forest owners' decision-making. This process is complemented by expert consultation (Task 4.1 interviews) in Chapter 4 to ensure practical context is captured. The outcome is an integrated overview of the current policy framework that will inform future PRUDENT's policy recommendations, regarding the introduction of efficient green nudging practices into the future CAP framework and relevant policy initiatives under the European Green Deal, building also on the results of WP1 "Green nudges landscape analysis", WP2 "Testing innovative nudging practices" and WP3 "Business models, social innovation and cooperation for more sustainable farming and forestry systems" of the PRUDENT project.

### 3.2. Methodology

To analyse the current EU policy framework within the PRUDENT project, the integrative literature review methodology is applied to systematically map and synthesise policies relevant to environmental, agricultural, food, forestry, climate, and bio-economy sustainability goals in the agriculture and forestry sectors. This methodology is particularly appropriate because it enables the integration of diverse sources and types of evidence, including legislative texts, strategic documents, scientific papers, evaluations, and grey literature, across multiple policy domains and governance levels. It is well-suited for addressing complex, cross-sectoral questions and for identifying both synergies and gaps in the policy landscape, which aligns with the PRUDENT project's objectives and the multi-level, multi-actor context of EU agricultural and forestry policy.

The process begins with a clear scoping phase, where the main concepts and boundaries of the analysis are defined in relation to sustainability as understood in the EU context. This includes identifying key policy instruments such as the Common Agricultural Policy (CAP), the European Green Deal and its constituent strategies (Farm to Fork, Biodiversity Strategy 2030, Forest Strategy 2030, Fit for 55 package, EU Zero Pollution Action Plan, EU Soil Strategy etc), and ensuring alignment with the PRUDENT project's farming and forestry systems.

During the next stage, identification and collection of relevant policy documents and scientific literature are conducted. This is achieved through comprehensive searches of official EU databases (such as EUR-Lex and the EU Publications Office), national and regional government portals, and other repositories relevant to the four PRUDENT use cases. Additional scientific literature is reviewed, using the following search terms: "Common Agricultural Policy" or CAP, "European Green Deal", "Farm to Fork Strategy", "EU Biodiversity Strategy 2030", "EU Forest Strategy 2030", "Fit for 55", "EU forest Strategy", "EU Bioeconomy Strategy" and "EU zero pollution action plan". These are combined with thematic keywords such as "sustainable agriculture", "sustainable farming", "sustainable agricultural practices", "climate change and agriculture", "eco-schemes", "agri-environmental measures", "climate-smart farming", "resilient farming systems", and "environmental impact of agriculture". To capture insights on governance and implementation, additional terms like "policy analysis", "policy coherence", "multi-level governance", "policy gaps", and "policy integration" are used. The national and regional dimensions are addressed through search terms such as "Italy", "Flanders", "Belgium", "Lithuania", "regional agricultural policy", and "CAP implementation". Both primary sources (e.g., legislative texts, official strategies) and secondary or grey literature (e.g., evaluations, implementation reports, regional plans) are included to capture the full spectrum of policy instruments and their implementation contexts.

Once the literature is collected, a quality appraisal is conducted. Given the diversity of sources, this involves assessing the coherence of each policy (how well it aligns with other policies at EU, national, and regional levels), the balance of policy instruments (regulatory, economic, informational), and the clarity of sustainability targets and indicators. The core of the integrative review is the thematic synthesis. Here, findings from the collected literature are abstracted and coded into thematic categories, such as strategic alignment, implementation mechanisms, funding provisions and monitoring frameworks. Special attention is given to identifying policy gaps—areas where objectives are not matched by effective instruments or where implementation barriers exist, particularly at the interfaces between EU, national, and regional governance. The synthesis also considers the needs of different farming and forestry systems and market segments, as defined by the PRUDENT project's segmentation analysis, to ensure that policy gaps and opportunities are contextualised for each use case.

The integrative review process is iterative and allows for the refinement of themes and identification of cross-cutting issues, such as the coherence between CAP eco-schemes and other sustainable types of interventions and Farm to Fork or Biodiversity Strategy targets, or the alignment between forestry policies and biodiversity or climate objectives. The results are then validated by triangulating findings across Member States and regions represented in the PRUDENT use cases, and by engaging with policymakers, farmers and private forest owners at the EU and national level for feedback.

This methodology is chosen because it offers the flexibility and breadth to address the complexity of the EU policy landscape, incorporates grey literature and policy documents critical for up-to-date analysis, and is specifically designed to identify and synthesise knowledge across disciplinary and sectoral boundaries. The integrative review thus provides a robust foundation for mapping strategies, initiatives, and policies that influence the adoption of sustainable agriculture and forestry practices at regional, national, and EU levels, and for producing actionable insights into policy gaps and needs for the PRUDENT project.

### 3.3. Results – Key strategies and policies for sustainable agriculture and forestry

### 3.3.1. EU International Partnerships focusing on sustainable agriculture and forestry

The European Union (EU) has made sustainability a cornerstone of its international development partnerships, aligning efforts with the United Nations Sustainable Development Goals (SDGs). In particular, SDG 2, “Zero Hunger”, and SDG 15 “Life on Land”, are focal points for EU action abroad. Sustainable agriculture is central to the 2030 Agenda, and SDG2 represents the first essential step toward achieving zero hunger. Over the past thirty years, there has been substantial discussion regarding the definition of “sustainable agriculture.” While many SDGs address agricultural issues, SDG Target 2.4 calls for sustainable food production and resilient agricultural practices by 2030, and is tracked by Indicator **2.4.1 – the proportion of agricultural area under productive and sustainable agriculture** ([SDG Indicators Data Portal, FAO](#)). This indicator aims to monitor progress toward sustainable and productive agricultural practices by measuring eleven metrics at the farm level (FAO, 2023). Likewise, SDG Target 15.2 aims to promote sustainable management of all forests by 2020, monitored through Indicator **15.2.1 – progress towards sustainable forest management** ([SDG Indicators Data Portal, FAO](#)). These targets recognise that farming and forestry must balance productivity with environmental and social well-being. The EU’s international partnerships – both at the EU level and via Member States – play a pivotal role in implementing and monitoring these goals.

In September 2015, the United Nations General Assembly adopted the 2030 Development Agenda and an associated 17 Sustainable Development Goals (SDGs). The resultant SDGs are accompanied by 169 targets under the various goals and a set of 232 indicators to monitor progress toward the SDGs. The 2017 *European Consensus on Development* aligned EU aid with the SDGs, and the 2019 European Green Deal added an external dimension to mobilise partnerships for climate and environmental goals. Through initiatives like the Farm to Fork Strategy (for sustainable food systems) and the EU Forest Strategy 2030, the EU “explicitly refers” to integrating biodiversity, sustainable agriculture and forestry into its cooperation with non-EU countries (EC, 2023). EU development programs increasingly aim to tackle hunger, climate change, and ecosystem loss, reflecting that agriculture and forests are interlinked. The Commission keeps focusing on delivering concrete actions that will bring tangible progress in the SDGs. The President’s political guidelines for 2024-2029 constitute this Commission’s strategy to implement the SDGs. The President’s political programme integrates the SDGs into all Commission proposals, policies and strategies. All of the 17 SDGs feature in one or more of the six headline ambitions announced in [President von der Leyen’s Political Guidelines](#), as shown in Figure 1. SDG2 and SDG15 lie under the political priority “Sustaining our quality of life: food security, water and nature”.



Figure 1: All 17 SDGs feature in one or more of the six headline ambitions for 2024-2029 (retrieved from European Commission).

SDG 2.4.1 is multifaceted: it captures three dimensions of sustainability – environmental, economic and social ([SDG Indicators Data Portal, FAO](#)). In other words, a farm is counted as “sustainable” only if it meets criteria across all three pillars (for example, using eco-friendly practices, being economically viable, and ensuring decent working conditions). This holistic approach reflects a shift from viewing sustainability purely in environmental terms to recognising that farmer livelihoods and community well-being are equally critical ([SDG Indicators Data Portal, FAO](#)). Developing a robust measure for 2.4.1 has been challenging; it required years of work led by the FAO and partners to agree on sub-indicators and survey methods. As of the late 2010s, the methodology was established, but data remained sparse, so the UN approved the use of a proxy indicator while countries ramp up reporting capacity ([SDG Indicators Data Portal, FAO](#)). The proxy – “Progress towards sustainable agriculture” – is an interim gauge as farm-level data are collected.

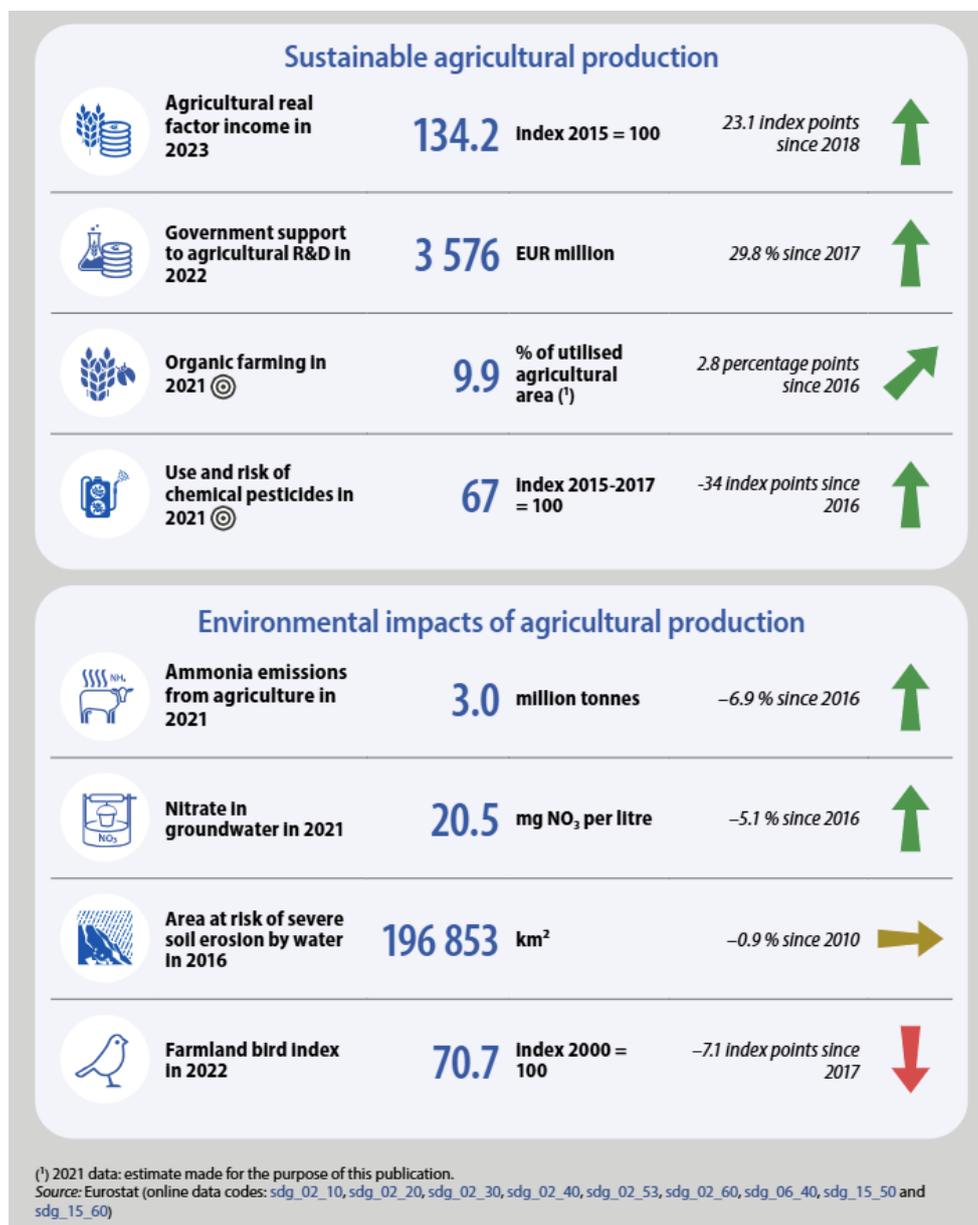


Figure 2: Progress towards SDG2 in the EU – Government Support to Agricultural R&D, actual public expenditure in current prices (EC, 2024).

In the EU, considered one of the most food-secure regions in the world, the monitoring of progress towards SDG 2 focuses on malnutrition, sustainable agricultural production and the adverse environmental impacts of agricultural production. Long-term and short-term trends for the indicators identified for the EU zone (see Figure 2) show an uneven picture: over the past few years, there has been steady progress in making EU agricultural production more sustainable, but results in reducing the adverse environmental impacts of agriculture are mixed, with ample room for improvement. Russia's invasion of Ukraine has also contributed to high food inflation in the EU, increasing moderate or severe food insecurity in Europe (Albaladejo et al., 2024).



Figure 3: Progress achieved towards SDG15 in the EU (EC, 2024).

SDG 15.2.1 tracks “progress towards sustainable forest management (SFM)” and is composed of five sub-indicators ([SDG Indicators Data Portal, FAO](#)). These cover key aspects of forest health and management: (1) the annual rate of forest area change (are we losing or gaining forests?), (2) the amount of biomass (carbon stock) per hectare, (3) the share of forest area in protected areas, (4) the share of forest under long-term management plans, and (5) the area of forest certified as sustainably managed. To interpret these, a “traffic light” dashboard is used – green, yellow, red – indicating whether trends are positive or negative for each. By aggregating multiple metrics, 15.2.1 provides a comprehensive picture of how well countries manage their forests. It directly links to SDG Target 15.2’s objectives of halting deforestation, restoring forests, and increasing reforestation. Globally, the data show a mixed picture: the world is making some progress toward sustainable forest management, but the rate of forest loss remains high ([SDG](#)

[Indicators Data Portal, FAO](#)). Over the past decade, more forests have come under certification and management plans, yet overall forest area continues to shrink due largely to agricultural expansion. As of 2023, about 389 million hectares of forest worldwide were certified under independent sustainability schemes – a 13% increase since 2010 – but recent figures showed a dip (a net decrease of 55 million ha in certified area between 2022 and 2023) ([SDG Indicators Data Portal, FAO](#)). This underscores that gains in one indicator (like certification) can be offset by losses in another (like total area), reinforcing the need for integrated solutions.

In the EU, the monitoring of progress towards SDG 15 focuses on the trends in ecosystem status, land degradation and biodiversity. The goal of life on land (SDG 15) is characterised by several unsustainable trends in biodiversity and land degradation, leading to a moderately unfavourable assessment of the EU's progress in this area over the short-term period assessed (Figure 3). The European Commission has proposed important policy initiatives to reverse the degradation of ecosystems, as part of the European Green Deal, such as the EU Biodiversity Strategy, the EU Forest Strategy and the EU Soil Strategy for 2030 (EC, 2024).

### 3.3.2. The Common Agricultural Policy (CAP) 2023-2027

The EU's Common Agricultural Policy (CAP) ensures food security and a stable income for farmers, stabilises markets, encourages sustainable agricultural practices and supports rural areas. The latest reform for 2023–2027 has applied since 1 January 2023 and introduced a “*new way of working*” for Member States, with a strong emphasis on results, performance, and flexibility in allocating funds based on local conditions and needs. The CAP pursues ten specific objectives, balancing economic, environmental, and social sustainability – from ensuring viable farm incomes and food security to climate action and vibrant rural areas (Figure 4).



Figure 4: Key policy objectives of the CAP 2023-27, source European Commission.

Instead of a one-size-fits-all EU policy, each Member State implements the CAP via a tailored CAP Strategic Plan (CSP) integrating all CAP interventions (direct payments, rural development, market measures). These plans allow targeting measures to local needs while aligning with EU objectives. The European Commission approved 28 plans (27 countries, with Belgium uniquely having two plans – one for

Flanders and one for Wallonia) in late 2022. In approving plans, the Commission ensured they are consistent with EU laws and commitments, including those in the European Green Deal (Figure 5). Member States set performance targets and report annually on outputs and results, subject to Commission review to assess progress toward CAP objectives and Green Deal contributions. This performance-based approach shifts from mere compliance to delivering concrete sustainability outcomes. EU countries are required to update their CSPs when climate and environmental legislation is modified.

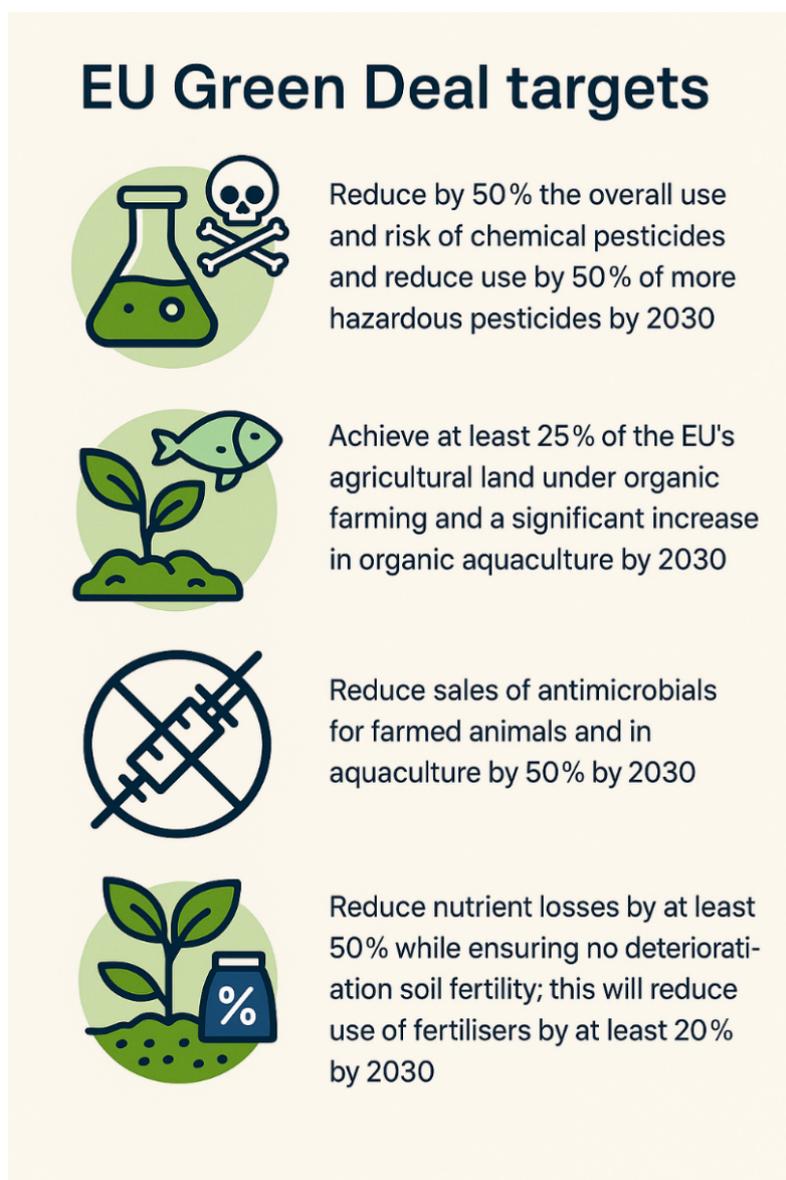


Figure 5: EU Green Deal targets.

Sustainability is at the heart of the CAP. The CAP aims to ensure sustainable agriculture concerning economic, social and environmental aspects, offering farmers several ways to contribute to the EU's climate and environmental ambitions. About 40% of the total CAP budget is climate-relevant, contributing to the goal of 10% of the EU budget for biodiversity by 2027. At least 25% of the budget for direct payments is allocated to eco-schemes, providing stronger incentives for climate and environment-friendly farming practices and approaches. In the fruit and vegetables sector, operational programmes allocate at least 15% of their expenditure towards the environment.

In this report, we focus on the environmental sustainability of the CAP, which places good environmental practice at the heart of agriculture and forestry in the EU. According to the CAP Strategic Plans Regulation, to receive the full amount of direct payments and some types of rural development funds, such as agri-

environment-climate commitments (AECC), payments for natural or other area-specific constraints (ANC) and Natura 2000 and Water Framework Directive payments, farmers must adhere to enhanced environmental 'conditionality'. All CAP payments are tied to the following stricter types of requirements:

- Statutory Management Requirements (SMRs) are obligations that apply to all farmers, regardless of whether they receive CAP income support. These requirements originate from other EU legislation on animal welfare, public, animal and plant health, and climate and the environment, but are integrated into the CAP legislation. Farmers must currently adhere to 11 SMRs;
- Standards for Good Agricultural and Environmental Conditions of land (GAECs) are specific to the CAP. While the CSP Regulation lays down the main principles for the GAECs, Member States decide the minimum requirements to allow for the particularities of their agriculture. The current CAP includes nine GAECs.

According to the [Commission report<sup>1</sup>](#) on the collective ambition of the CAP strategic plans, Member States originally expected that 89 % of EU farmland would be subject to conditionality. Still, this report did not take into account the derogations approved in 2023 and 2024 in the wake of the Russian invasion of Ukraine, the ensuing fears of a global food shortage, and the rapid inflation in food prices.

The GAEC related to the sustainable practice tested in Flanders, Belgium, is GAEC 4 “Establishment of buffer strips”. To prevent water pollution, farmers are required to use no fertilisers or pesticides on at least three metres of land adjoining the length of water courses. This is an enhanced requirement compared to the previous CAP. Nine Member States require wider buffer strips. In Flanders, the latest action program for implementing the EU Nitrates Directive, known as MAP7 (2023–2027)<sup>2</sup> was approved in December 2024. This program significantly strengthens the requirements for buffer strips.

The GAEC related to the sustainable practice tested in Lithuania is GAEC 7 - Crop rotation. It applies to all arable land at the parcel level, except for crops growing under water. Almost all Member States require a significant share of land per farm to rotate at least once a year. Most Member States used a derogation from this GAEC in 2023, the first year of the new CAP. This is an enhanced requirement compared to the crop diversification that was part of the greening obligations in the previous CAP. Following the recent targeted CAP amendments<sup>3</sup> on environmental conditionality, annual crop rotation at the farm level would no longer be the only way to fulfil the GAEC 7 requirement. Member States would be allowed to enable farmers to comply through crop diversification instead ([Šajin, 2024](#)).

The CAP's green architecture also includes eco-schemes – direct payments for environmentally friendly practices that go beyond the conditionality imposed by the CAP, and which are voluntary for farmers. These schemes differ greatly across the EU, as they are designed by Member States, which are expected to adapt them to the particular characteristics and priorities of their agriculture. They were required to set aside 25 % of their allocations for direct payments for this purpose. Italy is among the Member States with the highest financial allocation to eco-schemes (EUR 4.4 billion). Lithuania and Flanders-Belgium with less UAA (Utilised Agricultural Area) allocated EUR 753,1 million and EUR 261,4 million respectively.

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<sup>1</sup> REPORT FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT AND THE COUNCIL, *Summary of CAP Strategic Plans for 2023-2027: joint effort and collective ambition*, COM(2023) 707 final.

<sup>2</sup> ONTWERP 7DE ACTIEPROGRAMMA IN UITVOERING VAN DE NITRAATRICHTLIJN (ONTWERP-MAP 7) [https://www.vlm.be/nl/SiteCollectionDocuments/Mestbank/Algemeen/MAP7/Ontwerp\\_7de\\_actieprogramma\\_Vlaanderen.pdf](https://www.vlm.be/nl/SiteCollectionDocuments/Mestbank/Algemeen/MAP7/Ontwerp_7de_actieprogramma_Vlaanderen.pdf)

<sup>3</sup> Regulation (EU) 2024/1468 of the European Parliament and of the Council of 14 May 2024 amending Regulations (EU) 2021/2115 and (EU) 2021/2116 as regards good agricultural and environmental condition standards, schemes for climate, environment and animal welfare, amendment of the CAP Strategic Plans, review of the CAP Strategic Plans and exemptions from controls and penalties.

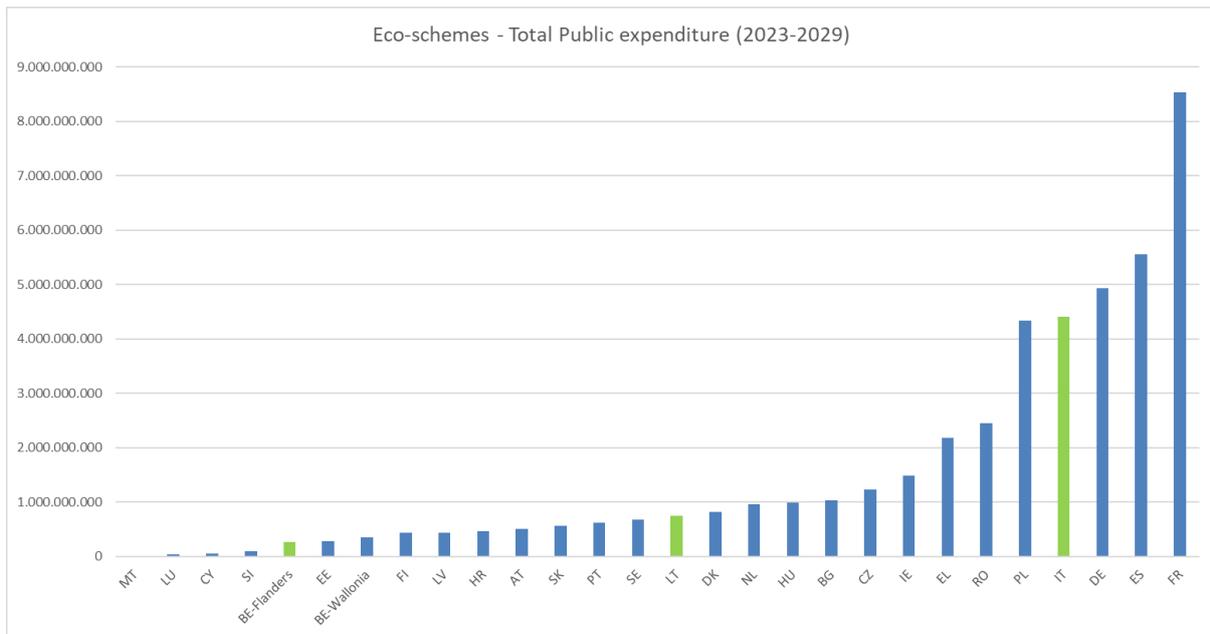


Figure 6: Financial allocation to Eco-schemes by Member State (CSP 2023-2027 ; payments possible until 2029 under N+2), planned public expenditure in current prices (million EUR) - Data from [Catalogue of CAP interventions](#).

Under rural development, at least 35% of funds are allocated to measures to support climate, biodiversity, environment and animal welfare. The interventions that support these objectives are environmental, climate-related and other management commitments (ENVCLIM), sustainable forest management, investments, cooperation, knowledge transfer and other farming activities that contribute to climate action, the sustainable management of natural resources and biodiversity.

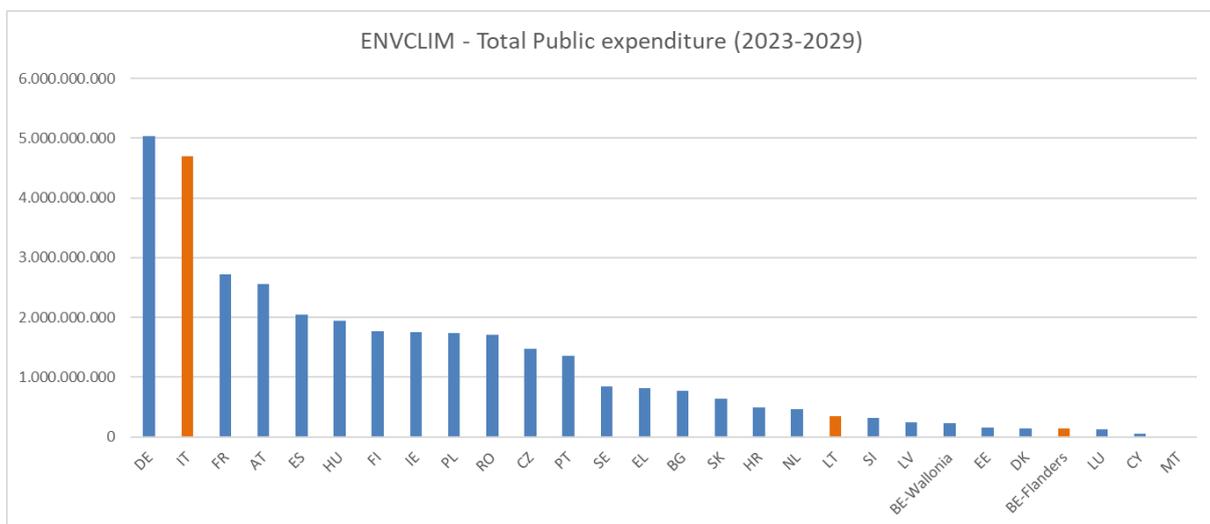


Figure 7: Financial allocation to AECC by Member State (CSP 2023-2027; payments possible until 2029 under N+2), planned public expenditure in current prices (million EUR) - Data from [Catalogue of CAP interventions](#)

The CAP supports sustainable forestry through various types of interventions, aiming toward the environmental, social, and economic sustainability of forestry areas. The forestry interventions are specifically mentioned as contributing to implementing the 'New EU Forest Strategy for 2030' and expanding the use of agroforestry systems. These interventions are expected to be based on Member States' national or subnational forest programmes or equivalent instruments, aligning with commitments on greenhouse gas emissions and removals from land use, land use change, and forestry. Specifically, Article 70 allows for support for management commitments, including forest environmental and climate services and forest conservation, as well as premiums for forests and the establishment of agroforestry systems. Article 73 enables Member States to support investments in tangible and intangible assets that contribute to achieving CAP objectives, potentially including investments in the development,

modernisation, or adaptation to climate change of forestry, and the restoration of forestry potential following natural disasters. For larger holdings, support for the forestry sector may be conditional on presenting information from a forest management plan or equivalent instrument, in line with sustainable forest management principles. Result indicator R.30PR specifically monitors the share of forest land under commitments to support forest protection and management of ecosystem services (Figure 8).

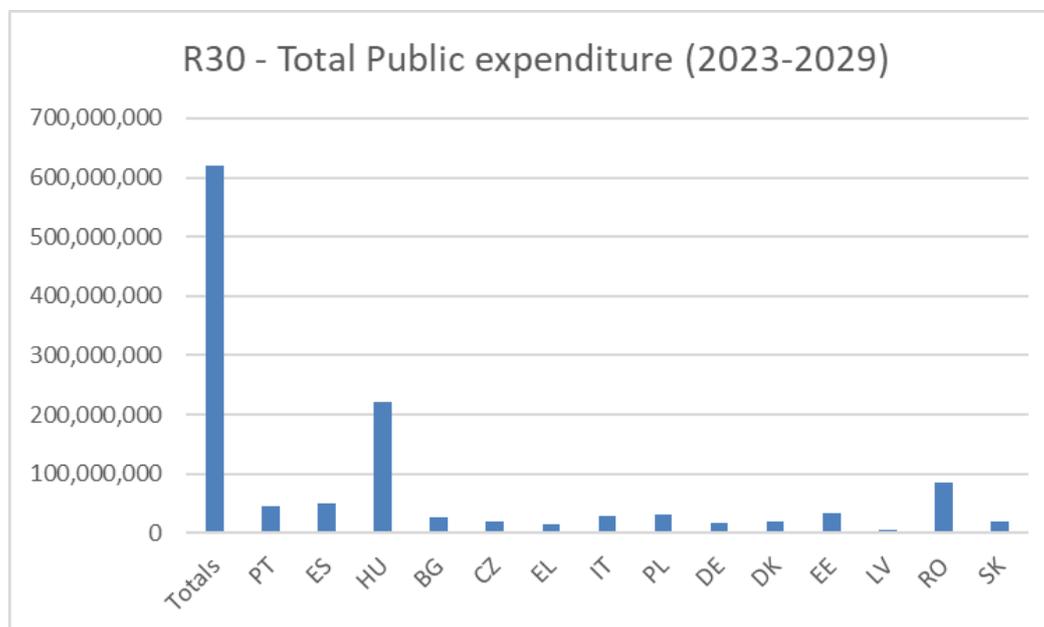


Figure 8: Financial allocation to R.30 (share of forest land under commitments to support forest protection and management of ecosystem services) by Member State, (CSP 2023-2027; payments possible until 2029 under N+2), planned public expenditure in current prices), (million EUR) - Data from [Catalogue of CAP interventions](#).

### 3.3.3. European Green Deal: Key Strategies Shaping Agriculture and Forestry

The European Green Deal (EGD) is the EU's overarching growth strategy for climate neutrality by 2050 while promoting sustainable economic growth and protecting the environment and citizens' well-being. It is closely linked to the United Nations Sustainable Development Goals (SDGs) of the 2030 Agenda, sharing common objectives related to environmental, social, and economic sustainability. The EGD consists of several new policies and amended legislation across seven thematic areas, outlining a detailed roadmap for sustainable development in Europe (Marelli et al., 2025).

In February 2025, the Commission presented its Vision for Agriculture and Food<sup>4</sup> (Vision), an ambitious roadmap on the future of farming and food in Europe. The Vision sets the stage for an attractive, competitive, resilient, future-oriented and fair agri-food system for current and future generations. The European Green Deal is not explicitly mentioned in the Vision, nor is it related to the agriculture and food Strategies. However, the Vision seems to embrace and support the core objectives and ambitions often associated with the European Green Deal by placing sustainability at the heart of its vision for 2040. It is explicitly focused on creating an agri-food system that is "functioning within planetary boundaries" and where farming and the food sector "contribute together to the EU's climate objectives". This includes the

<sup>4</sup> COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS A Vision for Agriculture and Food Shaping together an attractive farming and agri-food sector for future generations, [COM/2025/75 final](#).

ambition for the EU to be climate neutral by 2050, with the agri-food sector expected to contribute to achieving emissions cuts in alignment with EU climate targets for 2030 and pathways for the 2040 target.

The Vision emphasises that the sector must work "hand in hand with nature", focusing on "preserving healthy soils, clean water and air, and protecting and restoring Europe's biodiversity". It highlights that farming is fundamentally about "working with nature" and positions farmers and fishers as "custodians of nature" who are vital to its protection and resilience. The growing organic sector and agroecological farming practices are mentioned as attractive options for younger farmers, combining economic possibilities with environmental results and social responsibility. At the same time, the ecological transition must carefully integrate economic and implementation challenges, as well as the need for a just transition in social terms.

Key areas of focus, such as climate action through emission reduction and carbon removals, reducing dependencies on imported inputs like fertilisers and promoting low-carbon alternatives and recycled nutrients, incentivising sustainability, providing tools for nature-friendly farming, reducing harmful pesticides, and improving water and nutrient management, are all central themes of environmental sustainability efforts often framed under the Green Deal.

The thematic areas of the EGD most related to sustainable agriculture and sustainable forestry are the following (Figure 9):

- A fair, healthy and environmentally friendly food system
- Preserving and restoring ecosystems and biodiversity
- EU's climate ambition
- A zero pollution ambition for a toxic-free environment

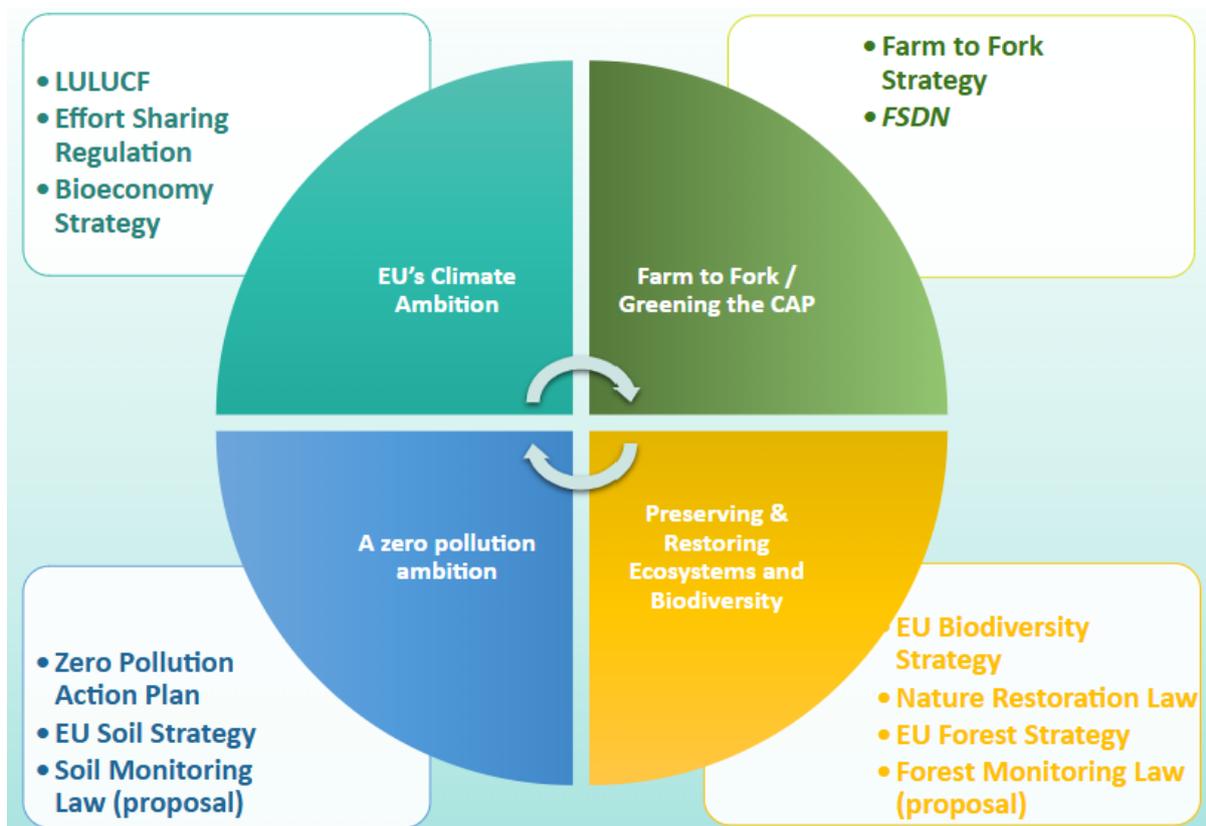


Figure 9: Thematic Areas of the EGD related to sustainable agriculture and forestry.

### 3.3.3.1. *A fair, healthy and environmentally friendly food system*

**Farm to Fork Strategy (F2F)**<sup>5</sup> lies at the heart of the EGD and aims to make food systems fair, healthy, and environmentally friendly across the entire value chain. It sets quantitative, but not binding, 2030 targets highly relevant to farmers: a 50% reduction in the use and risk of chemical pesticides, a 50% reduction in nutrient losses (leading to a reduction in fertiliser use by about 20%), a 50% cut in sales of antimicrobials for farmed animals, and achieving 25% of EU agricultural land under organic farming. The F2F strategy supports sustainable agriculture and aims to achieve its targets through various means, mainly through the national CSPs. The European Commission also adopted recommendations to each Member State addressing the specific objectives of the CAP, to implement F2F-specific actions within these plans. Furthermore, the F2F strategy promotes research, innovation, technology, and investments in sustainable agriculture, aiming to strengthen the European Innovation Partnership's "Agricultural Productivity and Sustainability" (EIP-AGRI) role in the CSPs. It also promotes adopting integrated pest management (IPM), encouraging techniques like crop rotation, mechanical weeding, and organic farming. The strategy also supports the development of new green business models such as carbon farming, which rewards farmers for practices that remove CO<sub>2</sub> from the atmosphere, providing a new source of income and helping other sectors decarbonise. It also recognises farmers' central role and calls for substantial CAP support to help them adopt agro-ecological practices.

Finally, the F2F strategy involved revising the rules on the sustainable use of plant protection products as a core element to reach its targets. On 22 June 2022, the Commission proposed a regulation on the sustainable use of pesticides, which would repeal and replace Directive 2009/128/EC. The proposal set at the EU level legally binding targets to reduce by 50 % the use and the risk of chemical pesticides, as well as the use of the more hazardous pesticides, by 2030. The proposal would also ban the use of all pesticides in sensitive areas (and within three metres of those areas). In this framework, Member States would have the flexibility in setting their binding national reduction targets. However, the Commission withdrew its proposal due to the Parliament's rejection of the text and the lack of progress in Council discussions in May 2024.

The European Environmental Agency, in its report aiming to assess the EU policy mix governing Europe's food system, suggests that the inconsistencies in policy goals and instruments of the food policy instruments (CAP, Common Fisheries Policy (CFP), and F2F Strategy) create ambiguities about the desired direction of change toward sustainability. The report notes that the F2F Strategy frequently refers to "sustainable agriculture," but this concept is open to varying interpretations, leading to mixed signals for stakeholders (EEA, 2022).

Marelli et al., (2025) assessed progress against seven key quantifiable targets extracted from the Farm to Fork Communication. The sources clarify that 100% of these seven targets are not legally binding and originate from the Communication. To provide a more comprehensive view of the EU food system, the report also includes insights on an additional 25 objectives, drawing on indicators from the [EU Food System Monitoring Framework](#) (Caivano et al., 2023). Regarding the seven quantifiable targets, the report indicates that acceleration is needed for 70% of them. Progress is described as ongoing, but is impeded by data gaps and the unpredictability of specific components related to greenhouse gas emissions in the food system. Insights from the additional indicators point to mixed but largely insufficient progress. While some pressures (e.g., antimicrobial sales, pesticide use and fishing pressure) are declining, energy use in agriculture and the food industry and the environmental footprint of EU food consumption continue to rise, employment in the agrifood sector is structurally decreasing, and shifts towards healthier and more plant-based diets remain limited.

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<sup>5</sup> COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS A Farm to Fork Strategy for a fair, healthy and environmentally-friendly food system, COM/2020/381 final. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52020DC0381>

Implementation faces several challenges, including political and institutional barriers, such as policy trade-offs concerning land and forest use. The objectives of the F2F strategy, such as increasing organic farming and reducing pesticide/fertiliser use, potentially increase competition for land. The transition is also challenged by behavioural resistance to changing traditional farming practices, socio-economic issues like an ageing workforce and declining rural employment, a noted policy and ambition gap due to the absence of a planned legislative framework for a sustainable food system, and personal choices influenced by income and food affordability (Marelli et al., 2025).

Despite these challenges, initiatives are progressing. The Nature Restoration Law entered into force in August 2024. A package of proposals addressing natural resource use, including targets for food waste and a soil monitoring law, was published in July 2023. A "Strategic Dialogue on the future of agriculture" was launched in January 2024 to involve stakeholders in shaping the future of EU farming and food systems. Member States' CAP Strategic Plans provide initial qualitative indications of combined efforts towards CAP objectives.

The **FSDN Regulation**, established by Regulation (EU) 2023/2674<sup>6</sup> represents a significant shift from the former Farm Accountancy Data Network (FADN). The core objective is to create a Farm Sustainability Data Network (FSDN) for the collection and analysis of farm-level data encompassing economic, environmental, and social dimensions of sustainability. This expanded data collection aims to support the development of evidence- and performance-based policies, analyse agricultural sectors, and gauge progress towards sustainability goals. The FSDN will continue to rely on data collectors in each Member State. The regulation explicitly mentions the need to comply with the General Data Protection Regulation (GDPR) and the General Data Protection Regulation (EUDPR) regarding the processing of personal data.

The conversion of the FADN to the FSDN is a direct response to the Farm to Fork Strategy, where the European Commission announced its intention to collect farm-level data on sustainability to align with the objectives of the EGD. One key feature introduced by the FSDN regulation is the benchmarking of farm performance against regional, national, Union, or sectoral averages. This benchmarking tool aims to provide valuable feedback to farmers in order to facilitate the management of their holdings and improve their sustainable agricultural practices. The publication of results and the use of data for benchmarking or advice purposes will be made publicly available as aggregated and anonymised data.

The new Vision for Agriculture and Food<sup>7</sup> also emphasises sustainability and includes a proposal for a voluntary benchmarking system for on-farm sustainability assessments. This system is referred as 'On-farm Sustainability Compass'. The Sustainability Compass should act as a one-stop-shop that streamlines reporting and reduces administrative burdens for farmers, allowing them to monitor and record sustainability data only once. Secondly, it will support farmers in gradually adopting more sustainable practices and attracting new sources of financing. It will allow them to measure better, benchmark their sustainability performance, and demonstrate their provision of ecosystem services through easier data sharing. Thirdly, improved measurement and reporting can help design public policies in a proportionate way.

The FSDN's established data collection mechanisms and its focus on economic, environmental, and social sustainability data at the farm level can provide the necessary data inputs for the 'Sustainability Compass' or similar benchmarking tools. Therefore, the FSDN provides a concrete framework and data infrastructure that underpins the broader sustainability assessment and benchmarking goals outlined in the Vision for Agriculture.

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<sup>6</sup> REGULATION (EU) No 2023/2674. amending Council Regulation (EC) No 1217/2009 as regards conversion of the Farm Accountancy Data Network into a Farm Sustainability Data Network, OJ L, 2023/2674, 29.11.2023.

<sup>7</sup> COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS 'A Vision for Agriculture and Food Shaping together an attractive farming and agri-food sector for future generations', COM(2025) 75 final. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52025DC0075>

### 3.3.3.2. Preserving and restoring ecosystems and biodiversity

The **EU Biodiversity Strategy for 2030**<sup>8</sup>, a key pillar of the European Green Deal, aims to bring nature back into our lives and ensure that Europe's biodiversity is on a path to recovery by 2030, benefiting people, the planet, climate, and the economy. It addresses the five main drivers of biodiversity loss, enhances the governance framework, and ensures full implementation of EU legislation. The strategy recognises that current protection and restoration efforts have been insufficient.

To achieve its aims, the Biodiversity Strategy sets out a number of key commitments and targets for 2030, many of which are now being implemented through legislative and non-legislative actions. These include:

- Legally protecting a minimum of 30% of the EU's land area and 30% of the EU's sea area. The EU has so far reached 26% of terrestrial protected areas and 12% of marine protected areas. Progress needs to accelerate to meet the 30% target for both land and sea.
- Strictly protecting at least a third of the EU's protected areas, including all remaining EU primary and old-growth forests. Strict protection of primary and old-growth forests is planned to begin in 2029. Currently, an independent scientific assessment shows that only 3.5% of protected areas are strictly protected.
- Effectively managing all protected areas, defining clear conservation objectives and measures, and monitoring them appropriately. Indicators are lacking to fully assess the effective management of protected areas.
- Restoring significant areas of degraded and carbon-rich ecosystems, ensuring habitats and species show no deterioration in conservation trends and status, and at least 30% reach favourable conservation status or at least show a positive trend. This target is shared with the Nature Restoration Law.
- Restoring at least 25,000 km of free-flowing rivers. The JRC and EEA are developing an indicator to track progress, but no data is yet available.
- Reversing the decline of pollinators. Based on the grassland butterfly index, pollinators are still declining. The Nature Restoration Law also sets an obligation to improve pollinator diversity and reverse their decline by 2030.
- Reducing the risk and use of chemical pesticides by 50%, and reducing the use of more hazardous pesticides by 50%. The use and risk of chemical pesticides decreased by 33% between 2015-2017 and 2020, suggesting the first part of the target can be achieved. However, the use of more hazardous pesticides only fell by 21% by 2021, making the 50% reduction challenging.
- Ensuring at least 10% of agricultural area is under high-diversity landscape features. Currently, at the EU level, 5.6% of agricultural land is covered by landscape features, but data on high-diversity features and temporal trends is lacking. The Nature Restoration Law also aims for an increasing trend in the share of agricultural land with high-diversity landscape features.
- Having at least 25% of agricultural land under organic farming management, and significantly increasing the uptake of agro-ecological practices. Progress is being made, with organic farming increasing from 5.6% to 9.1% between 2012 and 2020, but an annual growth rate of 9.3% is

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<sup>8</sup> COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS 'EU Biodiversity Strategy for 2030, Bringing nature back into our lives', COM(2020) 380 final. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52020DC0380>

needed to meet the 25% target by 2030. An Action Plan on organic farming aims to stimulate supply and demand.

- Reducing nutrient losses from fertilisers by 50%, resulting in a reduction of fertiliser use by at least 20%.
- Addressing land take and restoring soil ecosystems: Achieving no net land take by 2030, as outlined in the EU Soil Strategy for 2030.
- Making significant progress in the remediation of contaminated soil sites. Progress in remediation varies considerably across Member States.

The Biodiversity Strategy is designed to work in conjunction with other initiatives such as the Farm to Fork Strategy, with which it shares several targets, the new EU Forest Strategy, the Common Agricultural Policy (CAP), and the new EU Soil Strategy. The Nature Restoration Law is a key legal instrument to fulfil the objectives of the Biodiversity Strategy, setting binding targets for the restoration of ecosystems across land and sea, including agricultural ecosystems and forests.

A new European biodiversity governance framework has been established to map obligations, set out a roadmap for implementation, and establish a monitoring and review mechanism with agreed-upon indicators. This mechanism will feed into the Environmental Implementation Review and the European Semester. The strategy also recognises the need for significant public and private investments, aiming to unlock at least €20 billion a year for spending on nature. It promotes the integration of biodiversity considerations into business decision-making and supports the development of a European Business for Biodiversity movement. Furthermore, it emphasises the EU's role in the global biodiversity agenda, aiming for an ambitious post-2020 global framework under the Convention on Biological Diversity. Despite progress in some areas, significant challenges remain in fully implementing biodiversity and nature restoration initiatives. These include insufficient funding, incomplete uptake of EU policy instruments by Member States, data gaps, and behavioural barriers. Progress towards many targets needs to be accelerated. The EU Biodiversity Strategy for 2030 impacts sustainable agriculture and sustainable forest management.

In the realm of sustainable agriculture, the strategy works in conjunction with the Farm to Fork Strategy and the Common Agricultural Policy (CAP) to promote a transition towards sustainable agricultural practices. A key target is a 50% reduction in the use and risk of chemical pesticides and more hazardous pesticides by 2030. The strategy also aims to increase the area of agricultural land under organic farming to at least 25% by 2030. Furthermore, the strategy targets the return of at least 10% of agricultural area to high-diversity landscape features to support wild animals, plants, pollinators, and natural pest regulators. The Nature Restoration Law, a key legal instrument, reinforces these aims by setting targets for improving biodiversity in agricultural ecosystems through indicators such as the grassland butterfly index, stock of organic carbon in cropland mineral soils, and share of agricultural land with high-diversity landscape features. Member States are required to put measures in place to achieve an increasing trend in at least two of these three indicators by 2030. The strategy also includes a target to reduce nutrient losses from fertilisers by 50%, resulting in at least a 20% reduction in fertiliser use. Achieving these reduction targets remains challenging and requires acceleration. The strategy recognises the importance of reversing the decline of pollinators, with the Nature Restoration Law setting an obligation to improve pollinator diversity and reverse their decline by 2030.

Regarding sustainable forestry, the Biodiversity Strategy sets the ambitious goal of strictly protecting all remaining EU primary and old-growth forests. This target is shared with the New EU Forest Strategy. Strict protection is planned to begin in 2029. The strategy also includes a commitment to plant at least three billion additional trees in the EU by 2030, with full respect to ecological principles, to increase the quantity, quality, and resilience of forests. The Nature Restoration Law aims to contribute to this commitment. The strategy promotes biodiversity-friendly forestry practices, such as closer-to-nature forestry. Member States are required to achieve an increasing trend in the common forest bird index and at least six out of seven

indicators including standing and lying deadwood, share of forests with uneven-aged structure, forest connectivity, common forest bird index, stock of organic carbon, share of forests dominated by native tree species, and tree species diversity. The New EU Forest Strategy for 2030, linked to the Biodiversity Strategy, emphasises the multifunctional role of EU forests and aims to increase the share of forest areas covered by management plans. The Land Use, Land Use Change and Forestry (LULUCF) regulation also plays a role by accounting for emissions and removals from forest land and setting targets for increasing CO<sub>2</sub> uptake. Policy trade-offs between using land and forest biomass for bioenergy and preserving forests as long-term carbon sinks and biodiversity reservoirs can complicate progress.

Marelli et al. (2025) consider 33 quantifiable targets extracted from policy documents, including the Nature Restoration Law and communications, in the thematic area of 'preserving and protecting biodiversity'. Some biodiversity targets were originally from communications but have been turned into binding targets by the Nature Restoration Law. Many targets from the Nature Restoration Law currently lack the indicators or data needed to quantify progress, although Member States may use alternative datasets in their National Restoration Plans. Regarding specific biodiversity targets, Marelli et al. (2025) note that the target on the 'Use and risk of chemical pesticides', which is common to both the Farm to Fork and Biodiversity strategies, shows a decrease of 33% from the 2015-2017 baseline to 2021, suggesting the first part of the 50% reduction target by 2030 can be achieved. However, for the use of more hazardous pesticides, there was a 21% decrease between 2015-2017 and 2021, but an increase between 2020 and 2021, indicating that achieving the 50% reduction target by 2030 remains challenging. Despite improvements in some areas, biodiversity in the EU continues to decline and shows deteriorating trends. Most habitats protected under the Habitats Directives are in an unfavourable conservation status. Key implementation challenges include human activities causing environmental pressures, insufficient funding for mitigation, persistence of data gaps, and the fact that Member States have not fully adopted EU policy instruments.

The **Nature Restoration Law**<sup>9</sup> is a key component of the European Green Deal and the EU Biodiversity Strategy for 2030. The regulation sets out overarching objectives and specific targets for the restoration of degraded ecosystems, aiming to contribute to climate change mitigation and adaptation, enhance food security, and meet the Union's international commitments. It is the primary legal instrument to fulfil the objectives of the EU Biodiversity Strategy for 2030, focusing on species and ecosystem restoration. It aims to put the EU's biodiversity on a path to recovery by 2030, with a longer-term vision of all ecosystems being restored, resilient, and adequately protected by 2050.

The regulation sets several binding restoration targets and obligations across a broad range of ecosystems:

- Member States must put in place restoration measures for at least 20% of the EU's land and 20% of EU sea areas by 2030, and all ecosystems in need of restoration by 2050.
- Member States must implement measures to improve the condition of degraded habitats listed in Annex I of the regulation (which aligns with the Habitats Directive) on at least 30% by 2030, 60% by 2040, and 90% by 2050 of the total area of each group of habitat types not in good condition. They must also re-establish these habitat types on at least 30% of the additional overall surface needed to reach their favourable reference area by 2030, 60% by 2040, and 100% by 2050. Priority should be given to restoration measures in Natura 2000 sites until 2030.
- Member States have an obligation to reverse the decline of pollinator populations by 2030 and achieve an increasing trend thereafter until satisfactory levels are reached.
- Non-Deterioration: Member States should endeavour to prevent the significant deterioration of areas with habitat types in good condition or necessary to meet restoration targets.

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<sup>9</sup> Regulation (EU) 2024/1991 of the European Parliament and of the Council of 24 June 2024 on nature restoration and amending Regulation (EU) 2022/869, OJ L, 2024/1991, 29.7.2024, <http://data.europa.eu/eli/reg/2024/1991/oj>

- National Restoration Plans: Member States are required to develop national restoration plans within two years of the law's entry into force, outlining how they will achieve these targets at the national level. These plans will include a quantification of areas to be restored, a description of measures, timelines, monitoring plans, and financing needs. The Commission will assess these plans.

The Nature Restoration Law includes specific provisions aimed at enhancing biodiversity in agricultural ecosystems and supporting sustainable agriculture:

- Member States must implement measures to achieve an increasing trend at the national level in at least two out of three indicators by 2030, measured every six years thereafter until satisfactory levels are reached. These indicators are the grassland butterfly index, the stock of organic carbon in cropland mineral soils, and the share of agricultural land with high-diversity landscape features. Member States may develop their methodology to complement the EU-wide method for monitoring high-diversity landscape features.
- The law sets targets for the common farmland bird index to be reached by 2030, 2040, and 2050, with different levels for Member States with historically more and less depleted populations.
- Specific targets are established for restoring organic soils in agricultural use, constituting drained peatlands. Member States must put measures in place on at least 30% of such areas by 2030 (with at least a quarter rewetted), 40% by 2040 (at least a third rewetted), and 50% by 2050 (at least a third rewetted). There is flexibility in counting the restoration and rewetting of drained peatlands in peat extraction sites and, to a certain extent, under other land uses towards these targets. Member States can also reduce the extent of rewetting in duly justified cases with considerable negative impacts, provided it's not feasible to rewet peatlands under other land uses. The law clarifies that the obligation for rewetting targets does not directly oblige farmers and private landowners to rewet their land.
- The law acknowledges the role of the Common Agricultural Policy (CAP) in supporting environmental protection and biodiversity. Synergies between the national restoration plans and the national CAP strategic plans should be considered.
- An "emergency brake" allows for the temporary suspension of relevant provisions on the restoration of agroecosystems by the Commission in case of exceptional events outside EU control with severe impacts on land availability needed for sufficient food production.

The Nature Restoration Law also includes provisions to enhance biodiversity in forest ecosystems:

- Member States must achieve an increasing trend at the national level of the common forest bird index by 2030, and every six years thereafter until satisfactory levels are reached. This aligns with a target in the Biodiversity Strategy.
- Member States must also aim to achieve an increasing trend at the national level in at least six out of seven indicators in forest ecosystems by 2030, chosen based on their ability to demonstrate enhanced biodiversity. These indicators include: standing deadwood, lying deadwood, share of forests with uneven-aged structure, forest connectivity, stock of organic carbon, share of forests dominated by native tree species, and tree species diversity.
- When identifying and implementing restoration measures for various ecosystems, Member States should aim to contribute to the commitment of planting at least three billion additional trees by 2030 at the Union level, in full respect of ecological principles. This is a target shared with the Biodiversity Strategy.
- The law acknowledges the New EU Forest Strategy for 2030, which also outlines the need to restore forest biodiversity and reinforces sustainable forest management for climate adaptation and forest resilience.

Overall, the Nature Restoration Law represents a significant step towards achieving the goals of the European Green Deal. It sets legally binding targets for ecosystem restoration across various sectors, including agriculture and forestry, requiring Member States to develop and implement national plans to achieve these objectives. While aiming to enhance biodiversity and ecosystem resilience, the law also includes flexibilities and considerations for socio-economic factors and food security.

The European Union approaches forests through the lens of the European Green Deal's objectives regarding climate neutrality and biodiversity protection. The **EU Forest Strategy for 2030**<sup>10</sup>, adopted in 2021, is a cornerstone policy of the [European Green Deal](#) that aligns forestry with its sustainability goals and builds on the [EU biodiversity strategy for 2030](#). It seeks to improve both the quantity and quality of EU forests and recognises their multifunctionality – they provide raw materials, jobs, and recreation, but also critical ecosystem services like carbon sequestration, water regulation, and habitats for species. It promotes sustainable forest management in ways that strengthen their biodiversity, health, and resilience while still providing economic and social benefits. Key elements include increasing EU forest coverage (afforestation and reforestation initiatives), enhancing biodiversity in forests (e.g., encouraging “close-to-nature” forestry and mixed-species plantings), and strengthening forest protection against threats like wildfires, pests, and climate change. Notably, the strategy calls out certain close-to-nature silvicultural practices as exemplary for sustainable forest management. For instance, it highlights uneven-aged and continuous-cover forestry – alongside measures like increasing deadwood and preserving habitat trees – as essential for long-term ecosystem viability and resilience. By maintaining continuous canopy and structural diversity, such practices support biodiversity and climate adaptation in managed forests. The EU Forest Strategy also cautions against intensive practices: it states that clear-cutting should be used only in duly justified cases given its negative impacts on biodiversity and soil carbon, and urges leaving stumps and roots in place to protect forest soils. This marks a significant policy signal favoring sustainable forest management practices at the EU level.

Although the EU cannot dictate national forest management regimes by law, it uses guidance and incentives to encourage a shift toward sustainable forest management practices. A key initiative under the Forest Strategy is the development of Guidelines for Closer-to-Nature Forest Management<sup>11</sup>. The European Commission, in collaboration with Member States, is formulating criteria and indicators for what constitutes “closer-to-nature” practices – which essentially encompass continuous-cover forestry principles like avoiding large clear-cuts, increasing mixed species and ages, and working with natural processes. Building on these guidelines, the Commission plans to launch a voluntary certification scheme to reward and label forests managed with the most biodiversity-friendly methods. The idea is to create an EU quality label for climate- and biodiversity-friendly forestry, that recognises and credibly certifies forest owners using continuous-cover forestry or similar sustainable practices, with the aim of strengthening market differentiation and enabling potential price premiums for sustainably managed forest products..

The strategy also aims to develop a new EU Forest Monitoring framework with more precise data on forest condition. The European Commission's proposed **Forest Monitoring Regulation**<sup>12</sup>, introduced on 22 November 2023, aims to establish a harmonised framework for monitoring forests across the EU. The proposal aims to address critical gaps in forest data that currently hinder effective policymaking and sustainable forest management. The proposal focuses on creating an integrated monitoring system that tracks parameters related to EU policy priorities such as climate change, biodiversity, invasive species, and forest health. It proposes the use of advanced technologies like Earth Observation and ground-based measurements to ensure high-quality, standardised data collection and sharing. It includes three key components: a geographically explicit mapping system, a data collection framework with clear timing and requirements, and a data-sharing mechanism to facilitate access across member states. The legislative

<sup>10</sup> *Communication from the European Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions 'New EU Forest Strategy for 2030', COM(2021) 572 final.*

<sup>11</sup> *European Commission: Directorate-General for Environment, Guidelines on closer-to-nature forest management, Publications Office of the European Union, 2023, <https://data.europa.eu/doi/10.2779/731018>*

<sup>12</sup> *Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on a monitoring framework for resilient European forests, COM(2023) 728 final.*

process is being actively negotiated within EU institutions. The European Parliament's ENVI and AGRI committees have held multiple discussions and hearings on the proposal. In the Council, progress has been slower due to concerns from member states about administrative burdens, costs, and the feasibility of satellite-based monitoring. Despite these challenges, there is broad agreement on the need for harmonised forest monitoring to support EU environmental goals. Member states have called for greater flexibility and reliance on existing national systems to avoid excessive complexity.



Figure 10: EU forest Strategy objectives (European Commission, 2021) retrieved from <https://data.europa.eu/doi/10.2775/706146>

While forestry policy largely remains a Member State competence, the EU Forest Strategy provides a cooperative framework. It can mobilise funding through the CAP rural development for forest interventions, as well as programs like LIFE for nature conservation in forests. The strategy suggests developing carbon farming mechanisms to reward forest owners for carbon sequestration, for instance, via future carbon credit markets or CAP payments for enhanced carbon storage. Actions like planting new forests, preventing deforestation, and improving management will contribute. It also complements the Biodiversity Strategy by focusing on forest ecosystems and ties into climate goals, linking with the LULUCF regulation under Fit for 55. Notably, it endorses the LULUCF goal of enhancing the EU's forest carbon sink (the Fit for 55 LULUCF target is to reach 310 Mt CO<sub>2</sub> removals by 2030).

### 3.3.3.3. EU's climate ambition

The EU has put in place a comprehensive set of climate change policies, including its first-ever Climate Law<sup>13</sup> to become climate-neutral by 2050. In 2023, the EU adopted a set of proposals to make the EU's climate, energy, transport, and taxation policies fit for reducing net GHG emissions by at least 55% by 2030, compared to 1990 levels. The 'European Climate Law' also recognised the need to enhance the

<sup>13</sup> Regulation (EU) 2021/1119 of the European Parliament and of the Council of 30 June 2021, Establishing the framework for achieving climate neutrality and amending Regulations (EC) No 401/2009 and (EU) 2018/1999 ('European Climate Law'), vol. 243. 2021. <http://data.europa.eu/eli/reg/2021/1119/oj/eng>

EU's carbon sink. The laws that are more relevant to the agriculture and forestry sectors are the **Land Use, Land-Use Change and Forestry (LULUCF) Regulation**<sup>14</sup> and the **Effort Sharing Regulation (ESR)**. Fit for 55 also revises the Renewable Energy Directive, which, inter alia, affects the use of biomass from agriculture and forests, requiring it to meet sustainability criteria. Fit for 55 brings climate accountability in the agriculture and forestry sectors. They are now integrated into the EU's emission budgeting, pushing national policies to include climate-smart farming (like methane reduction strategies) and climate-resilient forestry.

The **Land Use, Land-Use Change and Forestry (LULUCF) Regulation** sets out rules for including GHG emissions and removals from the LULUCF sector within the Union's climate and energy framework. It establishes commitments for Member States regarding this sector, contributing to the objectives of the Paris Agreement and the Union's GHG emission reduction targets. For 2021 to 2025, Member States must ensure that GHG emissions from the LULUCF sector do not exceed their removals. The regulation also sets a 2030 Union target for net GHG removals in the LULUCF sector. A recent revision of the LULUCF Regulation has increased the overall net GHG emission reduction target for 2030 to 57 %, up from 55 % required by the European Climate Law, largely due to a new EU target for carbon dioxide removals in the LULUCF sector, set at 310 million tonnes of CO<sub>2</sub> equivalent (Mt CO<sub>2</sub>e).

Regarding sustainable agriculture, the LULUCF Regulation includes accounting for land use reported as cropland, grassland, wetlands, settlements, or other land, including conversions between these categories. Starting in 2026, wetland areas will become a specific reporting category. Agro-ecology and agro-forestry in the agricultural sector are seen as beneficial to achieving LULUCF targets, and they are supported, along with other sustainable agricultural practices, through the CAP. The Nature Restoration Law contains provisions relevant to the restoration of agricultural ecosystems. Member States are expected to implement measures aiming to increase trends in indicators like the grassland butterfly index and the share of agricultural land with high-diversity landscape features. There are also targets for the restoration of organic soils in agricultural use, particularly drained peatlands.

For sustainable forestry, the regulation focuses on emissions and removals from managed forest land. Each Member State accounts for these based on its forest reference level, which is based on the continuation of sustainable forest management practices documented between 2000 and 2009. This reference level takes into account the future impact of dynamic age-related forest characteristics to avoid unduly constraining forest management intensity, to maintain or strengthen long-term carbon sinks. The regulation also addresses accounting for harvested wood products. To achieve the LULUCF's targets, Member States need to increase and protect forest cover, as forests deliver most carbon removals. Measures include afforestation, reforestation, and increasing resilience to natural disturbances like wildfires and pest outbreaks. The revision aims to reverse the declining trend in LULUCF removals by setting more ambitious goals for 2026-2030. However, achieving the revised LULUCF targets will likely require substantial changes in forest management.

The EU promotes sustainable forest management through the LULUCF Regulation and climate targets. Continuous cover forestry can help maintain higher carbon stocks in soil and biomass by avoiding large clear-cut emissions spikes, making it a tool for countries to meet these targets. The EU also provides funding for sustainable forest management via the CAP and other programs. CAP rural development funds can support afforestation, forest-environmental measures, or climate-friendly forestry pilots. Horizon Europe and LIFE projects further support innovation in forestry practices.

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<sup>14</sup> Regulation (EU) 2018/841 of the European Parliament and of the Council of 30 May 2018 on the inclusion of greenhouse gas emissions and removals from land use, land use change and forestry in the 2030 climate and energy framework, and amending Regulation (EU) No 525/2013 and Decision No 529/2013/EU.

The **Effort Sharing Regulation (ESR)**<sup>15</sup>, recently amended by Regulation (EU) 2023/857, lays down binding annual GHG emission reduction obligations for Member States for the period from 2021 to 2030. These obligations contribute to the Union's target of reducing its GHG emissions by 40 % below 2005 levels by 2030, in sectors not covered by the EU Emissions Trading System (ETS), like transport, buildings, agriculture, and waste. Each Member State has a specific target for reducing its overall GHG emissions in these sectors. Sustainable agricultural practices, that lead to a measurable reduction in GHG emissions involve changes in farming practices related to agro-ecology (crop rotation with leguminous crops) organic farming, precision farming, and other agricultural activities that release GHGs. The revised ESR has even set more ambitious national reduction targets, ranging from 10% to 50% compared to 2005 emissions, putting greater pressure on the agricultural sector to achieve significant emission cuts. While the ESR directly applies to emissions from agriculture, it does not apply to greenhouse gas emissions and removals covered by the LULUCF Regulation. The LULUCF Regulation addresses emissions and removals from land use activities, including forestry. It has its own set of targets with ambitious goals for 2026-2030, contributing to enhancing the EU's carbon sink. This includes the carbon dioxide that forests absorb from the atmosphere (removals) and the emissions that can occur from deforestation or changes in land use. Therefore, sustainable agriculture falls under the binding emission reduction targets of the ESR, and sustainable forestry is addressed through the separate but related LULUCF Regulation, both working towards the EU's broader climate objectives.

Marelli et al. (2025) indicate that the long-term EU forest sink is developing away from the LULUCF target, jeopardising its fulfilment. Natural disturbances are also expected to increase with ongoing climate change, which could potentially reduce the carbon sink further, making the situation even more difficult. The gap towards the 2030 target has widened; in 2020, the EU needed to improve its sink by -42 MtCO<sub>2</sub>e between 2016-2018 and 2030, but by 2024, this gap increased to -80 MtCO<sub>2</sub>e that the EU needs to improve between 2022 and 2030. Achieving these LULUCF targets will be difficult without substantial changes in forest management very soon, and it is considered very unlikely that the EU will achieve them. The size of the carbon sink is continuing to decrease.

Regarding sustainable agriculture and the Effort Sharing Regulation (ESR), Marelli et al. (2025) note that reducing non-CO<sub>2</sub> emissions is important for achieving the ESR targets, and agriculture accounts for around half of these non-CO<sub>2</sub> emissions. Progress in emission reduction in agriculture has been far too slow recently, remaining stable at the same level as ten years ago. The contribution to climate change mitigation under the Common Agricultural Policy (CAP) is largely qualitative, which might result in inconsistent CAP Strategic Plans by Member States with respect to EU climate goals. Nature restoration and Nature-Based Solutions should be better integrated into Member States' plans as they contribute to overarching removal targets by LULUCF.

The **Bioeconomy** is considered a catalyst for systemic change in Europe. A circular and sustainable bioeconomy has the potential to contribute to all dimensions and objectives of the European Green Deal, including producing fossil-free materials for a climate-neutral future and enhancing environmental and ecosystem protection. It encompasses biomass production, its conversion into food, bio-based materials and products (including biochemicals), and bioenergy. The bioeconomy generated a significant EUR 728 billion of value added and employed 17.2 million people in the EU in 2021, representing 5% of the EU's gross domestic product and 8.2% of its employment, indicating substantial growth potential (EC, 2024).

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<sup>15</sup> Regulation (EU) 2018/842 of the European Parliament and of the Council of 30 May 2018 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement and amending Regulation (EU) No 525/2013. <http://data.europa.eu/eli/reg/2018/842/2023-05-16>

The initial 2012 bioeconomy strategy<sup>16</sup> and its 2018 update<sup>17</sup> achieved progress in research and innovation, but policy fragmentation has hindered the EU's potential in this expanding market. Consequently, the 2025 Commission work programme<sup>18</sup> announces a new bioeconomy strategy by the end of 2025. This new strategy will aim to boost the EU's competitiveness and increase green jobs while promoting a bioeconomy that reconciles different biomass uses within ecological boundaries.

Future plans involve a new bioeconomy strategy that will focus on ensuring the long-term competitiveness of the EU bioeconomy and investment security by scaling up and commercialising biotech solutions and bio-based products. It will also aim to secure a competitive and sustainable supply of biomass domestically and from outside the EU, strengthening the role of primary producers and generating wealth in rural areas by creating jobs and diversifying incomes for private forest owners and farmers while rewarding them for ecosystem preservation. This aligns with the Vision for Agriculture and Food, which identifies the bioeconomy and circularity as key instruments for agriculture, forestry, and the entire food system to reduce external dependencies and diversify income sources. For sustainable agriculture, the bioeconomy strategy aims to help farmers close the innovation gap and succeed in the green transition by promoting innovation in primary production, increased circularity, and resource efficiency. It will also provide more diversified revenues for farmers. Regarding sustainable forestry, the strategy intends to strengthen the role of private forest owners, creating jobs and diversifying their incomes while rewarding them for ecosystem preservation. The strategy will also address barriers and identify drivers for bioeconomy innovations and solutions to reach the market, ultimately reducing pressure on limited resources. The Commission will continue to monitor the bioeconomy's development through the EU Knowledge Centre for Bioeconomy and the Bioeconomy Monitoring System and will assess the implementation of the proposed measures four to six years after the strategy's adoption.

#### 3.3.3.4. *A zero pollution ambition for a toxic-free environment*

The **Zero Pollution Action Plan (ZPAP)**<sup>19</sup>, adopted in 2021, is a key component of the European Green Deal, serving as a compass to integrate pollution prevention across all relevant EU policies. The Zero Pollution Action Plan specifically aims for a toxic-free environment by 2050, where air, water, and soil pollution are reduced to levels no longer considered harmful to health and natural ecosystems, respecting the planet's limits. To steer towards this long-term vision, the plan sets out concrete 2030 targets to significantly reduce pollution at its source.

Concerning soil, water, nature, and biodiversity, the Zero Pollution Action Plan establishes several key objectives. By 2030, the EU aims to reduce by 25% the EU ecosystems where air pollution threatens biodiversity (compared to 2005). It also targets a 50% reduction in nutrient losses to the environment (air, water, and soil), which is closely linked to preserving soil fertility. Furthermore, the plan aims to improve water quality by reducing waste, including a 50% reduction in plastic litter at sea and a 30% reduction in microplastics released into the environment by 2030. The importance of reducing pollution as a means of

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<sup>16</sup> COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS *Innovating for Sustainable Growth: A Bioeconomy for Europe*, COM/2012/060 final). <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52012DC0060>

<sup>17</sup> COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS *A sustainable Bioeconomy for Europe: Strengthening the connection between economy, society and the environment*, COM/2018/673 final. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52018DC0673>

<sup>18</sup> COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS *Commission work programme 2025 Moving forward together: A Bolder, Simpler, Faster Union*, COM/2025/45 final. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52025DC0045>

<sup>19</sup> COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS *Pathway to a Healthy Planet for All EU Action Plan: 'Towards Zero Pollution for Air, Water and Soil'*, COM/2021/400 final. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52021DC0400>

improving human health and protecting biodiversity is emphasized throughout the European Green Deal initiatives.

The Zero Pollution Action Plan supports sustainable agriculture and sustainable forestry. The target to reduce nutrient losses by 50% and the use and risk of chemical pesticides, including the more hazardous ones, by 50% by 2030 directly impacts agricultural practices, pushing towards more sustainable nutrient management and reduced reliance on chemical inputs. Similarly, the reduction in the sale of antimicrobials aims to combat antimicrobial resistance and reduce pollution from these sources. The plan also recognises the importance of addressing air pollution from agriculture. For sustainable forestry, while less directly targeted with specific quantitative goals in the action plan itself, the ambition to protect and restore biodiversity and reduce air pollution impacts on ecosystems are relevant. Furthermore, the emphasis on a toxic-free environment and reduced pollution contributes to healthier soil and water resources, which are fundamental for both sustainable agriculture and forestry. The Farm to Fork strategy, which is integrated with the Zero Pollution Action Plan and the Biodiversity Strategy, further drives the transition towards environmentally friendly food systems and sustainable land management practices.

The Zero Pollution Action Plan (ZPAP) is closely related to and interlinked with a range of existing and future laws and policies concerning agriculture and forestry. The plan serves as a compass to integrate pollution prevention across all relevant EU policies, including those specific to these sectors.

Regarding agriculture, the ZPAP is significantly connected to:

- The Farm to Fork (F2F) Strategy: This strategy, central to the European Green Deal, shares several key objectives with the ZPAP, particularly concerning the reduction of nutrient losses, the use and risk of chemical pesticides (including the more hazardous ones), and the sale of antimicrobials for farmed animals and in aquaculture. The ZPAP aims to support the concrete implementation of the F2F strategy. Several targets of the ZPAP directly mirror those of the F2F strategy. The analysis of progress towards the European Green Deal considers the F2F strategy and its targets.
- The Biodiversity Strategy: This strategy also has strong links to the ZPAP, especially concerning the reduction of pollution that harms biodiversity, such as air pollution threatening ecosystems and pollution from pesticides and nutrients. Some targets are shared between the Biodiversity Strategy and the F2F strategy, which are both relevant to the ZPAP.
- The Common Agricultural Policy (CAP): The measures adopted under the new CAP can contribute to achieving the zero pollution targets. The CAP Strategic Plans (CSPs) are expected to be consistent with and contribute to the Union's environmental and climate legislation and commitments, helping to meet the 2030 targets outlined in the F2F Strategy and the EU Biodiversity Strategy, both linked to the ZPAP. The ZPAP aims to make best use of the green architecture of the new CAP, especially via conditionality and eco-schemes. National advisory services for farmers are being developed to build capacity for less polluting practices, notably to reduce ammonia and nitrates emissions, supported by the Commission.
- The EU Soil Strategy for 2030 and the upcoming Soil Health Law directly address soil pollution, a key area of focus for the ZPAP. The lack of an EU legal framework for soil monitoring and reporting, which the upcoming soil health law will tackle, is highlighted in the context of the ZPAP.
- The Integrated Nutrient Management Action Plan (INMAP): This future plan, announced in both the F2F strategy and the ZPAP, will holistically address the long-standing environmental challenge of nutrient losses from agriculture, aiming to efficiently use the nutrients and reduce losses to air, water, and soil.
- The review of the Industrial Emissions Directive (IED) aims to curb ammonia emissions, a significant source of air pollution from agriculture.

- The Nitrates Directive addresses diffuse nitrate pollution from agricultural sources, which contributes to water pollution targeted by the ZPAP.

Regarding forestry, the ZPAP is interlinked with:

- The EU Biodiversity Strategy for 2030 and the New EU Forest Strategy for 2030: These strategies aim to protect and restore biodiversity and promote sustainable forest management, which are indirectly supported by the ZPAP's goal of reducing pollution impacting ecosystems. The Nature Restoration Law, stemming from the Biodiversity Strategy, includes targets for forest ecosystems.
- The Nature Restoration Law: This legally binding act includes specific targets for restoring forest ecosystems, such as increasing standing and lying deadwood, promoting uneven-aged structures, enhancing forest connectivity, increasing organic carbon stock, and the share of forests dominated by native tree species and tree species diversity. It also includes a commitment to planting at least three billion additional trees. Reducing air pollution, as aimed by the ZPAP, can contribute to the health and resilience of forest ecosystems, supporting the goals of the Nature Restoration Law and the Forest Strategy.
- The LULUCF (Land Use, Land Use Change, and Forestry) Regulation: This regulation accounts for emissions and removals from land use activities, including forestry, and is relevant to the broader environmental goals of the European Green Deal, including zero pollution.
- The future EU Bioeconomy Strategy will promote the sustainable use of biological resources, including those from forests, in the context of a circular economy, which is linked to reducing pollution from resource use.

The ZPAP aims to maximise synergies between these various policies to achieve a toxic-free environment, including in the agriculture and forestry sectors. The integrated Zero Pollution Monitoring and Outlook Framework will also help to assess the combined impacts of these policies.

The **EU Soil Strategy for 2030**<sup>20</sup> is a crucial component for achieving the environmental and climate ambitions of the European Green Deal. It works in synergy with other Green Deal policies, such as the Biodiversity Strategy, the Farm to Fork, the Climate Adaptation Strategy and the Zero Pollution Action Plan, to underpin the EU's aim for global action on the soil. The Soil Strategy sets a long-term vision of having healthy EU soil ecosystems by 2050, capable of providing essential services, with no net land take and soil pollution reduced to non-harmful levels. The strategy sets several medium-term objectives for 2030, including combating desertification, restoring degraded land and carbon-rich ecosystems, achieving significant net greenhouse gas removal from the land use sector, and reducing nutrient losses and the risk of chemical pesticides. A key element of the strategy is the upcoming Soil Monitoring Law, which aims to establish a legal framework for soil protection.

Regarding its contribution to sustainable agriculture, the EU Soil Strategy promotes the Sustainable Soil Management (SSM) practices as the new normal. The National CAP Strategic Plans may include interventions to maintain and enhance soil health, such as carbon farming, organic farming, and other agroecological approaches and provide funding for sustainable soil use and restoration.

Regarding sustainable forest management, the strategy underscores the critical link between healthy soils and thriving forests. It calls for forest management practices that avoid soil degradation through compaction, erosion, or loss of organic carbon. The strategy also points out opportunities for private forest owners to enhance forest productivity and carbon sequestration through practices that simultaneously improve soil health.

<sup>20</sup> COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS EU Soil Strategy for 2030 Reaping the benefits of healthy soils for people, food, nature and climate COM/2021/699 final, <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52021DC0699>

According to the EU soil strategy, the lack of dedicated EU legislation is a significant cause for the alarming state of EU soils. To ensure the same level of soil protection for water, the marine environment and air in the EU, the Commission proposed an **EU Directive on Soil Monitoring and Resilience (the Soil Monitoring Law)**<sup>21</sup> on 5 July 2023. The objective of this directive is to have all soils in a healthy condition by 2050, in line with the EU Zero Pollution ambition, and contribute to the achievement of the UN 2030 agenda for sustainable development.

The Soil Monitoring Law aims to establish a coherent monitoring framework for soil health across all Member States. Its long-term objective is to ensure EU soils are healthy by 2050, enabling them to provide essential ecosystem services, mitigate climate change, protect biodiversity, and ensure food security. Negotiations between the European Parliament and the Council have reached a provisional agreement on 9 April 2025. This deal ensures that soil health will be monitored across the EU using common soil descriptors and an EU common methodology for sampling points. The directive will oblige EU countries to protect soil health and resilience, with support measures anticipated for farmers and private forest owners, including advice, innovation, and capacity building. This framework is expected to drive the adoption of sustainable soil management practices in farming and forestry by requiring Member States to define and promote such practices, taking into account the outcomes of soil health assessments. The monitoring data collected will also inform the development and implementation of these sustainable practices.

The analysis of the research papers revealed a complex landscape of interacting policies aimed at addressing sustainability in agriculture and forestry. Cuadros-Casanova et al. (2023) highlight significant challenges in aligning the CAP with the European Green Deal objective. They suggest that the CAP lacks appropriate planning measures for effectively protecting biodiversity and mitigating climate change. They also identify continued subsidisation of intensive farming practices and synthetic inputs, which may hinder the transition to more sustainable agricultural and forestry practices.

Several studies, including Alexoaei et al. (2022) and Boix-Fayos & de Vente (2023), suggest a trend towards greater integration of environmental and climate objectives into EU agricultural policies. Mowlds (2020) find gaps in policy integration and particularly in addressing interconnections between agricultural practices, environmental sustainability and nutritional outcomes.

Multiple studies emphasise the need for a more holistic approach. Boix-Fayos & de Vente (2023) seek better alignment of policies across social, economic, and environmental aspects, while Peeters et al. (2020) call for CAP reform to better incorporate agroecological principles.

Among the policy instruments studied, several challenges were revealed. They ranged from balancing flexibility and effectiveness to long-term planning and regional variation. Other challenges included productivity impacts, integration with agricultural practices, monitoring and reporting, unequal distribution, complexity, administrative burden, technology adoption, data governance, market development, conversion challenges, and lack of comprehensive directives.

The 'Fit for 55' Package aims to align EU regulations with climate neutrality goals, particularly in land use and forestry sectors. However, Köhl et al. (2021) appear to argue that the measures affecting forestry in the 'Fit for 55' package lack coherence and are dominated by ecological aspects, potentially overlooking other important dimensions of sustainable forest management.

Regarding the environmental and climate policy alignment, Stubenrauch et al. (2022) provide a critical assessment, concluding that existing EU forest law fails to comply with climate and biodiversity targets. This finding underscores the challenges in translating high-level environmental goals into effective, implementable policies. Winkel et al. (2022) appear to identify several challenges in aligning forest ecosystem services supply and demand in Europe. Their analysis points to issues such as insufficient policy integration, ambiguous regulatory frameworks, and difficulties in implementing European-level

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<sup>21</sup> Proposal for a DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on Soil Monitoring and Resilience (Soil Monitoring Law). COM/2023/416 final

policy solutions due to the diversity of forest contexts across the EU. Overall, the forestry policies show a diverse range of objectives and implementation mechanisms, with a strong emphasis on climate change mitigation and environmental sustainability. Many policies aim to balance economic and environmental concerns.

### 3.3.4. National Policy Framework for Sustainable Agriculture and Forestry

EU-level policies set the framework, but practical implementation of sustainable agriculture and sustainable forest management happens through national and regional initiatives. Below we map how strategies cascade down to the PRUDENT's Use Cases in Italy, Belgium, Lithuania, and Finland – highlighting their CAP Strategic Plans, complementary national policies, and regional programs. A comparative approach reveals similarities and differences, as well as opportunities and best practices that can be shared.

The use cases were selected to cover Europe's diversity of agricultural and forestry systems – spanning Northern (Finland), Southern (Italy), Western/Central (Belgium), and Eastern (Lithuania) regions – in line with PRUDENT's emphasis on heterogeneity. This selection builds on the WP1 landscape mapping (Bonan et al., 2025), which also surveyed green nudging in these same countries. The survey targeted distinct farming contexts: mixed farms in Belgium, forest owners in Finland, winegrowers in Italy, and wheat farmers in Lithuania. For each UC, the baseline adoption of a relevant sustainable practice was assessed. In Table 1, the key information about context, sustainable practice, target population for each of the four UCs is presented (Bonan et al., 2025).

Table 1: Context and target population (Bonan et al., 2025).

Context	Belgium	Finland	Italy	Lithuania
<b>Environmental issue</b>	Water pollution, biodiversity loss, soil erosion	Intensive forest management, ecosystem services	Climate change impacts, intensive pesticide use, biodiversity loss	Biodiversity loss, intensive pesticide use
<b>Sustainable practice</b>	Buffer strips	Continuous cover forestry	Green insurance	Crop rotation
<b>CAP support</b>	Yes	No	Yes	Yes
<b>Target population</b>	Dairy farmers	Forest owners	Winegrowers	Wheat farmers

#### 3.3.4.1. Flanders - Belgium

Belgium has a highly productive agricultural sector in a small land area which is internally diverse: Flanders (northern region) is characterised by intensive, industrial-style farming – dense livestock herds (especially pigs and poultry), high use of fertilisers and pesticides, and horticulture; Wallonia (southern region) has more extensive arable and livestock farming, more organic farms, and larger forest areas (Ardennes). The number of agricultural holdings in Belgium decreased by 2.3% in 2022 compared to 2021, confirming a continuing trend of decline in farm numbers (STATBEL, 2024). In Flanders, there are about 23.000 farms (22.449 in 2022), with an average size of 27 ha (STATBEL, 2024). Since 1980, the average size of agricultural holdings in Belgium has tripled, reaching 38.7 ha in 2022. The increase in the average size of agricultural holdings has been more pronounced in Flanders than in Wallonia since the 1990s. Farms are highly specialised in livestock (particularly pigs and poultry) and horticulture, and certain areas may specialise in specific crop types like forage (STATBEL, 2024). Livestock densities are among the highest in Europe. Flanders hosts 1.3 million cattle, 5.7 million pigs, and over 42 million poultry (EC, 2024). This intensive production has led to concerns about environmental impacts, particularly nutrient pollution, soil degradation, and biodiversity loss.

Sustainable agriculture practices – such as crop rotation, vegetative buffer strips, cover cropping, reduced tillage, and agroforestry – are increasingly promoted to address these challenges. Buffer strips (uncultivated vegetated strips alongside fields) help reduce runoff of fertilisers and pesticides into water bodies and provide habitat for biodiversity. Buffer strips are crucial for curbing nutrient leaching in Flanders, a region struggling with water quality. The status of nitrates in water in Flanders shows a recent positive trend in surface water quality, with exceedances of the 50 mg/l nitrate threshold falling to 17.5% in the winter year 2023-2024 (VLM, 2024). However, this improvement may be partly due to wet weather conditions, and the overall progress in both surface and groundwater quality over the past five years has been insufficient compared to the starting point of the 6th Manure Action Programme in Flanders (MAP 6). Despite a decrease in average nitrate concentration in shallow groundwater in 2023 to 36 mg/l, levels remain above the initial state of MAP 6. Consequently, Flanders continues to face pressure from the European Commission and is currently subject to fines for not meeting water quality targets, particularly the 50 mg nitrate per litre limit set by the European Nitrates Directive. In July 2024, the European Commission took Belgium to the Court of Justice of the EU for not taking sufficient action against nitrate pollution. The Flemish government's new manure action plan, approved in December 2024, is the seventh version (MAP7) of the Manure Action Plan. It aims to address nitrogen pollution and improve water quality in Flanders by implementing measures such as buffer zones along watercourses, reducing fertiliser standards, decreasing animal manure use through livestock population reductions, and increasing the cultivation of crops less sensitive to nitrates.

In this context, it is vital to examine how current policies and initiatives at both the European Union (EU) level and the Flemish regional level encourage or hinder the adoption of sustainable practices like buffer strips. There are several Flemish (regional) policies that influence sustainable agriculture. These mainly include the Flemish CAP Strategic Plan and environmental regulations in Flanders.

The Flemish CAP Strategic Plan (2023–2027) aims to support farmers in their search for sustainable opportunities for their businesses and gives them opportunities to invest, innovate and develop resilient and future-oriented farming income models. Income security, the reduction of greenhouse gas emissions, climate change adaptation, improving water quantity and quality, and productive and resilient soils are the main objectives of the Plan ([EC, 2024](#)).

Regarding the *conditionality in Flanders*, the GAEC 4 is implemented more strictly, and also aligns with the implementation of the EU Nitrates Directive. The latest MAP7 (2023–2027)<sup>22</sup> was approved in December 2024. It includes protection strips along watercourses, lower fertiliser standards, less use of animal manure by reducing the pig population and increasing the proportion of crops that are not sensitive to nitrates. It significantly strengthens buffer strip requirements. In critical zones, it sets the obligation for 3 - 5m (depending on the type of crop) crop-free buffer along waterways -meaning no crops, no manure, no pesticides - from 2025, and in all other areas buffer strips widen from 1m to 3m (no inputs) by 2026. GAEC 7 is fully applied, meaning all arable farms (above certain size/exemptions) must rotate crops. Flanders dedicates 25% of direct payment budget to eco-schemes ([EC, 2024](#)). One flagship eco-scheme is “Buffer strips” with around €35 million allocated budget ([EC, 2024](#)). This scheme pays farmers to establish wider buffer strips than GAEC minimum (e.g., 6–12m or even up to 30m on high-risk parcels) with strict no-input management (EC, 2023). Different options include grass buffers for erosion control or biodiversity (grass/herb or flower mixes), (EC, 2023). Other Flemish eco-schemes support soil cover, precision fertilisation and integrated pest management. Under Pillar II, Flanders offers multi-year contracts for practices like organic farming, field edge management, and conservation of landscape elements. For instance, fertiliser-free buffer zones are also supported via rural development in some cases (EC, 2023).

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<sup>22</sup> *ONTWERP 7DE ACTIEPROGRAMMA IN UITVOERING VAN DE NITRAATRICHTLIJN (ONTWERP-MAP 7)*  
[https://www.vlm.be/nl/SiteCollectionDocuments/Mestbank/Algemeen/MAP7/Ontwerp\\_7de\\_actieprogramma\\_Vlaanderen.pdf](https://www.vlm.be/nl/SiteCollectionDocuments/Mestbank/Algemeen/MAP7/Ontwerp_7de_actieprogramma_Vlaanderen.pdf)

Investment aid (through VLIF<sup>23</sup>) is also available for equipment that supports sustainable practices (e.g., no-till drills, GPS sprayers), under the Flemish CSP.

#### 3.3.4.2. Italy

Italy's agriculture is characterised by remarkable diversity in farm types, crops, and regional specialisations. Thanks to a range of climates from alpine to Mediterranean, Italy produces a wide array of products. In the fertile northern plains, farms focus on grains (maize, wheat), soybeans, dairy and meat, while southern regions specialise in fruits, vegetables, olive oil, wine, and durum wheat. This makes Italy one of Europe's largest agri-food producers, and the world's top wine producer by volume. Italian agriculture also boasts the most Protected Designation of Origin (PDO) and Geographical Indication (PGI) products in the EU ([Italy - European Commission](#)), reflecting its rich food heritage.

The farming structure is dominated by small, family-run holdings – ~1.1 million farms averaging only ~11–14 hectares in size ([EC/DG AGRI, 2025](#)). Over half of farmland is in hilly or mountainous areas with natural constraints ([Italy - European Commission](#)), and many farms maintain traditional practices. This small scale and geographic variation pose challenges but also foster certain sustainable practices (e.g., mixed cropping, pasture-based livestock in hills). Notably, Italy has embraced organic farming extensively: as of 2023, about 2.46 million ha (~19.8% of Italy's Utilised Agricultural Area) is organic, well above the EU average (~10%) and moving toward Italy's goal of 25%. Such diversity and high organic uptake underscore Italy's potential for agroecology, while also necessitating robust support to sustain farmer livelihoods and environmental stewardship.

Within the EU framework, Italy has developed a national strategy committed to key national priorities, ensuring adequate farm incomes (with a focus on small farms), protecting farmers from adverse climatic events, reducing agriculture's environmental impact, and improving rural quality of life ([Italy - European Commission](#)). Italy moved from regional Rural Development Programs to a single national plan (with regional implementation), enabling a more coherent strategy. Italy's CAP Strategic Plan 2023–2027 (CSP) provides for a total of 173 interventions, between the First and Second Pillars, and financial resources for almost 37 billion euros overall for the period 2023-2027, with which to address the needs expressed by the territory, aiming to strengthen the competitiveness of the agri-food and forestry system from a sustainable perspective, to strengthen the resilience and vitality of rural territories, to promote quality agricultural and forestry work and safety in the workplace, to support the ability to activate exchanges of knowledge, research and innovation and to optimize the governance system.

The Italian CSP aligns closely with EU Green Deal goals and introduces several types of interventions to encourage environmental sustainability and climate risk management. Under the plan, climate and environment interventions receive over €10 billion, more than one-third of Italy's total CAP funding ([EC/DG AGRI, 2025](#)). Italy designed 34 environmental and climate-related schemes ("interventi") to incentivise practices like reducing synthetic fertilisers and pesticides, preserving on-farm biodiversity habitats, conserving soil, and improving animal welfare ([EC/DG AGRI, 2025](#)). Many of these are implemented as regionalised agri-environmental commitments funded by EAFRD, in addition to the national eco-schemes in Pillar I. Italy thus created a dense policy toolbox to encourage agroecological farming systems, ranging from organic agriculture to integrated pest management, cover cropping, precision farming, and landscape conservation.

Italy introduced 5 national Eco-Schemes ("ecoschemi") that target specific sustainability objectives on a broad scale. These include:

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<sup>23</sup> [Vlaams Landbouwinvesteringsfonds](#) (VLIF), which translates to the Flemish Agricultural Investment Fund. It is a key financial instrument in Flanders, Belgium, designed to support investments in the agricultural sector, particularly those that enhance sustainability, resilience, and future-proofing of farms.

- an animal welfare and antimicrobial reduction scheme (in synergy with veterinary advisory services);
- an integrated pest management/pollinator protection scheme (requiring pesticide use reduction across all eco-schemes);
- an olive grove landscape conservation scheme, with €150 million/year to preserve traditional high-nature-value olive orchards;
- a cover-cropping/soil cover in orchards scheme that mandates year-round vegetative cover in tree crop rows (banning herbicides) to reduce erosion, nutrient loss and support biodiversity; and
- an extensive crop rotation with legumes scheme (€163 million/year) to increase soil organic matter and fertility by requiring legumes/forages in rotations and incorporating crop residues.

All these eco-schemes not only provide farmers with payments for eco-services, but also tie into Green Deal targets – for example, every scheme explicitly includes a chemical pesticide reduction commitment as a condition.

In Rural Development, Italy offers a rich menu of agro-environmental measures (often denoted as SRA# in the plan). For instance, integrated production (SRA01) supports environmentally friendly pest management; cover crops/under-sowing (SRA06) and buffer strips (SRA10/11) help soil and water conservation; extensive pasture systems (SRA07) and ecological set-aside (SRA26) create wildlife habitat; precision farming (SRA24) reduces input use; and a specific measure to reduce pesticide impact (SRA19) directly contributes to the 50% pesticide reduction goal. Italy has in total 34 such voluntary schemes compensating farmers for the costs of going beyond baseline environmental standards ([EC/DG AGRI, 2025](#)). These measures are widely available and cover diverse farming systems (from rice paddies biodiversity commitments to pollinator strips in arable land), reflecting Italy’s all-out approach to foster agroecology at the farm level.

A flagship commitment is to organic farming. Italy views organic agriculture as a “privileged technique” to meet all environmental objectives. The plan allocates roughly €2.0–2.1 billion to organic conversion and maintenance payments ([EC/DG AGRI, 2025](#)). This is expected to support an additional ~1.48 million ha under organic management. Italy explicitly aims to reach 25% of its agricultural area in organic by 2027, ahead of the EU’s 2030 target. This aggressive timeline is backed by a rise in organic support funding from 12.5% of the rural development budget previously to 16.3% now. The plan notes Italy’s organic sector is already strong (many organic farms thrive without subsidies), and the new funding should further “significantly contribute” to the organic expansion (Italian CSP). Indeed, by 2023, Italy had nearly 20% organic area, on track to hit the 25% target. Moreover, Italy’s plan leverages other tools to boost organic: certain sectoral programs (Fruit & Veg and Olive Oil) give bonus support for organic producers, and organic farms can stack eco-schemes payments to enhance their environmental performance even more.

Italy has made risk management tools a cornerstone of its agricultural policy, seeing them as essential for resilience in the face of more frequent extreme weather. Under the CAP plan, Italy is dedicating about €2.9–3.0 billion (including national co-financing) – roughly 8% of its total CAP budget – to risk management instruments. This is by far the largest allocation among Member States (Italy alone accounts for over half of all EU CAP risk management funding). With these resources, Italy will support around 800,000 farmers in protecting themselves from climate adversities ([EC/DG AGRI, 2025](#)). The main tools are:

- Subsidised Crop Insurance (Intervento SRF01): The plan continues Italy’s longstanding agevolata insurance scheme, which shares farmers’ insurance premiums (up to 70% subsidy) for policies covering weather risks, plant diseases, pests, and environmental incidents. This is Italy’s primary risk management instrument, already widely used by farmers. It enables producers to transfer climate risks to insurers at an affordable cost, with public subsidies as an incentive. The CAP plan seeks to “ensure continuity, improvement and expansion” of this system to increase farm resilience

to climate change. Public support also pushes insurers to develop products tailored to farmers' emerging needs. Notably, SRF01 is restricted to covering significant losses (>20% of average production) and allows index-based insurance, in line with EU rules.

- Mutual Funds for Adverse Events (SRF02) and Income Stabilisation (SRF03): These instruments encourage farmers to pool risk. SRF02 provides support for mutual funds compensating farmers for crop or livestock losses not easily insurable, while SRF03 is an innovative Income Stabilisation Tool for sector-wide income drops. The CAP plan positions these mutual funds as complementary to insurance, filling gaps for risks insurance doesn't cover.
- Catastrophic Events Fund (SRF04): This is a national-level fund for disasters intended to act "in complement or autonomously" alongside insurance. It likely covers extreme catastrophes (drought, floods, frost) that affect large areas. It is essentially a reinsurance or safety-net fund, preventing ad-hoc emergency payments by having a prepared mutual fund.

By heavily supporting these tools, Italy aims to shield farmers from climate shocks and thus maintain farm viability and willingness to invest in sustainability. The plan explicitly notes that ~€3 billion will help ~800k farmers cope with climatic adversities via insurance and mutual funds for disasters (frost, floods, drought) ([EC/DG AGRI, 2025](#)). This massive rollout is a strategy to promote adaptation: with a financial safety net, farmers may be more confident to adopt new drought-resistant crops, soil conservation, or other adaptive practices. However, Italy also recognises that risk management must go hand-in-hand with risk *reduction*. The national law 2022/23 designating farmers as "guardians of the land"<sup>24</sup> reinforces this by assigning farmers the responsibility to maintain land and prevent hydrogeological risks (erosion, landslides, wildfires) in exchange for societal recognition. In other words, public support helps farmers manage climate risks, and in return, farmers are stewards of environmental stability.

Italy's significant commitment to risk management tools in its current CAP strategic plan appears to strongly align with the new Vision for Agriculture and Food for risk and crisis management. The new Vision advocates for an ambitious European risk and crisis management approach to review and strengthen the available toolbox. This involves reinforcing incentives for farmers to reduce vulnerability through on-farm adaptation and risk sharing, such as via producer organisations or cooperatives, and requires ambitious action on risk preparedness, insurance, and risk reduction, necessitating cooperation with entities like the European Investment Bank (EIB), banks, and insurance companies to improve the availability and affordability of agricultural insurance. Policy coherence between risk and crisis management tools is also essential, encouraging farmers towards proactive risk management and Member States to develop efficient strategies. The functioning of the agricultural reserve should be assessed to refocus it on specific crises of significant magnitude, linking exceptional support to appropriate risk management and preventive measures.

Beyond the CAP mechanisms, Italy has pursued additional policies to foster sustainable agriculture:

- **National Organic Action Plan:** Italy developed a "Piano d'Azione Nazionale per l'agricoltura biologica" (updated 2022)<sup>25</sup> to complement CAP measures (Italian CSP). It includes actions like research, training, and market development for organic produce. Italy also passed a new framework law for organic agriculture in 2022, affirming organic farming as an activity of national interest and encouraging organic districts ("Bio-distretti"). These bio-districts integrate organic farming with local food chains and community involvement, exemplifying agroecology in practice. Many regions provide additional support or incentives for farms in bio-districts, leveraging regional rural development funds and the national plan.

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<sup>24</sup> LAW 28 February 2024, n. 24 'Provisions for the recognition of the figure of the farmer as guardian of the environment and the territory and for the establishment of the National Agriculture Day.' (24G00039). ([Official Journal n.62 of 14-03-2024](#))

<sup>25</sup> LAW 9 March 2022, n. 23 'Provisions for the protection, development and competitiveness of organic agricultural, agri-food and aquaculture production'. (22G00031). ([Official Journal n.69 of 23-03-2022](#))

- **Pesticide Reduction and Integrated Pest Management:** Italy implements the EU's Sustainable Use of Pesticides Directive via a national action plan (PAN) that promotes Integrated Pest Management (IPM) for all farms. Under PAN IPM, chemical pesticide use must be minimised and alternatives (biological controls, crop rotation) prioritised. The CAP plan builds on this with targeted measures (like SRA19 for reducing pesticide impact) and cross-compliance rules. Four of Italy's eco-schemes explicitly require cutting pesticide use (e.g., a ban on herbicides in the cover crop scheme, and general pesticide reduction commitments in all schemes). These efforts contribute to the EU's pesticide use goal. Italy's approach is to incentivise lower pesticide use through payments (organic, IPM, precision agriculture) rather than impose immediate bans, but combined with stricter EU regulation on hazardous products.
- **Fertiliser and Manure Management:** Italy faces nutrient pollution issues (especially nitrates in the Po Valley). The CAP plan earmarks funding to improve fertiliser application methods – over €52 million will co-finance modern manure spreading equipment and techniques on ~50,000 ha to curb runoff and emissions ([EC/DG AGRI, 2025](#)). Precision agriculture (SRA24) also helps optimise fertiliser use. These address the EU target to reduce nutrient losses by 50%. Additionally, Italy participates in the EU Circular Economy action plan by encouraging nutrient recycling (composting, digestate from biogas, etc.). Some regions have started carbon farming pilot projects where farmers get credits for improved soil carbon management, aligning with EU plans for carbon farming certifications.
- **Agroecological Research and Knowledge Transfer:** Italy leverages EU Horizon projects and its Agricultural Knowledge and Innovation System (AKIS) to diffuse sustainable practices. The CAP plan funds advisory services and training (Measure SRH03 and others) specifically linked to eco-scheme and agri-environment commitments. For example, farmers in the animal welfare scheme receive tailored veterinary advice to reduce antibiotics. Italy's Farm Advisory Service is being upgraded to cover climate adaptation, agroecology, and organic conversion support. There is also support for Operational Groups and cooperation projects on topics like agroforestry, integrated production and landscape management (EC, 2023), fostering innovation from the ground up.

#### 3.3.4.3. Lithuania

Lithuania has a robust agricultural sector with approximately 2.8 million hectares of agricultural land benefitting from CAP income support ([csp-at-a-glance-lithuania\\_en.pdf](#)). The landscape is dominated by arable farming – notably cereals (such as wheat and barley) and oilseeds (rapeseed) – alongside significant dairy and livestock production. Farm structures are mixed: many small and medium-sized farms (under 50 ha) operate alongside larger commercial farms. The CAP Plan seeks to improve the viability of smaller farms, for example by granting 16% higher payments per hectare for farms <50 ha via redistributive payments ([csp-at-a-glance-lithuania\\_en.pdf](#)), reflecting the prevalence of smallholders.

To maintain a diverse production base, Lithuania targets support to certain sectors considered vulnerable or underdeveloped. Protein crops, fruit and vegetables, nuts, dairy cows, seed potatoes, beef, sugar beet, sheep and goats are explicitly identified for additional aid under the national plan ([csp-at-a-glance-lithuania\\_en.pdf](#)). This indicates an effort to diversify beyond the dominant cereal and rapeseed cropping systems and to bolster sectors (like protein legumes) that can enrich crop rotations and improve soil fertility. In terms of farming practices, most conventional arable farms have until now followed simple rotations (sometimes just two main crops) or even continuous monoculture, which has raised concerns about soil degradation and pest build-up. Recognizing these issues, Lithuania – in line with EU policy – is moving to enforce crop rotation on arable land as a baseline requirement and to incentivise more diverse and sustainable crop mixtures (including cover crops and nitrogen-fixing legumes).

Environmental sustainability is an increasing priority. Only about 8–9% of Lithuania's farmland is organic at present, but the CAP Strategic Plan aims to expand organic farming by 50%, to reach almost 13% of

agricultural area under organic management by 2028 (csp-at-a-glance-lithuania\_en.pdf). Soil erosion and soil carbon loss are concerns in some regions, partly due to intensive tillage and lack of ground cover. To address this, conservation agriculture practices like no-till farming are being promoted at scale – indeed, one new support scheme has allocated nearly €160 million to encourage no-tillage, with a target of over 1 million hectares of arable land managed under no-till methods to improve soil structure and reduce emissions (EC/DG AGRI, 2025).

Both the EU and Lithuania have introduced strategies, initiatives, and policies in the 2023–2027 period to foster sustainable agriculture. The EU-level policies, under the CAP and Green Deal framework, are put into practice in Lithuania through its CAP Strategic Plan and national initiatives. This includes how EU rules and funding are used to guide farmers toward more sustainable practices, especially for improving soil health, protecting biodiversity, and tackling climate change. Key areas include mandatory rules like crop rotation and voluntary measures such as Eco-schemes and agri-environmental commitments, which support farmers in going beyond the basic requirements.

**Conditionality in CAP Strategic Plan (Pillar I):** Lithuania applies all GAEC standards nationwide on virtually all farmland (about 96% of agricultural area) (csp-at-a-glance-lithuania\_en.pdf):

- GAEC 7 (Crop Rotation): Implemented very ambitiously – 100% of arable land must be rotated, with no crop grown in the same field for more than two consecutive years (EC, 2023). This effectively forces at least a two-crop rotation on all arable farms.
- GAEC 6 (Soil Cover): Enforced to ensure fields are covered by vegetation or crop residues in critical periods. Farmers can choose cover crops or leaving stubble, etc., giving flexibility (EC, 2023).
- GAEC 8 (Non-Productive Areas): Lithuania requires a 3% non-productive area on arable farms, e.g., through maintained field margins, fallow strips, buffer zones, etc., in line with the EU rule (and offers further support via Eco-schemes to encourage up to 7%). Very small farms and certain specialised holdings are exempt from some GAEC obligations (according to the EU rules), but these account for a small share of land (EC, 2023). Overall, Lithuania’s baseline conditionality sets a high bar, particularly on crop rotation, as a pre-condition for receiving payments.

**Lithuania’s Eco-Schemes (Pillar I):** Lithuania devoted 25% of its direct payments budget to Eco-schemes, creating 9 different Eco-scheme options covering all types of agricultural land (arable, permanent crops, grassland, wetlands) (csp-at-a-glance-lithuania\_en.pdf). These schemes incentivise a wide range of sustainable practices:

- Diverse Crop Rotation Eco-scheme: This eco-scheme requires farmers to include at least one crop from certain groups (legumes, oilseeds, herbs, maize/potatoes “stockpile” crops, or green manure/fallow) in their rotation each year (EC, 2023). This effectively reduces monocropping to one year and promotes diversification with nitrogen-fixing or soil-improving crops. It complements GAEC 7 by adding qualitative crop diversity criteria, and farmers who meet these stricter rotation rules get an additional payment (EC, 2023).
- No-Till Farming Eco-scheme: Supports zero or minimal tillage on arable land to avoid soil disturbance. This scheme has high uptake – backed by ~€160 million – with an expected >1 million ha under no-till management (csp-at-a-glance-lithuania\_en.pdf). It aims to improve soil structure, increase soil organic matter, and reduce fuel use/GHG emissions.

- **Grassland & Pasture Management:** Payments for extensive pasture management (e.g., rotational grazing, maintaining permanent grasslands, mowing regimes that enhance biodiversity and soil cover). These reduce erosion and protect soil carbon.
- **Integrated Pest and Nutrient Management:** Some schemes encourage reduced fertilizer and pesticide use (for instance, an eco-scheme for sustainable orchards and berry plantations that limits agro-chemicals and promotes ecological practices (csp-at-a-glance-lithuania\_en.pdf)).
- **Agroforestry and Landscape Features:** Converting arable land to grassland, planting shelterbelts or hedges, and maintaining wetlands are encouraged via specific schemes or higher payments for those features, in line with biodiversity goals (csp-at-a-glance-lithuania\_en.pdf) (csp-at-a-glance-lithuania\_en.pdf). **Participation:** Farmers can choose one or multiple eco-schemes annually. The broad menu ensures coverage of all farm types and incentivizes practices most relevant to each (crop farmers, orchard keepers, livestock graziers, etc.). By design, these schemes reward voluntary “green” efforts that go beyond GAEC minimums – for example, a crop farmer might pair the rotation scheme with the no-till scheme for synergistic benefits to soil.

**Lithuanian Agri-Environmental Measures (Pillar II):** Lithuania’s plan allocates a substantial share of rural development funds to environmental schemes (over €1 billion for 2023–2027 on “green” interventions) (csp-at-a-glance-lithuania\_en.pdf). Key programs include:

- **Organic Farming Support:** Continuation and expansion of payments for organic conversion and maintenance. This is expected to help increase organic farmland to ~13% by 2028 (csp-at-a-glance-lithuania\_en.pdf). Farmers receive per-hectare support for adhering to organic standards (crop rotations, no synthetic inputs, etc.) over a 5-year commitment.
- **Extensive Grassland Management:** Agri-environment payments for maintaining high nature value grasslands, wetlands, and peatlands in sustainable ways (e.g., no drainage of peat soils, late mowing to protect bird habitats). These preserve biodiversity and carbon sinks.
- **Precision Farming & Nutrient Management:** Some measures fund farmers to adopt precision application of manure/fertilizers and other practices that reduce nutrient runoff (contributing to water quality goals).
- **Afforestation and Forest Management:** Grants for planting new forests or buffer strips and for sustainable forest management (which help climate mitigation and soil erosion control) (csp-at-a-glance-lithuania\_en.pdf).
- **Integrated Crop-Livestock Systems:** There are likely measures encouraging crop rotations with fodder crops and manure management to close nutrient loops (for instance, support for catch crops or winter green cover, which improve soil between main crops). **Synergy with Eco-schemes:** Many Pillar II measures complement the eco-schemes – e.g., a farmer might use an eco-scheme for no-till annually and also commit to an agri-environment contract for organic farming or multi-year soil conservation. Unlike eco-schemes, these commitments lock in practices for several years, ensuring continuity.

**Lithuania’s Coupled Payments (Pillar I):** Lithuania makes use of coupled support to bolster certain crops and livestock that align with both economic and environmental objectives. Notably, protein crops (e.g., peas, beans) receive coupled subsidies (csp-at-a-glance-lithuania\_en.pdf), which encourages farmers to grow more of these nitrogen-fixing crops. This policy not only aims to reduce dependence on imported protein feed but also serves as a rotation incentive – legumes become more financially attractive to include in crop sequences, improving soil fertility and reducing need for synthetic fertilizer (EC, 2023). Other coupled supports target dairy cows, beef cattle, sheep, goats, sugar beet, and seed potatoes (csp-at-a-glance-lithuania\_en.pdf), aiming to sustain these sectors. While primarily economic in intent, some have sustainability angles (e.g., maintaining livestock on pasture can help keep grasslands intact, and supporting sugar beet ensures diversity in arable rotations).

**Capacity Building and Advisory Services:** Lithuania’s plan recognises that achieving sustainability goals depends on farmers' knowledge and effective advice. Funding is directed to improve training and farm advisory services, integrating them into a national AKIS network. According to the plan, particular attention is given to innovation diffusion and climate/environment topics (csp-at-a-glance-lithuania\_en.pdf). This means:

- **Enhanced Advisory Services:** Professional advisory centers and consultants are being bolstered, with efforts to improve their qualifications and outreach. Advisors are trained to guide farmers on new crop rotation techniques, soil management (e.g., no-till practices), nutrient management, and compliance with GAEC standards (EC, 2023). The aim is to ensure every farmer has access to guidance on how to implement sustainable practices effectively.
- **Research-Practice Linkages:** The plan encourages cooperation between researchers, farmers, and businesses (for instance, demonstration farms or pilot projects on crop diversification), so that innovations (like new drought-resistant legume varieties or precision farming apps) are quickly shared and adopted on the ground (EC, 2023)
- **Digital Tools and Monitoring:** Lithuania also invests in digital platforms, assisting farmers in decision-making such as designing crop rotation plans or monitoring crop cover via satellite. Through such AKIS measures, policies acknowledge that financial incentives alone are not enough – building knowledge and capacity is critical for long-term adoption of sustainable practices.

#### 3.3.4.4. Finland

Finland is the most forested country in Europe, with forests covering about 75% of its land area. This equates to roughly 22.6 million hectares of forest land, of which about 20 million hectares are classified as productive forest available for timber, and 2.6 million hectares are of low productivity. Finnish forests are predominantly boreal coniferous forests, dominated by Scots pine, Norway spruce, and birch. These forests span a range of site types from fertile mineral soils to extensive peatlands – about one third of Finland’s commercial forest land is peatland forest (often drained for forestry). Forest ownership is fragmented, with about 60% of forest land owned by private individuals (over 600,000 private owners), with the remainder held by the state (mostly in the north and east) and companies (Ministry of Agriculture and Forestry, 2023). This diverse ownership results in a highly diverse landscape of forest management practices, shaped by varying ownership profiles, economic interests, and levels of engagement in forest management activities (Bonan et al.,2024).

Despite the EU’s emphasis on sustainable forest management through the Common Agricultural Policy (CAP), Finland has strategically chosen not to prioritise forestry interventions in its [National CAP Strategic Plan for 2023–2027](#). This strategic choice aligns with Finland’s National Forest Strategy 2025, which emphasises forest-based business competitiveness and diversified forest use. Finland’s approach reflects a broader reliance on national strategies and regional programs to address forestry concerns. Traditionally, Finnish forestry has relied on even-aged management (rotation forestry), which involves clear-cutting mature stands and replanting or natural regeneration, resulting in even-aged monocultures. This system has produced a very uniform age structure – over 70% of stands are under 80 years old – but has raised concerns about biodiversity loss, soil degradation, water impacts, and carbon emissions from clear-cuts. In recent years, attention has grown on Continuous Cover Forestry (CCF) as a sustainable alternative to clear-cutting. CCF (also known as uneven-aged management) maintains a permanent forest cover by selectively harvesting individual trees or small groups rather than removing entire stands. This approach promotes natural regeneration of a mixed-age stand, helps preserve biodiversity, protects soils and water quality, and can enhance carbon sequestration relative to conventional clear-cuts (Bonan et al.,2024).

In Finland, therefore, variants of uneven-aged management have been practiced for decades by some private owners and in protection forests. What is new is that these approaches are now being formally recognised, and gradually promoted in the policy and legal framework. The 2014 revision of the Forest Act explicitly permitted uneven-aged silviculture, national silvicultural guidelines have been updated to include CCF methods, and the National Forest Strategy 2035 highlights diversified silviculture and closer-to-nature management as tools to reconcile wood production with biodiversity and climate objectives. In this sense, Finnish forest policy is shifting from treating CCF-type systems as marginal or exceptional towards positioning them as a mainstream, policy-supported option alongside traditional rotation forestry. To

understand the multi-level governance of sustainable forest management (SFM) and continuous cover forestry, it is helpful to map key policies and initiatives at the EU and Finnish national levels. Table 2 provides a comparative overview of the main strategies, policies, and programs with the aim to influence forestry sustainability adoption in the EU and Finland.

Table 2: Key EU and Finnish policies/strategies shaping sustainable forest management.

Policy instrument	European Union (EU-Level)	Finland (National Level)
<b>Forest Strategy</b>	<p>New EU Forest Strategy for 2030 (EC, 2021) – A comprehensive framework promoting sustainable forest management, climate adaptation, biodiversity protection, and socio-economic viability of forests. Emphasises “closer-to-nature” forestry practices (including CCF) and promotes win-win measures for all in sustainable forest management.</p> <p>A proposal for a Forest Monitoring Law that will plug existing gaps in the information on European forests and create a comprehensive forest knowledge base.</p>	<p>National Forest Strategy 2035 (Ministry of Agriculture and Forestry, 2023) – Finland’s overarching forest policy strategy. Aims to balance economic, ecological, social, and cultural sustainability. Highlights diversifying silviculture.</p>
<b>Biodiversity Strategy</b>	<p>EU Biodiversity Strategy 2030 (EC, 2020) – Commits to protect 30% of EU land and strictly protect all remaining primary and old-growth forests. Foresees the legally binding Nature Restoration Law with targets to restore degraded forest ecosystems (e.g., increase forest structural diversity). Natura 2000 network (Habitats and Birds Directives) protects forest habitats, indirectly encouraging low-impact management.</p>	<p>Forest Biodiversity Programs (METSO &amp; Helmi) – The METSO Programme (2008–2025) and Helmi habitats program complement Finland’s forest strategy with ecological targets. METSO incentivises voluntary conservation of valuable habitats in private forests, boosting continuous cover by leaving areas unmanaged. Finland’s protected areas cover ~13% of all forest land (about 23% of commercial forests under some protection or restricted use), focusing on old-growth, peatlands, and other high-biodiversity forests.</p>

<b>Climate Change &amp; Carbon Sinks</b>	<p>EU Climate Policy (LULUCF Regulation) – Under the EU Climate Law, Member States must strengthen forest carbon sinks. The LULUCF Regulation (updated 2023) sets increasing targets for net CO<sub>2</sub> removals by 2030. This pushes sustainable practices (afforestation, improved management) to maintain or enhance sinks. The EU Forest Strategy links climate goals with resilience, urging forestry practices that preserve carbon (e.g., caution with clear-cuts).</p>	<p>Climate Targets &amp; Land Use Plan – Finland’s Climate Strategy (carbon neutrality by 2035) and the Climate Plan for the Land Use Sector (Ministry of Agriculture &amp; Forestry of Finland, 2023) integrate forests as a carbon sink. Policy measures promote forest growth and carbon sequestration and storage, and prevent forest loss. Finland is committed to sustainable forest management (including CCF), driven by national legislation, voluntary certification schemes, international agreements, and strategic goals related to bioeconomy, climate change mitigation, and biodiversity conservation.</p>
<b>Bioeconomy</b>	<p>EU Bioeconomy Strategy (2018) – Advocates for sustainable use of renewable biological resources (including wood) for industry, while emphasising cascading use, circularity, and ecosystem services. It encourages innovation in forestry but underlines that biomass sourcing must remain sustainable. The European Green Deal and Circular Economy Action Plan also frame wood use within climate-biodiversity objectives. The European Commission is preparing a new bioeconomy strategy, expected in Q4-2025, under the initiative titled "Towards a Circular, Regenerative and Competitive Bioeconomy".</p>	<p>Finnish Bioeconomy Strategy 2022 – Titled “Sustainably towards higher value added” (Finnish Government, 2022), it seeks to grow the bioeconomy while securing the sustainability of biomass supply. This includes adding value to wood products and ensuring forestry practices maintain ecosystem health. Finland’s strategy sets targets for bioeconomy jobs and turnover, and calls for a “competitive operating environment” for forestry that is also ecologically sustainable. Sustainable forest management is at the core of the forest-based bioeconomy. Versatile forests with a high level of biodiversity are the ecological foundation on which all forest management and use is based.</p>
<b>Forestry Legislation &amp; Guidelines</b>	<p><i>(No EU-level forestry law; forestry is mainly a Member State competence.)</i> The EU relies on the EU forest Strategy and some funding tools: e.g., guidelines for “closer-to-nature forestry”, a planned voluntary certification scheme for biodiversity-friendly management, and funding instruments (CAP Rural Development, LIFE, Horizon Europe) to support sustainable forestry projects.</p>	<p>Forest Act – Finland’s Forest Act (1093/1996), revised in 2014, legally permits both even-aged and uneven-aged silviculture, giving landowners flexibility in management. This enabled wider adoption of CCF. Forestry guidelines and extension services (e.g., Tapio’s silvicultural recommendations) have been updated to include continuous-cover methods. National funding schemes (e.g., Kemera/Metka subsidies) support forest management and could incentivise CCF-related practices. Current funding schemes do not explicitly incentivise CCF, although some biodiversity- or climate-oriented measures may indirectly support CCF-compatible practices.</p>

The EU’s framework provides high-level direction (strategy, targets, funding) for sustainable forestry and conservation, while Finland implements detailed national strategies, laws, and programs on the ground.

CCF is increasingly reflected in both levels – explicitly in Finland’s forest policy and implicitly through EU’s closer-to-nature forestry emphasis. At the national level, Finland has developed a detailed framework of strategies, laws, and programs to steer forestry toward sustainability, with Continuous Cover Forestry gradually arising in these policies.

Finland’s National Forest Strategy 2035 is a policy framework about forest management and use, with the vision of “Growing Wellbeing from Forests and for Forests”. The Strategy is driven by sustainability and highlights the interdependence between societal well-being and forest health. The strategy sets four strategic objectives: fostering a competitive forest-based sector, promoting active and diverse forest use, enhancing forests’ vitality and biodiversity, and improving knowledge-based management in the forest sector. Notably, it advocates for ecological sustainability by diversifying silvicultural methods, including continuous-cover forestry (CCF) and mixed-species cultivation, while maintaining active use of forests. Quantitative targets, such as increasing deadwood volume and preserving large deciduous trees in commercial forests, aim to reverse biodiversity loss in managed forests.

Legislative and policy tools reinforce this direction. The 2014 revision of the Forest Act removed legal barriers to uneven-aged silviculture, and national guidelines now include CCF techniques like selective thinning and group selection. Economic incentives are gradually evolving from traditional support for regeneration toward schemes that reward biodiversity and climate benefits. Programs like Metka and emerging carbon credit initiatives are beginning to align financial support with the ecosystem services delivered by CCF, making it more attractive for forest owners—especially those with amenity or conservation-oriented goals.

In addition to core policy instruments, targeted biodiversity programs such as METSO and Helmi complement the Forest Strategy by promoting forest conservation and restoration in ecologically valuable areas. These programs often rely on or encourage continuous cover management, particularly in sensitive peatland forests that are important carbon sinks. Climate policies further support this transition by emphasizing reduced-impact forestry on peatlands, where clear-cutting and drainage lead to high emissions. Overall, NFS2035 positions CCF as a viable and increasingly supported approach to achieving ecological sustainability in Finland’s forests, integrating legal, financial, and advisory mechanisms to enable its wider adoption.

## 3.4. Discussion – Policy Framework

### 3.4.1. Sustainable Agriculture

Sustainable agriculture is a fundamental element of the European Union's sustainability agenda. The EU explicitly aligns its efforts in this area with the United Nations Sustainable Development Goals (SDGs). Specifically, SDG 2 "Zero Hunger" is a key point for EU action abroad and within the Union. SDG Target 2.4 calls for sustainable food production and resilient agricultural practices by 2030. Progress towards this target is monitored through Indicator 2.4.1 – the proportion of agricultural area under productive and sustainable agriculture. In the EU context, monitoring progress towards SDG 2 focuses on malnutrition, sustainable agricultural production, and the adverse environmental impacts of agricultural production. Recent years show an uneven picture; there has been steady progress in making EU agricultural production more sustainable, but results in reducing adverse environmental impacts are mixed, indicating ample room for improvement.

The EU's agricultural policy framework is primarily built around two major policy pillars: the Common Agricultural Policy (CAP) and the European Green Deal initiatives (Cuadros-Casanova et al., 2023 & Boix-Fayos and de Vente, 2023). The EU integrates sustainable agriculture into its broader policy framework, particularly under the European Green Deal (EGD) objectives. Several key strategies within the EGD directly influence agriculture. The CAP legislation for 2023-2027 is aimed at aligning with the European Green Deal (EGD) and to be a key tool for achieving the objectives outlined in the Farm to Fork and Biodiversity strategies, as well as targets for greenhouse gas (GHG) emissions mitigation (EC/JRC, 2024).

The latest reform for 2023–2027 introduced a "new way of working" with a strong emphasis on results, performance, and flexibility for Member States. Implementation is done via tailored CAP Strategic Plans (CSPs) for each Member State, which integrates various CAP interventions, such as direct payments, rural development, market measures (Peeters et al., 2020). Member States report annually on progress, which the Commission reviews to assess contributions to CAP objectives and the Green Deal. The CAP allocates a significant portion of its budget towards environmental and climate goals, with about 40% of the total CAP budget being climate-relevant and contributing to the EU's biodiversity spending target. At least 25% of the budget for direct payments is specifically allocated to eco-schemes, which provide stronger incentives for climate- and environment-friendly farming practices.

Environmental sustainability in the CAP is also reinforced through enhanced 'conditionality', meaning farmers must adhere to stricter requirements to receive full direct payments and certain rural development funds. These requirements include Statutory Management Requirements (SMRs) derived from other EU legislation and applicable to all farmers, and Standards for Good Agricultural and Environmental Condition of land (GAECs), which are specific to the CAP but allow for Member State flexibility in setting minimum requirements. Despite the conditionality standards, concerns have been raised that they are not ambitious enough, even without derogations (EEA, 2022). Furthermore, the CAP has been criticised for inconsistencies, simultaneously supporting sustainable practices like organic farming and eco-schemes while also heavily subsidising high-input, intensive farming systems through per-hectare payments that favour larger holdings (EEA, 2022). Some see the CAP conditionality requirements and voluntary schemes functionally disconnected from the objectives set under the EGD, weakening the CAP's ability to achieve pressing environmental objectives. (Cuadros-Casanova et al., 2023).

Beyond conditionality, the CAP's green architecture includes eco-schemes, which are voluntary direct payments for practices going beyond mandatory requirements. These schemes vary significantly across Member States as they are designed to local characteristics and priorities. Member States were required to allocate at least 25% of their direct payment budgets to eco-schemes. Rural development funds also support climate, biodiversity, environment, and animal welfare measures, including environmental and climate management commitments, investments, and activities contributing to sustainable management

of natural resources and biodiversity. The CAP also supports sustainable forestry interventions, which are linked to implementing the New EU Forest Strategy for 2030 and expanding agroforestry systems. Support for forestry may require a forest management plan aligned with sustainable forest management principles for larger holdings. The CAP is expected to contribute to achieving targets set by other key EGD strategies.

The European Green Deal framework encompasses multiple interconnected strategies:

- The Farm to Fork Strategy, which targets 50% reduction in pesticide use and 20% reduction in fertilizer use by 2030 (Moschitz et al., 2021),
- The Biodiversity Strategy 2030, aiming for 25% organic farming and 10% high-diversity landscape features (Cuadros-Casanova et al., 2023),
- The EU Soil Strategy, focusing on soil protection and health (Montanarella and Panagos, 2021).

Additional policy instruments include the Land Use, Land-Use Change and Forestry (LULUCF) Regulation, the Effort Sharing Regulation, the EU Emission Trading System (Zezza, 2023), the Water Framework Directive, addressing agricultural impacts on water quality (Bieroza et al., 2021).

The F2F strategy supports these aims through various means, primarily via the national CSPs. It promotes research, innovation, technology, and investments in sustainable agriculture, integrated pest management (IPM) (including techniques like crop rotation and mechanical weeding), and organic farming. It also supports developing new green business models like carbon farming, which rewards farmers for carbon sequestration. The strategy recognises the central role of farmers and calls for substantial CAP support to help them adopt agro-ecological practices. Efforts to revise rules on the sustainable use of plant protection products were a core element, proposing legally binding targets for pesticide reduction, but the legislative proposal was withdrawn. The F2F strategy has been noted for its ambiguity regarding the definition of "sustainable agriculture," leading to varying interpretations and potentially mixed signals for stakeholders (EEA, 2022).

Data collection and monitoring for sustainable agriculture are being enhanced through the transition from the former Farm Accountancy Data Network (FADN) to the Farm Sustainability Data Network (FSDN). The FSDN aims to collect and analyse farm-level data across economic, environmental, and social sustainability dimensions to support evidence- and performance-based policies and gauge progress towards sustainability goals. This network provides the data infrastructure for tools like the 'On-farm Sustainability Compass' proposed in the Vision for Agriculture and Food, which aims to provide voluntary benchmarking of farm sustainability performance and reduce administrative burdens. Transitioning from FADN to FSDN represents a significant opportunity to support evidence-based behavioural interventions in European agriculture. The FSDN creates a robust foundation for designing, implementing, and evaluating green nudges that can guide farmers toward more sustainable practices by collecting comprehensive sustainability data across economic, environmental, and social dimensions.

The EU Biodiversity Strategy for 2030 is linked to the F2F strategy and the CAP, promoting a transition towards sustainable agricultural practices. It shares several targets with F2F, including those on pesticides, organic farming, nutrient losses, and pollinators. It also promotes agro-ecological practices. Progress is being made on some targets, such as the reduction in chemical pesticide use (33% reduction between 2015-2017 and 2020), though reaching the 50% target for more hazardous pesticides is challenging. Organic farming area has increased (from 5.6% to 9.1% between 2012 and 2020), but requires an annual growth rate of 9.3% to meet the 25% target by 2030. The strategy also aims for at least 10% of agricultural area to be under high-diversity landscape features, but data on this is currently lacking. The Nature Restoration Law, stemming from the Biodiversity Strategy, is a key legal instrument with binding restoration targets that include agricultural ecosystems. The law acknowledges the role of the CAP in supporting environmental protection and biodiversity and suggests considering synergies between national restoration plans and national CAP Strategic Plans. An "emergency brake" mechanism allows for

temporary suspension of agroecosystem restoration provisions in case of severe impacts on food production.

The Zero Pollution Action Plan (ZPAP), a component of the EGD, aims for a toxic-free environment by 2050 and sets 2030 targets to significantly reduce pollution. These targets directly impact agriculture, including reducing nutrient losses by 50%, and the use and risk of chemical pesticides (including more hazardous ones) by 50%. The ZPAP supports the implementation of the F2F strategy and the Biodiversity Strategy, sharing several targets. It is linked to the CAP, aiming to use its green architecture, especially conditionality and eco-schemes, to achieve zero pollution targets.

The EU Soil Strategy for 2030 is considered crucial for achieving the EGD's environmental and climate ambitions, working in synergy with other strategies. It promotes Sustainable Soil Management (SSM) practices as the new normal. National CAP Strategic Plans are encouraged to include interventions relevant to soil health, such as carbon farming, organic farming, and other agroecological approaches, and provide funding for sustainable soil use and restoration. The strategy highlights the lack of dedicated EU legislation as a cause for the state of soils. So, the Commission proposed the Soil Monitoring Law aiming to establish a legal framework for monitoring soil health. This framework is expected to drive the adoption of sustainable soil management practices by requiring Member States to define and promote them.

Climate regulations also play a role. The Land Use, Land Use Change and Forestry (LULUCF) Regulation accounts for land use reported as cropland, grassland, wetlands, etc., and conversions between them. Agro-ecology and agro-forestry are viewed as beneficial for achieving LULUCF targets and are supported through the CAP. Provisions in the Nature Restoration Law related to restoring agricultural ecosystems, particularly drained peatlands, are also relevant to LULUCF accounting. The Effort Sharing Regulation (ESR) sets binding annual GHG emission reduction obligations for Member States in sectors not covered by the EU Emissions Trading System (ETS), including agriculture. Sustainable agricultural practices that lead to measurable reductions in GHG emissions, such as changes in farming practices related to agro-ecology, organic farming, and precision farming, fall under the scope of the ESR targets.

The integration of these policy instruments faces several challenges. Studies indicate disconnects between CAP implementation mechanisms and the more ambitious environmental targets of the European Green Deal (Cuadros-Casanova et al., 2023 & Mowlds, 2020). There is also a need for a more holistic approach and for better alignment across social, economic, and environmental aspects of agricultural policy (Boix-Fayos & de Vente, 2023).

The policy framework continues to evolve, with increasing emphasis on digital technologies for sustainable agriculture (Garske et al., 2021) and greater integration of climate action into agricultural policies (Montanarella and Panagos, 2021). However, achieving coherence among these various policy instruments remains a key challenge for the effective implementation of sustainable agricultural practices across the EU.

Challenges also include difficulties in balancing flexibility and effectiveness, long-term planning, regional variation, productivity impacts, integration with agricultural practices, monitoring and reporting, unequal distribution of support, complexity, administrative burden, technology adoption, data governance, market development, conversion challenges, and a lack of comprehensive directives. The ambiguity in definitions like "sustainable agriculture" within strategies like the F2F can lead to mixed signals. Achieving ambitious, but non-binding, targets set by strategies like F2F and the Biodiversity Strategy remains challenging and requires accelerated effort. Full implementation of biodiversity and nature restoration initiatives faces challenges including insufficient funding, incomplete uptake by Member States, data gaps, and behavioural barriers. The lack of dedicated EU legislation for soil protection has also been noted as a significant issue.

Implementation of these policies varies across member states. For example, in Italy, regional authorities have adapted EU policies to local contexts through initiatives like the "custodian farmers" program for

biodiversity conservation (Labianca, 2022). In Lithuania, implementation focuses on supporting young farmers and improving environmental awareness (Baležentis et al., 2020).

Across Flanders, Italy and Lithuania, the EU Common Agricultural Policy (CAP) provides a strong overarching framework that supports the adoption of sustainable agricultural practices. The integration of enhanced conditionality (GAECs) under the CAP 2023–2027, which sets stricter mandatory good practices for all farmers receiving CAP payments (EC/JRC, 2024), is a shared feature. For instance, GAEC 7 mandates crop rotation to preserve soil structure, fertility, and biodiversity. Lithuania has implemented this very ambitiously, requiring annual crop changes on all arable land, with no crop grown in the same field for more than two consecutive years (EC, 2023). Flanders also fully applies GAEC 7 without opting for mere diversification. Flanders also places a strong emphasis on buffer strips along watercourses, with stricter mandatory requirements under GAEC 4 and MAP7, coupled with dedicated eco-schemes for enhanced buffer strips. Italy, under its CAP Strategic Plan, also adheres to these EU-wide conditionality standards (EC, 2023).

Eco-schemes under CAP Pillar I serve as a critical support tool in all three cases, channelling at least 25% of CAP direct payments into voluntary practices beyond the mandatory baseline and rewarding farmers for climate- and environment-friendly practices (EC, 2023). Lithuania has planned nine different eco-schemes, including one for diverse crop rotation, which incentivises the inclusion of specific crop groups like legumes and oilseeds and others that support no-till methods, and ecological landscape features (EC/DG AGRI, 2025). Italy, aligning closely with the EU Green Deal, promotes agroecological methods through five targeted eco-schemes, including those for crop rotation with legumes, pollinator protection, and orchard floor management without herbicides (EC, 2023). Flanders focuses its eco-scheme investments heavily on vegetative buffer strips, offering differentiated payments for width, composition, and environmental risk zone and additional incentives for cover crops and soil fertility practices (EC/DG AGRI, 2024), currently creating a new eco-scheme related to buffer strips for the year 2026 (MAP 7, 2024).

Pillar II of the CAP provides Environmental, Climate-related and other management commitments (ENVCLIM), multi-year rural development measures for environmental and climate good practices. Lithuania has allocated a substantial share of its rural development funds (over €1 billion) to this type of intervention, including support for organic farming and extensive grassland management (EC/JRC, 2025). Flanders offers multi-year contracts for practices like organic farming and field edge management (EC/JRC, 2024). Italy has a rich menu of 34 agro-environmental measures under Rural Development, incentivising practices like integrated production, cover cropping, buffer strips, and organic farming, with a significant allocation of around €2.0–€2.1 billion for organic conversion and maintenance (EC/JRC, 2025). Italy also stands out for its extensive risk management tools. It dedicates nearly 8% of its CAP funding (2,9 billion euros) to subsidised crop insurance and mutual funds, providing farmers with tools to manage climate risks while supporting long-term sustainability transitions, followed by France, Croatia and the Netherlands, each allocating about 2% (EC, 2023).

Promoting knowledge and innovation and encouraging their uptake in agriculture and rural areas is identified as a cross-cutting objective within the ten key objectives of the CAP for 2023-2027 (EC, 2024). Support for knowledge transfer and innovation through the Agricultural Knowledge and Innovation Systems (AKIS) is also prioritised across all three countries. Lithuania's plan recognises the importance of farmers' knowledge and directs funding to improve training and advisory services, focusing on innovation and climate/environment topics (EC/JRC, 2025). Flanders invests 5% of its Public Expenditure for Rural Development to knowledge exchange and dissemination of information interventions (EC, 2024). Italy leverages its national AKIS to diffuse sustainable practices, funding advisory services linked to eco-schemes and agri-environment commitments (Italian CSP).

Despite this policy support, barriers remain to adopting sustainable agricultural practices at EU and national/regional level. A common challenge is bridging the gap between ambitious sustainability targets and on-the-ground implementation. Much of the environmental benefit under CAP relies on voluntary eco-schemes. An EU-level challenge is that there's no guarantee farmers will join these schemes at the scale

needed to hit EU climate and biodiversity targets. Uptake shortfalls could lead to missing the intended 40% climate-spending impact or the 10% biodiversity-friendly land target (EC, 2024). Additionally, there are concerns that some schemes might lack sufficiently stringent environmental criteria, potentially leading to 'greenwashing' if payments support nominal practices without substantial environmental benefits (Birdlife, 2022).

Moreover, the potential for partial exemptions and flexibility in rules can also limit the environmental impact, as in Lithuania, where small farms are exempt from crop rotation rules (EC, 2023). There is a need for greater policy coherence and integration across agricultural and environmental regulations. Cuadros-Casanova et al., 2023 also reports a fundamental disconnect between the Common Agricultural Policy (CAP) implementation mechanisms and the more ambitious environmental objectives of the European Green Deal, at the EU level. This misalignment particularly affects the capacity to achieve targeted environmental outcomes while maintaining agricultural productivity.

Complex administrative procedures present another significant barrier across the EU, often hampering the effective implementation of sustainable practices (Hupková et al., 2023). The farmers in Flanders note the plethora of rules (GAEC, eco-scheme criteria) as potentially discouraging participation in voluntary measures, leading the Flemish authorities to simplify the buffer strip eco-scheme in 2025 to encourage farmers to use it (Flemish CSP). The enforcement of GAEC and other sustainability conditions, while formally present, varies in effectiveness. In Flanders, persistent nitrate pollution underscores the limitations of monitoring and compliance, and in Lithuania, adoption of complex crop rotations is often minimal beyond what is strictly required.

The transition to sustainable practices requires substantial support mechanisms, including improved advisory services and market development opportunities for sustainably produced goods (Garske et al., 2021). However, current policies often lack sufficient integration between environmental protection measures and economic viability concerns Boix-Fayos and de Vente, 2023, creating barriers for farmers attempting to adopt more sustainable practices while maintaining profitable operations. Across farming systems, analyses call for financial support, knowledge transfer, and tailored measures that balance productivity with environmental protection (Fayet et al., 2022 and Vergamini, 2024).

Regarding farming system needs, the policy framework requires better integration of financial support mechanisms with knowledge transfer initiatives (Moschitz et al., 2021). The knowledge gaps and the lack of technical expertise among farmers can reduce the uptake of innovative, sustainable agricultural practices, with the need for enhanced advisory services emerging (EC, 2023). Farmers and other rural actors need training to embrace changes related to the transition to more resilient and sustainable agriculture and rural areas. Lifelong training will enable farmers to improve farm practices and hence productivity, address environmental and climate challenges, adapt to the digital transformation and acquire skills for the uptake of innovative solutions (EC, 2023).

Different farming systems across the EU require tailored measures that can balance productivity demands with environmental protection goals. Structural characteristics also affect implementation. The smallholder dominance in Italy and Lithuania restricts large-scale adoption of specific sustainable practices, while high specialisation and livestock intensity in Flanders reduce flexibility for diversified crop rotations. The current one-size-fits-all approach often fails to address the specific challenges faced by diverse farming systems, from intensive agriculture to small-scale traditional practices (Peeters et al., 2020).

The analysis of EU and national agricultural and environmental policies reveals several significant gaps that hinder the full mainstreaming of sustainable agricultural practices at both European and national/regional levels, in all three countries. At the EU level, the ambition of the Green Deal targets is not always matched by binding implementation measures, leading to uneven progress across Member States. While Italy has integrated these targets into its plan, uneven progress across the EU could undermine overall goals. In Flanders, ensuring the long-term effectiveness and funding of strict measures like wider buffer strips remains a concern, particularly if EU funding priorities shift.

Another common limitation is the insufficient promotion of integrated and systemic approaches. While most eco-schemes focus on individual practices—such as maintaining ground cover or buffer strips — they rarely incentivise whole-farm transitions to agroecological or regenerative models. Moreover, the reliance on voluntary eco-schemes at the EU level also presents a gap, as there is no guarantee of sufficient uptake to meet overall environmental targets. Better integration of CAP with other EU environmental policies, is also needed. In Italy, studies have identified insufficient support for biodiversity conservation in intensive farming areas, alongside an uneven distribution of agri-environmental measures (Labianca, 2022). Lithuania faces distinct challenges, particularly regarding inadequate support for young farmers and low environmental awareness among the farming community (Baležentis et al., 2020). The need for improved advisory services and knowledge transfer is particularly acute in this region, highlighting the importance of capacity building alongside policy implementation. Policy coverage gaps might also exist where certain sustainability issues, such as the quality of crop rotations or comprehensive nutrient management planning, are not fully addressed. In Lithuania *crop rotation is enforced, but crop rotation quality (such as including a true break crop for disease control) might vary*. In Flanders, regarding buffer strips, while their quantity is increasing due to regulations, their quality in terms of ecological function and connectivity across landscapes is not guaranteed, highlighting a need for better management guidelines and coordinated efforts.

Another procedural gap exists in the need for better monitoring of environmental outcomes to evaluate the effectiveness of implemented policies and allow for necessary adjustments. Although enhanced conditionality has raised the baseline, implementation remains uneven, particularly in environmentally sensitive areas. In Flanders, despite strict buffer strip regulations, nitrate levels in shallow groundwater remain high. In Lithuania, enforcement capacity is stretched, and monitoring relies heavily on self-reporting and infrequent field checks. This highlights the need for more robust digital tools and real-time compliance systems.

There are also differences in how countries have addressed climate risk. Italy has made risk management a cornerstone of its CAP plan, providing a full suite of insurance and mutual fund mechanisms that not only compensate for losses but also incentivise proactive adaptation. In contrast, Lithuania and Flanders lack similarly scaled instruments. Their limited use of risk-sharing tools exposes farmers to climate-induced volatility and undermines confidence in shifting toward more climate-sensitive practices. However, in Italy, might exist a gap in fully integrating 'green' incentives into risk management tools because the current insurance schemes do not differentiate based on farmers' adoption of environmentally beneficial practices.

In all three countries, a common need emerges for stronger horizontal coordination between CAP instruments and other EU and national environmental frameworks. Currently, CAP supports biodiversity and water quality goals, but coordination with the Water Framework Directive, Nitrates Directive, the Farm to Fork Strategy and the EU Biodiversity Strategy remains inconsistent. Without greater alignment, policy fragmentation may continue to limit the systemic transformation that is urgently required. Finally, a need exists for long-term commitment and consistency in policy signals to provide farmers with the confidence to invest in sustainable transitions.

These gaps highlight the need for a more nuanced and integrated approach to agricultural policy development, one that can better accommodate regional variations while maintaining coherence with overarching EU sustainability objectives (Zezza, 2023). The challenge lies in developing flexible yet effective policy instruments that can support the diverse needs of European agriculture while advancing towards ambitious environmental and climate goals.

Addressing these barriers and gaps necessitates several key actions and highlights critical needs. Ensuring long-term policy coherence and commitment and a clear vision for sustainable agriculture beyond the current CAP cycle at both EU and national levels is crucial to provide farmers with the confidence to invest in sustainable transitions. There is a need to simplify and streamline participation in eco-schemes to reduce administrative burdens.

Enhancing advisory and knowledge transfer services with locally adapted information and peer-to-peer learning opportunities can better motivate farmers to adopt and effectively implement sustainable practices. Integrating behavioural "green nudges" into policy tools could also enhance the effectiveness of existing measures. The need here is to incorporate new approaches that encourage farmers' intrinsic motivation for sustainability. For example, the EU could support a platform where farms can benchmark their environmental performance (nutrient use efficiency, soil health metrics) against peers, "nudging" hesitant farmers and private forest owners to improve without mandating it. Projects like PRUDENT can provide evidence on how such nudges might be implemented alongside traditional policies.

Policies also need to address structural issues within the agricultural sector and support farmers in diversifying or transitioning to more sustainable models. In the case of Flanders, leveraging collaborative landscape approaches can enhance the ecological benefits of measures like buffer strips by creating connected habitats. In the case of Italy, there is a need to introduce green conditionality into insurance schemes to incentivise farmers to adopt risk-reducing sustainable practices. Increasing support for precision and smart farming technologies can facilitate the reduction of input use while maintaining productivity. Addressing regional disparities by providing targeted support and technical assistance to regions with lower uptake of sustainable measures is necessary.

Furthermore, improving data collection and monitoring of environmental outcomes is essential to evaluate policy effectiveness and guide future adjustments. Policy needs to ensure more comprehensive coverage of sustainability issues and promote higher quality implementation of practices. There is also a need for continuous stakeholder engagement and co-creation in policy design and evaluation to ensure policies are practical and effective. Finally, fostering greater market and consumer demand for sustainably produced food will be crucial for the long-term viability of sustainable agricultural systems. By addressing these needs through targeted policy improvements, Member States can further advance the adoption of sustainable agricultural practices and achieve the EU environmental goals.

### 3.4.2. Sustainable Forest Management

Sustainable forest management is part of the European Union's broader sustainability agenda. The EU aligns its efforts with the United Nations Sustainable Development Goals (SDGs). SDG Target 15.2 specifically aims to promote sustainable management of all forests by 2020, monitored through Indicator 15.2.1 – progress towards sustainable forest management. Globally, progress is mixed; while certification and management plans have increased since 2010, overall forest area continues to shrink, mainly due to agricultural expansion. Despite a 13% increase in certified area since 2010 (reaching 389 million hectares in 2023), there was a net decrease of 55 million hectares between 2022 and 2023, illustrating that gains in one area can be offset by losses in another, underscoring the need for integrated solutions. In the EU, monitoring progress towards SDG 15 focuses on ecosystem status, land degradation, and biodiversity trends. Short-term trends lead to a moderately unfavourable assessment of the EU's progress in this area, characterised by several unsustainable trends in biodiversity and land degradation.

The EU approaches forests through the lens of the European Green Deal's (EGD) objectives, particularly regarding climate neutrality and biodiversity protection. The New EU Forest Strategy for 2030, adopted in 2021, is a cornerstone policy of the EGD that aligns forestry with sustainability goals. The Strategy aims to improve the quantity and quality of EU forests and recognises their multifunctionality, providing raw materials, jobs, recreation, and critical ecosystem services like carbon sequestration, water regulation, and habitats. The strategy promotes sustainable forest management to strengthen biodiversity, health, and resilience while still providing economic and social benefits.

Notably, the strategy highlights certain close-to-nature silvicultural practices as exemplary for sustainable forest management, such as uneven-aged and continuous-cover forestry, increasing deadwood, and preserving habitat trees. These practices support biodiversity and climate adaptation by maintaining continuous canopy and structural diversity. The strategy also cautions against intensive practices like

clear-cutting, stating it should only be used in duly justified cases due to negative impacts on biodiversity and soil carbon, and urges leaving stumps and roots to protect forest soils. This indicates a policy signal favoring sustainable practices at the EU level.

While forestry policy largely remains a Member State competence, the EU Forest Strategy provides a cooperative framework and can mobilise funding. A key initiative is the development of Guidelines for Closer-to-Nature Forest Management, with the Commission formulating criteria and indicators for these practices. Building on these guidelines, the Commission plans a voluntary certification scheme and an EU quality label for climate- and biodiversity-friendly forestry.

The strategy also aims to develop a new EU Forest Monitoring framework with more precise data. The Commission's proposed Forest Monitoring Regulation aims to establish a harmonised monitoring system across the EU, tracking parameters related to climate change, biodiversity, invasive species, and forest health using technologies like Earth Observation and ground-based measurements. However, progress on this proposal has faced challenges in the Council due to Member State concerns about administrative burdens, costs, and feasibility, although there is broad agreement on the need for harmonised monitoring.

The Common Agricultural Policy (CAP) also supports sustainable forestry through various interventions, aiming for environmental, social, and economic sustainability. Forestry interventions under the CAP are explicitly mentioned as contributing to the implementation of the New EU Forest Strategy for 2030 and expanding agroforestry systems. Support can be provided for management commitments, including forest environmental and climate services and conservation, and for investments in tangible and intangible assets that contribute to CAP objectives, potentially including investments in the development, modernisation, or adaptation to climate change of forestry, and restoring forestry potential after natural disasters. For larger holdings, support may be conditional on information from a forest management plan or equivalent instrument, in line with sustainable forest management principles. A specific result indicator (R.30PR) monitors the share of forest land under commitments to support forest protection and management of ecosystem services. CAP rural development funds can support afforestation, forest-environmental measures, or climate-friendly forestry pilots, and the strategy suggests developing carbon farming mechanisms to reward forest owners for carbon sequestration, potentially via future carbon credit markets or CAP payments.

The Land Use, Land Use Change and Forestry (LULUCF) Regulation is particularly relevant for sustainable forestry due to its focus on including GHG emissions and removals from the LULUCF sector within the EU's climate framework. It establishes commitments for Member States and a 2030 Union target for net GHG removals in the LULUCF sector. A recent revision increased the 2030 net GHG emission reduction target to 57% (up from 55%), largely due to a new EU target for carbon dioxide removals in the LULUCF sector, set at 310 million tonnes of CO<sub>2</sub> equivalent. For sustainable forestry, the regulation focuses on emissions and removals from managed forest land, accounted for based on forest reference levels. Achieving the LULUCF targets will likely require substantial changes in forest management. Practices like continuous cover forestry can help countries meet these targets by maintaining higher carbon stocks in soil and biomass and avoiding emissions spikes from large clear-cuts.

The EU Biodiversity Strategy for 2030, linked to the Forest Strategy, sets the ambitious goal of strictly protecting all remaining EU primary and old-growth forests (Lier et al., 2022). The New EU Forest Strategy for 2030: A New Understanding of Sustainable Forest Management? *Forests*, 13(2), 245.), with strict protection planned to begin in 2029. The strategy promotes biodiversity-friendly forestry practices, such as closer-to-nature forestry. The Nature Restoration Law, stemming from the Biodiversity Strategy, is the primary legal instrument to fulfil its objectives and includes specific targets for restoring forest ecosystems. Member States must achieve an increasing trend in the national common forest bird index by 2030 and thereafter. They must also aim for an increasing trend in at least six out of seven indicators by 2030 to demonstrate enhanced biodiversity. The law also contributes to the three billion trees commitment.

The Zero Pollution Action Plan (ZPAP), while less directly focused on forestry than agriculture, indirectly supports sustainable forest management through its ambition to protect and restore biodiversity and

reduce air pollution impacts on ecosystems. The EU Soil Strategy for 2030 underscores the critical link between healthy soils and thriving forests. It calls for forest management practices that avoid soil degradation through compaction, erosion, or loss of organic carbon. The strategy points out opportunities for private forest owners to enhance forest productivity and carbon sequestration through practices that simultaneously improve soil health. The proposed Soil Monitoring Law aims to establish a legal framework for soil protection, obliging EU countries to protect soil health and resilience, with support measures for private forest owners anticipated. The future EU Bioeconomy Strategy intends to strengthen the role of private forest owners, creating jobs and diversifying their incomes while rewarding them for ecosystem preservation.

Finland's forest policy framework puts a growing emphasis on sustainability, with Continuous Cover Forestry (CCF) gaining recognition as a key practice to balance timber production with ecological and climate goals. Finland's National Forest Strategy 2035 (NFS2035) provides a more concrete framework for sustainable forest management. It explicitly recognises the need to diversify silvicultural methods and anticipates that continuous-cover forestry and mixed-species cultivation will become more common. The revision of the Forest Act in 2014 legally permitted uneven-aged silviculture, removing previous barriers to CCF adoption. Forestry guidelines and extension services have been updated to include continuous-cover methods. Moreover, Finland's Forest Biodiversity Programs (METSO & Helmi) provide financial incentives for voluntary conservation of valuable habitats, often involving continuous cover by leaving areas unmanaged. Climate policies, such as the Climate Plan for the Land Use Sector (MISU), also acknowledge the role of CCF in reducing carbon emissions from peatland forests.

Despite this policy support, some factors hinder the widespread adoption of sustainable forest management practices, such as CCF. A growing body of literature on European forest governance consistently shows that, in the absence of an explicit EU competence on forest policy, most forest-relevant EU measures remain voluntary, weakly coordinated, and lack binding enforcement mechanisms. As a result, there is no authoritative framework to ensure coherent implementation and accountability across Member States, which contributes to a persistent gap between ambitious EU-level objectives (e.g., under the European Green Deal, the EU Biodiversity Strategy and the EU Forest Strategy) and on-the-ground practices (Wolfslehner et al., 2020; Winkel et al., 2022; Sandström et al., 2022; Stubenrauch et al., 2022).

This governance fragmentation is further reinforced by insufficient policy coherence across EU initiatives affecting forestry. Several studies highlight misalignment between the CAP and broader European Green Deal objectives, which may hinder the transition towards more sustainable forest management practices (Köhl et al., 2021; Winkel et al., 2022). In particular, measures under the 'Fit for 55' package have been criticised for their limited coherence with forestry policy, often prioritising ecological dimensions while insufficiently addressing the economic and social aspects of sustainable forest management (Köhl et al., 2021; Stubenrauch et al., 2022). Sandström et al. (2022) further argue that the EU Forest Strategy for 2030 risks promoting a one-size-fits-all approach that does not adequately reflect the diversity of European forest ecosystems or the scientific evidence on context-specific management practices.

At the national level, these EU-level gaps translate into concrete implementation challenges. In Finland, for example, tensions persist between economic and ecological objectives. While the National Forest Strategy 2035 seeks to balance wood production and biodiversity, existing economic support structures have historically favoured rotation forestry and clear-cutting, providing limited direct financial incentives for private forest owners to adopt CCF. Additional barriers include limited practical knowledge and training in CCF methods among forest professionals, insufficient guidance on applying CCF across diverse forest types, and challenges in integrating CCF with other land-use objectives. Overall, these findings reinforce that weak accountability mechanisms, policy incoherence, and limited implementation capacity jointly contribute to the gap between policy ambition and practice.

In Finland, it is important to align economic incentives with the ecological benefits of CCF in a better way. This could involve dedicated forest environment payments for continuous cover management and rewarding ecosystem services. Several studies, including Blattert et al. (2022) and Pietarinen et al. (2022), identify challenges in balancing economic growth targets with biodiversity and ecosystem service goals.

Pietarinen et al. (2022) appear to find that Finnish forest policies tend to prioritise economic values over ecological sustainability, potentially hindering the achievement of broader environmental goals. Blattert et al. (2022) highlight incoherence between different Finnish forest policies, with economic growth targets often conflicting with biodiversity objectives.

Sandström et al. (2022) appear to point out that the EU Forest Strategy for 2030 insufficiently acknowledges the competence of Member States and regional, local, traditional, and indigenous knowledge in forest management. Enhanced education and training programs are needed to build expertise in CCF among forest professionals and owners. Tailored guidance and operational targets for CCF in different forest types are also essential. Winkel et al. (2022) appear to highlight the challenge of implementing EU-wide policies across the diverse forest contexts found in different regions of Europe. Furthermore, greater policy coherence is required to ensure that different sectoral goals (e.g., bioeconomy and biodiversity) are mutually supportive, with CCF recognised as a strategy to achieve both. Finally, there is a need for improved forest data and monitoring systems capable of accurately assessing the outcomes of sustainable forest management adoption. The PRUDENT project can contribute by providing evidence-based recommendations and testing innovative approaches like behavioural "green nudges" to encourage CCF uptake.

# 4. Stakeholder Perspectives on Sustainable Agriculture and Forestry Policies

## 4.1. Introduction

As part of Task 4.1 'Identification and analysis of current policy framework that stimulates more sustainable behaviour and practices' of the PRUDENT project, interviews with policymakers at the EU and national level (Flanders, Finland, Italy and Lithuania) and interviews with farmers and private forest owners across all Use Cases (Belgium, Finland, Italy, and Lithuania) were conducted. These interviews aimed to explore policymakers' perspectives on the effectiveness and challenges of current agricultural and forestry policies in promoting sustainability, the alignment between EU-level and national policy objectives, the potential role of behavioural interventions, particularly green nudges, in complementing traditional policy instruments and the specific contexts and considerations that shape policy implementation across different European regions. The farmer and private forest owner interviews aim to investigate and analyse their views on the EU agri-environmental policies, eco-schemes, and the new European Green Deal (EGD) strategies and action plans.

More specifically, this involves understanding their current engagement with sustainable practices, any challenges or barriers faced in their implementation, the motivation behind adopting them, whether they have received support (such as CAP funding) for these practices, and how it has helped. For those not currently implementing such practices, the questions aim to understand if they plan to, and if so, their needs or motivations, or if not, the reasons why. The interviews also aim to note their experiences and opinions regarding the CAP by assessing the perceived complexity of complying with various CAP conditions and types of interventions, as well as understanding the challenges and benefits of CAP funding for sustainable practices. Finally, the aim is to explore their perspectives on the European Green Deal (EGD) by identifying the main business challenges they face, their feelings and their main concerns about the triple planetary crisis (climate change, biodiversity loss, environmental pollution), their perception of the EGD's impact on their farming practices, and what changes they would like to see in related policies at the European or national/regional level.

This chapter is structured as follows:

- The **Methodology** section describes the thematic analysis approach applied across all interview sets, including data familiarisation, coding, theme development, and reporting.
- The **Results** section presents a comparative analysis of key themes identified across the EU and national contexts, highlighting commonalities and variations.
- The **Discussion** section explores the implications of these findings for the transition to sustainable agriculture, forestry practices, and smart farming technologies by developing policy recommendations for the future, with particular attention to how behavioural interventions should be adapted to different contexts.

## 4.2. Methodology

This study employed the six-stage thematic analysis framework developed by Braun and Clarke (2006) to analyse interviews with policymakers from the EU, Flanders-Belgium, Finland, Italy, and Lithuania and interviews with farmers and private forest owners from Flanders-Belgium, Finland, Italy, and Lithuania. This methodological approach was selected for its flexibility and proven effectiveness in qualitative research, particularly for policy-relevant studies and cross-national comparisons. The same systematic

approach was applied across all interview sets to ensure comparability while remaining sensitive to context-specific variations.

Policymakers from the European Parliament and the European Commission (DG AGRI and DG ENV) were invited to participate in interviews to explore their perspectives on integrating green nudges into sustainable agriculture and forestry policies. The project team sent them personalised emails, introducing PRUDENT's goals and explaining the value of their insights in shaping practical and effective policy recommendations.

Participants were given the interview questionnaire (APPENDIX) in advance and given the flexibility to either respond at their convenience or schedule a full interview. All participants were informed about confidentiality measures and data handling protocols, and their consent was requested for audio recording. This outreach approach was essential in gathering high-quality input to inform research and policy design.

Six in-depth interviews were conducted with EU policymakers from DG AGRI, DG ENV, and the European Parliament. Each interview lasted approximately one hour, was recorded with consent, and subsequently transcribed for analysis. In parallel, interviews with policymakers and farmers/private forest owners were implemented across the Use Cases in Belgium, Finland, Italy, and Lithuania. Tailored interview guides (APPENDIX) were provided in English, along with machine-translated versions in the relevant local languages, accompanied by clear instructions and a submission deadline of December 15th, 2024.

Each partner identified and interviewed five policymakers, from their regional networks, involved in the CAP Strategic Plans or related policy initiatives, as well as five farmers or private forest owners (in the case of Finland) engaged in or receptive to sustainable practices. The goal was to collect insights into the potential role of green nudges in promoting environmentally friendly behaviour in agriculture and forestry. Detailed guidance was offered on interview preparation, consent procedures, and data management to ensure consistency and quality across all contributions.

Between November 2024 and February 2025, 28 interviews with policymakers and 22 interviews with farmers and private forest owners were completed with the support of the Use Case leaders. This exceeded the expected key performance indicators and provided a robust evidence base to advance the objectives of Task 4.1.

Braun and Clarke's six-stage thematic analysis framework (2006) began with familiarisation through close reading of all transcripts to identify initial patterns across contexts. Researchers then conducted manual systematic coding to capture meaningful data segments and develop broader themes through iterative grouping of related codes. The themes were reviewed and refined to ensure they accurately reflect the data. Each theme was then defined and named in relation to the research objectives. Finally, representative extracts were selected to illustrate key findings, with additional comparative analysis highlighting cross-cutting themes and national differences.

The policy analysis adopts a qualitative and exploratory approach, combining systematic review of EU and national policy documents with semi-structured interviews conducted with 50 stakeholders (n = 50), including policymakers, farmers and private forest owners across the selected case-study countries. The objective of this approach is to capture contextualised insights, implementation experiences and policy-relevant perspectives, rather than to produce statistically representative results. Consequently, findings should be interpreted as qualitative and interpretive evidence, highlighting indicative patterns, differences and recurring themes. Given the limited and purposively selected sample, results are not intended for quantitative generalisation, and conclusions are framed with due caution regarding their scope and transferability.

## 4.3. Results – Stakeholders’ perspectives

### 4.3.1. Policymakers

This section presents the findings of a thematic analysis conducted on 28 interviews with policymakers from the EU Institutions (European Parliament and European Commission) and Italy, Flanders - Belgium, Lithuania, and Finland, within the framework of Task 4.1 under Work Package 4 (WP4) of the PRUDENT project. Using Braun and Clarke’s thematic analysis framework (2006), the analysis reveals significant commonalities and variations in policymakers' perspectives across the EU and the four countries. This section presents a comparative analysis around four major cross-cutting themes, highlighting shared patterns and significant contextual differences. The themes revealed from the analysis are:

- Balancing Economic Viability and Environmental Sustainability
- Multi-level Governance Complexity and Implementation Challenges
- Knowledge Systems, Communication, and Digital Technology
- Perceptions and Applications of Green Nudges

#### 4.3.1.1. *Balancing Economic Viability and Environmental Sustainability*

A central tension between economic viability and environmental sustainability emerged consistently at the EU level and across all national contexts, though with important variations in how this tension was framed and addressed.

EU policymakers noted that achieving a balance between economic viability and environmental sustainability in agriculture and forestry is a core objective, but is full of significant challenges and competing views. The Common Agricultural Policy (CAP) is highlighted as the primary policy instrument with the budget and funding potential to address all three dimensions of sustainability – economic, environmental, and social – through financial support and incentives. However, its effectiveness in driving environmental change often depends on how Member States implement their Strategic Plans, and policymakers observe a disconnect between the intended incentives for sustainable practices and farmers' perception of subsidies as a "historical right" rather than a tool for change. There is sometimes a "struggle" within the Institutions, regarding the fundamental approach, with one view emphasising that "public policy should deliver results for public money" and the other suggesting "we need to give money to the farmers and... they will implement what is the best for them, for environment...". Some see the current environmental state as evidence that this latter approach is not working. Policy contradictions also exist, where economic support or promotional funds might encourage practices that negatively impact environmental goals, such as those related to nitrates or fisheries. Furthermore, ambitious environmental targets set at the EU level are sometimes viewed as not being "based on solid analysis" of what is "possible and feasible" on the ground, increasing the gap between desired outcomes and reality and creating frustration. These differing perspectives on how to balance economic support with environmental delivery may hinder integrated policy implementation.

The transition to sustainable practices often involves practical and economic barriers that policy struggles to overcome. A major challenge is the "technological lock-in", where farmers are "tightly bound to the upstream and downstream sectors of the food value chain", limiting their flexibility to adopt more sustainable, potentially less input-intensive methods. Policies aiming for sustainable practices need to provide "alternative options" and involve the entire food chain to address this. Implementing environmental rules or adopting new practices can be "extremely complex and bureaucratic", and rules like integrated pest management are sometimes "not so clearly implemented or they are not really translated into practices that would be easily implementable for farmers". Policymakers recognise that changes must be

"economically manageable for them [farmers]" and that transitioning, especially for systems reliant on certain inputs, might lead to a temporary decrease in productivity, requiring public policy support "to cover the gap, the losses". There's a need to "empower farmers, to give them back options, power" so they can adopt sustainable agriculture "adapted to their own situation". Practical advice and communication that "speaks their language" – focusing first on agronomic and socioeconomic realities before discussing the environment – are crucial for building trust and encouraging behavioural change. Significant improvements are needed for policies to effectively navigate the balance between economic survival and environmental ambition on the ground. These could involve simplification, prioritisation of key indicators, and a positive message that acknowledges farmers' contributions while encouraging further steps towards sustainability.

Belgian policymakers widely acknowledge the crucial relationship between economic viability and environmental sustainability, seeing financial incentives as key drivers for adopting sustainable agriculture practices. Policies have been effective "thanks to the financial stimuli, direct incomes, young farmers, greening measures", with high subsidy percentages making a significant difference. It is considered "ethical to financially compensate" farmers for costs incurred by sustainable actions, as the "economic aspect remains their primary concern", and without financial incentives, farmers "won't implement it". However, policymakers are concerned that agricultural policy is evolving to "benefit large farms and harm small farms", as "really strict rules" necessitate a certain scale, putting pressure on the "business model for the smaller farms". The challenge lies in balancing ecological goals with economic realities; for instance, stricter conditions in environmental agreements can decrease uptake, and rules like the "maintained grassland" rule can lead to unintended negative environmental consequences, such as plowing every four years to retain "freedom to decide how to use the land", indicating a conflict between environmental aims and farm management flexibility/economic choice. Farmers are unwilling to adopt sustainable practices, regardless of potential environmental or long-term economic benefits, because they fear "big fines" for non-compliance. Achieving sustainability requires policies considering these complex economic pressures, practical concerns, and environmental ambition.

The central theme from the interviews with Italian policymakers is the fundamental challenge of balancing environmental sustainability goals with agricultural businesses' economic viability and survival. Policymakers highlight that farmers often perceive the transition to sustainable agriculture as a "threat rather than an opportunity" because pursuing sustainability frequently involves significant financial costs. Furthermore, farmers face increasing vulnerability to external factors like climate events, plant diseases, and soil fertility loss, making their production and income increasingly vulnerable. In this context, ensuring an adequate income for farmers is seen as a crucial priority alongside pursuing sustainability, with the "adequate support of fair farm profitability" being the first sustainability criterion in the Common Agricultural Policy (CAP) since its foundation. The challenge is to find a "difficult balance between the pursuit of environmental objectives and the economic costs that this inevitably entails, and the survival of farm businesses".

Policymakers suggest that policy tools, including green nudges and digital technologies, must be implemented to acknowledge and address these economic realities. As one policymaker notes, it is necessary "to demonstrate its advantages" to promote the adoption of sustainable practices. In that sense, he highlighted the need to "exploit consumer preferences towards more sustainable products" commercially. Another one points out that farmers use pesticides because they are required for production. If they had an alternative to chemical pesticides, they would prefer not to use them, underscoring the need for "correct and truthful concepts" that acknowledge the practical necessities and economic logic of farming. Successful incorporation of new approaches requires sharing objectives and strategies with the agricultural world and strengthening training, communication, and partnership to ensure policies and interventions are not perceived as simply putting agriculture "in difficulty" but rather support sustainable practices while safeguarding economic viability. Green nudges can help with the necessary "mindset changes" for adopting sustainable practices more easily.

Lithuanian policymakers note that the effectiveness of policies like the Common Agricultural Policy and the Green Deal addressing sustainability is debated. One notes that aligning policies with the broader

goals of the European Green Deal involves navigating the "difficult balance between environmental protection and bioeconomy". One perspective suggests that current policies have helped maintain the competitiveness of agriculture and forestry while developing agri-environmental practices. However, another view is that the policies were "extreme, not fully discussed among member states, and faced much backlash, " implying potential negative economic impacts or lack of buy-in.

"Promoting sustainability comes at the expense of farmers, ..., their business usually suffers," notes one policymaker. A key challenge identified is the potential for promoting sustainability to come at the expense of farmers' businesses, leading to a need for appropriate compensation. Lithuanian policymakers note that while "requirements for farmers increase, funding is decreasing. They also highlight the importance of ensuring that sustainability efforts cover all sectors equally, rather than solely focusing on agriculture, to avoid resistance. The call for greater discussion among member states and considering the "specificity of the region" and climatic conditions when formulating policies suggests a need for tailored approaches that can better accommodate the diverse economic realities and environmental conditions across the EU. One policymaker involved in organic certification explained that the practical implementation of policies could be complicated for farmers, leading to less sustainable choices due to ignorance. It is crucial to make clear and understandable information available to farmers to help them make conscious choices towards sustainable production systems. Another view highlights the need to eliminate policy gaps by striking a balance between sectors and identifying the overall benefits they bring to sustainable agriculture.

A central perspective of the Finnish policymakers regarding sustainable forestry is the complex and often conflicting challenge of balancing economic viability with environmental sustainability. Due to the significant economic importance of the forestry sector in Finland, national policy "has dominantly maintained this aspect", which can lead to a perceived misalignment with broader EU environmental goals. Policymakers note that while national policies generally align with the aims of the European Green Deal (EGD), particularly in increasing focus on climate and biodiversity, there is ambiguity in the "actionable means" and debate over what is "regarded as sufficient for realising the goals". The National Forest Strategy, for instance, attempts to assign "equal value to both sides" – the economic goals of the industry and ecological protection – but their "inherent conflicting aims" can make policy guidance "very grey". Some policymakers feel that EU policy, such as the EGD, did not sufficiently address the economic benefits of forests, being viewed as a "programme for the greening" rather than "green growth". Neglecting the economic and social aspects alongside environmental ones has been a "detrimental barrier for sustainable policy change to take place", highlighting the need for "more holistic policy approaches" that integrate environmental, economic, and social considerations.

A key structural feature of the European forest sector is the predominance of private ownership. Approximately 60% of forest land in the EU is privately owned, and this ownership is highly fragmented, with the majority of private forest holdings being small-scale properties, often managed by individual or family owners. Many of these holdings are below 10 hectares, which has important implications for policy design and implementation. Small-scale private forest owners often have limited access to advisory services, financial resources, and administrative capacity, making it more difficult to engage with complex policy instruments or management schemes. This fragmentation increases transaction costs and limits the effectiveness of uniform policy measures, reinforcing the need for targeted, flexible approaches that take into account the specific characteristics and constraints of private forest ownership.

Addressing this crucial balance requires integrating environmental goals within the economic system. The interviewees consistently pointed out that state funding alone is "not sufficient for achieving the ambitious goals for 2030 and beyond". For them, engaging the private sector in funding and instigating a market-wide transition is a key priority. A "significant gap" identified in current policy is the lack of sufficient market incentives, including the creation of markets for biodiversity values and carbon sequestration. Initiatives such as the ecological compensation scheme and the development of a state-regulated private market for natural assets are being explored to give natural assets "real market value" and mobilise private finance

for sustainability. The aim is to address the "interlinkages between forests, natural habitats, and the economy" and find ways the environment can be "accommodated in existing markets", thereby fostering sustainable practices by making them economically attractive and viable in the long term. This balance is further complicated by a "polarised public discourse regarding sustainable practices" in the forestry sector versus the urgent need to address climate change and biodiversity loss.

#### 4.3.1.2. *Multi-level Governance Complexity and Implementation Challenges*

Based on the perspectives of EU policymakers, the implementation of sustainable agricultural and forestry policies is marked by significant multi-level governance complexity and a range of practical implementation challenges. The Common Agricultural Policy (CAP) is highlighted as the most crucial framework with EU-level budgeting and funding, but its effectiveness hinges on how Member States implement their Strategic Plans. As one policymaker notes, "The CAP is effective if the MSs implement the CSPs as agreed. It depends on the implementation", suggesting that divergences or shortcomings at the national level can hinder overall EU policy goals. This is compounded by the need for the CAP to be "complemented by other sectoral policies that provide the regulatory framework", such as the Water Framework or Natura 2000 directives. However, these regulatory policies are only "really impactful where they are implemented properly", pointing to variability in implementation effectiveness across the Union. Furthermore, there is acknowledged complexity and differing views within the Commission regarding the fundamental approach to policy, highlighting a governance challenge at the EU level itself. Fragmentation also exists in areas like forest monitoring, where there is "not a common system for all MSs", leading to calls for a new proposal to address this data gap. Policy approaches need to navigate the considerable diversity that exists "within MSs and across them".

Beyond the complexities of multi-level governance, practical challenges significantly impede implementation on the ground. Policymakers note that policies can be "extremely complex and bureaucratic to implement". Rules and practices that seem straightforward at the policy level, such as integrated pest management, are sometimes "not so clearly implemented or they are not really translated into practices that would be easily implementable for farmers", leading to a "lack of clarity around that" for both farmers and national administrations tasked with checking compliance. Data and knowledge gaps are also crucial challenges. There is often a lack of sufficient, reliable, and detailed data, for instance, on pesticide use or biodiversity at a local level, which is needed to underpin policy and monitor impact. Resistance from Member States to provide new data, citing burdens on farmers, further complicates this. Engaging farmers effectively is another key challenge. Farmers are sometimes perceived as less willing to be nudged, showing "a kind of fatigue... to have more constraints and rules", and may see subsidies as a "historical right" rather than an incentive for change. Building trust and providing practical, tailored advice is seen as essential for farmer buy-in. There is also a sense among some policymakers that ambitious targets have been set without sufficient solid analysis, creating a gap between what is desirable and what is "possible and feasible", leading to frustration and hindering effective implementation. Simplification and prioritisation are suggested as key to overcoming some of these challenges.

Belgian policymakers frequently refer to challenges related to both the complexity of the governance framework and the practical difficulties encountered during policy implementation in the agriculture and forestry sectors. While one policymaker noted the provincial level's limited direct contact with the EU or federal levels, the overarching sentiment highlights significant administrative complexity within the existing structures. One provincial policy advisor feels there is "too much policy", which is "really strict", leading to a lack of trust. Policymakers note the "big frustration among farmers" with administrative complexity, such as having to complete the same data multiple times, and suggest pre-filling data could help, although data privacy is a concern. The administrative process for project calls is also burdensome, requiring farmers to write several pages just to apply. Showing "too much information" is identified as a problem, making farmers feel "lost when completing the collective application" due to the "complexity of everything" and having "so many options". There is a clear call to "Reduce the complexity", and it is observed that larger

farms are "good at adhering to administrative rules" due to their scale, implying this complexity disproportionately affects smaller operations.

Beyond administrative hurdles, policymakers identify numerous implementation challenges. A significant barrier is the lack of trust and fear among farmers, who worry that creating nature on their land, like hedges or pools, will lead to nature organisations or the government later claiming it back or limiting their activities. A Flemish policymaker explained that there have been instances where farmers voluntarily implemented certain sustainable practices that support biodiversity, like pools, which later led to obligations related to those pools. Such practices become "unpopular, even though 100% support" is offered, because farmers fear the government's actions. Policymakers acknowledge that strict rules and large fines erode trust. They also perceive a gap in government capacity and approach; the government "don't have the time nor expertise ourselves to support the implementation" directly, often relying on external organisations. Compared to suppliers who invest in relationships and respond immediately, the government is often seen as providing "a lot of rules" and being perceived as annoying by farmers, hindering engagement. Some suggest the government should profile itself as a partner, perhaps even providing "some kind of government advisor for each farm". Communication is crucial, yet some regulations with significant financial support receive "0 applications" because they fail to reach farmers. It is noted that "a lot depends on the way you communicate it or the way you convey that to farmers", especially since farmers "don't always believe what's being communicated" by the government. Financial compensation "remains very important", but implementation is hampered by inadequate subsidy calculations, sometimes made by people without agricultural experience, which doesn't increase enthusiasm. Policy design itself can create challenges; stricter conditions in agro-environmental agreements can decrease uptake, and rules intended to promote sustainability can have unintended consequences, such as the "maintained grassland" rule leading farmers to plow every four years, thereby reducing biodiversity, or "calendar farming" leaving "very little room, to let farmers keep their own business strategies/management". Furthermore, policymakers express concern that policies are evolving to benefit "larger industrial farms" and are "harming small farms", with strict rules making it difficult for smaller family farms to survive. Farmer motivation and mindset also play a role; a "large group of farmers are very careful, only slowly adopt new practices", some lack knowledge about certain practices, and they are "very worried about making mistakes" that can lead to "big fines". There is also a perception that little appreciation is shown towards farmers who adopt sustainable practices. These interconnected factors illustrate the significant implementation challenges faced by Belgian policymakers.

Italian policymakers highlighted issues with the alignment between EU-level policies and local realities. The complexity of multi-level governance significantly impacts the implementation of sustainable agricultural practices. Italian policymakers point to a gap between the decision-making process at higher levels and the correct implementation in the field. This disconnect means that policies, even well-intentioned ones like eco-schemes or PNRR initiatives aimed at sustainability, can face difficulties in translating into practical, on-the-ground changes. The process can become an "administrative burden" for farmers. One policymaker notes that sometimes sustainability-related regulations "seem to put agriculture in difficulty". Improved communication and alignment across governance levels are essential to navigate this complex landscape.

The implementation challenges also occur from farmers' practical realities and their need for adequate support. Farmers may be reluctant to adopt new sustainable practices due to initial costs, lack of technical knowledge, or the perception that such practices are a "threat rather than an opportunity". There is a recognised need for strengthening training, communication, and partnership between stakeholders and providing necessary "support advice". Policymakers highlight that farmers make decisions, such as using pesticides, out of necessity to ensure production, not for the sake of using them. Therefore, interventions need to acknowledge these practicalities and ensure "correct and truthful concepts" are conveyed. Policies and tools like green nudges need to be "well designed and clearly communicated to farmers" and be accompanied by technical support and financial incentives to overcome the practical hurdles and ensure sustainable practices are viable.

Lithuanian policymakers highlight the inherent complexity of multi-level governance and the significant challenges encountered in implementing sustainable agriculture and forestry policies, particularly those stemming from the EU level. One perspective notes the "difficult balance between environmental protection and bioeconomy" when aligning policies with goals like the European Green Deal. A recurring theme is the lack of adequate discussion among member states during policy formulation, leading to policies being "imposed on everyone the same", despite the vast differences between countries. Policymakers consider this a key challenge and emphasise the need to take into account the "specificity of the region" and climatic conditions when formulating policies. While some policies, like CAP interventions and strategic plans, are considered effective in achieving sustainability goals and maintaining competitiveness, another view suggests recent policies were "extreme, not fully discussed among member states, and faced a lot of backlash," indicating implementation difficulties and resistance.

The implementation of these policies at the farm and forestry level faces several hurdles. A significant challenge is ensuring policies and sustainability initiatives are presented in a simple and understandable form for farmers, as complicated practical implementation can sometimes lead farmers to choose less sustainable options due to ignorance. Lithuanian policymakers suggest a need for better coordination of new measures with beneficiaries. Furthermore, the implementation of sustainable agricultural practices needs appropriate compensation due to perceived insufficient funding. For policies to be effective, they need to be scientifically substantiated and fully integrated and implemented.

Based on the interviews with policymakers involved in sustainable agriculture and forestry policy in Finland, the complexity of multi-level governance and the associated implementation challenges are significant themes. Policymakers describe a landscape where European Union goals and directives, such as those under the European Green Deal, interact with national policies, strategies, and unique local contexts. While national policies generally align with the broader aims of the EGD, particularly in incorporating climate and biodiversity considerations, there is perceived misalignment regarding what is considered sufficient for achieving these goals. The economic importance of the forestry sector in Finland heavily influences national policy, sometimes maintaining this aspect dominantly despite increased focus on climate and biodiversity from EU policies. This can lead to contradictions and ambiguity in actionable means. A key challenge in multi-level governance is the debate over competence and jurisdiction, specifically where the line lies between EU and national responsibility concerning forest issues. Policymakers note that while the EU can provide general directional advice, the appropriate interpretation and implementation of these broad guidelines within national borders remains a national responsibility, and what works in one country may not work in another.

The effectiveness of forest-related policies is strongly influenced by the structure of private forest ownership. Private forest owners constitute a highly diverse group in terms of property size, management objectives, economic dependence on forestry, and engagement with policy instruments, which limits the effectiveness of uniform policy approaches. While Finland is often cited as an example of small-scale and spatially fragmented private forest ownership, this pattern is common across many EU Member States and should not be considered unique. As a result, policies need to be tailored to different owner profiles and local contexts, rather than relying on standardised measures. In this context, behavioural and nudging approaches may offer added value, particularly by lowering administrative burdens, supporting incremental behavioural change, and improving engagement among small-scale and less professionally organised forest owners, for whom traditional regulatory or financial instruments may be less effective.

#### *4.3.1.3. Knowledge Systems, Communication, and Digital Technology*

The role of knowledge systems, communication approaches, and digital technology regarding the promotion of sustainable agricultural and forestry practices emerged as a significant theme across all contexts, with both commonalities and variations in how policymakers viewed these factors.

EU policymakers stress the need for policies that promote sustainable agricultural practices and sustainable forest management to be informed by analysis and evidence, advocating for science-based decision making, although this is acknowledged as difficult in practice. A major policy gap identified is the lack of adequate knowledge and data. While efforts exist to collect data, for instance through the newly established Farm Sustainability Data Network (FSDN), there are significant gaps in specific areas like pesticide use, biodiversity trends at regional or local levels, and even the economic value of different pollinators. Obtaining new data is met with resistance from Member States, who cite the "burden for farmers". Furthermore, concerns are raised that targets are sometimes set without "solid analysis", creating a gap between what is "possible and feasible and what is desirable. The debate needs to shift to focus on what "works under which conditions" based on evidence. There is also a paradox where beneficial technologies like biotechnology are not permitted in agriculture. EU policymakers consider that the simplification and prioritisation of key indicators, such as soil organic matter, is crucial for making data collection and analysis manageable.

Effective communication approaches are highlighted as essential for encouraging farmers to adopt sustainable practices and building trust. Policymakers note the importance of speaking farmers' language ("you have to speak their language") and addressing their practical concerns, starting with "agronomic background" and socioeconomic realities before discussing environmental goals. Simply presenting environmental concepts like "bees and butterflies" may not resonate, but linking them to farmers' daily life and potential benefits can be effective. Giving farmers options and different pathways "adapted to their own situation" is key to empowering them. Communication should also be positive; constantly portraying farmers as a "catastrophe" is ineffective, and a positive message acknowledging their contributions, while encouraging more, is necessary. It is also important to use social dynamics, such as farmers' pride in their achievements or meeting farmers in local venues like pubs for discussions on biodiversity, to share best practices and build community trust. Another challenge is the EU's linguistic diversity in getting farmers to understand and accept policy concepts and terms. Engaging citizens and making policy relevant through understandable examples, such as pollinators, is seen as important for broader support.

Digital technology is widely recognised as potentially playing a "huge role" and being "crucial" in future agricultural and forestry policy. Its potential to improve monitoring, advance precision farming to restrict inputs and maximise income, and collect data for policy design is significant. Benchmarking tools using digital data are seen as promising for farmers to compare their performance with peers. However, significant practical and systemic challenges exist. These include the digital divide, with disparities in internet connectivity in rural areas and variations in farmers' ability and willingness to use new tools. Some farmers perceive digital monitoring as intrusive or feel a "lack of clarity" and trust regarding its implementation. Broader issues revolve around data management: the difficulty in distinguishing between data for the public good (e.g., environmental impacts) and private economic data, concerns about data privacy and transparency, and the concentration of power arising from data held by few players in the value chain. Policymakers suggest digital tools are a "means to help" rather than a singular solution and call for more research to explore their full potential, understand regional differences in implementation challenges, and ensure they are translated effectively from "theory to practice". The successful example of a digital app in Greece, bypassing training, highlights its potential, but overcoming the digital divide and trust issues remains a major hurdle.

Belgian policymakers highlight significant challenges in knowledge transfer and communication with farmers regarding sustainable practices. They note that despite having valuable information, such as data in a sustainable databank, it hasn't been effectively communicated to farmers due to "Priorities and time limitations". A key challenge is simply reaching farmers, who are perceived as a "difficult population to reach," with many wanting "to be left alone". Policymakers acknowledge a disconnect, stating farmers "don't always believe what's being communicated" by the government. They contrast the government's communication effectiveness with that of suppliers, who attract large audiences to information evenings by offering financial incentives and investing in relationships, responding "immediately". This indicates an acknowledgement that market players are already influencing farmers, often more effectively than the

government. Furthermore, policymakers explicitly mention the potential for using Key Performance Indicators (KPIs) in the private sector to influence behaviour, such as relating them to subsidies or using them to give better prices to farmers, although this also raises ethical concerns about potentially categorising farmers. The role of advisors, including those linked to feed producers, also points to market actors influencing farmer choices. In farmers' eyes, the government is often seen as providing "a lot of rules" and being perceived as annoying. To bridge this gap, some suggest the government should profile itself as a partner and consider "some kind of government advisor for each farm," as farmers cannot be expected to be specialists in everything. The work of "Business planners," government personnel who provide direct, personalised advice and support by doing "a lot of the thinking work" and making things "simple for them," is seen as a valuable approach, even if not explicitly termed 'nudging'. Policymakers also stress the importance of understanding farmers' perspective, building trust, and communicating the 'why' behind sustainable measures – explaining "what it actually helps" and their "contribution to society".

Digital technology is seen as holding potential, particularly for analysing data and providing "better data". The idea of using farmer data to offer personalised suggestions, akin to online shopping recommendations, like suggesting the "perfect fit" eco-scheme based on a farmer's profile, is proposed as a future direction. However, significant challenges exist. Policymakers worry that farmers might view digital tools like apps or GPS with suspicion, perceiving them as invasive control mechanisms: "you come to control us". Collecting reliable data for analysis, such as comprehensive water usage information across different farm types, is difficult due to variations in water sources and concerns about "Privacy wise you can't just make that public". There are also practical limitations, with policymakers noting that constraints in IT resources and time mean they are still working on getting "the basics" right, such as making existing administrative processes "more user-friendly," before developing more advanced digital systems. Despite efforts like pre-filling data in the administrative collective application to "make it easier for the farmers," the system's complexity persists, with farmers feeling "lost" due to "too many options" and not understanding the purpose or consequences. The potential loss of farmer data if a company providing digital services goes bankrupt is another concern raised regarding data ownership.

Italian policymakers highlight a "gap between the decision process and the correct implementation in the field" of sustainable agricultural practices, noting a lack of "support advice in between" and the need for effective knowledge transfer and communication strategies. There is a recognition that adopting sustainable practices often requires "mindset changes", and tools like green nudges can help facilitate this process. Key challenges in incorporating new approaches include understanding where the main difficulties lie for farmers, and ensuring "sharing of objectives and strategies with the agricultural world". Ensuring effective implementation requires strengthening training, communication, and partnership between stakeholders at the territorial/local level. Transparency is also linked to effectiveness, and there is a call for conveying "correct and truthful concepts" and being sincere, particularly regarding the practical reasons farmers make certain choices, such as using pesticides because they are required for production. Farmers need training programs and educational resources to understand and adopt new sustainable practices.

Digital technology is considered a "fundamental asset for future development" and its role in agriculture, like other sectors, is viewed as "unavoidable", deserving of specific funding instruments from the CAP. Policymakers see technology as "crucial to tackle this challenge without increasing the cost for the farmers and consumers". They mentioned that precision agriculture, the use of sensors, drones, satellites, real-time monitoring, data analytics, and artificial intelligence are technologies that can improve farm management, enhance productivity and efficiency and support informed decisions. Digital platforms can also provide continuous training and technical support to farmers. However, the successful integration of technology depends on farmers having the necessary "skills that are not yet fully widespread", meaning action is needed on training and skill development. While initiatives like those within the PNRR have aimed to direct companies towards sustainability through investments, their effectiveness was sometimes limited by "the extreme burdensomeness of the procedures", suggesting that even technologically-driven policies

face implementation hurdles if not coupled with streamlined administrative processes and effective communication.

There is a view among Lithuanian policymakers that policies are sometimes "imposed on everyone the same", with "too little discussion between member states", failing to account for the "specificity of the region" or climatic conditions. This points to a need for better knowledge sharing and communication channels at the EU level. At the farm level, policymakers note that while legal acts are "comprehensive and informative, they can be difficult for farmers to understand, and their practical implementation is more complicated". This complexity and a lack of accessible information can sometimes lead farmers to choose "less environmentally friendly or sustainable production systems... due to ignorance". Therefore, information must be provided in a "simple, understandable form" and tailored, for example, to individual farms when discussing issues like pesticide use. Policymakers also stress the importance of building "bridges between science and farming practitioners" and ensuring scientific work is "not only theoretical, but also applied in practice", focusing on the practicalities and benefits for specific regions and crops. The main task in promoting new initiatives is seen as needing to "sell the idea" by convincing farmers "how the green push can benefit him". Education and promoting knowledge about sustainable practices are considered vital first steps.

Digital technology is seen as playing a significant, even "one of the most important roles", in the future of agricultural policy development. Policymakers anticipate that digital tools will facilitate processes, increase "accounting efficiency", and allow decisions to be "based on data". Digital technologies are expected to improve "more accurate data collection and processing, production planning and precise execution", allowing for the analysis of historical and current data to plan future actions for a "common positive impact". Artificial intelligence (AI) is specifically highlighted for its "great impact on decision-making" and is even suggested for use in "consultations". The Internet of Things (IoT) is also mentioned for its potential benefits. However, policymakers caution that digital technology "cannot solve all problems, because nature operates according to its own laws". The integration of these technologies is seen as crucial for faster, higher quality, more sustainable, and safer processes.

The Finnish policymakers view the role of knowledge systems, communication approaches, and digital technology as crucial for promoting sustainable forestry, though challenges exist in their implementation within the complex Finnish context. Policymakers emphasise the need to leverage research and scientific evidence-based recommendations for developing best practices, with a stated priority to "advance the scientific knowledge and data, as well as its availability to forest owners and actors". Digital technology is already playing a significant role in providing the data necessary for informed policymaking through "monitoring and inventory services" and acting as "a bridge between the state and policy and individual private actors (i.e., forest owners)". Immense databases exist for forest inventory, and services like Metsä.fi provide "open access to data on forest resources, nature and species information, and information on forest management". This technological capacity is seen as "essential in the development of evidence-based and informed policymaking" and is "crucial for policy implementation through information management and soft governance (targeted use of information to steer public behaviour and norms)". Its centrality is expected to increase.

#### *4.3.1.4. Perceptions and Applications of Green Nudges*

Policymakers' familiarity with and perspectives on green nudges varied considerably both within and across national contexts, revealing important insights for potential applications of behavioural approaches.

There is a mixed level of explicit familiarity with the term "green nudges" among the EU policymakers, although the underlying concept is recognised and seen as having potential. Some policymakers stated they were "not aware of these terms" or were "not so familiar with this being applied to farmers", while others were familiar with the general concept of nudging, often in consumer behaviour, or specifically with green nudges. Crucially, those initially unfamiliar often realised during the interview that they had been

"implementing some green nudges already in the past" or had been involved in developing initiatives that fit the description. Despite the varying familiarity with the specific terminology, there is a broad perspective that green nudges have "significant potential to contribute to policy goals" in the agricultural and forestry sectors, particularly in encouraging farmers towards more sustainable practices. Some believe they could be "very powerful" and potentially "more effective" in practice than traditional tools like regulatory or financial incentives, which are perceived by some as facing limitations or being seen merely as "historical rights". The concept is viewed as a possible "third path that we have not really tried to use" and could play a crucial role, especially in conjunction with digital applications or integrated into broader policy approaches.

However, incorporating green nudges effectively faces several significant challenges according to the EU policymakers. A key barrier is the lack of reliable data, such as on pesticide use or comprehensive biodiversity trends, which makes implementing data-driven nudges like comparative information difficult. Obtaining necessary data from farmers is also seen as challenging due to perceived burden or lack of willingness. Policymakers highlight the need to build trust with farmers and adapt communication to "speak their language", addressing agronomic and socioeconomic realities before focusing on environmental concepts. There's a debate around transparency; while some argue nudges "must be transparent" to avoid suspicion, others question if full transparency is necessary for effectiveness or might even be counterproductive. The digital divide in rural areas is another hurdle for technology-enabled nudges, along with concerns about data privacy and who controls the data. Furthermore, policymakers noted that nudges might be most effective for changes that "don't require huge cost" and must be part of a broader, comprehensive approach involving the entire food value chain. Examples of initiatives discussed as potentially fitting the nudge concept include early warning systems for non-compliance, environmental certification schemes, benchmarking and social comparison tools (including digital apps or even informal discussions in local pubs), timely reminders, result-based payment schemes that leverage farmer pride, group bonuses for collective action, and engaging citizens with environmental concepts. Researchers are advised to focus on simplification, prioritisation of key indicators, listening to practical know-how, and basing work on solid evidence.

Flemish policymakers exhibit varying levels of familiarity with the concept of green nudges. While some are aware of nudging, often referencing consumer examples like those used in supermarkets or on toilets, others had to research the term specifically for the interview or only know it from workshop training. Despite the formal concept not being explicitly integrated into policy ("we don't use the word nudge", "no one ever told me ever that our goal is to nudge"), policymakers recognise that practices already in use, such as simplifying administrative processes or business planners guiding farmers, could be considered forms of nudging or "thinking for the farmer". They see potential room for nudging within the agriculture sector, particularly for fostering change "from the bottom up" and helping farmers feel they have made the choice themselves. However, they immediately highlight challenges, noting that policy discussions around nudging have often remained just an idea, and it's not currently a priority due to IT limitations and focusing on getting "the basics" right. There's also an acknowledgement among policymakers that implementing nudges, especially those using psychological techniques, raises ethical considerations and requires caution from the government.

Flemish policymakers discuss several types of nudges regarding the potential and challenges. Although policymakers acknowledged the potential effectiveness of the relatively well-known default-nudge, they stressed that farmers must decide for themselves to implement sustainable practices. Making some practices the default will most likely result in a backlash. Many sustainable practices imply multiple actions, and when farmers do not fully understand them, it can lead to resistance. So, it really depends on the specific sustainable practice. Social norms and comparisons, such as showing farmers their water use compared to neighbours or benchmarking economic performance, are seen as potentially effective because farmers are competitive and already influence each other. Simplifying information and processes, like pre-filling data in applications or offering pre-made planting schemes, are seen as valuable ways to make choices easier, although some view this simply as logical process improvement rather than nudging. Personalised suggestions based on farmer data, like recommending eco-schemes, are proposed as a

future data-driven approach, akin to online shopping models. However, major challenges include the ethical implications of government "advising" or "steering" and concerns about damage/insurance claims. They doubt if nudging is appropriate for the long-term, significant choices required in agriculture, as opposed to small, impulsive consumer decisions. Furthermore, building trust is paramount, as farmers are already suspicious of government communication. Transparency in nudges is debated, with some believing transparency is possible and necessary for trust, while others feel nudges are most effective when the individual is unaware they are being influenced. Policymakers generally perceive regulation and financial incentives (subsidies) as currently more effective than nudges for achieving sustainable practices, especially when subsidies are substantial. They suggest nudging might work best in combination with other policies, for actions requiring less effort, or with farmers already intrinsically motivated. Crucially, for any approach including nudging, policymakers stress the need to understand the farmer's perspective, business model, and practical reality, communicate the 'why' behind measures, and reduce overall administrative complexity. Furthermore, one policymaker explicitly broadens the scope beyond just farmers and policymakers, suggesting that researchers should also "inspire the politicians". They point out that there is a significant gap between what civil servants prepare and what politicians ultimately decide. This indicates a perception that influencing the political level is also necessary for effective policy implementation and sustainability transitions.

The interviews with Italian policymakers showed a varied but generally positive perspective regarding the potential use of green nudges in agricultural policies, although familiarity with the explicit concept differs. One policymaker stated, "I understand the concept of 'Green Nudges' but I am not familiar with it", noting they were not aware of their development or implementation in existing policies. Another admitted, "It's actually the first time I've heard about it," but interpreted the concept and suggested interventions supporting competitive, virtuous companies could be seen as "small pushes". In contrast, one policymaker was explicitly familiar with the concept, while another described them as "tools for sharing and driving towards specific choices" and noted they represent "innovative tools and methods that even EU policies are trying to adopt". Despite differing levels of formal familiarity, the potential for green nudges to contribute to policy goals is largely seen as broad and useful. They are viewed as a "useful approach to the inclusion of environmental concerns" and a "valid way to implement new strategies and operational methods that are environmentally conscious".

Italian policymakers see green nudges as potentially effective tools for fostering sustainable practices, particularly in complementing traditional regulatory or financial incentives. It is suggested they could be "crucial as an interface for the farmer in order to a successful implementation of the policy", helping with the necessary "mindset changes" where implementing measures like eco-schemes was and is not so easy. They are viewed as more effective in agriculture than "sanctioning interventions" and can "accompany policies and foster sustainable practices". Several conditions and challenges must be addressed for green nudges to be effective. Policymakers stress the need for them to be "well designed and clearly communicated to farmers" and linked to "benefits for companies", demonstrating "advantages" that make adopting certain behaviours "convenient". Crucially, they must be transparent to "have value and be recognised as such", as transparency increases trust. Implementation also requires "strengthening training, communication and partnership between stakeholders", providing "training and technical support", and conveying "correct and truthful concepts". Some see them as a "bottom-up" approach and suggest researchers analyse "case studies". While potentially a "very effective new methodology", they must be "correctly and objectively translated" and researchers are advised to be "loyal, sincere".

Lithuanian policymakers demonstrate varied levels of familiarity with the specific term "green nudges," though several recognise the underlying concepts and examples within existing policies. While one policymaker states they are not familiar with the concept in this form, another explicitly says they know the term. Others are familiar with it but haven't encountered it directly or identified their institution's activities, such as providing information and reminders about organic production certification requirements, or implementing green initiatives. Examples of existing "green pushes" or potential nudges mentioned include reminders about agri-environment and climate change from the Ministry of Agriculture and CAP agency, the automatic continuous area monitoring system (NMA agro), the application of eco-schemes, and the

Common Agricultural Policy (CAP) itself being designed to move towards sustainability goals. There is a positive outlook on the potential of green nudges, with one policymaker saying it "has great potential and is highly valued for innovation" and another noting it "can contribute greatly". One view describes it as an "enabling measure" or "additional information" that can help in decision-making.

However, Lithuanian policymakers identify several challenges in incorporating green nudges into agricultural policies. A key hurdle is ensuring policies and initiatives are presented in a "simple, understandable form" for farmers. Policymakers suggest that nudges should be "presented in an understandable form and using authorities" and should be "analysed and scientifically substantiated". A significant challenge is seen in convincing farmers of the benefits, with one policymaker stating, "The main task is to sell the idea... to convince the farmer how the green push can benefit him". When considering specific nudges, like social comparison for pesticide use, one perspective noted that such information would need to be "provided in great detail and tailored to individual farms" due to farm-specific factors. Regarding their effectiveness compared to traditional incentives, views differ; some believe they can be "as effective", while others see them more as "additional measures" that supplement support and CAP objectives, which remain the main drivers. Advice to researchers working on green nudges includes building "bridges between science and farming practitioners" and ensuring scientific work is "not only theoretical, but also applied in practice", focusing on tailoring interventions to "the specificity of the region," typical crops, and "creating added value".

Finnish policymakers have varied levels of familiarity with the specific concept of "green nudges", though they are generally aware of broader "informational governance tools" and "soft governance" aimed at "norm steering". Some policymakers explicitly state they are not familiar with the term "green nudges", while others are aware of it through research or earlier projects. However, they identify existing practices that resemble nudges, such as forest certifications like PEFC and FSC, the Finnish Forest Centre's national forest management recommendations, and providing targeted information like bark beetle risk maps coupled with advice or information about valuable natural resources in areas planned for logging. These "informational governance tools" are considered "very important for shifting norms" and are seen as potentially "as effective as traditional regulatory or financial incentives", possibly even "more effective in instigating longer-term norm changes", especially when based on "scientific evidence and credible sources". There is perceived "significant potential" for extending information management and norm steering. Specifically, the idea of peer comparison nudges, like those showing neighbours' behaviour, is thought to be "very successful in the forestry sector" and could have an "immense impact on changing behaviours".

However, the implementation of green nudges in Finland could face significant challenges. The main reasons are a "diversity of forest owners" and the "polarised public discourse regarding sustainable practices". Policymakers note that what works for one owner "will not work for another", and nudges would need to be "tailored to specific groups with specific circumstances", creating a need for a "wide arsenal" which is seen as "not very realistic". The highly "politically and culturally laden" nature of forestry issues in Finland means nudges carry a "high risk of failure and countering responses". If a nudge is perceived as biased or opposing an individual's values, it might trigger an "unwanted counter response" or even have the "opposite of its intended effect". The issue of transparency is also complex; while some argue transparency is necessary for trust in a sceptical environment, others suggest that in this volatile context, a very transparent nudge could be seen as a "provocation" and thus be "ineffective". However, the effectiveness may depend less on transparency and more on the source of the nudge and its alignment with the individual's values. Another crucial point is to ensure public trust and credibility for nudges, as they may currently "lack the same credibility" as traditional financial tools. Finally, policymakers suggest that nudges are unlikely to work alone and should be considered as "support tools" or integrated within a broader, synergistic policy mix, possibly even integrated into the "existing market system" for greater success.

### 4.3.2. Farmers Private Forest Owners

This section presents the findings of a thematic analysis conducted on 22 interviews with farmers from Italy, Flanders—Belgium, Lithuania, and private forest owners from Finland, within the framework of Task 4.1 under Work Package 4 (WP4) of the PRUDENT project. Using Braun and Clarke’s thematic analysis framework (2006), the analysis uncovers shared patterns across the dataset about sustainable practice adoption and identifies the main barriers and drivers that shape how policies are interpreted and implemented on the ground. However, the results are based on a small, selective sample and should be interpreted as qualitative insights.

The 22 respondents represent a diverse group of agricultural and forestry professionals across Europe. Flemish farmers manage mixed farms, with cereals, livestock, and other field crops, ranging from 13 to 120 hectares and 50 to 359 cattle. Lithuanian farmers operate larger arable farms, averaging 179 hectares. Italian farmers focus on diverse sectors, including cereals, horticulture, olives and wine, ranging from 35 to 130 hectares, and Finnish private forest owners manage forests averaging 52 hectares. Most respondents are aged 50–64, with only one Italian wine producer under 30.

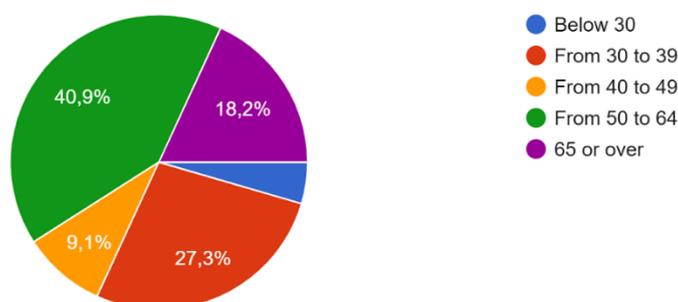


Figure 11: Most respondents are aged 50-64.

The majority (55%) have full agricultural or forestry training, while others have basic or practical training. Experience in farming or forestry ranges from three to over 50 years, with most having at least a decade of experience.

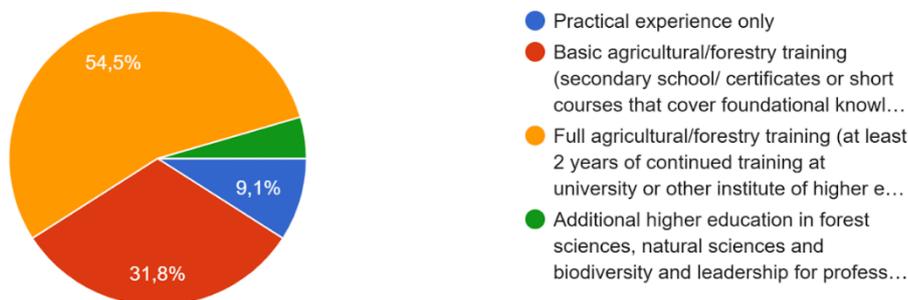


Figure 12: Experience/Training in agriculture/forestry of respondents.

#### 4.3.2.1. Climate Change and Environmental Concerns

Participants’ perceptions of the “triple planetary crisis” (climate change, biodiversity loss, pollution) varied, with some feeling directly threatened and already experiencing impacts, and others relatively unconcerned or confident in coping, often depending on local context. When asked if they feel threatened by climate change, biodiversity loss and environmental pollution in their role as farmers or private forest owners, just over half (12 out of 21 who answered) said “Yes,” they do feel threatened, while the remainder said “No.”

This split, highlights a diverse range of viewpoints. Italian farmers almost unanimously felt threatened by climate and environmental changes. Flemish and Lithuanian farmers were more mixed, leaning slightly towards not feeling personally threatened. Finnish private forest owners were also split, with a slight majority saying they did *not* feel threatened by climate/biodiversity loss. Only 2 of 5 Finnish participants answered yes. Although he did not feel concerned, one forest owner in Finland explained that the warming climate might transform Finnish forestry: *“The species currently growing in our forests will not survive if conditions change drastically.”* He was considering how to adapt by maybe introducing new tree species that could handle a warmer climate, but he cautioned, *“introducing new species requires caution and knowledge, as species from non-boreal climates cannot survive northern winters yet. Planning which species to introduce (e.g., oak and beeches), and when, is multifaceted and requires informed prediction systems”*.

When asked about their specific environmental concerns (from a list of potential issues), participants across countries most frequently cited extreme weather events and pests/diseases as top concerns, followed by water scarcity and soil health. These are practical, immediate issues that affect production. For example, *“extreme weather events (heat waves, droughts, floods, storms)”* was chosen by 70% of the respondents. Almost one-third of Italian, Flemish, and Lithuanian farmers worry about shifting growing seasons. Pests, diseases, and invasive species were other major concerns (selected by at least 14 participants). Finnish private forest owners are highly concerned about pest outbreaks. One Finnish participant mentioned the risk of damage by pests like the bark beetle. Water scarcity was highlighted explicitly by farmers in Italy and Flanders, as well as by two Finnish private forest owners. Soil health emerged as a concern mainly in Italy, Lithuania, and Finland.

It was interesting that “biodiversity loss” as a standalone concern was less frequently cited (only a couple of people chose it specifically), even though biodiversity is part of the triple crisis. This might be because farmers and private forest owners often view biodiversity loss through the lens of other concerns or because some see it as a more abstract issue. One exception was a Finnish forest owner who was deeply concerned about biodiversity decline in forests and said that his motivation to adopt sustainable forest practices is his *“personal principle of maintaining biodiversity and allowing the forest to grow in its natural state without too much influence from forestry practices and clearings”*. Carbon footprint or mitigating one’s own emissions was notably *not* a primary concern for participants. None explicitly said they worry about their farm’s carbon footprint in the context of threats. Most are more concerned with adapting to climate effects (e.g., drought) than with mitigating climate change. Farmers probably experience themselves as victims of climate change more than contributors, so their focus is on coping with impacts rather than reducing emissions (especially if not compensated or required).

Four central themes emerged across the dataset: (1) Sustainable Practices: Motivations and Barriers, (2) Bureaucracy and Administrative Overload, (3) Economic and Market Challenges in the Sustainability Transition and (4) Perspectives on the European Green Deal: Policy Impact and Reactions. These themes capture the concerns expressed by the interviewees across countries, pointing to the structural weaknesses affecting the implementation of sustainability transitions under EU policy.

#### 4.3.2.2. *Sustainable Practices: Motivations and Barriers*

The adoption of sustainable farming/forestry practices among respondents is widespread, driven by both intrinsic values and external incentives, yet not without significant challenges. Nearly all interviewees reported implementing at least some form of sustainable practice on their farm or forest. These practices ranged from agro-environmental measures in farming, such as maintaining flower strips for pollinators, practising crop rotation and cover cropping, reducing chemical inputs, or improving animal welfare, to sustainable forest management techniques like continuous cover forestry, mixed-species planting, and setting aside conservation areas. A few farmers had even embraced certified organic production or High Nature Value farming on parts of their land. When asked what motivated them to adopt these sustainable practices, many participants emphasised an ethic of environmental stewardship. *“I am for nature, no more*

*motivation needed*,” said one Flemish farmer, indicating that personal values and a sense of responsibility to the land were sufficient incentive. Another Finnish private forest owner said that *“he has the traditional value of a forest owner that not everything has to be logged as soon as it is possible [...] my forest will stay up for as long as possible.”* Several others echoed the satisfaction of seeing environmental benefits: *“I find it nice to see the positive impact that I create for biodiversity – seeing endangered or protected birds nesting on my land,”* shared a Flemish farmer who had set aside field margins as wildlife habitat.

Intrinsic motivations are often intertwined with practical and economic reasoning. Many farmers acknowledged that certain eco-friendly practices brought direct agronomic benefits. For instance, a Belgian farmer highlighted that *“some practices provide agricultural benefits like carbon farming and precision farming”* in addition to the subsidy received for them. By improving soil quality or reducing input costs (through precision application of fertilisers, for example), sustainable methods were seen as win-win in the long term. A Lithuanian crop farmer likewise noted that adopting winter cover crops and reduced tillage improved his soil structure and yields over time, which reinforced his decision to farm more sustainably. Financial incentives from policy also played a role in motivation. The majority of participants who adopted green practices did so at least partly voluntarily, but urged by available support schemes. *“The adequate subsidy for some practices [was a motivation]... Without this financial support, the costs to maintain it would be too high,”* explained one farmer, referring to EU CAP eco-scheme payments. In other words, these farmers were environmentally inclined but also economically rational – they seized opportunities where public funds offset the expense or risk of trying something new. Several explicitly mentioned CAP’s new eco-schemes or agri-environmental measures as enablers of their actions. For example, Flemish interviewees frequently brought up participating in regional “management agreements” (agri-environment contracts) or eco-schemes: *“It helps to cover some costs made for the implementation of buffer strips and flower strips,”* said one. In Italy, a farmer cited a regional program covering 80% of the cost to build a covered manure storage tank as critical support: *“For example 80% contribution for covering the sewage storage tank from the Lombardy region,”* which enabled him to invest in that facility to reduce water pollution.

It is important to note that not everyone’s adoption was wholly voluntary. Two of the 22 participants indicated they implemented certain practices because they were essentially required by law or policy mandate rather than out of personal initiative. *“It was mandated at the European and national levels,”* one farmer explained, referring to measures like setting aside a portion of arable land as non-productive. Another admitted, *“I applied part [of the practices] involuntarily, like setting aside an area,”* meaning that although he did engage in a conservation practice, it was due to regulatory compulsion (or as a condition for receiving subsidies) rather than his own choice. These cases highlight that policy can induce minimum environmental actions, but they contrast the majority who opted in more enthusiastically.

When it came to barriers and challenges in implementing sustainable practices, a striking theme was the presence of multiple and often overlapping obstacles. All participants, including the most committed eco-friendly farmers, acknowledged facing barriers of one form or another. The challenges ranged from knowledge and informational gaps to economic and policy-related barriers. On the knowledge front, a few farmers admitted that initially there was a *“lack of practical knowledge”* or access to technical advice on new practices. *“Continuous cover forestry seems to weaken the growth... and uncertainty regarding how changes in practices will affect the products for customers,”* Finnish forest owners listed among their concerns, highlighting informational uncertainty in the forestry context. Another barrier frequently cited was insufficient training opportunities. For instance, a younger Lithuanian farmer noted the *“lack of access to investments and information”* on agroecological techniques in his region, which made it discouraging to try them without guidance.

However, by far the most emphasised barriers were economic and policy-related. Many farmers pointed to the *lack of financial incentives or funds* as a limiting factor. *“Sustainability involves expensive methods... this is a relevant challenge,”* an Italian farmer stated simply. Several respondents mentioned *“lack of systemic business incentives”* – in other words, the current market and policy system does not reward sustainable farming enough to make it the easy choice. One Belgian farmer captured a common feeling:

*“Certain practices create an additional cost – the society should pay for them.”* This sentiment reflects frustration that farmers bear the expense of producing public goods (like clean water or biodiversity) without adequate compensation. Indeed, *“lack of adequate policies [supporting sustainability]”* was a phrase that appeared in multiple responses. For example, one respondent said that some of the sustainable practices he’d like to do were actually not permitted by current regulations – *“Some sustainable practices fit the EU objectives, but are not allowed by Europe [regulations]... For example, until April 2024 it was not allowed to work woodchips into agricultural soil in Flanders, even though it could help with carbon storage,”* he explained. This situation illustrates a paradoxical policy barrier: rules that have not kept up with innovative sustainability ideas.

Another major barrier was the bureaucracy and complexity associated with implementing sustainable practices, which will be discussed in more detail in the next theme. Here it is worth noting that many farmers conflated the challenge of “doing something sustainable” with the challenge of *navigating the paperwork or criteria attached to it*. For instance, some cited *“High bureaucracy of CAP payment system”* as a deterrent: even if funds are available for sustainable measures, the administrative effort to obtain them or prove compliance can be discouraging. One farmer ticked off a whole list of policy-related barriers he felt: *“Lack of adequate policies, high bureaucracy... risk aversion, and consumers’ unwillingness to pay more for sustainable products,”* suggesting that from his perspective the policy environment, combined with market realities, made significant change risky and unrewarding. Market factors indeed were mentioned as barriers by several participants: *“Consumers’ unwillingness to pay more for sustainable products”* was a common refrain, indicating farmers feel trapped by slim profit margins and fear that producing in a more eco-friendly way (often at higher cost) will not fetch a higher price. This links to a broader structural issue: sustainability may require short-term investments or yield trade-offs that a small farm business cannot shoulder unless the market compensates or subsidies do.

Psychological and cultural factors also play a role as barriers. A few respondents spoke of resistance to change. They often replied that they *“hesitated to move away from known practices”*. In some cases, this was understood in terms of tradition or identity – e.g., *“farming feels more like nature management than farming [now]”*, one Flemish farmer complained, implying that adopting too many new sustainable practices made him feel he was losing his identity as a productive farmer. Such statements reveal that farmers want to be seen as producers of food, not just stewards of the countryside, and some resent the push to change practices if they perceive it as undermining their professional pride or livelihood. Still, it must be emphasised that nearly all participants were *open to sustainable practices*, and even those not currently doing much expressed willingness to move in that direction under the right conditions. One of the farmers who had not yet embraced any explicit sustainable techniques said he *“does consider moving towards more sustainable practices”* because *“climate change is making me realise how essential it is to adopt sustainable methods to reduce pollution.”* This statement shows that even non-adopters recognise the imperative and they seek the means (financial and technical) to do so effectively. Another one similarly responded that he would if he could *“renovate the farm and build new greenhouses”*, indicating an interest in modernisation and likely needing capital.

#### 4.3.2.3. *Bureaucracy and Administrative Overload*

Most farmers have engaged with the Common Agricultural Policy to enable sustainable practices, but the complexity of these programs and the administrative burden have emerged as major concerns. Out of the 17 farmers, 15 indicated that they are currently applying for or have received CAP support. The types of support reported include the EU direct payments and eco-schemes under the new CAP, as well as agri-environment-climate measures (AECMs) in rural development programs, and national/regional subsidies. For example, many EU farmers mentioned enrolling in eco-schemes, such as the eco-scheme for planting cover crops or maintaining biodiversity-friendly features. *“Yes, I make use of the eco-schemes for flower strips, a grass-clover mixture, and the use of manure. The financial support... is welcome,”* said one Belgian farmer, illustrating how these payments were helping offset the cost of sowing flower strips and

optimising manure use. Another farmer in Flanders noted involvement in *“Agro-management agreements and eco-schemes. The support I get from the CAP and regional government means I can keep investing in nature on my lands. Without this financial support, the costs would be too high.”* This sentiment – that CAP support makes the difference in affordability – was echoed across countries. In Lithuania as well, farmers spoke of various rural development measures that provided co-funding for modernisation of farming or sustainable farming practices.

Privet forest owners in Finland, while not beneficiaries of CAP per se (since CAP mainly targets agriculture), referenced analogous national forestry funding programs. One Finnish forest owner described using *“national support schemes (Kemera and METKA) for setting aside natural areas and for active care of young forests.”* These state-funded programs provided financial compensation for *“a more active management of early-stage forest growth, which may have otherwise not been done”*, he noted. However, he also pointed out that some available supports were *“left unapplied for”* due to the stringent criteria and low payouts: *“The criteria are so strict, and the financial compensation so low, it does not sufficiently compensate for the loss of income or risk,”* especially in cases like storm damage risk if one leaves older trees standing longer. This highlights that support schemes are appreciated, but often seen as too complicated or inadequate.

In fact, when discussing their experiences with policy support, nearly all participants pivoted to talking about bureaucracy and complexity. The interviews revealed a strong undercurrent of frustration with how demanding the application and compliance processes can be. Farmers were asked to rate the complexity of various aspects of CAP compliance (from meeting basic Good Agricultural and Environmental Conditions – GAECs – to fulfilling eco-scheme and AECM requirements, and adhering to rules on nitrates, water, Natura 2000, pesticides, animal welfare, etc.). The majority described these processes as moderately to highly complex. Not a single participant who had engaged with agri-environmental schemes rated them *“low complexity”* – in fact, most rated complying with AECM requirements as *“high complexity.”* Many struggled with the volume of rules and the pace of change. As one farmer vividly put it, *“In year 2, I still do not get all the legislation; finally, when I get everything in year 5, there is new legislation.”*

Administrative burden was frequently cited as a limiting factor or a challenge. *“A farmer is not an accountant – he would rather be in the field or with the cattle than deal with all the administration imposed,”* said a Flemish dairy farmer, reflecting a widespread sentiment. He went on to complain that if a farmer makes an honest mistake in the paperwork, *“he risks high fines or a withholding of support... the fines are disproportionate,”* drawing an analogy that missing a box on a subsidy application could cost as much as serious infractions in other domains. Such experiences create a climate of fear and resentment toward the bureaucratic system. In Italy, farmers likewise lamented *“excessive bureaucracy”* in accessing funds. One Italian viticulturist noted that *“understanding rules and EU regulations”* was his primary challenge.

Despite these difficulties, those who did manage to obtain support generally acknowledged real benefits from it. Financially, CAP support often provided a safety net that made environmentally friendly practices viable. *“Income support from the CAP helped me cover the costs associated with sustainable practices,”* noted one Italian farmer, crediting direct payments for easing the transition to crop rotation and reduced chemicals. A Lithuanian farmer shared that the eco-scheme payments allowed him to *“increase my farm size and overall progress of my sustainable practices,”* meaning he reinvested the support into expanding environmentally friendly production. Environmental benefits were also realised: *“There was greater care for the soil, reduced pesticide use, and improved landscaping,”* said a Lithuanian farmer, listing the positive outcomes on his farm attributable to the measures he implemented with CAP support.

However, these benefits came *in spite of* challenges that had to be overcome. Participants narrated mostly financial challenges and several specific challenges in implementing sustainable practices even after receiving funding. One common challenge was the need for upfront investments. *“(Challenges: Additional investment in equipment was required... Benefits: improved soil and landscape,”* one farmer summarised, implying that while the results were good, finding capital for new machinery was difficult.

Interestingly, several farmers and private forest owners pointed out that the design of some support measures is too rigid or impractical, limiting their usefulness. A Flemish farmer provided an example: *“We did not implement temporary buffer strips because of the chance that the legislation in Flanders will change so that the buffer strips become permanent and we cannot change them back to farmland.”* Here, the farmer avoided a well-intentioned scheme (encouraging buffer strips) due to fear that it might eventually lead to loss of productive land if rules tightened. This illustrates how policy uncertainty and mistrust can undermine participation: farmers are wary that today’s voluntary measure could become tomorrow’s mandate without adequate compensation.

Country-level differences in experiences with CAP and funding emerged to some extent: Belgian (Flemish) farmers generally were very active in implementing both EU and regional schemes, but also among the most vocal about complexity, often feeling their regional authorities added extra red tape or stricter conditions. *“Flanders’ reaction to the Green Deal and CAP is more strict than in other countries... EU legislation should be the same in all countries, otherwise agriculture in Flanders is doomed to fail,”* as one put it. This betrays a sense of unfairness – Flemish farmers think they are asked to do more for the same or less reward, leading to competitive disadvantage. Italian farmers, while also facing bureaucracy, said that the CAP support *“helped to improve the overall farm”*. Lithuanian farmers in our sample were less likely to apply for EU environmental schemes, and instead, most applied for farm modernisation support. Those who did engage with CAP in Lithuania mentioned moderate complexity but also said *“not applicable”* or *“did not apply”* in some categories, reflecting either avoidance of the most complex schemes or limited exposure. Finnish private forest owners implement sustainable forest management voluntarily, and only two of them received national financial support schemes for voluntary protection, active care of seedlings and young trees, and early grooming practices. One Finnish interviewee suggested the EU should develop *“a unitary market for natural assets and carbon offsetting... incorporating the private sector for a faster shift,”* indicating an appetite for more innovative financing (like carbon credits) beyond traditional subsidies.

#### 4.3.2.4. *Economic and Market Challenges in the Sustainability Transition*

Farmers and private forest owners are operating under intense economic pressures – high costs, low margins, and market competition – which directly impact their capacity to adopt or maintain sustainable practices. Throughout the interviews, when asked about the main challenges in their farming or forestry business (a general question not specifically limited to sustainability), participants overwhelmingly highlighted classic economic challenges, many of which are intensified by or directly intersect with environmental efforts.

The most frequently mentioned challenges were: high production costs, regulatory compliance costs, competition from cheap imports, and low or volatile income. These issues were nearly universal. All seven Italian farmers, for instance, said that the rising cost of inputs (fuel, feed, fertiliser, energy) was putting severe strain on their operations. Belgian farmers unanimously considered “High production cost” a top challenge. Over half of the respondents explicitly referred to the *“falling agricultural income”* or described their profit margins as thin. This precarious financial situation makes farmers risk-averse and cautious to adopt a new practice that might reduce yield or require upfront costs.

Competition from imports and global market pressures were also among farmers' main challenges. A number of participants argued that European farmers are held to higher standards (environmental, animal welfare, etc.) which raise their costs, while imports from other countries can undercut them. *“It’s unfair competition,”* an Italian arable farmer fumed, *“We have to leave land fallow and cut pesticides, while foreign producers keep using them and then export to our markets.”* Lithuanian farmers, who have seen grain imports from Ukraine and Russia influence local prices, similarly ticked *“competition from cheap imports”* as a key challenge (3 out of 5 Lithuanians did). They worry that sustainability requirements, if not mirrored by trading partners, become a competitive disadvantage.

Regulatory compliance costs and burdens, as already detailed, were often described as not just a policy issue but an economic one. Compliance can mean needing to purchase new equipment, hire extra labor (to handle paperwork or new tasks), or even losing productive land (to meet e.g., habitat set-aside rules). Thus, farmers experience regulations as a direct hit to their economic viability. In the survey of challenges, *“strict green policies, safety standards, certification requirements”* were grouped as an option, and it was one of the most frequently chosen (especially in Italy and Finland). Finnish forest owners described how new environmental regulations could devalue their timber assets, for example, if part of their forest is designated as a habitat of interest to the public good, potentially reducing the harvestable area. One Finnish private forest owner spoke of *“land expropriation resulting in forest owners losing economic forests to the public good, and the compensation (200 euros/ha) not at all sufficient to cover the loss of income”*. This highlights the economic perspective from the forestry side: policies like setting aside peatlands for carbon storage are seen as quasi-expropriation if not fairly compensated.

Labour was another challenge mentioned by some, specifically labour shortages and costs. This was more acute among Italian farmers (especially in horticulture or wine) and was also mentioned by two Finnish private forest owners. One private forest owner mentioned the *“lack of well-trained and experienced loggers and forestry professionals, who have sufficient knowledge of the physical and biological aspects of the environment”* as a challenge and explained that it is getting more complicated when *“a language barrier exists among foreign workers”*. While labour issues were not the top concern for all, about a third of participants mentioned them, often tied to the challenge of generational renewal. Indeed, in the final *“anything to add”* question, a Lithuanian farmer explicitly said that resolving generational change and farm takeover issues is crucial.

Land availability was a significant challenge, especially highlighted in Finland and individually by farmers from Flanders, Italy and Lithuania. In Finland, *land availability* is not about not having enough land per se, but rather about accessible, quality land that is not restricted by conservation or competing uses. The Finnish participants raised concerns about land being taken out for other uses: *“purchase of land for energy production (solar or wind farms)... power lines... protected natural habitats... without adequate compensation,”* one said. In Lithuania, most farmers mentioned *“supply chain disruptions”* (like those caused by the COVID-19 pandemic or war in Ukraine) as a primary challenge, which might indirectly tie into land and input availability.

These economic challenges form a background that influences every decision about sustainability. A farmer might be very keen to, say, reduce pesticides or plant trees on field edges, but if they are barely surviving economically, such moves might feel like *“luxuries”* without stronger external support. A Flemish farmer said: *“I became a farmer out of passion... but the CAP and Green Deal make farming much harder because of all the regulations and administration. ...farming feels more like nature management than farming, and they do not pay farmers enough to implement these practices. The farmer pays all the costs, but they should be paid by society.”* This quote ties the economic and policy threads together. It implies a call for a new social contract that ensures farmers and private forest owners, who manage the majority of land in the EU and implement sustainable practices, are adequately compensated for the environmental public goods they provide. These practices benefit both rural areas and society as a whole.

In conclusion, economic viability is the foundation without which sustainability efforts cannot be sustained. Farmers and private forest owners in this study are aware of that. They live in the reality that profitability and environmental stewardship must go hand in hand. Any policy or initiative (like the Green Deal) that is perceived to threaten their already risky economic stability is met with resistance or anxiety, which brings us to their specific perceptions of those new policies.

#### 4.3.2.5. Perspectives on the European Green Deal: Policy Impact and Reactions

The agricultural and forestry strategies and policies of the European Green Deal (EGD) faced significant skepticism and concern from participants, with only a few expressing positive opinions. Farmers and

private forest owners often voiced strong criticisms of the EGD when asked about its impact on their practices. The general sentiment was that the Green Deal, as currently conceived, would impose additional burdens on producers and potentially reduce productivity without sufficient compensation or fairness in trade.

A common theme was the fear of increased costs and reduced yields under Green Deal measures. *“It will further increase the costs for farmers (administration, adjusted management...) and it is not aligned with trade agreements,”* one Flemish farmer asserted. This summarises two concerns. First, that complying with things like stricter pesticide rules or the obligation to leave 4% of arable land fallow will directly or indirectly raise a farm’s operating costs (through needing alternative pest control, losing some crop area, doing more paperwork to document compliance, etc.); and second, that European policy might put EU farmers at a disadvantage if trade deals still allow imports from countries with looser rules.

Administrative burden and regulatory overreach were also major talking points. We have already referred to the complaint about too much administration making “a farmer feel like an accountant” – the EGD is perceived as adding layers to that. A Belgian farmer predicted, *“The EU Green Deal will be very restrictive on farmers. Small-scale farming will become unfeasible because of the high cost of administration and regulation. If he makes an honest mistake, he risks high fines...”*. This indicates a fear that EGD measures might overwhelm family farms. In particular, the requirement to devote at least 4% of arable land to non-productive features (fallow, hedges, buffer strips) was very contentious. Several farmers described this as *“absurd”* or *“difficult to understand.”* It’s not that they oppose creating habitats because many already have buffer strips or hedgerows. The issue is with making it an obligation and potentially increasing that percentage over time.

Pesticide and fertiliser reduction targets under the Green Deal were also met with unease. Many farmers feel they have already reduced use compared to past decades and that further cuts will be challenging without new tools. An arable farmer from Lithuania said, *“If reducing fertiliser is justified, then [it’s] positive. However, we have too few pesticides to choose from, as most are banned,”* capturing a nuanced view: he agrees with cutting excess fertiliser, but is frustrated by pesticide bans that leave him with limited crop protection options. A Flemish farmer stated that *“If they [pesticides] are harmful, they must be banned for everyone, otherwise it is unfair competition”*. An Italian farmer described the Green Deal in one word: *“worst”*.

Finnish private forest owners gave detailed feedback on EGD strategies and policies related to forests. They value their right to manage their property and worry about EU overregulation of forestry. They voiced a theme that EU forestry policy should allow more national differentiation and not impose one-size-fits-all practices. For instance, continuous cover forestry (CCF) – which environmentalists often promote as a more sustainable alternative to clear-cutting – was specifically debated. One Finnish participant said, *“EU policies should acknowledge and promote other sustainable practices instead of deeming continuous cover forestry as the main best practice. CCF is not a good practice for every type of land... it should not be blindly adopted everywhere.”* He even quoted: *“I think continuous cover forestry is only one of a multitude of different practices... and it does not necessarily always lead to good outcomes.”* This demonstrates a concern that EU policies might push a silvicultural method that does not suit all local conditions. Finnish owners argue that there are many ways to achieve sustainability and that local knowledge should guide what is best for a given forest stand.

Another Finnish private forest owner stated, *“EU should not have jurisdiction over [forest policy]. The decision-making power should remain at the national level, where the circumstances of individual private forest owners are considered. Finns have a strong emotional connection to forests... owners want to maintain their right to decide about their property.”* This expresses a sovereignty issue – they feel the Green Deal’s forest measures infringe on what has traditionally been national competence. He even gave a dramatic quote: *“If someone from Brussels tells me I cannot cut down these trees, I will do exactly that and cut them and go to jail if I have to.”* This statement underscores the depth of feeling. It vividly illustrates potential compliance issues if policies are not co-designed with farmers and private forest owners.

On the other hand, some private forest owners acknowledged that Green Deal-inspired policies have not yet drastically affected them personally. One said, *“The impact of EGD has not been that prevalent; it has had more impact on the dialogue than on personal practices. Finnish forest owners have until now maintained their right to decide on their property, which is good. There are more opportunities for support or grants, mostly through nature protection schemes... this shapes national forestry, but personally, there has not been much change.”* This suggests that, so far, EU policy has nudged Finland to offer more conservation incentives (like METSO program for voluntary habitat protection), which is considered good. However, it has not forced individual owners to change how they log or plant. Another private forest owner noted, *“EU policies only influence personal forestry practices through legally binding measures... These have been somewhat successful in forwarding biodiversity protection. However, the EGD has had little influence on personal choices for new measures.”* He gave an interesting insight on restoration: *“The EU may mandate a restoration of an area, but after it’s done, it’s still in the hands of the landowner what to do next... That’s the more transformative thing.”* This means that policy can set a broad goal, but the actual stewardship and outcome depend on the continuous actions of the landowner, which relates to engagement for lasting impact.

Amidst predominantly negative or cautious views, there were a few positive or hopeful voices regarding the Green Deal. Not everyone was against it. A minority of respondents felt that the Green Deal’s objectives align with what is necessary for the future. *“In my opinion it has a positive impact, because I always try to practice sustainable farming,”* said one Lithuanian farmer, perceiving EU policy as catching up to where he already is. An Italian farmer said, *“I am doing my best to respect EU regulation and legislation. Challenges could improve my activity and I am positive about [it].”* This optimistic view holds that meeting the Green Deal challenges will make the farm more innovative or efficient. It is worth noting these voices among many, because they might reflect individuals who either are early adopters of sustainable farming or who possibly have enterprises that stand to benefit.

A couple of farmers indicated the EGD hadn’t impacted them “yet” or at all: *“There will be no impact,”* one Italian farmer answered flatly, perhaps indicating either scepticism that these policies will actually be implemented or that his farm is so small or marginal that it will not feel it. Another farmer from Lithuania said, *“It didn’t have any impact on our farm”*.

In conclusion, the Green Deal as perceived by these stakeholders is something of a top-down force that, in their view, could either transform agriculture/forestry for the better or run farms into the ground, and many fear the latter more than hope for the former. The pervasive concern is that the policies are being designed without adequately consulting or considering the realities on the ground (i.e., *“by people behind a desk with no feeling of the profession”* as one farmer criticised). This points to a need for more dialogue between policymakers and practitioners. Indeed, one farmer said in final remarks: *“Quit making fun of farmers, and before eliminating the solutions we have, provide alternatives.”* This captures the feeling that policymakers should not simply ban or restrict (like banning pesticides) without giving farmers viable alternative tools and methods. Otherwise, farmers feel set up to fail.

Having examined the participants’ experiences and attitudes toward current policies, including the CAP and EGD, the next logical area is to look at what they themselves propose for the future. In the interviews, they were asked what changes they would like to see in policies. The final theme distills these suggestions and hopes, which often directly address the challenges we’ve discussed: bureaucracy, economics, fairness, and support for sustainability.

It should be noted that the findings presented in this subsection are based on a limited and selectively composed sample of stakeholders. As such, the observed patterns should be interpreted as qualitative indications of differences in perceptions, priorities and experiences across stakeholder groups and country contexts, rather than as statistically representative or generalisable results. The analysis therefore aims to highlight contrasting viewpoints and policy-relevant insights, which are particularly valuable for informing subsequent co-creation activities and policy development, while avoiding over-generalisation of the results.

#### 4.3.2.6. Recommendations for Policy Change

Farmers and private forest owners across all four regions voiced a clear desire for policy reforms that make sustainable farming and forestry more feasible: chiefly by simplifying bureaucracy, increasing support and incentives, ensuring fairness (especially in trade and among EU countries), and involving practitioners in policy design. Participants were remarkably forthcoming in their answers to the question about changes they would like in European or national policies. Many provided concrete suggestions or pointed critiques that essentially map out a policy wishlist.

The most dominant request can be summarised as “Less bureaucracy, more support.” Nearly every farmer mentioned administrative simplification in one way or another. *“More administrative facilitation/simplification,”* said one, briefly. This call was echoed in different words: *“Leaner applications,”* *“Reduced bureaucracy,”* *“Make legislation practical,”* etc. The rationale is straightforward: if it were easier to apply for programs and comply with rules, farmers could spend more time and energy on actual sustainable farm management. A Flemish farmer pleaded, *“Please make legislation that is feasible for farmers.”* This came after his critique that current rules are made by desk experts with little practicality. Indeed, he said a somewhat emotional appeal: *“Listen to the farmers before making new rules that are barely feasible... trust the farmers’ instincts.”* This highlights another recommendation: better dialogue and recognition of farmer knowledge. Many respondents felt that policies should be shaped with farmer input so that they reflect on-the-ground reality and harness farmers’ innovative ideas rather than being purely top-down.

Correspondingly, there is a wish for greater appreciation of farmers’ and private forest owners’ roles. *“Farmers and their profession deserve greater appreciation, not only from society, but especially from politicians,”* one Flemish farmer said. He pointed out how farmers often get bad press for environmental problems. In contrast, in his view they are also the first to suffer from global issues (he gave the example of farmers being financially hit by events like the Suez Canal blockage or export bans – showing how they are exposed to global forces beyond their control). So, he argues, policymakers should treat farmers as partners and problem-solvers. This suggests policies should come with a narrative of respect and support, not just restrictions.

Increased financial support and better-targeted incentives for sustainability were also frequently mentioned. *“There is insufficient support for sustainable practices that make a positive contribution to nature and biodiversity. There should be more support for farmers to implement sustainable practices,”* urged one Belgian respondent. A couple of answers explicitly mentioned things like *“more incentives and schemes to encourage engaging in more natural practices.”* For example, a Finnish private forest owner recommended more incentives so that forest owners might seek advice from independent ecologically-oriented advisors rather than just industry private forest owners; he suggested supporting services like carbon offset scheme setup, which could financially reward owners for carbon sequestration. Similarly, an Italian farmer wrote he wants *“CAP contributions to real farms, through sustainable farming techniques, with a more significant contribution to reducing CO<sub>2</sub>.”*

Policy stability and long-term consistency were other themes. *“I would like to see less change in the policies and have more stability. Policies are changing too quickly and you don’t get the time to adapt,”* one Lithuanian farmer commented. This reflects fatigue with constant reforms. To farmers, frequent policy changes create uncertainty and can deter investments in sustainable infrastructure that have long payback periods. As a Flemish farmer highlighted, *“In year two I still do not get all the legislation. Finally, when I get everything in year five, there is a new legislation”.*

Farmers also seek more flexibility and tailoring of rules to local conditions. This was especially voiced by those who felt one-size-fits-all EU rules do not work in their context. *“Rules are simple and appropriate for the crops and territories in which they are applied... for example... climate, soil, pests are different in us [Italy] and Denmark and the regulations must take this into account”,* one Italian grape grower said.

Similarly, Finnish participants urged for country-specific approaches: *“EU forest policy should be made country-specific instead of a collective regional policy,”* one said, citing varying climates and economic circumstances. He warned that a uniform policy is *“ineffective and rigid,”* whereas region-specific policies could achieve broader climate goals more effectively. He also stressed that *“the economic contributions of the Finnish forestry sector cannot be restricted [too much]; if Nordic wood production halts, wood has to be imported from elsewhere,”* basically arguing for balancing climate goals with maintaining productive capacity in places that are efficient at producing timber. The underlying recommendation here is for differentiated targets or measures that allow flexibility at national/regional levels, rather than forcing everyone to do everything the same.

Fairness in competition and trade also came through. Farmers want policies that *“encourage local production and restrict third-country products”* that do not meet EU standards. One Lithuanian explicitly said the EU should *“promote the local market”* and curb imports that are unfair competition. The recommendation may translate into policies like mirror clauses (requiring imports to meet specific standards) or clearer labelling for consumers about production standards, etc. At minimum, it is a call for the EU to ensure its farmers are not sacrificed in global trade deals – something policymakers are indeed grappling with (for example, discussions about requiring imported foods to meet some of the same pesticide or deforestation rules).

A few also mentioned generational renewal and structural support. *“Resolving issues related to generational change and farm takeover,”* one Lithuanian farmer responded. Also, farmers from Flanders expressed their concern about *“less young farmers starting the business”*. This points to policies that make it easier for young farmers to start (e.g., grants, access to land, training) and for retiring farmers to pass on their farms. It is indirectly related to sustainability because new entrants might be more open to innovation and sustainable methods. So, enabling generational transition is another policy area that needs to be strengthened.

The forestry sector participants offered specific suggestions too. They emphasised property rights protection: ensuring that any new conservation mandates come with adequate compensation. One wrote, *“if protecting areas becomes mandatory, sufficient compensation should be provided in return for setting aside areas from wood production.”* This is a clear recommendation not to make individual landowners bear the cost of EU’s biodiversity ambitions, but to pay them for the service of preserving nature. Another private forest owner highlighted tackling *“death estates”* (forests stuck in inheritance limbo with no active management) – suggesting national policy to facilitate transferring those to active managers, which would improve sustainable management. There were also calls to invest in advisory services and education: *“More resources and finance should be allocated to professional advisory services and face-to-face management help,”* as one Finnish private forest owner urged. He pointed out that even the best regulations will not lead to healthy forests if owners do not have the knowledge or capacity to implement good practices. So he advocated EU or national programs to bolster on-the-ground extension services, perhaps funding more forest advisors who can visit owners and provide personalised guidance (rather than just digital informing tools, which he criticised as too complex and overwhelming).

Accountability for larger actors: a Finnish participant suggested more oversight on big corporate forest companies, which he accused of *“greenwashing”* while doing most of the clear-cuts. This implies a policy change to not only target small private owners but also ensure big industry players adhere to sustainability. Another innovative idea from Finland was to integrate economic and environmental decision-making, using the example of Metsähallitus (the state forestry enterprise), where the commercial and environmental divisions are currently separate. He recommended merging these considerations so that forestry decisions always account for environmental impact and vice versa – essentially institutionalising a holistic approach.

Summarising across these recommendations, participants want policies that are farmer-friendly in process, supportive in substance, fair in competition, flexible in design, and created in collaboration with those on the land. They are not asking to shirk environmental goals. Many explicitly want more help to contribute to those goals (more funding for biodiversity measures, more research into alternatives to

chemicals, etc.). However, they insist the path to sustainability must be paved with realistic, incentivising, and participatory policy measures. For example, one farmer said, *“Before eliminating the solutions we have, provide alternatives,”* which is a recommendation to invest in innovation. If the EU wants to ban certain pesticides, it should ensure there are effective biopesticides or integrated pest management tools ready to use. Others calling for “alternatives” likely meant technological ones (like precision agriculture tools) and market ones (like remunerative prices for eco-products or carbon farming credits). Indeed, a few mentioned developing a market for ecosystem services. A Finnish respondent suggested the EU help create a *“unitary market for natural assets and carbon offsetting”*, bringing in the private sector. This is forward-looking: facilitating carbon credit systems or biodiversity credits that could pay farmers/private forest owners for carbon sequestration and habitat provision. That mechanism could address the core issue of farmers bearing costs for public goods.

Finally, a softer but vital recommendation implicit in many responses is improved communication and respect. Farmers want politicians to visit farms (“pay more attention to agricultural visits”, one said – likely meaning come and see firsthand), to hear their experiences. This would not only make policies better but also increase farmers’ willingness to trust and implement them. As one farmer humorously – but pointedly – put it, *“Quit making fun of farmers.”* There is a sense that media/politics sometimes blame farmers for environmental problems (like climate or water pollution) without acknowledging the efforts and constraints farmers have. Policies that acknowledge positive contributions (perhaps via incentive payments, awards, public recognition campaigns) could boost spirits and foster greater support.

## 4.4. Discussion – Stakeholders’ perspectives

The interviews with different actor types, notably EU-level and national/regional policymakers, farmers and private forest owners revealed converging concerns about how current policies drive sustainability, alongside distinct perspectives from each group. Policymakers across the EU and regional/national levels identified multi-level governance complexities that hinder policy impact. They emphasised that the Common Agricultural Policy remains the central framework to promote sustainable farming and forestry, given its budget and tools, but its effectiveness “*hinges on how Member States implement their Strategic Plans*”. Many noted that EU environmental directives (e.g., Water Framework, Natura 2000) need proper national enforcement to complement the CAP, yet inconsistent implementation and bureaucratic fragmentation at national/regional levels are common. Farmers and private forest owners, by contrast, were more likely to emphasise practical implementation challenges: policies often translate into burdensome rules on the ground, with complex compliance procedures and unclear guidance (for instance, integrated pest management requirements are “*not so clearly implemented*” in practice). They observed a resulting “*lack of clarity*” and a trust deficit, noting that land managers frequently exhibit “*fatigue*” toward new constraints and may distrust government initiatives.

Another theme raised primarily by policymakers and advisory actors was the presence of knowledge and data gaps. Policymakers expressed concern that decisions can outrun evidence, citing cases where ambitious targets are set without “*solid analysis*”. They pointed to insufficient farm-level data on key metrics (such as local pesticide use or biodiversity status), which hampers science-based policymaking and effective feedback loops. Advisory and support actors stressed that better communication and strengthened advisory systems are essential, emphasising the need to engage farmers and forest owners in “*their language*” and to provide on-the-ground support, rather than relying solely on top-down instructions.

Finally, perceptions of green “nudges” (behaviourally-informed policy tools) varied. Awareness of the term “*green nudges*” was mixed, but most policymakers recognised the concept once it was explained. Many saw nudging as a promising “*third path*” to encourage sustainable practices – potentially “*very powerful*” if combined with digital tools – and noted they may already be using nudge-like approaches unintentionally. However, they also cautioned about significant barriers to applying nudges: lack of robust farm data makes tailored, data-driven nudges difficult; farmers’ trust must be earned for nudges to work; and there are ethical concerns about how transparent such nudges should be. Policymakers generally felt that nudges should complement, not replace, traditional instruments – regulations and subsidies are still viewed as more immediately effective in driving change, especially for big decisions, whereas nudges might steer smaller-scale behaviours or work on already motivated farmers.

Farmers and private forest owners, for their part, underscored many of the same challenges from an on-the-ground perspective. They confirmed that a variety of sustainable practices are being adopted, yet motivations and barriers differ widely by region and personal situation. A unifying concern was the heavy administrative burden linked to current agri-environmental policies. Farmers consistently described policy compliance as overly complex, with “*high bureaucracy*” especially attributed to accessing CAP payments. In their view, multiple forms, repetitive data requirements, and complicated application processes reduce time and trust. Farmers also perceived a bureaucratic overload and a disconnect between policy and practice, feeling that some policies are designed without sufficient understanding of farm realities. For instance, individual quotes spoke of policies that promote one-size-fits-all “*best practices*” without accounting for local conditions, leading farmers to feel policymakers “*neither understand nor address*” on-the-ground needs. This gap is aggravated by poor communication; several farmers noted they often learn of new rules second-hand or find official guidance confusing, fueling the sense that policy is made in a “*top-down*” manner. Another key theme was economic pressures and generational gaps. Farmers voiced that adopting greener practices can be financially risky, especially for smaller farms operating on thin margins. Many are willing to transition only if the changes make economic sense. Older farmers, in

particular, were described as more cautious and set in their ways, while younger farmers might be more open but often face structural barriers (e.g. land access or inheritance issues, such as unmanaged “death estates”) that limit their capacity to innovate. This highlights a generational dimension to sustainability uptake. Farmers also reported issues like delayed subsidy payments, unreliable funding from one year to the next, and limited access to personalised technical advice. Such shortcomings leave farmers feeling unsupported in making big changes and show the fragility of existing support systems for sustainable transition. The interviewees called for stronger, more continuous assistance – “*more administrative facilitation*”, “*leaner applications*”, and a more stable advisory presence to help implement sustainable practices.

Both groups of stakeholders – those crafting policies and those meant to implement them – thus identify broadly similar challenges, with bureaucratic complexity, misalignment between high-level goals and ground reality, knowledge gaps, and trust issues recurring throughout the interviews. This provides a critical reality check on the aspirations of current EU policy frameworks. Taken together, these findings illustrate the tensions and opportunities in advancing the EU’s sustainability objectives – particularly the CAP and the suite of European Green Deal strategies – from multiple perspectives. The interviews shed light on what the high-level policies of the Green Deal mean in practice, and where gaps remain between intent and outcome.

Both policymakers and farmers recognise the CAP as the cornerstone policy for agriculture and forestry sustainability. They consider it to have a unique impact, as it channels significant funding and sets the baseline rules across member states. The interviews suggest that CAP’s potential to drive environmental and social goals is undisputed, but its impact is heavily mediated by implementation at the national level. Policymakers noted that CAP Strategic Plans, which give Member States flexibility, can lead to uneven ambition – “*The CAP is effective if the [Member States] implement [their plans] as agreed. It depends on the implementation*”. Farmers echoed this, observing that navigating CAP programs often results in “*a high level of bureaucracy*” on their end. This indicates that while CAP provides the framework (including new eco-schemes and agri-environmental measures), its success for sustainability hinges on simplifying procedures and ensuring each country’s CSP delivers on green objectives in practice. In relation to the Green Deal, the CAP is expected to be a primary vehicle for Farm to Fork and Biodiversity Strategy goals on farms, but the interviews reveal a risk: if farmers perceive CAP processes as overly complex or unfair, the uptake of its sustainability measures could be limited. In short, the CAP’s ambitions for post-2023 will require cutting red tape and strengthening trust at the farm level to truly succeed.

The interviews provide important insight into how EGD targets are viewed on the ground. Some policymakers felt that certain EU proposals under F2F were “*imposed on everyone the same*”, with insufficient consultation of member states’ differing contexts. A Lithuanian policymaker, for example, mentioned “*recent policies were extreme, not fully discussed among member states, and faced a lot of backlash*”, indicating that aspects of Farm to Fork (or related regulations like the pesticide reduction law) may have been perceived as top-down. From the farmers’ side, while none explicitly named *Farm to Fork*, their description of a disconnect between policy and practice suggests that sweeping EU-wide measures risk falling flat if they do not account for local realities. For instance, a blanket mandate to reduce inputs or change practices can “*put agriculture in difficulty*” if not paired with viable alternatives and proper guidance. Thus, the Farm to Fork Strategy’s success will likely depend on improving the policy design process – making it more inclusive and context-sensitive – and on ramping up advisory support so farmers can feasibly meet these targets. The interviews underscore that ambitious goals need accompanying, easy-to-follow action plans on the ground. Otherwise, as one interviewee implied, there’s a gap between what is “*desirable*” in theory and what is “*possible and feasible*” in the field.

The EU Biodiversity Strategy 2030 emerged in the interviews, especially in discussions around balancing environmental and economic objectives. Policymakers from countries like Lithuania spoke about the “*difficult balance between environmental protection and bioeconomy*” when aligning national policies with the European Green Deal’s biodiversity goals. They observed that EU-wide conservation targets can conflict with local agricultural or forestry interests if not adaptable – a reflection of tensions inherent in the

Biodiversity Strategy (which calls for expanding protected areas, restoring ecosystems, etc.). Finnish interviewees similarly noted a misalignment: despite broadly supporting EU climate and biodiversity aims, Finnish forestry policy still prioritises economic outputs, given how vital forestry is to the national economy. This has led to *“ambiguity in actionable means”* and even policy contradictions – for example, efforts to increase carbon sinks and protect biodiversity versus incentives to maximise timber harvests. Such feedback suggests that achieving the Biodiversity Strategy’s targets will require resolving conflicts between economic and ecological goals. The interviews highlight the need for policy coherence: farmers and private forest owners need consistent signals that environmental stewardship will be rewarded, not undermined by other economic pressures. If policies send mixed messages, it can breed cynicism and non-compliance.

Crucially, the interpretation of these findings must account for the heterogeneity among farmers and private forest owners, as revealed by the project’s segmentation analysis (Bonan et al., 2025). That analysis identified two broad clusters of producers with distinct mindsets and behaviours toward sustainability. The first cluster (G1) is characterised by more progressive attitudes: higher environmental concern, greater openness to innovation, lower risk aversion, and stronger trust in scientific advice (Bonan et al., 2025). Members of this group are more likely to view a given sustainable practice as the “norm” and even tend to make decisions to *“signal virtue,”* suggesting an intrinsic or reputational motivation to go green (Bonan et al., 2025). Demographically, G1 has less farming experience and includes a larger share of female respondents; it also had relatively more participants from Italy and Lithuania (Bonan et al., 2025). In contrast, the second cluster, G2, represents a more conservative or reluctant segment. These farmers/private forest owners exhibit lower baseline environmental concern, less openness to new techniques, more impatience (short-term focus), and higher risk aversion (Bonan et al., 2025). They are generally older, with more years in farming/forestry and were over-represented in Belgium and Finland in the survey sample (Bonan et al., 2025). This group is less inclined to adopt sustainable practices: being in G2 *“decreases the likelihood of having implemented or being interested in the target practice”* by a large margin, according to the analysis (Bonan et al., 2025). These segmentation insights help explain some of the divergent views observed in the interviews. For example, many of the frustrations voiced (about bureaucracy, fear of new rules, scepticism toward government programs) resonate with the traits of G2 – a segment likely to find change burdensome and to prefer the status quo. On the other hand, the more innovative ideas and proactive attitudes (such as enthusiasm for precision farming or farmers taking pride in environmental stewardship) align with G1 characteristics. Notably, the segmentation also examined attitudes toward green nudges. Both groups seem to find social appeals less effective (social norms, moral appeals, making action visible), and G2 seems to find them even less acceptable. This implies that an intervention like Farm to Fork’s promotion of sustainable practices might be embraced by the G1-type farmers (who are already inclined to be “green”) but meet resistance or apathy from G2-type farmers. Policies under the Green Deal need to be tailored to different farmer segments – a point explicitly made in PRUDENT’s approach. Rather than a one-size-fits-all rollout of, say, a new eco-scheme or advisory campaign, policymakers might deploy different engagement strategies: leverage the enthusiasm and peer influence of the G1 segment as early adopters or champions, while devising extra support and simplified pathways to bring G2 along gradually. The segmentation analysis highlighted that it is critical to understand farmer behaviour. Therefore, effective policy must address each group’s specific barriers and motivations. The European Green Deal’s strategies will only translate into on-ground change if they acknowledge this diversity. The interviews, interpreted through the lens of the segmentation analyses, strongly suggest that behavioural segmentation and targeted nudging could be invaluable for fine-tuning policies: for instance, designing communication that builds trust with the risk-averse group, while empowering the innovative group to lead by example. This approach can increase the overall acceptance and effectiveness of CAP and Green Deal measures.

The combined insights from policymakers and farmers/private forest owners carry several important implications for developing more sustainable and effective agricultural and forestry policies in Europe. There is a clear call to reduce administrative complexity in sustainability programs. Cumbersome procedures frustrate farmers and consume administrative resources with little added environmental benefit. An implication is that both the European Commission and Member States should invest in simplifying CAP mechanisms and other policy tools. By making compliance easier, smaller farms – often

overwhelmed by paperwork – can engage more with sustainability measures, levelling the playing field. Importantly, simplifying rules can reduce errors and build trust that policies are meant to help, not punish, farmers.

The multi-level governance issues identified imply that better vertical and horizontal coordination is needed. To avoid contradictory policies and implementation gaps, EU, national, and regional authorities must work in coordination. In practical terms, it means to enhance the dialogue during policy formulation and incorporate systematic feedback from national ministries, local authorities, and farmer organisations on feasibility. This could prevent scenarios where well-intentioned EU directives are unworkable locally. Additionally, once policies are set, consistent interpretation is key: member states should be supported to implement EU environmental rules fully rather than cherry-picking. The CAP's new governance (with National CAP Strategic Plans) offers an opportunity. The Commission can rigorously review these plans to ensure they truly address Green Deal objectives and foster peer learning between countries (e.g., sharing how one country successfully implements an eco-scheme could inspire others). In forestry, clarity on EU vs national roles must be achieved – perhaps via guidelines under the Forest Strategy 2030 that delineate where EU recommendations end and national measures begin, to respect subsidiarity while upholding EU goals.

Both groups emphasised knowledge as a cornerstone for sustainable transitions. An implication is that policy development should prioritise robust Agricultural Knowledge and Innovation Systems (AKIS) as envisioned in the CAP. This involves funding for extension services, farmer field schools, and digital knowledge platforms. Concretely, governments should expand training programs and advisory networks that translate Green Deal goals into practical guidance (for example, helping a farm reduce pesticide use by teaching integrated pest management step-by-step). The finding that farmers *“don't always believe what's being communicated”* by authorities suggests these advisory efforts must be local and trusted. One implication is to empower local agricultural advisors or lead farmers who can act as intermediaries bridging the gap between policy and practice. The idea voiced in interviews that governments could assign an advisor *“for each farm”* (while ambitious) underscores the need for far more person-to-person outreach. Even if not one per farm, significantly increasing advisor-to-farmer ratios and improving their training in sustainability (and communication skills) will be critical. Furthermore, addressing data gaps is an implication for the policy-science interface: initiatives like the Farm Sustainability Data Network (FSDN) mentioned by EU policymakers should be accelerated. Collecting and sharing key sustainability metrics (soil health, input use, biodiversity indicators) can guide more targeted policies and allow tracking progress toward Green Deal targets. Policymakers should ensure data collection is done in a farmer-friendly way to support evidence-based decision-making without adding undue burden. Enhanced knowledge systems will also improve policy feedback loops. If policymakers see, for example, low uptake of a certain eco-scheme and hear qualitative feedback from advisors about why, they can adjust the scheme faster.

A consistent thread was the erosion of trust between farmers and authorities. Rebuilding this trust is an essential implication for sustainable policy development. Policymakers should adopt a more participatory and empathetic approach in crafting and rolling out policies. This means actively involving farmers and private forest owners in the policy design process – for instance, through consultations, workshops, and co-creation exercises (as the PRUDENT project itself will do in later stages). In terms of policy measures, trust-building could involve ensuring fairness and transparency. Farmers need to see that rules apply equally and that *“good actors”* are recognised. For example, interviewees noted that little appreciation is shown to those already doing the right thing, which can demotivate them. Policies could address this by rewarding frontrunners (through public acknowledgement, bonus incentives, or preference in grant selections), which also serves as a positive reinforcement nudge. Another implication is improving communication strategies – not just the content, but the medium and messenger. Since farmers often trust advisors or fellow farmers more than distant officials, governments might channel key messages through these trusted figures. The Flemish experience, where suppliers attracted farmers to info sessions by offering incentives, could inspire public agencies to partner with farmer cooperatives or supply chain actors for outreach. Importantly, communication should be two-way: establishing channels for farmers to voice

concerns and get timely responses (e.g., hotlines, interactive webinars, or regional “Green Deal ambassadors” who regularly meet with farming communities) can mitigate misinformation that breeds mistrust. Social capital is as important as financial capital in driving change. Policies must deliberately cultivate trust, whether by humanising the bureaucracy (e.g., fielding more extension agents as the friendly face of programs) or by delivering on small promises (paying grants on time, reducing surprise rule changes) to demonstrate reliability.

Both policy and farmer respondents referred to the role of the broader value chain (agribusiness companies, retailers, consumer behaviour) in enabling or constraining sustainable practices. This implies that sustainable policy development should not stop at the farm gate. Policies should encourage or require other value-chain actors to support farmers’ sustainability efforts. The EU could promote initiatives where processors or supermarkets offer premiums or longer-term contracts for sustainable products, effectively sharing the cost of transition with industry. On the regulatory side, addressing oligopolies or unfair trading practices in input and output markets can empower farmers economically, giving them more flexibility to adopt sustainability measures (when farmers are under less price pressure, they can afford to think long-term). The mention of farmers being “*tightly bound to upstream and downstream sectors*” and lacking flexibility suggests policies might also target those upstream/downstream players – for instance, incentivising fertiliser companies to develop lower-impact products or mandating transparency in sustainability metrics throughout the food chain, so that the burden of change does not rest solely on farmers. The interviews imply that this whole-chain approach is necessary. Farmers alone cannot deliver sustainability if the rest of the system is not aligned. Therefore, an implication for policy is to create integrated frameworks, such as collaborative grants that bring together farmers, processors, and tech providers to solve a specific issue (like reducing pesticide use via new technology and market differentiation). In forestry, value-chain leverage could mean engaging timber companies and wood product buyers in sustainability certification and payments for ecosystem services, ensuring forest owners see financial returns for managing forests in a biodiversity-friendly way.

The cautious enthusiasm for green nudges among policymakers implies that these tools have a place in the future policy mix, but must be applied carefully. One implication is that policies could include well-designed nudging interventions to complement traditional instruments, in areas where appropriate. For instance, incorporating social comparison feedback into agri-environment schemes (e.g., informing farmers how their environmental performance compares to peers) could tap into positive competition, as long as data privacy is respected. Pilot programs might provide timely “environmental scorecards” or recognition for top performers, leveraging social norms for improvement. Another application is default options – for example, making sustainable practices the default in advisory recommendations or in program enrollment (farmers would have to opt out rather than opt in to certain eco-schemes), which could significantly increase participation given known inertia biases. However, the interviews also defined boundaries: nudges should not be manipulative or erode trust. Thus, an implication is the need for ethical guidelines and transparency in deploying nudges. Policymakers may consider developing a code of conduct for behavioural interventions in the public sector, ensuring farmers are informed of how and why certain information is presented, and that nudges supplement, not substitute, incentives and regulations. Moreover, given the “digital divide” noted (some rural areas lack the connectivity for high-tech solutions), any tech-based nudges (like smartphone apps for sustainable farm decisions) must be coupled with efforts to improve rural digital infrastructure, or alternative low-tech approaches for those without access. Essentially, nudges should be tested in controlled settings (e.g., field trials or living labs) before large-scale rollout. The implication for policy development is to embrace innovation but base it on evidence and feedback – i.e., use the ongoing results from projects like PRUDENT’s experiments to see which nudges actually work for which segment of farmers (Bonan et al., 2025). If a particular nudge (say, a group reward for collective action) proves effective and acceptable in one region, it can be scaled up through the CAP or national programs. Conversely, if farmers find a nudge patronising or confusing, it should be reworked or scrapped. Behavioural insights can be woven into policy instruments in a manner that respects farmer autonomy and enhances policy outcomes. In the bigger picture, the implication is that the future of agri-environmental policy will be “policy mixes” – combining regulatory standards, economic incentives, and

behavioural nudges to achieve durable change. The interviews validate this approach: no single tool is a silver bullet, but together they can address the multifaceted barriers to sustainability.

## 5. Discussion - Synthesis of the results

This chapter synthesises the discussion points from the policy framework analysis (Chapter 3) and the stakeholder interviews (Chapter 4). It provides a comparative discussion that bridges policy intentions with on-the-ground stakeholder perceptions. Key challenges, opportunities, gaps, and needs are critically examined to reveal how well current policy objectives align with practical realities in sustainable agriculture and forestry. The analysis emphasises where there is coherence or complementarity between EU policy frameworks and stakeholder experiences, as well as where notable divergences or disconnects occur. Finally, differences across the national contexts of Belgium (Flanders), Italy, Finland, and Lithuania are also discussed and show how context-specific factors influence both policy implementation and stakeholder views. This integrated discussion lays the groundwork for the subsequent policy recommendations in the conclusion.

### 5.1. Common Challenges and Policy–Practice Gaps

Both the policy analysis and stakeholder interviews find significant challenges in translating high-level EU strategies into effective action on the ground. A central issue is the **complexity of multi-level governance** – the way EU policies (e.g., the Common Agricultural Policy and Green Deal strategies) rely on national and regional implementation. Policymakers acknowledged that even well-designed EU frameworks can be undermined by fragmented or uneven national execution. For example, interviewees noted that the CAP’s effectiveness “hinges on how Member States implement their Strategic Plans,” with inconsistent enforcement and bureaucratic fragmentation at national/regional levels hindering impact. The policy review also found that many EU environmental directives (e.g., on water or habitats) suffer from variable adoption by Member States, creating gaps between EU intentions and outcomes. In the forestry domain, Finnish stakeholders questioned the boundary between EU guidance and national sovereignty in forest management, mirroring real-world contention over the EU Forest Strategy. The divergence between policy intentions and practice is evident across both agriculture and forestry because the ambitious targets are set centrally, but inconsistent local implementation and governance complexity dilute their effectiveness.

In addition to CAP-related governance challenges, the analysis identifies specific and structural gaps in the forestry policy domain. Unlike agriculture, forestry lacks a comparable, binding EU-wide policy framework with dedicated financial instruments, relying instead on a combination of soft-law strategies and national measures. This results in weaker coordination, limited enforceability, and uneven implementation of sustainable forest management objectives across Member States. Stakeholders highlighted that EU-level forestry strategies often provide high-level direction but insufficient operational guidance, particularly regarding the integration of biodiversity, climate mitigation, and economic objectives. This contributes to uncertainty among forest owners and practitioners, especially in contexts with long planning horizons and diverse ownership structures. As a result, expectations placed on forests under EU climate and biodiversity agendas are not always matched by coherent, predictable or adequately supported policy instruments at national level.

A closely related challenge is the **administrative complexity and bureaucracy** of current policy instruments. Both analyses reveal that policies often translate into burdensome procedures on the farm/forest level. The policy framework review identified “complexity, administrative burden”, and excessive reporting requirements as persistent problems across CAP interventions. Stakeholder interviews confirm the administrative complexity and bureaucracy as key challenges. Farmers and private forest owners described policy compliance as overly complex, citing “high bureaucracy” in accessing CAP supports and meeting environmental rules. Many reported dealing with multiple forms, repetitive data submissions, and confusing application processes that reduce time and trust. This bureaucratic overload was a dominant theme in all case study regions. It reflects a clear gap: policy intentions to promote sustainable practices are undermined by procedural inefficiencies. Both policymakers and practitioners

see that *how* policies are implemented can impede *what* they aim to achieve. Indeed, officials noted that well-meaning requirements (e.g., for Integrated Pest Management) often come with “unclear guidance” and heavy paperwork, leading to a “lack of clarity” among farmers. Regulations intended to encourage sustainable practices are often experienced as compliance exercises immersed in red tape. This gap deteriorates stakeholder goodwill and can reduce participation in the schemes designed to drive change.

Both policy framework analysis and the interviews with policy makers and farmers/private forest owners highlight a **misalignment between top-down policy design and the realities of farming and forestry operations**. From the policy perspective, several EU strategies have been critiqued for one-size-fits-all approaches. The literature notes, for instance, that the CAP and Green Deal measures sometimes lack tailoring to local contexts, risking inefficacy. Stakeholders echoed this strongly. Interviewed farmers frequently felt that some policies are devised without sufficient understanding of field conditions. They gave examples of blanket “best practices” being promoted (such as uniform crop rotation rules or generalised land set-asides) that ignore local agronomic or environmental differences. This fuels a sentiment that policymakers “neither understand nor address” on-the-ground needs. Such feedback aligns with findings on the Farm to Fork Strategy: a Lithuanian policymaker observed that recent Green Deal proposals were perceived as overly “extreme” and not fully discussed with Member States, leading to backlash. Italian stakeholders similarly warned that ambitious EU targets can “put agriculture in difficulty” if not paired with viable alternatives and guidance, underscoring the gap between what is desirable in theory and feasible in practice. This divergence indicates that well-intended policy objectives (e.g., pesticide reduction, organic expansion) may falter without context-sensitive implementation. Poor communication exacerbates the disconnect – farmers often learn of new rules second-hand and find official instructions confusing, reinforcing the view that policy is made in a top-down silo. There is a critical coherence issue where policy frameworks support adaptive, sustainable management, yet stakeholders experience them as inflexible or out of touch with day-to-day challenges.

A consequence of the above challenges is a **trust deficit** between policymakers and practitioners. The interviews reveal **fatigue** among farmers and private forest owners toward constant new “green” requirements. Many are sceptical that adopting specific environmental measures (e.g., creating a pond or hedge for biodiversity) could later trigger new restrictions or penalties on their land. Policymakers acknowledged this trust deficit, noting that farmers often exhibit “fatigue” and distrust toward government initiatives after facing years of shifting rules. From the policy analysis side, this expresses a gap in the policy feedback loop. Insufficient stakeholder engagement and clarity can breed cynicism, causing resistance to even well-designed interventions. Both sources stress that even the best policies will see mild adoption without rebuilding trust and providing consistent support.

Another challenge identified in both analyses is the **gap in knowledge exchange and capacity** that hinders effective policy uptake. The policy review pointed out that many initiatives suffer from data deficiencies and variable knowledge dissemination – for example, lacking farm-level data on pesticide use or biodiversity status hampers science-based policy and adaptive management. Besides, incomplete advisory services and training for sustainable practices were noted as bottlenecks. In the interviews, the stakeholders confirmed that current advisory and extension systems often fall short. Farmers showed concern for the decline of accessible, trustworthy advisory services, noting that guidance is often remote, generic, or biased toward certain commercial interests. Private forest owners in Finland see as barriers to nature-based management practices, the loss of on-site professionals and the over-reliance on digital advice. These gaps in knowledge systems mean that even when farmers and private forest owners want to implement sustainable practices, they may lack the know-how or confidence to do so effectively. A complementarity problem is that policy frameworks assume the presence of knowledge infrastructure and capacity-building, but stakeholders report that these supports are inadequate or misaligned. The net effect is a gap between policy ambition and implementation capability. Both the literature and interviews call for bolstering communication channels, technical assistance, and participatory learning to ensure policies can be translated into action on the ground.

Finally, both policy framework analysis and the interviews with policy makers and farmers/private forest owners highlight the **tension between economic viability and environmental sustainability** as a cross-cutting challenge. EU policies like the CAP and EGD aim to balance these, but in practice, finding that balance is difficult. The policy analysis noted that many instruments strive to reconcile economic and ecological objectives. Yet, issues like continued subsidies for intensive farming or unclear long-term planning can undermine environmental outcomes. Stakeholders put this into concrete terms: farmers insisted that adopting greener practices must “make economic sense” for them to commit. Financial risk is a major barrier to change, especially for small farms or those on slim margins. The interviews in Lithuania and Finland highlighted the “difficult balance between environmental protection and the bioeconomy,” where strict conservation targets can conflict with local economic reliance on agriculture or forestry. Finnish private forest owners also noted policy contradictions regarding their efforts to increase carbon sequestration versus existing incentives to maximise timber harvests. As a result, the stakeholders often perceive trade-offs when pursuing environmental goals, while policy documents talk of win-win solutions. Moreover, older producers are more reluctant to invest in uncertain “green” changes, whereas younger farmers are more open but struggle against structural barriers like land access. This generational dynamic means the economic calculus of sustainability can vary widely even within the same policy context. Overall, the need to better integrate economic support with environmental requirements emerges clearly. Without sufficient financial incentives or risk management tools, the gap between policy and stakeholder uptake will persist.

On the whole, the comparative analysis reveals a suite of common challenges that represent gaps between policy intentions and stakeholder experiences. These include complex governance and bureaucracy, misalignment of policy design with practical realities, erosion of trust, insufficient knowledge support, and tensions in balancing economic and environmental goals. Both the analysis of the policy framework and the interviews often identified the same issues, even though from different angles. The coherence between what the policy review criticises and what stakeholders complain about provides a reality check on the EU’s policy framework aspirations. It underlines that without significant adjustments, the goals of strategies like the CAP post-2023, Farm to Fork, the Biodiversity and Forest Strategies, and others may remain only partially realised in practice.

## 5.2. Opportunities and Complementary Insights

Despite the challenges presented above regarding the alignment of current policy objectives with the practical implementation of sustainable agricultural and forestry practices, there are also important opportunities and areas of coherence between policy goals and stakeholder perspectives. These represent points of complementarity where policy intentions and stakeholder needs can mutually reinforce each other, suggesting ways to improve outcomes.

At a fundamental level, both policy frameworks and stakeholders share **common ground in the desire to promote sustainability in agriculture and forestry**. The CAP’s overarching goals and the European Green Deal’s vision for climate-smart, environmentally friendly farming and forestry were broadly endorsed by interview participants. Policymakers and farmers alike *agree* that the CAP remains the “cornerstone” instrument to drive sustainability, given its vast reach and resources. They also concur those recent strategies – from Farm to Fork to the Biodiversity and Forest Strategies – set essential targets for the future of European agriculture and forestry. This consensus on what needs to be achieved (transition to more sustainable practices) is a powerful point of coherence. This means that, in principle, stakeholders are not resisting the goals of EU policies; instead, they are struggling with *how* those goals are pursued. This shared vision is an opportunity. It provides a foundation of goodwill and a common purpose to build upon. The fact that both groups identified many of the same problem areas (bureaucracy, implementation gaps, need for knowledge support) is encouraging because it means any reforms addressing these issues will likely be welcomed across the board.

The stakeholder interviews offer **practical on-the-ground insights that complement the high-level policy frameworks**. For instance, EU policies emphasise innovation and new practices (precision farming, agroecology, etc.), and indeed many farmers echo enthusiasm for innovation – especially those in the more progressive segment identified by PRUDENT’s analyses. This indicates an opportunity: policies that support and scale up such innovations will likely find willing adopters, at least among a segment of producers. At the same time, stakeholders pinpointed where innovations need policy support to flourish (e.g., ensuring economic viability and knowledge transfer for new practices). The complementarity lies in combining the ambition of policy (to drive forward new sustainable practices) with the pragmatic conditions stakeholders highlight (such as training, funding, and market access for those practices). An additional example is the concept of green nudges, behaviourally informed interventions. Policymakers showed cautious enthusiasm for nudges, seeing them as a potentially “very powerful” tool to encourage sustainable behaviour when paired with digital technologies. Farmers implicitly supported the idea of receiving better information that makes sustainable choices easier.

Both policy documents and stakeholders also call for **stronger knowledge systems and cooperative structures**, revealing a coherence that can be leveraged. The European Green Deal and related policies stress research, innovation, and knowledge sharing as keys to transition – notions that farmers and private forest owners on the ground also champion when asked how to improve current approaches. There is broad agreement that bolstering advisory services and peer learning is critical. This alignment is an opportunity: initiatives to expand on-farm advisory networks, demonstration projects, and digital knowledge platforms will likely find support from policymakers and practitioners. Similarly, the interviews and policy review highlight the need to engage the entire value chain in sustainability efforts. One EU-level interviewee argued that to break “unsustainable lock-ins,” policies must “embrace the entire food chain” rather than putting all responsibility on farmers. Farmers themselves noted they are often constrained by upstream (input suppliers) and downstream (processors, retailers) demands, which limit their flexibility to change practices. This aligns with the EGD thinking at the EU level, which promotes a systemic approach. The complementarity here is clear: stakeholders are essentially validating the policy push for integrated, supply-chain-wide solutions. This creates an opening for policies that incentivise cooperation – for example, programs that reward not just farmers but also processors who source sustainably, or that encourage cooperatives and producer organisations. Such measures, as suggested in the analysis, can distribute the burden of change and create win-win market situations (e.g., premium prices for sustainable products). In forestry, this could translate to involving timber companies in financing sustainable management or developing markets for ecosystem services, ideas that stakeholders also view positively (given the recognition that public funds alone are insufficient for ambitious goals). These views indicate that multi-actor collaboration is both a policy goal and a stakeholder demand.

The findings reveal that a subset of stakeholders is quite **open to change** and can serve as pioneers for new policy initiatives. PRUDENT’s segmentation analysis identified a large group of farmers/private forest owners with more progressive attitudes – higher environmental concern, greater openness to innovation, and trust in science. Notably, Italy and Lithuania had relatively more participants from this pro-environmental segment. These farmers are already inclined to view sustainable practices as the “norm” and sometimes even take pride in environmental stewardship. Their presence presents a significant opportunity: policies can partner with and empower these frontrunners to showcase success stories and mentor others. In the interviews, many forward-looking ideas and constructive suggestions came from such stakeholders, indicating how their perceptions complement policy aims. For example, some farmers were enthusiastic about precision farming tools and expressed willingness to try climate-smart techniques – but only if policies reduce the risk and complexity involved. This conditional openness is a positive sign. It means there is a latent readiness to innovate that policy can unlock by providing the right support (financial incentives, training, risk-sharing mechanisms). Generational turnover also contributes to opportunity. Younger farmers tend to be more receptive to sustainable practices and new business models, as both the literature and interviewees noted. Several participants mentioned that younger generations bring fresh perspectives and higher environmental awareness, which aligns with EU policy efforts to encourage young farmers. When policy facilitates the entry and empowerment of these young

innovators (through start-up grants, land access support, etc.), it directly complements an existing social dynamic pushing for change.

Perhaps the strongest point of coherence between the policy framework analysis and stakeholder input is the acknowledged **need for more coherent and flexible policy implementation**. Both perspectives converge on the notion that better coordination and simplification will benefit all. The interviews repeatedly underscored that consistent and clear policy signals are needed – farmers want to know that if they invest in sustainability, those efforts will not be undermined by conflicting policies or market forces. Policymakers themselves used the interviews to stress that coherence across EU initiatives is essential, echoing critiques in the literature that current policies can sometimes send mixed messages. This is an opportunity to push for alignment. It suggests strong support for initiatives that streamline objectives across the CAP, environmental directives, climate legislation, etc., so that stakeholders receive a unified message. Additionally, there is complementarity in the call for flexibility. Policy documents often emphasise allowing Member State flexibility (e.g., through CAP Strategic Plans) and adaptive management, but stakeholders are asking for flexibility at the farm level – meaning policies that can adjust to farm-specific conditions and needs. These two can complement each other. If EU and national authorities grant more space for local adaptation (without compromising core goals), and if implementation frameworks become less prescriptive and more result-based, farmers can innovate in how they meet sustainability targets. The opportunity here is to co-create solutions: pilot projects or co-design processes where policymakers and farmers together develop tailored measures that achieve policy goals in a way that fits local reality. The shared recognition that “one size does not fit all” could drive such collaborative innovation.

### 5.3. Identified Needs for Policy Improvement

Based on the identified gaps and opportunities, a clear set of needs emerges to bridge the gaps and build on the opportunities. These needs represent areas where policy adjustments or new initiatives are required to better align policy frameworks with stakeholder realities and aspirations. They reflect a synthesis of recurring themes emerging from the policy review and the 50 stakeholder interviews conducted under Task 4.1, rather than a prescriptive list of policy instruments.

There is an urgent need to make policy implementation more user-friendly at the farm and forest level. Both policymakers and farmers/private forest owners agree that cutting through bureaucratic complexity is essential to improve participation in sustainability schemes. By **making rules simpler**, institutions can remove a significant barrier to adoption and signal to land managers that the policy environment is enabling rather than hindering. This also entails providing clear, accessible guidelines for any new requirements so that farmers and private forest owners know exactly what is expected and how to comply. Interviewees consistently linked bureaucratic complexity to reduced uptake of sustainability measures, particularly among smaller farms and private forest owners with limited administrative capacity.

Additionally, enhanced vertical and horizontal coordination is needed so that EU policies, national strategies, and regional programs operate jointly. The analysis highlighted fragmentation in how policies are executed, so an effort to **coordinate across governance levels** is required. This could involve establishing stronger monitoring and feedback mechanisms between the EU and Member States to ensure that national implementations stay true to EU sustainability objectives. It also includes clarifying roles between EU legal acts and national sovereignty in areas like forestry to reduce resistance. In practice, this might mean more frequent dialogues or task forces that bring EU, national, and local authorities together to align interpretation and enforcement of sustainability measures. For forestry in particular, stakeholders emphasised that clearer coordination between EU strategic guidance and national forest governance is needed to avoid resistance and uncertainty linked to long-term management decisions.

Another consistent message is the need to **bolster advisory and knowledge systems** for sustainable agriculture and forestry. Farmers and private forest owners require reliable, on-the-ground support to

implement new practices – be it agronomic advice, forest management planning, or help with technology adoption. Investment in extension services (including hiring or training more advisors) and in participatory research will help close the gap between policy and practice. Moreover, improving data infrastructure (e.g., soil monitoring, biodiversity tracking at the local level) is needed so that policies are based on evidence and progress can be measured. Enhanced knowledge exchange platforms, farmer field schools, demo farms, or digital hubs can empower stakeholders with information and tools to meet policy goals. This need is particularly pronounced in forestry, where long planning horizons, fragmented private ownership and declining on-site advisory capacity make the implementation of sustainable forest management practices especially challenging.

Additionally, policies need to be designed and implemented with a **farmer/private forest owner-centric approach**, treating farmers and private forest owners as partners rather than passive recipients. This implies involving practitioners early in the policy design process (co-creation of measures, consultation on feasibility) and maintaining two-way communication during implementation. The interviews indicated that when stakeholders feel heard and involved, trust increases and policies can be better tailored to real needs. Thus, a key need is to **engage farmers and private forest owners as true partners** through consultation forums, collaborative governance bodies, and feedback loops. Such engagement would help ensure that policies address practical barriers and cultural factors and build the trust needed for smooth adoption. It also ties to the need for transparency and ethical consideration – for example, if behavioural nudges are used, stakeholders should be informed and agreeable to how these are employed. Overall, this partnership approach would directly tackle the current trust deficit by demonstrating respect for local expertise.

Regarding the tension between economic viability and environmental objectives, policies must **align incentives** so that doing the sustainable transition is also financially sensible for land managers. This involves both adequately funding green practices and creating market conditions that reward sustainability. Identified needs include ensuring fair and timely compensation for eco-schemes so that farmers are not unfairly carrying the cost of public goods. In forestry, this concern was particularly linked to conservation and climate-related measures that affect harvesting decisions over long time horizons. Value-chain incentives should be in place to encourage retailers and processors to offer premiums or secure contracts for sustainably produced commodities. It is also important to remove disincentives, such as phasing out perverse subsidies that support intensive practices and send a consistent message to farmers and private forest owners. The overarching need is to integrate the “farm economics” perspective into policy design, which means stress-testing new rules against farm budgets and rural incomes. If sustainability measures come with built-in economic rationale – whether through direct payments, cost-sharing schemes, or improved market access – stakeholders will be far more likely to embrace them.

As a complement to traditional regulatory and financial tools, the findings suggest exploring **behavioural approaches (green nudges)** in agricultural and forestry policy, but doing so carefully and transparently. Policymakers expressed interest in using nudges to encourage practices (such as default enrollment in eco-schemes or peer comparison feedback) as a way to support behavioural change. Rather than relying on a single logic, the effective use of nudging approaches requires a combination of experimentation with innovative instruments and the establishment of clear ethical safeguards. Stakeholders emphasised that experimentation should focus on areas where nudges can add value, for example, by improving adoption of an existing subsidy by simplifying choices, while ethical guidelines are essential to ensure transparency and avoid perceptions of manipulation, and second, to establish ethical guidelines for their use.

In addition, stakeholders highlighted the need to address practical preconditions for effective nudging, including data availability, trust in public authorities, and adaptation to diverse farmer and forest owner profiles. These conditions are particularly relevant in forestry contexts and for small-scale or less digitally connected land managers, where standardised nudges may be less effective. Stakeholders stressed that nudges must be transparent, voluntary and clearly communicated, and that behavioural intervention should be disclosed and designed with input from farmer representatives. This will ensure that nudges supplement, not substitute for, robust policy, serving as gentle assists to encourage the uptake of

sustainable practices, pairing them with proper incentives and rules. Importantly, making use of behavioural insights also means addressing the “digital divide” and data limitations noted: effective nudging may require improved data on farming behaviours and tailoring to different farmer segments.

Finally, a cross-cutting need is to make **inclusive, equitable policies** that accommodate the diversity of farming and forestry contexts. Policy measures should be flexible enough to adjust to this diversity because different regions, farm sizes, and social groups face distinct challenges. As the segmentation analysis showed, the more conservative farmers may respond to various incentives differently from the progressive ones. Smallholders, economically vulnerable farmers, and those in regions lagging in infrastructure will need extra support so that sustainability transitions do not widen existing gaps. Stronger support for young farmers would encourage generational renewal and fresh ideas. Finally, policies perceived as fair and adaptable will gather greater legitimacy and cooperation, enhancing overall effectiveness. This reinforces the need, identified through the segmentation analysis, to avoid uniform policy approaches and to tailor support according to behavioural profiles, resource constraints, and sector-specific contexts.

## 5.4. Differences Across National Contexts

The challenges and opportunities discussed above are broadly shared, but the analysis also reveals significant differences across the four national/regional contexts studied (Belgium-Flanders, Italy, Finland, and Lithuania). These variations highlight the need for context-specific approaches within the common EU framework.

In Flanders, a region with intensive agriculture, stakeholders demonstrated high awareness and adoption of certain innovations but also intense frustration with the regulatory burden. The Flemish interviews showed that many farmers already engage in sustainable practices, reflecting a relatively advanced starting point. However, these same farmers highlighted *bureaucracy* as especially burdensome, suggesting that administrative overload may be the top barrier to further progress in a highly regulated context like Flanders. Flemish farmers often felt suppressed under overlapping requirements. There is also an element of stakeholder scepticism in Flanders. Interviews contained frequent complaints about “strict rules” and a sense of distrust, aligning with the more conservative mindset segment (G2) being over-represented in Belgium. **Simplification and trust-building** are a priority in Flanders.

A notable point from Italy is the emphasis on tailoring and flexibility. Italian interviewees stressed that EU sustainability initiatives must be adapted to local realities. They warned that otherwise such measures could “fall flat” or even jeopardise production if farmers lack viable alternatives. Italian participants appeared relatively open to innovation and provided constructive suggestions. This is consistent with Italy having more of the progressive G1 farmer segment, but they want to be active partners in shaping how policies land on the ground. The policy review for Italy highlighted efforts to integrate agroecological principles and a recognition of regional differences in its national strategy. Italy’s context underlines the need for **inclusive policy design** by engaging local agricultural knowledge and networks.

Lithuanian interviewees showed strong awareness of the tensions between ambitious EU environmental goals and local economic realities. A policymaker from Lithuania explicitly mentioned recent EU proposals being perceived as “extreme” and insufficiently discussed, indicating a concern that the country’s context (with many small farmers and lower average incomes) was not fully considered. Moreover, the policy analysis and interviews for Lithuania pointed out structural issues: an ageing farming population and inadequate support for young farmers entering the sector, coupled with generally lower environmental awareness in rural areas. On the positive side, Lithuania’s stakeholders were interested in opportunities – they talked about the need for more innovation and were receptive to new ideas, reflecting that Lithuania had a share of the progressive G1 segment as well. The main needs in this context are capacity-building and inclusive growth, which ensure that smaller or resource-constrained farmers get the support (financial

and technical) to meet EU standards and boost education and awareness around sustainability. Lithuania also highlights how the **scale of farming matters**. EU policies must be calibrated for countries with many smallholders so that requirements are scalable and do not disproportionately burden those with less capital.

Finnish stakeholders, including policymakers, frequently raised the EU vs. national competence issue regarding forestry rules. They tended to support EU climate and biodiversity aims in principle, but were wary of centralised prescriptions that might not fit Finland's context (where over 60% of forests are privately owned and forestry is economically vital). The Finnish interviews reflected a mix of advanced practice and concern. Finland is a leader in sustainable forestry concepts. However, there is a protective attitude towards established management practices and scepticism of external interference. This was evident in comments about EU forest strategy proposals meeting resistance and the acknowledgement that Finnish policy still prioritises economic outputs from forests, creating ambiguities when aligning with EU conservation targets. Finland's context highlights the importance of **flexibility and subsidiarity** in policy. EU frameworks must allow room for national approaches in implementation, especially for sectors like forestry, and should work with Finland's proactive but sovereignty-conscious stance. It also points to the need for developing market-based incentives (like carbon credits and ecosystem payments), which Finnish stakeholders advocated as necessary to complement public funding.

These national nuances demonstrate that while the overall direction of challenges and needed solutions is common, the emphasis and strategy towards sustainable agriculture and forestry can differ by country. Belgium's (Flanders') case underscores administrative simplification; Italy's points to participatory policy adaptation; Finland's demands flexibility and innovation in forestry and climate measures; and Lithuania's calls for investment in capacity and social support for change. The findings confirm that geographic, economic, cultural, and structural factors influence how sustainable policies are implemented. An important part of policy development is recognising that the context matters and avoiding a one-size-fits-all approach. The next chapter will build on these insights to formulate preliminary policy recommendations.

## 6. Conclusion - Policy Recommendations

This report provides an in-depth analysis of the EU policy framework governing sustainable agriculture and forestry, aligned with the PRUDENT project's objectives. Through an analysis of current policy frameworks, in-depth stakeholder interviews across EU and national levels, a segmentation of farmer and private forest owner profiles (Bonan et al., 2025), and synthesis of the findings, a clear narrative emerged: policy must evolve to enable better and nudge a transition to sustainability. The new generation of EU policies – from the 2023–2027 Common Agricultural Policy (CAP) to the European Green Deal and strategies on farm to fork, biodiversity and forestry – provides an ambitious framework. However, our findings underscore that without addressing practical barriers and human factors, even well-crafted policies can fail in implementation. Producers often face cross-cutting systemic hurdles, such as *bureaucratic complexity, top-down policy design, and fragmented support*. A Flemish farmer and a Lithuanian cooperative member may operate in different contexts, yet both can be discouraged by burdensome rules. Italian farmers on the frontlines of climate adaptation invest in water-saving technologies but feel policy does not adequately back them. At the same time, Finnish private forest owners with a strong environmental ethos note that one-size-fits-all approaches will not suit every region. Across the board, economic viability and generational renewal emerged as delicate fault lines. Young entrants are hesitant to step into farming or forestry when land is costly and policies seem unstable. These insights call for policy innovation and responses that are as much about removing barriers as introducing new measures.

### 6.1. Make sustainable choices the easy choice

The first strategic direction is to simplify, streamline, and support the adoption of sustainable practices and make sustainable choices the easy choice. When sustainable practices are the *path of least resistance*, more farmers and private forest owners will adopt them. Cutting red tape and providing hands-on guidance are key solutions towards sustainability. The interviewees indicated that simpler, clearer schemes are not a luxury but a necessity. Authorities should continue to *simplify application processes and requirements* for green measures. For example, presenting eco-scheme options in user-friendly, consolidated terms and using digital tools to help farmers adapt measures on their land can increase participation. Flanders found that uptake of complex biodiversity measures (like flower strips) remained low until rules were made more straightforward. This kind of administrative streamlining directly addresses one of the main frustrations voiced by stakeholders and can be replicated elsewhere. Alongside simplification, strengthening advisory services and knowledge networks is critical. Nearly every farmer or private forest owner interviewed, from Italy to Lithuania, stressed the value of practical guidance over abstract instruction. Investing in local agronomists, farming and forest advisors, who can work one-on-one with producers to plan sustainable practices, would operationalise policy on the ground. These advisors should be equipped with technical know-how and training in behavioural techniques: for instance, providing personalised “farm sustainability audits” that highlight the concrete benefits (e.g. cost savings, yield stability) a farmer could reap from a change in practice. Peer learning is another powerful lever: demonstration farms and farmer field schools where early adopters share success stories can build trust within the community. Making policies simpler and support stronger creates an enabling environment in which sustainability is seen not as an extra burden but as an accessible improvement to the farming or forestry business.

## 6.2. Robust incentives and market structures must underpin sustainable practices

Even with better information and less bureaucracy, farmers and private forest owners will not embrace sustainable practices at scale unless they are financially viable. A consistent message across PRUDENT's case studies is that robust incentives and market structures must underpin sustainable practices. Many sustainable practices – adopting continuous cover forestry or diversifying crop rotations – carry upfront costs or risks before their long-term benefits materialise. Policy should proactively bridge this economic gap. In Finland, for instance, stakeholders highlighted that managing forests without clear-cuts (to preserve continuous cover) can mean foregoing short-term revenue. A logical policy response is to introduce dedicated payments for ecosystem services – paying land managers for the public goods they produce (biodiversity, carbon storage, landscape beauty) when adopting such practices. Likewise, farmers who implement measures like planting nitrogen-fixing cover crops or creating pollinator habitats could receive “bonus” payments or tax credits recognising the broader benefits (cleaner water, healthier soils) that accrue from these actions. The upcoming CAP post-2027 policy revisions present opportunities to incentivise sustainable practices. Instead of only paying farmers for what they do (e.g. sow a cover crop), authorities can also pay for what they achieve, e.g. a measurable improvement in soil organic matter or biodiversity on their land. Trials in some regions show that farmers respond well to such schemes, as they encourage innovation and ownership. If a farmer knows a bonus awaits for hitting an environmental target, they can choose how to get there, which can spark creative solutions. We recommend piloting these approaches and scaling up what works, gradually blending result-based elements into the mainstream support system.

In parallel, policymakers should create a situation where implementing sustainable practices is also profitable, by nurturing supply chains and consumer demand for sustainable products. For example, if organic farming is a desired practice, there must be a market for organic products. Investing in agri-food processing (through rural development grants or public-private partnerships) can ensure farmers have an outlet and fair price for these rotation crops, turning a compliance exercise into a business opportunity. Public procurement is another lever where governments can “lead by example” by sourcing a higher percentage of organic or sustainably produced food for schools, hospitals, and public canteens. Such demand-pull measures send a strong market signal and reward farmers who have already gone sustainable while incentivising others to follow. Similarly, strengthening labels and certification schemes (and ensuring consumers trust and recognise them) helps create premiums for sustainable products. If sustainability pays, adoption will accelerate rapidly.

## 6.3. Bridge the gap in leveraging behavioural science tools

While the CAP emphasises innovation and knowledge, there's a gap in leveraging behavioural science tools, such as green nudges, at the EU and national policy design level. Payments and penalties are classical tools, but subtler nudges (like default options, peer comparison feedback, recognition programs for sustainable farming and forestry) are not yet part of CAP's toolkit. However, transitioning from FADN to FSDN represents a significant opportunity to support evidence-based behavioural interventions in European agriculture. The FSDN creates a robust foundation for designing, implementing, and evaluating green nudges that can guide farmers toward more sustainable practices by collecting comprehensive sustainability data across economic, environmental, and social dimensions. FSDN may provide the foundation for successful green nudges by offering farm-level economic, environmental, and social insights. This includes customised feedback and benchmarking tools that identify sustainability possibilities and shortcomings. Policymakers and advisors can create focused interventions, like tailored suggestions

or comparative performance feedback, that motivate farmers to embrace sustainable practices like integrated nutrient management, less pesticide use, and improved soil conservation by utilising this data infrastructure. These data-driven nudges could increase the possibility of voluntarily adopting sustainable practices while reducing administrative expenses by making sustainable decisions more relevant, actionable, and visible to individual farmers.

A defining feature of the PRUDENT project is its focus on behavioural insights – the understanding of how real people make decisions – and how these insights can be turned into “green nudges.” The research, including segmentation analysis of farmers and private forest owners, confirmed that different groups respond to different motivators. Some agricultural producers are innovators or intrinsically eco-motivated, quick to embrace new practices. In contrast, others are more risk-averse or traditional, needing evidence and assurance before changing long-held methods. Policy can no longer assume a representative “average farmer.” Instead, it should leverage behavioural science to tailor interventions to diverse mindsets and contexts. The European Commission’s own recent analysis advocates embedding behavioural insights early in the policy cycle – not as an afterthought – to improve effectiveness and coherence (Dupoux et al., 2025). This means that policies should be designed with an awareness of cognitive biases, social norms, and decision environments from the start (Dupoux et al., 2025). For example, rather than simply offering a subsidy for an eco-friendly practice and hoping for uptake, policy could proactively shape the choice architecture that farmers and private forest owners navigate. One low-cost but potentially high-impact idea is adjusting default options. As PRUDENT’s stakeholder co-creation sessions suggest, many decisions can be nudged by changing the default setting to the sustainable choice. In practice, this could mean that a farm management software or a forestry planning tool comes pre-loaded with a sustainable plan (crop rotation schedule, selective harvesting regime) which the user would have to actively opt out of if they prefer something less sustainable. Experience shows that because people often stick with defaults, such an approach can significantly increase adoption of the preferred practice.

Other behavioural tools are personalised feedback and peer comparison. Farmers tend to compare themselves with peers, and many take pride in being good stewards if given the right feedback. Thus, a policy innovation could provide annual “sustainability report cards” to farms, highlighting metrics like soil health, input use efficiency, or biodiversity counts on their land compared to anonymised regional averages. Social norms and networks play a role here: if farmers see trusted peers successfully implementing a practice, the psychological barrier to trying it themselves lowers. Policymakers can encourage this by supporting farmer networks and champion farmers who can informally influence others, essentially seeding new norms, community by community.

The analysis showed that applying behavioural insights should complement, not replace, traditional policy instruments. Nudges are not a silver bullet to make hard trade-offs disappear; rather, they enhance the uptake of well-designed incentives and regulations. The interviews reinforced that farmers and private forest owners expect strong baseline support: adequate funding, fair rules, and technical help must be in place before nudges can do their work. We interpret this to mean policymakers should first ensure the “floor” – reasonable incomes, manageable rules, available advice – and then use nudges as the gentle push towards even better outcomes. When these conditions are met, behavioural interventions can be remarkably cost-effective and politically acceptable ways to drive change. They often face less resistance than blunt regulation because they preserve choice. Their effectiveness is inherently context-dependent and relies on data availability, trust in public authorities, and careful adaptation to diverse farming and forestry contexts, particularly where ownership structures and decision horizons differ. EU’s ambition should be not only to incentivise sustainable practices directly but also to engineer decision environments (in administration, marketplaces, and communities) where sustainable choices are the convenient, obvious choices. As a JRC report put it, it’s time to move from only “*influencing the individual*” to “*shaping the system*” with behavioural insight (Dupoux et al., 2025).

## 6.4. The power of collective approaches

A theme that resonated in both the policy analysis and stakeholder input is the power of collective approaches. Environmental challenges like biodiversity loss, water pollution, or climate resilience often display at the landscape level, beyond the boundaries of any single farm or forest parcel. Thus, solutions that encourage farmers and private forest owners to work together can unlock bigger gains than isolated efforts. Current CAP instruments like the cooperation measure or eco-scheme pilot projects could be harnessed to fund such joint initiatives, filling the gap between farm-scale measures and desired landscape outcomes (such as the EU Biodiversity Strategy's goal of 10% high-diversity landscape features). Policymakers can facilitate this by providing higher incentive rates or bonus payments for group participation, signalling that collaboration is valued. Beyond financial incentives, there is a behavioural angle. Green nudges could be designed, such as competitions or recognition programs for communities that achieve certain sustainability milestones (e.g. an award for a region that reaches an organic farming threshold or a watershed with improving water quality).

Collective approaches also tie into knowledge-sharing and social learning. A community that experiments together can learn faster and better support its members. For instance, if one private forest owner tries a new climate-smart technique and demonstrates success, neighbours are likelier to follow, mainly if a forum exists to share that experience. Thus, policy should continue funding and expanding platforms for exchange, such as cooperative groups or multi-actor workshops.

## 6.5. Policy processes must become more adaptive and inclusive

Finally, our conclusions point to how policy is made and evolves, not just the content of specific measures. Policy processes themselves must become more adaptive and inclusive to meet the challenges of sustainable agriculture and forestry. One clear recommendation is to institutionalise continuous stakeholder engagement in policy design and monitoring. Rather than drafting a strategic plan in a ministry office and rolling it out unilaterally, authorities should create regular opportunities for farmers, private forest owners, advisors, environmental groups, and other stakeholders to provide feedback and co-create improvements. Such engagement generates practical insights (like which eco-scheme design is not working on the ground and why) and builds trust. Farmers who feel heard and involved are more likely to buy into the resulting policies. The co-creation ethos helps transform policy from being perceived as imposed to being co-owned by the community it serves.

A related priority is policy adaptability. The current CAP allows revisions of national CAP Strategic Plans, and this flexibility should be embraced. We recommend that governments adopt an *adaptive management* mindset and treat policies as living programs to be refined. If an incentive is too low and uptake of a green measure disappoints, increase it; if a requirement is too complex and causing confusion, simplify it mid-course. Likewise, if monitoring reveals certain regions or practices lagging behind, launch targeted support or pilots to address that gap. Embracing real-time data and feedback loops in this way will make policy more responsive and effective. Of course, adaptability must be balanced with reliability. The key is to make the required adjustments without undermining the strategic direction.

Speaking of strategic direction, long-term vision and coherence emerged as non-negotiable elements of successful policy. Farmers and private forest owners operate with long planning horizons, albeit of different nature. They manage perennial or semi-perennial systems, make long-term investments in machinery, skills, and land management and often plan with intergenerational continuity in mind, particularly in the case of forest ownership. They need to know that sustainability is not a political trend but the cornerstone

of future farming. Policymakers should send strong signals of long-term commitment and ensure that major policy frameworks (CAP, Green Deal, climate laws, biodiversity strategy) all point in the same direction. Several stakeholders noted the effect of policy instability, where one year a practice is encouraged and the next it is not. This erodes confidence and appetite for change. To counter that, policy coherence across sectors and timeframes is essential. Aligning agricultural policy with environmental objectives might mean, for example, coordinating among ministries and departments. Additionally, securing financial and institutional support for sustainability beyond the current funding period provides reassurance. If farmers or forest owners know that support schemes are likely to persist, they are more willing to engage in long-term transitions.

## 6.6. In a nutshell

In light of all the above, an overarching recommendation could be that policymakers take a holistic, human-centred approach to accelerating sustainable agriculture and forestry. Technical solutions and funding alone are not enough. The uptake of those solutions lies in the hands of thousands of individual decision-makers whose behaviours, motivations, and constraints must be understood and addressed. The good news is that our research confirms a strong appetite for change among many farmers and private forest owners – they are often keen to be part of the solution and to steward their land responsibly, provided policies set them up for success. Policy can unlock this positive energy by making sustainable practices easier, more rewarding, and better tailored to real-world conditions. Importantly, the PRUDENT project itself serves as a catalyst in this journey. As a Horizon Europe initiative blending science and practice, PRUDENT can continue to pilot innovative “green nudges” and policy tools on a small scale, demonstrating what works and what does not. We encourage policymakers to remain closely engaged with such experiments – for example, through regular exchanges and by treating PRUDENT’s use cases as testbeds for potentially larger programs. The project’s final outputs will include evidence-based recommendations and toolkits that will integrate these insights. These results could be leveraged when designing the next wave of policies and support schemes.

Europe's transition to sustainable agriculture and sustainable forest management is at a tipping point. High-level strategies set the direction, a robust legislative framework and societal demand set the vision, but the speed and success of the journey will depend on policy innovation and smart policy implementation. Policymakers should pursue a strategy of “empower and nudge” – empower producers with the means and knowledge to change and nudge them with subtle cues and system adjustments to keep that change on course. Farmers and private forest owners will increasingly find that sustainable choices are not only expected but also the most rational and beneficial for their success. Over time, such alignment can transform our agri-food and forest systems. This is the vision that PRUDENT promotes – a future where European agriculture and forestry are productive, resilient, and climate-friendly by design, supported by policies that are as dynamic and foresighted as the challenges we aim to overcome.

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## 8. APPENDIX

### A. Interview guide for Policymakers

II. Policy Landscape and Experience (20 minutes)	
• Role and Responsibilities	
i. Can you describe your role and responsibilities in the context of EU/Member State level context agricultural/forestry/environmental policy?	
ii. How long have you been involved in policymaking? (Number of years)	
iii. Are you willing to be contacted for follow-up questions after the interview?	
Yes <input type="checkbox"/>	No <input type="checkbox"/>
• Current Policies	
1. In your opinion, what are the most important EU/Member State-level policies currently in place that address sustainability in agriculture and forestry?	
2. How do these policies align with the broader goals of the European Green Deal?	
3. Do you believe these policies have been effective? (Yes/No)	
If yes, why?	
3a. If no, why they have not been effective and what improvements would you suggest?	
4. What are the most important policy gaps and priorities that need to be addressed to promote sustainable agriculture and forestry in the EU?	
5. What role do you see for digital technology playing in future agricultural/forestry policy development?	

- Green Nudges:  
Behavioural interventions, most notably in the form of nudges, are rapidly becoming part of the policymaker's tool kit. A nudge is defined in economics as a change in the decision environment that influences people's behaviour without prohibiting any choices or significantly changing the economic incentives (Thaler and Sunstein, 2009). Green nudges are behavioural interventions that rely on people's cognitive biases and moral concerns about their impact on the environment to nudge them away from making choices that create negative externalities, such as waste, pollution, emissions, etc. (Carlsson et al., 2021);  
See below some examples of green nudges aiming to nudge farmers towards sustainable practices:
  - Timely Reminder: Sending text messages or email reminders to farmers about deadlines for participating in AEEM and eco-schemes, or displaying pop-up reminders when they access the farmer registration system.*
  - Updating risk expectations: Highlighting the risk of fines for non-compliance with environmental regulations.*
  - Social norms and Social comparisons: Conveying information about the number of peers who already undertook the desired sustainable action*
  - Simplify information and making it Visible: Awarding certificates or labels to farmers who implement sustainable practices.*

6. Are you familiar with the concept of green nudges?

7. To your knowledge, have green nudges been considered or implemented in any existing agricultural or forestry policies? If so, could you please provide examples?

### III. Needs and Challenges (15 minutes)

8. What is your opinion on the potential of green nudges to contribute to policy goals in the agriculture/forestry sector?

9. What are the key challenges in incorporating green nudges into agricultural/forestry policies, and how can these be addressed to effectively promote sustainable agricultural practices?

10. An example of a nudge is included in the Energy Efficiency Directive (EU) 2018/2002 and it is the inclusion of information about the average electricity use of relevant comparison groups on electricity bills. This nudge is based on evidence that such comparative information decreases the consumption of high electricity users. The reason is that humans like to conform to the behaviour of the majority – if relevant peers, such as neighbours, are using less energy, people will tend to do the same. Do you think that a similar nudge could be included in legislation related to the sustainable use of pesticides aiming to decrease the use of pesticides by farmers? Why or why not?

11. Do you believe that green nudges can be as effective as traditional regulatory or financial incentives (e.g., eco-schemes under CAP) in fostering sustainable practices? Why or why not?

12. In your opinion, can nudges be transparent and effective at the same time?

### IV. Opportunities and Recommendations (10 minutes)

13. Are there any new initiatives or policies related to sustainable agriculture/forestry being considered at EU/Member State level?

Yes/No

13a. If yes, what are they?

14. What advice would you give to researchers working on green nudges for sustainable agriculture and forestry?
15. Is there anything else you would like to share about the EU's efforts in promoting sustainable agriculture?
<b>V. Closing</b> <ul style="list-style-type: none"> <li>• Thank the policymaker again for their time and valuable insights.</li> <li>• Reiterate the confidentiality of their responses and how their input will be used.</li> <li>• Offer to share a summary of the findings from the interview and the PRUDENT project.</li> </ul>

## B. Interview guide for Farmers/Private Forest Owners

<b>II. Background Information</b>
i. What type of farming do you practice?
<input type="checkbox"/> Cereals <input type="checkbox"/> Other field crops <input type="checkbox"/> Horticulture, without greenhouses <input type="checkbox"/> Horticulture, in greenhouses <input type="checkbox"/> Wine <input type="checkbox"/> Olive oil <input type="checkbox"/> Other permanent crops <input type="checkbox"/> Livestock pigs <input type="checkbox"/> Livestock cattle (meat) <input type="checkbox"/> Livestock cattle (dairy) <input type="checkbox"/> Livestock poultry <input type="checkbox"/> Apiculture <input type="checkbox"/> Forestry <input type="checkbox"/> Other If other, please specify: ..... .....
ii. How big is your farm/forest ( <i>in hectares</i> )? / How many animals did you rear on your farm in 2023?
iii. How long have you been involved in farming/forestry? (Number of years)
iv. How old are you?
<input type="checkbox"/> Below 30 <input type="checkbox"/> From 30 to 39 <input type="checkbox"/> From 40 to 49 <input type="checkbox"/> From 50 to 64 <input type="checkbox"/> 65 or over
v. What is the level of your agricultural/forestry training?
<input type="checkbox"/> Practical experience only <input type="checkbox"/> Basic agricultural/forestry training (secondary school/ certificates or short courses that cover foundational knowledge)

- Full agricultural/forestry training (at least 2 years of continued training at university or other institute of higher education specialised in agriculture or associated)
- Other

If other, please specify:

.....  
 .....

### III. Sustainable Agricultural/Forestry practices

**Sustainable agriculture** is an approach to farming that focuses on producing food, fiber, or other plant or animal products in a way that protects the environment, supports economic profitability, and enhances the quality of life for farmers and society as a whole.

Where human intervention is necessary to the maintenance of a functioning forest ecosystem, this is known as **sustainable forest management** (SFM). In Europe, the concept of SFM was defined in 1993 at the pan-European [Ministerial Conference on the Protection of Forests in Europe](#) (MCPFE) as:

*"The stewardship and use of forest lands in a way and at a rate that maintains their productivity, biodiversity, productivity, regeneration capacity, vitality and their potential to fulfil now and in the future relevant ecological, economic and social functions at local, national and global levels and that does not cause damage to other ecosystems."*

1. Do you currently implement any of the following sustainable agricultural/forestry practices?  
 (if the interviewee doesn't implement any sustainable agricultural/forestry practices, go to Question No. 5)

- Organic farming practices (conversion/maintenance)
- Integrated Pest Management practices  
 (Including Buffer strips, Mechanical weed control, Increased use of resilient, pest-resistant crop varieties and species, Land lying fallow with species composition for biodiversity purposes)
- Agroecology  
 (Crop rotation with leguminous crops, Mixed cropping - multi cropping, Cover crop between tree rows on permanent crops, Winter soil cover and catch crops, Low intensity grass-based livestock system, Use of crops/plant varieties more resilient to climate change, Mixed species/diverse sward of permanent grassland for biodiversity purpose etc)
- Husbandry and animal welfare plans  
 (Feeding plans, Friendly housing conditions, Practices increasing animal robustness, fertility, longevity and adaptability, Animal health prevention and control plans, providing access to pastures and increasing grazing period for grazing animals, Provide and manage regular access to open air areas, etc)
- Agroforestry  
 (Establishment and maintenance of landscape features, Management and cutting plan of landscape features, Establishment and maintenance of high-biodiversity silvopastoral systems)
- High Nature Value (HNV) farming  
 (Land lying fallow with species composition for biodiversity purpose, Shepherding on open spaces and between permanent crops, Semi-natural habitat creation and enhancement, Reduction of fertiliser use, low intensity management in arable crops, etc)
- Carbon farming  
 (Conservation agriculture, Rewetting wetlands/peatlands, paludiculture, Minimum water table level during winter, Appropriate management of residues, Establishment and maintenance of permanent grassland, Extensive use of permanent grassland, etc)
- Precision farming  
 (Nutrients management plan, use of innovative approaches to minimise nutrient release, optimal pH for nutrient uptake, circular agriculture, Precision crop farming to reduce inputs, Improving irrigation efficiency, etc)
- Improve nutrient management  
 (Implementation of nitrates-related measures that go beyond the conditionality obligations, Measures to reduce and prevent water, air and soil pollution from excess nutrients, etc)
- Protecting water resources  
 (Switching to less water intensive crops, Changing planting dates, Optimised irrigation schedules)
- Other practices beneficial for soil  
 (Erosion prevention strips and wind breaks, Establishment or maintenance of terraces and strip cropping, etc)
- Other practices related to GHG emissions

(Feed additives to decrease emissions from enteric fermentation, Improved manure management and storage, etc)

Sustainable Forest Management  
(Promoting natural tree regeneration, Ensuring respectful harvest conditions, preserving and restoring soil and water ecosystems in forests, Optimising deadwood retention, Setting areas aside, etc)

Other  
If other, please specify:  
.....  
.....

2. Have you faced any challenges or barriers, such as those related to policy, funding, or knowledge in implementing sustainable practices?

Lack of understanding of the benefits of the sustainable practice

Lack of practical knowledge

Lack of access to training and information

Lack of systemic business incentives

Lack of adequate policies

Lack of funding programmes

Lack of access to investments

High bureaucracy of CAP payment system

Risk aversion

Hesitance to change behaviour or move away from known practices

Consumers unwillingness to pay more for sustainable products

Other  
If other, please specify:  
.....  
.....

3. Did you adopt these practices voluntarily? (Yes/No)

3a. If YES, what motivated you to adopt these sustainable practices?

.....

If NO, please explain how it was mandated (European, national, regional legal act, other?)

.....

4. Have you received any form of support, such as from the Common Agricultural Policy (CAP) or other regional, national, or European funding schemes, to help implement sustainable practices on your farm/forest? If yes, can you specify the type of support and how it has helped?

.....

5. If you do not implement any sustainable farming/forestry practices at the moment, do you consider to move towards more sustainable practices? (Yes/No)

5a. If YES, please specify what are your needs or motivation that you require?

.....

5b. If NO, please explain why.

.....

III. Common Agricultural Policy  
The CAP 2023-27 entered into force on 1 January 2023. Support for farmers and rural stakeholders across the 27 EU countries is based on the CAP 2023-27 legal framework and the choices detailed in the national CAP Strategic Plans (CSPs). The CAP supports agriculture in making a much stronger contribution to the goals of the European Green Deal, with higher green ambitions, enhanced conditionality, eco-schemes, measures to support climate, biodiversity, environment and animal welfare (AEEM). The CSPs are designed to make a significant contribution to the ambitions of the [European Green Deal](#), [Farm to Fork Strategy](#) and [Biodiversity Strategy](#).

6. Are you applying / Have you applied for CAP support?				
6a. If YES, please specify which kind of CAP support (income support, eco-schemes, young farmers, agri-environmental measures, etc).				
6b. If NO, please explain why.				
7. How do you rate the complexity of the following? Complexity may be linked to understanding, clarity of the rules, length of the process/operation or technical difficulties.				
	Low complexity	Medium complexity	High complexity	I did not apply
Respecting minimum requirements of good agricultural and environmental conditions (GAECs)				
Complying with the CAP funding conditions for eco-schemes				
Complying with the CAP funding conditions for agri-environment-climate commitments				
Complying with the rules related to nitrates				
Complying with the rules related to water				
Complying with the rules related to Natura 2000				
Complying with the rules related to plant health, pesticides Complying with the rules related to animal health				
Complying with the rules related to animal welfare				
Complying with the rules related to sustainable forest management				
8. What challenges have you faced while implementing sustainable practices supported by the CAP funding, and what benefits has this funding provided?				
<p>IV. European Green Deal (Farm to Fork/ Strategy/ Forestry Strategy)</p> <p>The European Green Deal aims to achieve climate neutrality by 2050, but many farmers feel that these ambitions are out of touch with the practical realities of farming business in Europe. There have been widespread protests across Europe against the current agricultural and environmental policies, shaped by the CAP and the European Green Deal.</p>				
9. What are the main challenges that you face in your farming/forestry business?				
<input type="checkbox"/> Falling income <input type="checkbox"/> High production cost <input type="checkbox"/> Competition from cheap imports <input type="checkbox"/> Regulatory compliance (strict green policies, safety standards, certification requirements etc)				

- Access to financing and capital
- Land availability
- Supply chain disruptions
- Access to advanced technology and innovation
- Labor shortages and costs
- Knowledge and education
- Climate change, biodiversity loss, and environmental pollution
- Other

If other, please specify:

.....  
 ...

10. Do you feel threatened by the triple planetary crisis of climate change, biodiversity loss, and environmental pollution as a farmer/private forest owner?

- Yes       No

11. What are your main concerns since farmers/private forest owners are the first impacted by climate change, biodiversity loss and environmental pollution?

- Extreme weather events (e.g., Heat waves, droughts, floods, storms)
- Shifting growing seasons
- Pests, diseases and invasive species
- Biodiversity loss
- Soil health
- Water scarcity
- Carbon footprint
- Other

If other, please specify:

.....  
 ...

12. How do you perceive the impact of the European Green Deal on your farming/forestry practices, particularly regarding the policies around pesticide use and fertiliser use reduction, land management, sustainable forestry (e.g., obligation for farmers to devote at least 4% of arable land to non-productive features, crop rotation etc.)?

13. What changes you would like to see in European or national/regional agricultural/forestry and environmental policies in the near future?

14. Is there anything else you would like to add about your experiences with sustainable agriculture/forestry and related European/national/regional policies and legislation?

15. Are you willing to be contacted for follow-up questions after the interview?

- Yes       No

V. Closing

- Thank the farmer/privet forest owner again for their time and valuable insights.
- Reiterate the confidentiality of their responses and how their input will be used.
- Offer to share a summary of the findings from the interview and the PRUDENT project.



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