

# Gaps and potential for the integration of PES within the EU policies and financial framework

## Deliverable 3.1



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### About the project

Payments for Ecosystem Services (PES) schemes are considered a promising economic instrument for diversifying income to forest owners and rural communities while supporting biodiversity and climate mitigation. LIFE ProForPES is an EU funded project that aims at collecting, synthesising and integrating the knowledge and the know-how already present at the national and EU level on PES and PES-like schemes.

This publication reflects the views only of the authors, and the European Commission cannot be held responsible for any use which may be made of the information contained therein.

## Executive summary

This document, LIFE ProForPES Deliverable 3.1 “*Gaps and potential for the integration of PES within the EU financial framework*” investigates gaps and potentials for integrating Payments for Ecosystem Services (PES) - with a specific focus on Forest Ecosystem Services (FES) - into EU policies and financial programs. To this aim, different methodologies were used: i) a structured review of key policies and financial programs (including an assessment of allocated budgets), ii) a two-round Delphi study with European experts, and iii) a workshop organised into twelve parallel sessions engaging a broad spectrum of stakeholders.

The results indicate that the Ecosystem Services (ES) concept is now firmly embedded in EU policies, with a growing number of documents, across sectors, explicitly referring to ES, often in a detailed manner. However, according to stakeholders, this momentum is not yet mirrored on the ground: forest owners and the wider public are not consistently aware or engaged. A second tension concerns financing: despite heightened political salience, the volume of funding dedicated to ES does not match stated ambitions. Where resources are channelled, they skew towards regulating services; climate-related lines dominate, while biodiversity often receives comparatively less support.

Concerning PES, meant as “*positive economic incentive where ES providers can voluntarily apply for a payment that is conditional either on ES provision or on an activity clearly linked to ES provision*” (Engel, 2016), the analysis shows that the PES concept has entered EU policy discourse. However, the terminology remains heterogeneous, frequently paraphrased, with notable differences across policy sectors, implying also not perfectly coincident meanings.

Regarding the presence of PES design elements already in the policy text, many of the policies analysed are high-level by nature and therefore light on operational detail. Notable exceptions anchor those details in implementable instruments: the Common Agricultural Policy (CAP) has long deployed Agri-Environment-Climate Measures and, more recently, Eco-Schemes; the emerging Carbon Removal Certification Framework (CRCF) articulates design elements central to PES practice - such as conditionality, monitoring and verification, baselines, and permanence, while the Nature Restoration Regulation (NRR) is increasingly referenced for indicators.

Regarding the financial programs, the analysis shows that only a quarter of the analysed programs have introduced PES schemes.

The policy screening, together with experts and stakeholders, identify promising design for PES that include hybrid approaches. Two directions stand out: blended finance that combines public and private sources to underwrite PES, and payment structures that mix action-based and results-based arrangements.

Experts and stakeholders also debated whether the CAP should be the primary vehicle for forest-sector PES—given its long history and wide uptake, but comparatively limited application in forestry and mixed positive environmental results—or whether a dedicated framework for FES would be more suitable. Opinions on the matter diverge, but they tend to favour a framework outside the CAP. Voices are unanimous, however, in indicating to move beyond CAP-only solution, also looking at the CRCF architecture, and the Roadmap toward Nature Credits Certification and surely opting for solutions that keeps channels open for private contributions.

Experts suggest that a rigorous PES for FES design should include tailored metrics and safeguards, avoid equity and visibility biases, recognise not only afforestation but also sustainable forest management and agroforestry, bundle, when possible, multiple ecosystem services to boost additionality and cost-effectiveness, and establish an EU-level platform to match FES buyers and providers with lesson learned and templates to improve knowledge and cut transaction costs.

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## List of abbreviations and acronyms

|          |                                                                                                                  |
|----------|------------------------------------------------------------------------------------------------------------------|
| AECM     | Agri-Environment-Climate Measures                                                                                |
| AES      | Agri-Environmental Schemes                                                                                       |
| BISS     | Basic Income Support for Sustainability                                                                          |
| BOKU     | <i>Universitaet für Bodenkultur Wien</i> - University of Natural Resources and LIFE Sciences, Vienna             |
| CAP      | Common Agricultural Policy                                                                                       |
| CRFC     | EU Carbon Removal Certification Framework                                                                        |
| CSP      | CAP Strategic Plans                                                                                              |
| DG       | Directorate General                                                                                              |
| EAFRD    | European Agricultural Fund for Rural Development                                                                 |
| EAGF     | European Agricultural Guarantee Fund                                                                             |
| EC       | European Commission                                                                                              |
| EFI      | European Forest Institute                                                                                        |
| ES       | Ecosystem Services                                                                                               |
| ETIFOR   | Etifor   Valuing Nature                                                                                          |
| EU       | European Union                                                                                                   |
| FES      | Forest Ecosystem Services                                                                                        |
| GAEC     | Good Agricultural and Environmental Conditions                                                                   |
| GHG      | Greenhouse Gases                                                                                                 |
| GI       | Green Infrastructure                                                                                             |
| HNEE     | <i>Hochschule für Nachhaltige Entwicklung Eberswalde</i> - The Eberswalde University for Sustainable Development |
| LULUCF   | Land Use, Land-Use Change and Forestry                                                                           |
| MBI      | Market Based Instruments                                                                                         |
| MRV      | Monitoring Reporting and Verification                                                                            |
| MS       | Member States                                                                                                    |
| OpenNESS | Operationalisation of Natural Capital and Ecosystem Services                                                     |
| PES      | Payments for Ecosystem Services                                                                                  |
| SMR      | Statutory Management Requirements                                                                                |
| RDP      | Rural Development Program                                                                                        |
| RBP      | Result-based payments                                                                                            |
| RQ       | Research question                                                                                                |
| UNIPD    | <i>Università degli Studi di Padova</i> - University of Padova                                                   |
| WFD      | Water Framework Directive                                                                                        |
| WP       | Working Package                                                                                                  |
| WTO      | World Trade Organization                                                                                         |

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## 1. Foreword

LIFE ProForPES project aims at collecting, synthesising and integrating the knowledge and the know-how present at the national and European Union level on Payments for Ecosystem Services (PES). ProForPES Working Package 3 (WP3) aims to map the potential for the EU financial programs and the State Aid framework to integrate or incentivize PES in their structure.

The present Deliverable 3.1, *“Gaps and potential for the integration of PES within the EU policies and financial framework,”* is one of the two outputs under WP3 and focuses on EU-level policies.

The document functions both as a standalone report and as an input to ProForPES WP4, which develops guidelines and recommendations for integrating PES into future policies and funding programs.

## 2. Introduction and objectives

Forests offer a wide range of Ecosystem Services (ES) that benefit society (Millennium Ecosystem Assessment, 2005). These Forest Ecosystem Services (FES) can be categorized as provisioning, e.g. timber provision; regulating, e.g. water and air quality; and cultural, e.g. landscape aesthetics. As for the ES in general, most FES are public goods in nature (Costanza et al., 1997; Nichiforel et al., 2018) meaning that markets fail to signal their value, with the risk of free-riding and overuse, so without collective governance, incentives, or regulation they tend to be under-provided and degraded. This has significant implications for forest management.

Payments for Ecosystem Services (PES) are widely regarded as promising economic instruments to sustain FES by creating (quasi-)markets for public goods while supporting livelihoods, household income and rural development (Wunder, 2005; Engel et al., 2008; Börner et al., 2017; Wunder et al., 2020). PES function as complementary instruments within a broader policy mix, working alongside regulation and other incentives (OECD, 2010; Vatn, 2010; Ring and Schröter-Schlaack, 2011; Barton et al., 2017).

There has been extensive discussion over what qualifies as PES (Tacconi, 2012; Wunder, 2015). Suggested definitions span a spectrum from quite restrictive (Wunder, 2005; Wunder, 2015) to quite broad (Muradian et al., 2010). For the purpose of this analysis, in accordance with Engel (2016) PES are considered as a “*positive economic incentive where ES providers can voluntarily apply for a payment that is conditional either on ES provision or on an activity clearly linked to ES provision*”.

Two broad types of PES are included in the definition: *Cosean arrangements* and *Pigouvian arrangements* (Engel et al., 2008; Tacconi, 2012; Schomers and Matzdorf, 2013). In a *Coasean arrangement*, ES buyers negotiate with ES providers. This is the arrangement in the well-known Vittel case, where the mineral water company paid the farmers operating in the watershed to adopt practices that reduced nitrate contaminants to the water (Perrot-Maître, 2006). *Pigouvian arrangements* resemble instead subsidisation: a public agency finances payments—sourced from earmarked user fees (e.g., water tariffs) or general taxation—to encourage activities that deliver ES. Agri-Environmental Measures in the European Union’s Common Agricultural Policy are prominent illustrations. Numerous PES schemes in the EU are hybrids of the two types (Sarvašová et al., 2019a).

Regarding the conditionality under which PES payments are disbursed, there are two principal modalities: *action-based payments*, i.e. remuneration for undertaking management actions known to have positive effects on ES output (such as changes in fertiliser use); and *results-based payments*, i.e. remuneration contingent on the demonstrated improvement of the ES (such as better water quality). Action-based payments are payments provided to beneficiaries for implementing pre-defined management practices, and which do not depend on the measured achievement of a specific environmental result. Conversely, result-based schemes link payments to the attainment of specific, measurable environmental outputs. In these schemes, beneficiaries have the flexibility to choose how to achieve the desired results. A key feature of result-based approaches is that compensation depends on the outcomes achieved, meaning that farmers operators out similar actions may receive different levels of payment depending on the results (Bartkowski et al., 2021). Hybrid models also exist: these foreseen payments based partly on results and on the basis of carrying out specific management actions.

### 2.1. Objectives

To investigate the gaps and opportunities for integrating PES within European Union (EU) policies and financial programs, this analysis pursues the following objectives:

- **The first objective** is to identify which EU policies and financial programs explicitly introduce, acknowledge, integrate and fund Forest Ecosystem Services (FES) within their frameworks.
- **The second objective** is to determine which of these policies and financial programs address PES, assessing whether the relevant references are general or specific, and whether they operate at a high-level strategic or practical implementation scale.

- **The third objective** is to analyse the existing gaps and explore the potential for further integration of PES into EU policies and financial instruments.

The research questions are as follows:

- **RQ1** - *What are the main policies and financial programs that coordinate/influence/fund the provision of FES? To what extent they do so?*
- **RQ2** - *What are the main policies and financial programs targeting/enabling PES (and similar instruments)? In what terms?*
- **RQ3** - *What are the gaps and potentials for PES integration in the EU policies and financial programs?*

## 2.2. Structure of the document

The document is structured as follows. After the introduction and the presentation of the objectives in **Chapter 2**, **Chapter 3** describes the methodology, which consists of three main steps:

- A **Policy analysis** to identify the current status, scope and relevancy of FES and PES in a) EU policies and b) EU financial programs.
- A **Delphi study** to identify the current status, scope and relevancy of PES into financial programs.
- Based on the retrospective analysis from the first two steps, a prospective analysis for the identification of future pathways for EU PES design through a **Multi-stakeholder workshop** is designed.

**Chapter 4** presents the results as follows:

- Findings from the *Policy analysis* covering both policies and financial programs. This includes dedicated sections on textual and budgetary analyses, an in-depth focus on the Common Agricultural Policy (CAP), and an analysis of PES design elements in the analysed policies.
- Results of the *Delphi study*.
- Outcomes of the *Multi-stakeholders workshop*.

**Chapter 5** provides a synthesis of the results and discussion. This chapter is intended to provide a reasoned synthesis of the results obtained with the different methodologies, so that ProForPES Working Package 4 can draw on it to formulate guidelines and recommendations.

## 3. Methodology

The assessment was organised in three analytical steps:

1. **Policy analysis.** A scoping study of EU i) policies and ii) financial programs was set, aiming at identifying the main documents that coordinate/influence/fund the provision of FES. Only documents in force were targeted. Documents were analysed with regard to a) what FES they mention/target and b) if PES (and similar market-based/incentive-based policy instruments) are applied for their provision, with a specific focus on PES. Policies and financial programs that incorporate/mention/refer to marketable instruments, and in particular PES, become subject of further analysis.
2. **Delphi study.** An online Delphi study involving experts from various academic disciplines, policy sectors and administrative levels was designed and carried out for validating results of the scoping study and gathering knowledge on barriers and enabling factors for PES integration into policies and financial programs.
3. **Multi-stakeholder workshop.** Based on the retrospective insights from the policy analysis and the Delphi study, a prospective view assessed the potentials for the future integration of PES in EU policies and financial programs. Therefore, four scenarios on future EU conditions were designed. During a workshop featuring several parallel sessions involving key stakeholders concerned with PES design, policy integration, FES supply and demand, the potentials, chances and limits of different PES design options and their integration into EU policies and financial programs were debated.

### 3.1. Policy analysis

#### 3.1.1. EU Policies

The scoping study on EU policies was based on a review of official EU policy documents (full list available in Annex I) coupled with a review of peer-reviewed scientific literature and grey literature. The analysis was conducted in the following steps:

- i. **Policy screening.** In the official websites of the EU<sup>1</sup>, the main policy documents with an influence on ES provision currently in force<sup>2</sup> were identified and collected from the following sectors: (i) forests, (ii) agriculture and rural development, (iii) biodiversity, (iv) climate and environment, and (v) land use. The screening was further extended through web search engines using as inclusion criteria the keywords "EU" + "ES", "ecosystem services", "environmental services", "nature", "payment ecosystem services", "payment environmental services", "market-based instruments", "result-based payments" "output-based payments". Additional keywords were included to reflect ES that have historically received greater policy attention, such as "carbon", "water", and "biodiversity". Documents have been categorized in terms of policy type, according to the EU classification (European Commission, Directorate-General for Translation, 2024; European Union, 2025), in: Regulations, Directives, Decisions, Recommendations, Opinions, Communications, Green and White papers, Commission Staff Working Documents (definitions available in Annex I).
- ii. **Keyword search.** Each document was analysed for content referring to:
  - **ES**, using the keywords "ES", "environmental services", "environmental benefits", and terms referring to specific ES such as "carbon", "biodiversity", and "water";
  - **PES** and related concepts, using the keywords: "payment ES", "PES", "payment environmental services", "market-based measure", "market-based instrument", "private investment", "voluntary investment", "public-private funds" (in connection to ES), "water pricing", "ES certification", "ES market/scheme/pricing", "result-based payments", and "ecoschemes".

<sup>1</sup>EU official portals such as [https://commission.europa.eu/about-european-commission/role-european-commission/law/areas-eu-action\\_en](https://commission.europa.eu/about-european-commission/role-european-commission/law/areas-eu-action_en)

<sup>2</sup> State Aid policies were excluded by this study, as they are the focus of LIFE ProForPES deliverable 3.2 "Gaps and potential for integration of PES within the State Aid financial framework". CAP 2014-2020, despite being not in force, was included, for a comparison with the current one.

- iii. **Excerpt analysis.** Relevant excerpts from the identified documents were extracted, read, and analysed qualitatively.
- iv. **Policy prioritization and analysis.** After reviewing all the excerpts, among the documents analysed, a subset of 17 policies was selected based on their relevance to the objectives of the study - specifically, the explicit and detailed consideration of ES, and the reference to PES (and related concepts), and specifically, i) the policy approach to PES, ii) the target on a specific ES, iii) the reference to ES buyer and seller, iv) the reference to conditionality, v) the reference to contract duration, vi) other contract details, v) the reference to monitoring provisions were assessed (Table 1).

Table 1 PES elements addressed in the policy analysis

| Element addressed             | Description                                                                                                                                                                                                      |
|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Policy approach to PES</b> | Indicates whether there is a general or specific mention of PES                                                                                                                                                  |
| <b>ES target</b>              | Specifies which ES (one or more) are the policy's targets.                                                                                                                                                       |
| <b>PES design elements</b>    | Indicates whether the policy includes elements of PES design.                                                                                                                                                    |
| <b>Buyer and sellers</b>      | Indicates whether the policy specifies who the buyers and sellers in the PES are.                                                                                                                                |
| <b>Conditionality</b>         | Indicates whether payment conditionality is specified (Conditionality refers to payments being made if and only if the ES is provided, or if an activity is implemented that is clearly linked to ES provision). |
| <b>Contract duration</b>      | Indicates whether the duration of PES contracts is specified.                                                                                                                                                    |
| <b>Other contract details</b> | Indicates whether other contract details are specified, including the payment modality.                                                                                                                          |
| <b>Monitoring provisions</b>  | Indicates whether the policy includes monitoring requirements.                                                                                                                                                   |

- v. **Scientific and grey literature contextualization.** Complementary evidence was collected from peer-reviewed scientific articles and grey literature sources to contextualise and evaluate the practical implementation and effectiveness of PES-related provisions in EU policy frameworks.

### 3.1.2. EU Financial programs

The analysis on EU policies was conducted in the following steps:

- i. **Selection of financial programs.** The financial programs were selected through a two-step screening process. First, a comprehensive list of all relevant financial programs was compiled. This was done by referring to the official list from the EU's 2021-2027 long-term Budget and NextGeneration EU (European Commission, Directorate-General for Budget, 2021). This document, along with the official web portal of the European Commission<sup>3</sup>, provided descriptions of each financial program. Second, the descriptions of each financial program were scanned for keywords relevant to the objectives of this study. As FES contribute to the achievement of a wide range of Sustainable Development Goals (Pham-Truffert and Pfund, 2024), the scope of the search for FES and PES in the financial programs by applying keywords that better reflect the multiple functions, goods and services of forests, was broadened. The following keywords were used: "climate", "climate change", "climate crisis", "disaster", "sustainable", "development", "sustainable development", "environment", "environmental", "forest", "social", "economic", "socio-economic", "education", "health", "culture", "resilient", "enterprise", "technology", "technological", "green", "energy", "agriculture", "industry". The screening resulted in a selection of 31 EU financial programs that were included in this study for analysis. They represent a broad range of sectors that illustrate the cross-sectoral significance of forests and FES.
- ii. **Analysis of financial programs.** The 31 programs were first systematically analysed to document whether they explicitly refer to FES in general or to particular FES types. Results were then aggregated for analysis on a policy sectoral level. The allocated budget for each policy program was also retrieved, where available, in order to determine the extent to which FES provision is financed. Finally, an analysis was done to find explicit references for PES within the funding programs.
- iii. **FES analysis.** A coding process was developed to analyse the relevant EU financial programs regarding FES classes, according to the CICES Ecosystem Services' classification (Haines-Young

<sup>3</sup> [https://commission.europa.eu/funding-tenders/find-funding/eu-funding-programs\\_en#heading-1-single-market-innovation-and-digital](https://commission.europa.eu/funding-tenders/find-funding/eu-funding-programs_en#heading-1-single-market-innovation-and-digital)

and Potschin-Young, 2018). The European Commission's Program Performance Statement<sup>4</sup> for each financial program served as reference for the analysis. For each financial program's performance statement webpage, associated policy documents were analysed. A value of "1" was assigned to every class of FES that the program supported, referenced, implemented, or introduced. Following this process, the total weight of each program's contributions to the three main section of FES (Provisioning, Regulating, and Cultural Services) was calculated. This enabled the derivation of proportional values (percentages) indicating the extent to which each program and sector focused on specific FES sections. As a result, data graphics (graphs, charts etc.) were created to display the insights. It has to be noted that not all the documents analysed explicitly establish a connection to forests (or other ecosystems) for the ecosystem services mentioned. For the purposes of this study, we dealt with this ambiguity by attributing the ecosystem service types found to forests. That is to say that forests can provide the ecosystem services recognized by the financial programs, albeit not exclusively.

- iv. **Budget analysis.** The program documents and official websites were further analysed to identify the budget allocation for FES provision and biodiversity. It should be noted that not all financial programs explicitly allocate finances for the provision of specific FES but rather for activities such as ecosystem restoration or climate change mitigation. These activities and projects have been included in the analysis, considering that they may result in FES provision, conservation or enhancement.
- v. **PES analysis.** A selection of programs was subjected to further analysis with regard to financing, i.e. reference to PES and related instruments. Documents were analysed in more detail with regard to objectives & scope, budget allocation, and in terms of reference to PES schemes. First, the objective and scope of the program's policies was explained, second the budget of the program was mentioned, third, the PES reference was identified and contextualized.
- vi. **Scientific and grey literature contextualization.** References to PES projects identified in the documents triggered targeted follow-up searches in the grey literature in order to clarify and explain the implementation of PES.

## 3.2. Delphi study

A Delphi study is a widely used method to obtain input from a group of experts (e.g. Duffield, 1993). The key features of the method are anonymity amongst participants with controlled feedback provided in a structured manner. Participants then may adjust their initial ratings based on feedback from the group in a number of subsequent iterations. Although classically the method seeks to elicit consensus on the topic under study, there are variations of the Delphi such as using this method to seek a broad range of opinions without necessarily achieving consensus (Steinert, 2009; Diamond et al., 2014).

For this Delphi study, the questions submitted had two main focuses: i) to validate the findings of the scoping study regarding financial programs, and to determine whether the desk analysis, including the monetary analysis, aligns with experts' views on the most important funds enabling PES and ii) to gather knowledge on barriers and enabling factors for PES integration into policies and financial programs and reaching, in the second round, a consensus on the main influencing factors.

The Delphi study was organised in two consecutive rounds. Each round consisted of both quantitative and qualitative questions (open and structured questions, 5-point Likert scale questions). The survey was administered through the Qualtrics<sup>xm</sup> platform.

35 European experts in policies, EU funding, and PES mechanisms were identified and contacted in Spring-Summer 2024. The identification of experts was carried out through the networks of the ProForPES Consortium partners, as well as through online searches targeting specialists in PES schemes, representatives of relevant EU Directorates-General (DGs), and academic researchers. Experts were reached via e-mail, by presenting the project and explaining the objectives, and a link was sent to the survey.

<sup>4</sup> European Commission *Program performance statements*. In *Performance and reporting — EU budget*. Retrieved March, 2025, from [https://commission.europa.eu/strategy-and-policy/eu-budget/performance-and-reporting/program-performance-statements\\_en](https://commission.europa.eu/strategy-and-policy/eu-budget/performance-and-reporting/program-performance-statements_en)

Unfortunately, despite numerous reminders and personalised emails, the response rate to the Delphi study was low. Other experts were added, reaching the number of 51. Out of 51 contacted experts, 12 completed the first Delphi round and 9 also the second round (23% response rate). This influenced the results. As abovementioned, a set of question was proposed in two rounds, aiming at reaching a consensus. However, changes in panel composition between rounds may have influenced observed convergence; results should be interpreted as consensus among the respondents in each round, rather than a fixed cohort.

Despite the sample size falling within the typical range for a policy Delphi - generally between 10 and 50 participants (De Loë et al., 2016), the lower number of experts involved, relative to the initial objective of engaging (over 30 participants), represents a limitation of the study. In light of this, the formulation of the key results presented in the final section of this document is supported by additional analysis of the scientific literature, including review articles incorporating scholars' opinions on the subject.

### 3.3. Workshop

#### 3.3.1. Scenarios and PES settings elaboration

Four scenarios for Europe in the year 2050 were developed, building on a set of socio-ecological storylines created within the EU FP7 project OpenNESS (Operationalisation of Natural Capital and Ecosystem Services). These scenarios describe alternative futures for Europe based on different policy choices, societal values, and environmental drivers, and were designed to explore how ecosystem services and natural capital might evolve under varying governance and management contexts (Priess et al., 2018; Harrison et al., 2019).

The OpenNESS scenarios have been slightly adapted to the requirements of the ProForPES research objectives by the BOKU University team, responsible of ProForPES WP4 and the tasks leading to policy recommendations on integrating PES into European policies, in collaboration with UNIPD, HNEE, EFI and Etifor.

In each scenario, PES mechanisms are assumed to exist and one specific PES setting was elaborated, with distinct characteristics in terms of the stakeholders involved, funding sources, application intensity, conditionality related to payments, contract duration, and monitoring arrangements. HNEE and UNIPD specifically concentrated on designing the various PES settings as a central interest for further discussion with stakeholders, and prepared materials accordingly.

A summary of the four elaborated scenarios is provided in Table 2. The four different PES settings, i.e. implementations of PES with distinct characteristics, are summarised in Table 3.

|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| <b>1.United-We-Stand</b> | <ul style="list-style-type: none"> <li>• By 2050, Europe has successfully built a highly connected, socially cohesive society, focusing on inclusive policies, economic equality, and technological innovation</li> <li>• European embrace unity and shared responsibilities, strengthening the "European Dream"</li> <li>• The EU works to ensure that wealth and opportunities are more evenly distributed</li> <li>• However, environmental policies have lagged behind, with resource-intensive industries and urban expansion continuing to put pressure on ecosystems</li> <li>• Efforts for equal prosperity led to higher taxes, including ecotaxes</li> <li>• A strong focus on technology and technological solutions</li> <li>• This overshadows nature-based solutions</li> <li>• Forest conservation is largely state-driven</li> <li>• PES only used by public authorities and public forest owners on public lands (large-scale)</li> </ul>                                                                                                                           |  |
| <b>2.Wealth-being</b>    | <ul style="list-style-type: none"> <li>• The Wealth-being scenario exemplifies a future where individualism and consumerism lead to a highly fossil fuel–dependent world driven by economic growth</li> <li>• Economic growth leads to rising individual wealth, with many Europeans enjoying higher incomes, but also leading to social inequalities and environmental degradation</li> <li>• EU unity weakens, leading to fragmented policies and deepening regional disparities. Rural areas suffer</li> <li>• Environmental policies weaken, and industrial-agrarian alliances push deregulation and trade priorities</li> <li>• Interest in nature conservation is selective, limited to areas tied to lifestyle benefits, such as luxury ecotourism</li> <li>• Corporate-led PES schemes have emerged, mostly related to ecotourism. However, these schemes primarily benefit large corporations rather than local communities or small forest owners</li> </ul>                                                                                                               |  |
| <b>3.Eco-centre</b>      | <ul style="list-style-type: none"> <li>• By 2050, Europe has become a global benchmark for sustainability, with rural and urban communities alike thriving under an integrated vision of ecological balance, social equity, and economic resilience. This transformation was fueled by a societal shift beginning in the 2020s, as younger generations embraced reduced consumption, climate justice, and nature-positive living</li> <li>• Environmental protection, close-to-nature forestry and eco-friendly behaviour are in the focus, economic system adapted to account more for social and environmental factors, sustainability oriented</li> <li>• Intense use of PES</li> <li>• A dedicated EU Forest ES fund has been established as part of EU Forest Strategy 2040, becoming a complementary income source for forest owners of all size, financing restoration projects, biodiversity measures, water quality improvements</li> <li>• There is large engagement of public authorities as ES providers + buyers, and private investments supplement EU fund</li> </ul> |  |

|                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                     |
|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| <b>4.Rural revival</b> | <ul style="list-style-type: none"> <li>• After several food, feed and spoiled meat scandals during which hundreds of people were hospitalized and millions of livestock had to be killed and destroyed, waves of concern, distrust in national and European politics shook Europe</li> <li>• The RR scenario reflects a world where localism is the focus of environmental management, including a back-to-nature movement and revitalization of traditional farming</li> <li>• Declining quality of LIFE in urban areas pushes people toward rural living</li> <li>• Restrengthened rural areas with a focus on healthy local live. Digitalization that boosts development</li> <li>• State regulation and direct public funding is more important</li> <li>• PES play a minor role, mostly implemented through private initiatives</li> <li>• Actors engaging in PES are private companies (large + small), private forest owners, payments are action-based, covering costs of action</li> </ul> |  |
|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|

Source: own elaboration based on the OpenNESS scenarios; figures: S.P. Nina

Table 3 The four different PES setting presented at the workshop

| Scenario                 | Main ES buyer                   | Main ES provider                        | Conditionality & payment      | ES price determination                          | Sources of funds for PES implementation | Specification of PES financing                                                                   | PES time horizon | Project intermediary                    | ES monitoring                                            |
|--------------------------|---------------------------------|-----------------------------------------|-------------------------------|-------------------------------------------------|-----------------------------------------|--------------------------------------------------------------------------------------------------|------------------|-----------------------------------------|----------------------------------------------------------|
| <b>1.United-we-stand</b> | Public entities (Member States) | Large land owners, public forest owners | Results-based                 | Based on predetermined ecological value         | Public funds                            | Funds from ecotaxes. The more the environmental parameters improve, the more funds are received. | Minimum 10 years | None                                    | Based on indicators                                      |
| <b>2.Wealth-being</b>    | Private                         | Mostly large owners                     | Action-based                  | Based on market dynamics: ES demand and supply  | Mostly private                          | Large corporations                                                                               | 5 years          | Private companies , NGOs                | Based on management action                               |
| <b>3.Eco-centre</b>      | Public entities (EU) + Private  | All forest owners                       | Action-based and result based | Based on cost of action implemented + incentive | Public funds + private investments      | EU FES fund+ state funds+private                                                                 | Minimum 10 years | Local authorities and local communities | A combination of action compliance and indicators for ES |
| <b>4.Rural revival</b>   | Private companies               | Private forest owners                   | Action-based                  | Based on cost of action + incentive             | Private sector                          | Privates (large corporations)                                                                    | 5 years          | None                                    | Based on management actions                              |

Source: own elaboration

### 3.3.2. Workshop preparation and running

The scenarios and PES settings were prepared to be discussed with stakeholders during an online workshop, featuring 12 breakout rooms.

After experiencing engagement problems during other project tasks (specifically the Delphi study in WP3), it was decided to organise the stakeholder's workshops as multiple parallel sessions within a single workshop. This choice was also based on evidence that organising a one-day workshop in parallel sessions enhances communication efficiency and saves time, benefiting from a single, streamlined communication campaign that maximises outreach effectiveness and reduces participant confusion, while at the same time reducing disengagement—a factor known to impair learning outcomes in longer or fragmented formats (Wang, 2022; Sutoi et al., 2025).

The aim of the workshop is to assess, together with stakeholders, PES options, and in particular: to identify the pros and cons of each PES setting, to openly debate trade-offs and requirements for PES design, to fine-tuning the PES settings and, based on the key points and discussion emerged, to draw conclusions for policy recommendations.

For contacting workshop's participants, personalised email invitations were sent to individuals with experience in PES. This list of names was compiled through the ProForPES Consortium network and with the support of the contact database produced by the project in ProForPES Deliverable 5.3 "*Network with other LIFE, Horizon, and other national projects*". In addition, a communication campaign was launched through the channels of the partner company Etifor srl. The invitation outlined the workshop objectives, the format and instructions for participation, and included background material to be read in advance.

The workshop was structured, and conducted, in four phases:

#### 1. Plenary session

The project responsible and other Consortium members introduced the project and the objectives of the workshop. It was explained that the workshop was organised around four different scenarios. Each participant was assigned to only one scenario and worked exclusively on it (being aware that other participants were working on the remaining scenarios, each with distinct characteristics). Together, participants would assess the potential benefits and challenges of each PES setting and formulate recommendations to inform EU policy. During this session, the twelve moderators coordinating the work in each breakout room and the two facilitators, responsible for ensuring the smooth and orderly conduct of the workshop, were also introduced. The moderators were drawn from all partners of the ProForPES Consortium, while the facilitators were two professionals from the partner Etifor srl.

#### 2. Breakout rooms

Twelve breakout rooms were created (three for each scenario). Participants were assigned to breakout rooms, each one including representatives from different stakeholder types. With the support of moderators, participants reflected on questions related to the proposed scenario and its PES setting, using participatory tools. The work in the breakout rooms was structured as follows:

- **Scenario introduction.** The moderator provided a short introduction and launched a video. It has been chosen to use interactive videos to present scenarios because it can significantly boost learner immersion and engagement, fostering a more immersive learning experience (Zhang et al., 2006; Lin et al., 2025). The videos, produced by the BOKU University team, are available at the ProForPES project website ([www.lifeproforpes.eu](http://www.lifeproforpes.eu)).
- **Immersion in the PES setting.** After the video, participants received (via chat) a fictional document illustrating how PES works in that scenario. It was decided to present the PES settings in a fictional style because the scientific literature reports that in online workshops, introducing fictional materials, such as blogs or emails, can promote deep reflective engagement and boost problem-solving and teamwork skills (Herrington et al., 2009; Arnedo-Moreno et al., 2021). These documents, also sent in

advance by email, described PES settings in narrative formats (material is available at the ProForPES project website - [www.lifeproforpes.eu](http://www.lifeproforpes.eu))<sup>5</sup>.

- **Icebreaker.** A short icebreaking activity was conducted to help participants get to know each other and to familiarize with the participatory tools.
- **Question and discussion time.** Participants answered three PES settings-specific questions in a shared online document. After each question, participants could expand on their written answers in an open discussion. The moderator recorded the main points at the end of the shared document.
- **Key takeaways.** The moderator, assisted by a participant who voluntarily took on the role of “rapporteur”, summarised the discussion into three key messages to be presented in the final plenary.

### 3. Macro breakout room with the same scenario

The three breakout rooms addressing the same scenario convened in a single macro-breakout room. The moderators highlighted that all three groups had worked on the same future, and the purpose of this session was to reflect on the main points that had emerged. The rapporteur presented the three key messages identified in the respective rooms. Space for discussion was given. Subsequently, participants were asked one final question: “Write in the chat one takeaway message you would provide for today’s policy making on PES schemes.”

### 4. Final plenary session

All participants reconvened in plenary for the event’s concluding remarks and acknowledgements

#### 3.3.3. Analysis of the responses

Responses to the questions and key points raised during the discussion were collected from the shared online documents filled during the twelve parallel sessions and the plenary sessions. Since, with the prior consent of all participants, the sessions were recorded and subsequently transcribed, the material was systematically analysed, and the key points emerged were clustered. In the Results section, these thematic clusters are presented, with individual contributions treated collectively and anonymised.

In the different breakout rooms, specific issues were discussed concerning different objectives of the project. Part of the outcomes of the discussions held in the various breakout rooms feed into ProForPES Deliverable 3.1, “Gaps and potential for the integration of PES within the EU financial framework”, and Deliverable 3.2, “Gaps and potential for the integration of PES within the State aid framework”. The conclusions and recommendations emerging from this workshop, together with findings from other analyses conducted under WP4, will be presented in Deliverable 4.1 “Preliminary options for integration of PES and PES related mechanisms to EU-framework programs” and 4.2. “Final Report on guidelines and recommendations for future funding programs”.

<sup>5</sup> *United-we-stand* scenario: PES setting was presented through the fictional blog of a traveller in a European national park, encountering a drone that explains how the PES works; *Wealth-being* scenario: PES setting was presented through a future exchange of emails among PES experts; *Eco-centre* scenario: PES setting was presented through a fictional Proposal for a Regulation establishing a Forest Ecosystem Services Fund launched by the EU; *Rural revival* scenario: PES setting was presented through a fictional magazine interview with the chief executive officer of a private company engaging in PES.

## 4. Results

The results chapter is structured into the following sections.

**Section 4.1** illustrates the policy analysis results, presenting an overview of the documents analysed, detailing the policy sectors they refer to, the types of documents involved, and basic statistics regarding the frequency and distribution of relevant keywords. **Subsection 4.1.1** provides an in-depth analysis of the selected policies, highlighting how FES and PES are referenced within the texts of key policy documents identified as particularly relevant. This analysis also incorporates a critical review by academic scholars. In **Annex II** is provided an illustration of the Common Agricultural Policy (CAP)'s Green Architecture, with a specific focus on Agri-Environmental and Climate Measures (AECM) and eco-schemes<sup>6</sup>. **Subsection 4.1.2** presents a summary table where the selected policies are evaluated in relation to PES design elements (refer to Table 1).

**Section 4.2** presents the results of financial programs analysis. **Subsection 4.2.1** provides an analysis of the budget spent for biodiversity and FES and for climate related services of 31 financial programs. **Subsection 4.2.2** identifies the policy areas of the financial programs that target FES. **Subsection 4.2.3** presents the expenditure dedicated to FES and climate-related services by policy sector. It also highlights which ecosystem services' section receives the largest share of the allocated budget. **Subsection 4.2.4** focuses on the use of PES within financial programs.

**Section 4.3** reports the findings of the Delphi study.

**Section 4.4** illustrates key insights from the workshop with stakeholders.

### 4.1. EU policies

A total of 46 EU policy documents in force across different policy sectors were screened and analysed. Figure 1 illustrates documents categorised by policy area/sector. A clear majority of the documents pertains to the Environment and Climate Action sector (59%), followed by Agriculture, Forestry and Maritime Policy (28%).

Figure 2 illustrates the documents classified by type of policy document. In the corpus, 34% are Communications, 30% Directives, 18% Regulations, 14% Commission Staff Working Documents, 2% Decisions, and 2% Green Papers (definitions available in Annex I). These documents therefore differ in legal nature and binding force (refer to Annex I for definitions). Regulations, Directives, and Decisions are binding instruments (with varying modes of application), whereas the others are soft-law instruments—means by which EU institutions express positions, suggest courses of action, or make statements without imposing legal obligations. Although non-binding, they provide direction and guidance. Because of these differences, documents vary in expected impact, language, and maturity, also in relation to the subject of this study - PES: binding instruments contain prescriptive and non-deferrable provisions, while non-binding texts articulate policy positions, make institutional statements, or present factual and informative content.

<sup>6</sup> The Common Agricultural Policy (CAP), as a policy framework, is addressed in the policies chapter, while the funds through which it is implemented are also examined in the financial programs chapter.

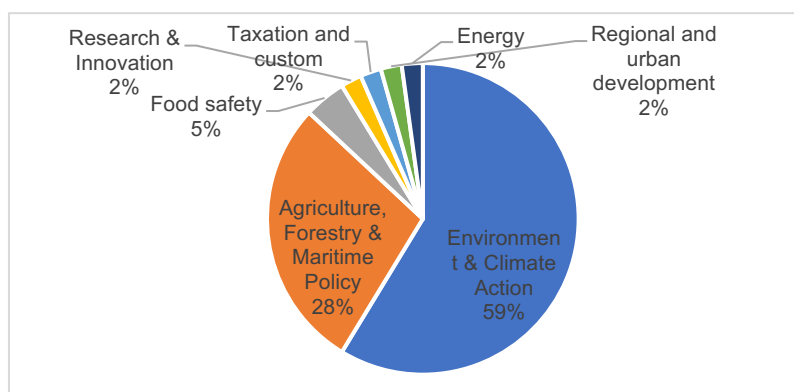


Figure 1 Policies analysed, per policy area

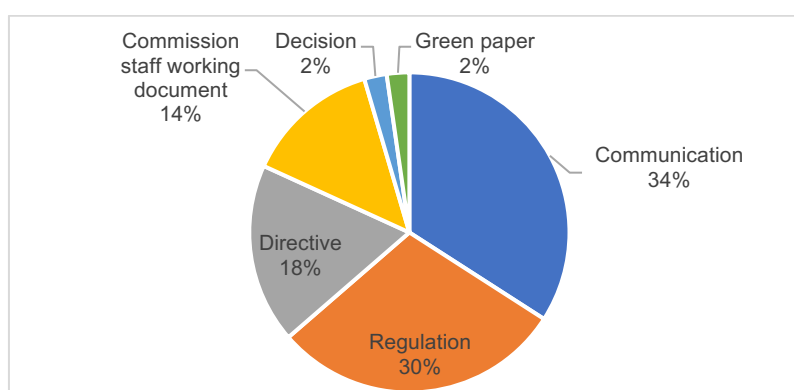


Figure 2 Policies analysed, per type of document

The analysis conducted on the **reference to ES** shows that in the corpus the great majority of the policy documents (**more than 91%**) refer to Ecosystem Services. Figure 3 shows with blue columns the number of policies considered by year<sup>7</sup> and with the orange colour line the number of documents referencing Ecosystem Services, including a citation presence index for ES/policies.

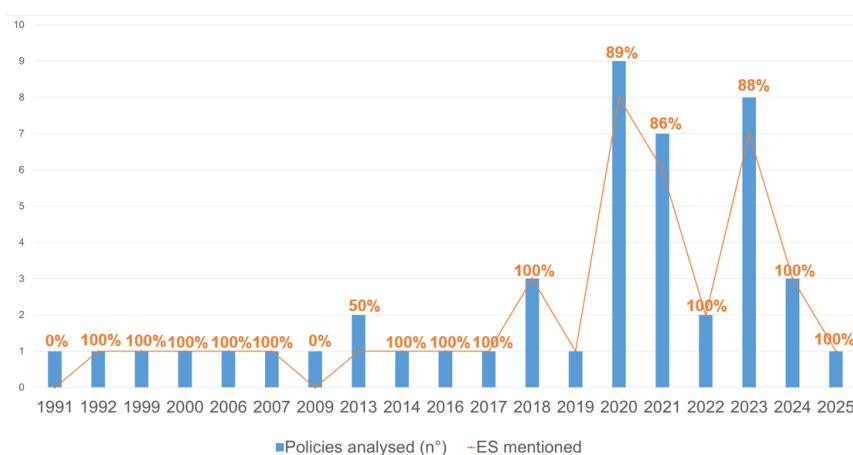


Figure 3 EU Policy documents citing ES, per year of publication<sup>8</sup>

With regard to the **reference to PES** (and similar concepts), many policies contain the selected keywords. However, the exact term “PES” was identified in 22% of the documents. More documents refer to market-

<sup>7</sup> As policies in force were targeted, there are more records in the recent years.

<sup>8</sup> When one of the ES keywords appeared in the text, the document was counted as 1 (even if the term appeared several times).

based instruments (28%). An additional 17% of documents mention result-based payments. 15% documents cite certification and credits, and 15% putting a price on ES (Figure 4). Within the Common Agricultural Policy (CAP) framework, the terms most commonly used are Agri-Environmental Measures and Eco-Schemes (refer to Annex II for a detailed discussion).

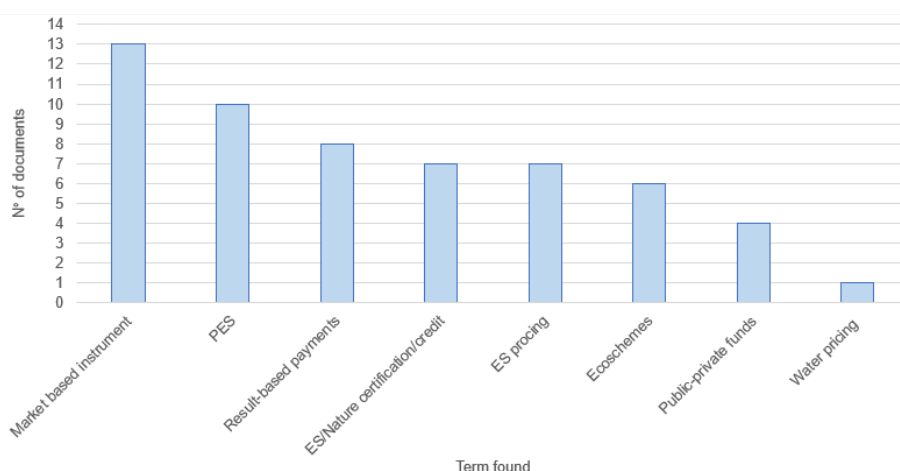


Figure 4 Terms found in the analysed policies, per number of documents citing them

After the first text screening, among the 46 policy documents, 17 were considered of greater relevance for enabling FES provision and for the inclusion of PES, and hence became subject for further analysis.

In the following section (4.1.1), these 17 EU policies are analysed to illustrate a) how these documents address FES—such as the distinction between provisioning, regulating, and cultural services—and whether these aspects are treated in general terms or with greater detail; b) how they reference PES. For each document, it is indicated whether it is binding and whether it serves a coordinating role—e.g., by setting agendas and encouraging or requiring (through follow-up legislation or funding conditions) for the integration of FES and PES into decision-making. The illustration is done through the use of excerpts and including also the opinions of scholars. The policies are presented in chronological order.

Then, in section Annex I, for its relevance as a default example of PES, duration and wide geographical scale, the Common Agricultural Policy was analysed in-depth.

Finally, an illustration of the PES-related features across the reviewed policy documents is presented in Chapter 4.1.2.

#### 4.1.1. Policy analysis regarding FES and PES

| 1. EU Nature Directives (Habitats and Birds Directives)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Council Directive 92/43/EEC on habitats and 2009/147/EC on birds | Binding |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|---------|
| <p><b>FES.</b> These directives established the Natura 2000 network, protecting forest habitats and species. They do not explicitly mention “Ecosystem Services” (the term wasn’t common in 1992), but their goal of maintaining “favourable conservation status of habitats” inherently supports ecosystem functions and services. By safeguarding biodiversity and habitat integrity, the Nature 2000 Directives aim at ensuring the continued provision of FES (e.g. water regulation, soil protection, pollination). However, the policy’s focus is broad biodiversity; any discussion of services remains implicit. The importance of this indirect role is underscored by the EU’s 2011 Biodiversity Strategy, which aimed to “halt the loss of biodiversity and ES in the EU by 2020” (European Commission, 2011), reflecting that conserving species and habitats (as the directives require) underpins ES delivery.</p>                                                                               |                                                                  |         |
| <p><b>PES:</b> The Habitats and Birds Directives do not explicitly mention PES or result-based schemes, as they primarily impose regulatory conservation obligations. The Habitats Directive acknowledges that conserving sites may create financial burdens for some Member States and suggests “means of Community co-financing” to help cover costs. These directives focus on regulatory measures and rely on public funding mechanisms rather than formal PES. However, they implicitly encourage compensatory payments. For example, Article 8 of the Habitats Directive allows EU co-financing for managing Natura 2000 sites. In practice, Member States have used agri-environmental and Natura 2000 payments under the CAP to compensate landowners in protected areas – a form of PES-like incentive. Researchers note that successful implementation of Natura 2000 often “needs to address...the incentive structure of forest owners and land users through funding” (Sotirov et al., 2017).</p> |                                                                  |         |

| 2. Water Framework Directive                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Council Directive 2000/60/EC | Binding |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|---------|
| <p><b>FES.</b> Water Framework Directive (WFD) requires achieving “good status” for water bodies. While not explicitly framed in ES language, it promotes an ecosystem-based approach to water management. Healthy forest watersheds under the WFD contribute to services like clean water supply and flood regulation. It is a binding directive that address ecosystem functions broadly, treating ES implicitly (e.g. valuing flood regulation by natural ecosystems) rather than detailing specific service categories.</p> <p><b>PES.</b> The WFD does not name PES, but it embeds the “user pays” and “polluter pays” principles and economic incentives for water protection. Article 9 requires Member States to ensure water pricing policies that recover costs of water services <i>“including environmental and resource costs”</i>. This economic approach opened the door to PES-like measures: for example, water utilities factoring in upstream catchment management costs.</p> <p>In practice, the WFD has spurred several PES initiatives at local level. Many EU countries have “Water PES” where water companies or governments pay farmers to reduce pollution or runoff, as a cost-effective way to meet WFD water quality standards (e.g. paying for buffer strips instead of building new treatment plants). The directive itself provided the rationale (cost recovery for ES) but implementing PES is voluntary. The alignment is strong: studies have found that well-designed PES programs (like paying forest owners to protect watersheds) can significantly aid WFD objectives (Wiegand et al., 2023).</p> |                              |         |

| 3. Green Infrastructure Strategy                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | COM(2013) 249 final | Not binding |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|-------------|
| <p><b>FES.</b> This EU strategy (“Green Infrastructure – Enhancing Europe’s Natural Capital”) was explicitly built around ES. Green Infrastructure (GI) is defined as a network of natural and semi-natural areas designed to deliver a wide range of ES. The Communication emphasizes that GI solutions use <i>“biodiversity and ES as part of an overall adaptation strategy”</i>. It provides concrete examples of how restoring ecosystems can provide services more cost-effectively than built infrastructure. For instance, it describes floodplain forests as natural GI that <i>“can deliver many benefits, such as filtering water, maintaining the water table and preventing erosion...mitigates climate change by storing CO<sub>2</sub>...acting as a ‘safety valve’ to store water and reduce flood risk”</i>. This exemplifies how one forest ecosystem contributes multiple services (water purification, flood regulation, carbon storage, raw materials). The GI Strategy treats ES in detail, using case studies and calling for investments in nature-based solutions. Forests are highlighted as key components (e.g. promoting urban forests, connectivity between Natura 2000 sites, etc.), with an integrated view of their provisioning, regulating, and cultural services.</p> <p><b>PES.</b> This strategy clearly acknowledged PES as a tool to support conservation outside of regulatory budgets. For instance, it encouraged urban authorities to explore PES for services like storm-water retention by parks, or for companies to fund GI that yields them benefits (e.g. cooler cities reducing energy costs). Following this, the European Commission launched guidance and pilots on urban PES and green infrastructure financing. One outcome was increased use of PES-for-water schemes where utilities pay upstream land managers for improved water quality – aligning with GI objectives and WFD goals (Viszlai et al., 2016)</p> |                     |             |

| 4. EU Bioeconomy Strategy                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | COM(2018) 673 final | Not binding |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|-------------|
| <p><b>FES.</b> This strategy seeks to balance increased use of renewable biological resources (including forest biomass) with sustainability. It recognizes that forests must be managed not just for raw materials but also for ES and biodiversity. It calls for <i>“maintaining and enhancing ES”</i> as part of a sustainable bioeconomy and promotes valuing natural capital. Thus, it influences forest management to consider synergies and trade-offs between provisioning services (timber, biomass) and regulating/cultural services.</p> <p><b>PES.</b> The Strategy does not directly institute PES programs, but it stresses integrating the value of ES and natural capital into the bioeconomy.</p> |                     |             |

| 5. Green Deal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | COM (2019) 640 final | Not binding |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|-------------|
| <p><b>FES.</b> The European Green Deal is a high-level strategy that explicitly acknowledges ES and natural capital. It notes that <i>“ecosystems provide essential services such as food, fresh water and clean air, and shelter”</i>, and that they <i>“mitigate natural disasters, pests and diseases and help regulate the climate”</i>. This sentence encapsulates provisioning services (food, water), regulating services (air quality, disaster mitigation, pest control, climate regulation), and cultural/supporting aspects (shelter and the intrinsic value of nature). The Green Deal frames protecting and restoring ecosystems as vital for both environmental sustainability and economic prosperity. Forest ecosystems are singled out as a priority. The strategy notes that <i>“forest ecosystems are under increasing pressure”</i> and it explicitly links forests to multiple benefits: <i>“Sustainable re- and afforestation and the restoration of degraded forests can increase CO<sub>2</sub> absorption while improving the resilience of forests and promoting the circular bio-economy.”</i> The Green Deal’s vision for forests is explicitly multifunctional. The treatment of ES, including those from forests is relatively high-level and strategic (the document is a Communication, not a law). It sets the tone that nature’s services must be safeguarded for society’s wellbeing and climate goals, and it proposes or reinforces various detailed measures (like the ones in climate, farm, forest, and biodiversity strategies) to achieve that. It is not legally binding, but rather it set a strategic roadmap, with profound influence on legislation. It led directly to binding measures: for example, the EU Climate Law, Biodiversity Strategy targets (some now in the Nature Restoration Regulation), the Soil Strategy and proposed Soil Directive, the Forest Strategy 2030, and revisions of the CAP and energy laws. In essence, the Green Deal ensures policy</p> |                      |             |

coordination by providing an overarching framework where protecting ES (including those of forests) is mainstreamed across sectors.

**PES.** The Green Deal does not specifically cite PES. It “*encourages changes in consumer and business behaviour and facilitates an increase in sustainable public and private investment. The different pricing instruments must complement each other and jointly provide a coherent policy framework*”. It highlights the need to mobilize private and public financing for nature. An EU analysis observed that under the Green Deal’s roadmap, “*farmers could play a significant role in the provision of ES should they receive payment for this*”, and that new policies (e.g. on biodiversity and public procurement) could create a “*flow of ‘payments for ES’ to reward land managers* (Guyomard et al., 2020).

| 6. EU Biodiversity Strategy 2030                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | COM(2020) 380 final | Not binding |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|-------------|
| <p><b>FES.</b> As part of the European Green Deal, the 2030 strategy reinforces ES as a policy focus. It frames nature’s contributions as vital for Europe’s prosperity and well-being, noting that over half of global GDP depends on nature’s services. The strategy calls for a “<i>New EU Nature Restoration Plan</i>” to restore ecosystems at large scale. It explicitly connects restoration to services: for instance, it proposes binding targets to restore ecosystems “<i>with the most potential to capture and store carbon and to prevent and reduce the impact of natural disasters</i>” – highlighting climate regulation, flood control and other regulating services as priorities. It also points out gaps in current law, such as “<i>no requirement to comprehensively map, monitor or assess ES</i>” under existing legislation, which the strategy aims to address. Forests figure in the 2030 strategy as a key ecosystem. The strategy’s language spans broad and detailed: generally, it speaks about ES at a high level but it gives specific examples of services like <i>climate regulation, water regulation, soil health, pollination and disaster prevention</i>” that healthy ecosystems deliver. It also led directly to concrete measures (e.g. the proposal and adoption of the Nature Restoration Regulation).</p> |                     |             |
| <p><b>PES.</b> The 2030 Biodiversity strategy explicitly endorses developing financial incentives for ES. It calls on Member States to “<i>foster innovative financial incentives, including payments for ES and result-based schemes (‘carbon farming’) for [land managers] that provide public goods such as carbon sequestration or biodiversity benefits</i>”. By advocating payments for ecosystem services, it aims to reward farmers and foresters for conservation outcomes. A scientific commentary welcomes this direction: the strategy explicitly mentions result-based payment schemes, signalling a shift toward performance-oriented conservation funding (Marino and Pellegrino, 2018). Overall, the Biodiversity Strategy elevates PES as a tool to halt biodiversity loss by 2030, coordinating public and private finance to pay for services like habitat preservation and carbon storage.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                      |                     |             |

| 7. Climate Adaptation Strategy                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | COM(2021) 82 final | Not binding |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-------------|
| <p><b>FES.</b> The updated EU Adaptation Strategy emphasizes using nature to provide services that help society adapt to climate change (often termed “nature-based solutions”). It encourages measures like restoring forests, wetlands, and green urban spaces to buffer heatwaves, droughts, and floods – essentially leveraging regulating services of ecosystems for climate resilience. While high-level, it reinforces that maintaining ES is a cost-effective adaptation. E.g., planting and managing forests can reduce wildfire risk and protect water supplies under climate stress.</p>                                                |                    |             |
| <p><b>PES.</b> The strategy advocates scaling up nature-based solutions and unlocking new funding sources. It stresses that “<i>Europe needs to leverage more investments in nature-based solutions to generate gains for adaptation, mitigation, disaster risk reduction, biodiversity, and health</i>”. The Commission committed to develop “<i>the financial aspects of nature-based solutions and foster...financial approaches and products that also cover nature-based adaptation</i>”. Though it doesn’t name PES specifically, this implies creating financing models (like insurance schemes) to pay for ecosystem-based adaptation.</p> |                    |             |

| 8. Forest Strategy 2030                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | COM(2021) 572 final | Not binding |
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| <p><b>FES.</b> Adopted in 2021 as part of the Green Deal, this strategy places even stronger emphasis on ES in forests than the predecessor (Forest Strategy 2020). It recognizes forests’ multifunctional role in achieving climate neutrality, biodiversity goals, and rural development. The strategy explicitly calls out that “<i>forests deliver a number of ES (clean water and air, control of erosion, shelter, etc.)</i>”. The 2030 Forest Strategy covers all categories of FES: it encourages a sustainable forest bioeconomy (provisioning services like timber and non-wood products) within ecological limits and simultaneously prioritizes regulating and cultural services – e.g. carbon sequestration, biodiversity habitat, recreation and ecotourism. It proposes actions like protecting primary forests (for biodiversity support services), planting climate-resilient trees (for carbon and climate regulation), and promoting agroforestry. Compared to its 2013 predecessor, the new strategy provides more detailed commitments: it includes a mix of regulatory, financial, and voluntary measures to strengthen ES provision, and it explicitly ties into other policies (Biodiversity Strategy, Climate Law, etc.) ensuring coherence.</p> |                     |             |
| <p><b>PES.</b> The Strategy, Green Deal aligned, proposes to reward forest owners for the provision of the ES. As the Commission states, the role of forest owners and managers in supplying ES “<i>is key and needs to be supported</i>”, and the Strategy will develop “<i>financial incentives...for the provision of these ES</i>”. This led to plans for payments for forest ES (e.g., the Commission in 2023 issued Guidelines on designing payment schemes for forest ES as a follow-up). The Strategy makes PES a key element of sustainable forest management. It urges Member States to set up national PES programs to pay forest owners for carbon storage, biodiversity and other services. It also supports “carbon farming” in forests as a form of result-based payment for carbon sequestration. Academic observers note this marks a shift in EU</p>                                                                                                                                                                                                                                                                                                                                                                                                    |                     |             |

forest policy – from relying solely on regulations and grants to creating market-like incentives for multi-functional forestry (Wolfslehner et al., 2020).

| 9. Soil strategy                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | COM(2021) 699 final | Not binding |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|-------------|
| <p><b>FES.</b> The EU Soil Strategy is a non-binding policy that, while not forest-specific, deals with soil health which underpins forest ES (e.g. nutrient cycling, water retention). It defines soil as providing essential services (food production, carbon storage, biodiversity reservoir) and calls for protecting soil ecosystems. In forests, healthy soil is crucial for tree growth and services like flood mitigation. The strategy uses ES terminology (soil “ES”) and complements forest policy by targeting a supportive component.</p> <p><b>PES.</b> The Soil Strategy explicitly proposes incentivizing farmers and land managers to improve soil health through payments. It envisions that land stewards should be “rewarded for carbon farming [and] receive payments for ES” that healthy soils provide. The strategy calls for developing carbon farming initiatives (to pay for soil carbon sequestration) and other schemes that increase the value of soil-friendly practices to society. The Soil Strategy led directly to the Carbon Farming pilot actions under the CAP, the Soil Deal for Europe mission, and it is referenced in the Carbon Removal Certification Framework.</p> |                     |             |

| 10. EU Climate Law                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Regulation (EU) 2021/1119 | Binding |
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| <p><b>FES.</b> The European Climate Law is primarily about GHG reduction targets, yet it does recognize ecosystems as crucial to climate action. In its recitals, the law stresses that restoring ecosystems helps maintain natural carbon sinks and biodiversity. Notably, Recital 23 of the Climate Law emphasizes the “triple role” of forests for climate mitigation and beyond: “the triple role of forests, namely as carbon sinks, storage and substitution, contributes to the reduction of greenhouse gases in the atmosphere, while ensuring that forests continue to grow and provide many other services.” Additionally, the Climate Law calls for promoting nature-based solutions and ecosystem-based adaptation as part of climate resilience efforts. The term “ES” itself is not used in the operative text – the concept is present via these references to natural capital, sinks, and co-benefits. The regulation makes the EU’s 2050 climate-neutrality target legally binding and achieving this relies in part on enhancing forest carbon sinks (including forests). The EU Climate Law is legally binding EU legislation. For forest ecosystems, this means that maintaining and enhancing carbon sink capacity is now a legal obligation, and initiatives like the EU Forest Strategy 2030 and Nature Restoration Regulation are partly driven by this climate mandate (European Parliament &amp; Council, 2021)</p> <p><b>PES.</b> The Climate Law’s relevance to PES lies in its recognition of <i>carbon sequestration as a service</i> that must be increased. It led the Commission to propose initiatives such as the Carbon Removal Certification Framework. The law does not provide for payments or incentives on its own – those are handled in sectoral policies (CAP, LULUCF, etc.). No explicit PES instruments are found in the Climate Law’s text. Instead, the law creates a binding demand for carbon removal which may indirectly spur the development of PES-like schemes (carbon farming) outside the law to help meet its targets.</p> |                           |         |

| 11. Land Use, Land-Use Change and Forestry (LULUCF) Regulation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Regulation (EU) 2018/841 (amended 2023 updated by Reg. 2021/841) | Binding |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|---------|
| <p><b>FES.</b> The Regulation is a binding climate law requiring Member States to account for GHG and removals from forests and other land use. Its primary aim is enhancing carbon storage in forests – a key regulating service. The regulation itself does not enumerate other ES, but it operates on the premise that sustainable forest management for carbon benefits can yield co-benefits for biodiversity and other services.</p> <p><b>PES.</b> The Regulation sets binding national targets for carbon removals in forests and land and it does not cite PES mechanisms. Financing is left to the Member State’s discretion. However, the Regulation implicitly drives the need for incentives like carbon farming. To meet ambitious carbon sink targets, governments may pay farmers and foresters to sequester carbon.</p> |                                                                  |         |

| 12. Common Agricultural Policy 2023-2027 | Regulation (EU) 2021/2115 | Binding |
|------------------------------------------|---------------------------|---------|
| See in-depth analysis in Annex II        |                           |         |

| 13. Guidance on the Development of Public and Private Payment Schemes for Forest Ecosystem Services                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | SWD (2023) 285 final | Not binding |
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| <p><b>FES.</b> The document specifically uses the term FES. It provides a FES guidance, clarifies FES types (provisioning, regulating, cultural). Encourages identifying and valuing specific FES—especially the less marketable ones like regulating and cultural services</p> <p><b>PES.</b> The document marks the EU’s most detailed foray into PES design for FES. It provides definitions and best practices for PES. The guidance affirms that “payment schemes for forest ES are a tool to provide financial incentives to forest owners and managers” to supply services beyond timber. It showcases case studies of public schemes (e.g. state-funded forest biodiversity payments) and private schemes (e.g. companies paying for watershed services). It covers key aspects like identifying buyers and sellers, setting baselines, determining payment levels, contract duration, suggestion of identifying and bundling multiple FES to maximize impacts and reduce transaction costs, and monitoring</p> |                      |             |

requirements. It also highlights the new opportunities under EU funding and state aid rules to support PES (e.g. using CAP funds, LIFE program, or blending private sponsorship).

| 14. EU Regulation on European Environmental Economic Accounts                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Regulation (EU) 2024/3024 | Binding |
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| <p><b>FES.</b> This 2024 regulation significantly broadens the EU's environmental economic accounting framework introducing accounts that track the extent, condition, and services provided by ecosystems. It requires Member States to produce ecosystem accounts, distinguishing between regulating, provisioning, and cultural services. Specifically, it provides accounting modules on ecosystem extent and condition and on seven ES that flow from ecosystems into the economy and society. A module is specifically dedicated to forests. MS are required to transmit the statistics periodically. The Commission shall draw up a program for pilot and feasibility studies to be carried out by MS on a voluntary basis in order to develop reporting and improve data quality, establish long time series and develop methodology. The account should be compliant with the SEEA EA (System of Environmental Economic Accounting – Ecosystem Accounting) standard adopted by the United Nations Statistical Committee in 2021. The European project INCA (La Notte et al., 2019) and subsequent studies based on it provided the scientific basis to this regulation.</p> <p><b>PES.</b> A recent amendment of this Regulation added ecosystem accounts to measure the extent and condition of ecosystems and the physical and monetary flows of ES. <i>“Ecosystem accounts, as a means to present data on the extent and condition of ecosystem assets and the services they provide to society and the economy, aim to put a value on nature, allowing the costs to nature to be better taken into consideration. The aim of establishing monetary values should be to raise visibility on the cost of non-action and to support the Union to achieve its environmental objectives”.</i> While this accounting law does not create any payment scheme, it aims to make nature's contributions visible in economic terms.</p> |                           |         |

| 15. Carbon Removal Certification Framework (CRCF)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Regulation (EU 2024/3012) | Binding |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|---------|
| <p><b>FES.</b> The EU Carbon Removal Certification Framework (CRCF) Regulation establishes a voluntary certification system for carbon removals, targeting three main categories:</p> <ul style="list-style-type: none"> <li>i) Carbon farming, including agriculture, forestry, agroforestry, and peatland restoration;</li> <li>ii) Wood-based materials in construction; iii) Bioenergy with carbon capture and storage (BECCS) and direct air carbon capture and storage (DACCS).</li> </ul> <p>While it does not explicitly use the term “ES,” it focuses on one specific ES provided by forest and other natural and seminatural lands - carbon removals. Moreover, it mandates that carbon removal activities generate co-benefits for objectives like climate adaptation, water resources, circular economy, pollution prevention, and “the protection and restoration of biodiversity and ecosystems, including soil health”. These co-benefits reflect regulating and supporting services (such as habitat provision and soil carbon retention), although the Regulation does not categorize services into provisioning/regulating/cultural classes. Instead, it treats them broadly as environmental sustainability criteria (i.e. a general rather than detailed treatment of the ES concept).</p> <p><b>PES.</b> CRCF is a regulatory infrastructure to enable, on a voluntary basis, a market for carbon removals. It sets the rules to quantify, certify, and verify carbon removals from natural and seminatural ecosystems, i.e. forests, agriculture and peatlands. While the CRCF itself is not a PES scheme, it creates the conditions under which PES schemes can emerge and scale, particularly by improving the credibility and fungibility of carbon-based services in markets. Private actors (e.g. companies) can buy these certified removals — turning the transaction into a PES. Certification will rely on methodologies, that are currently under development by designated expert groups and that will be included in delegated acts. These methodologies will establish quantified baselines, require additionality, and define criteria for permanence and risk mitigation, ensuring that certified removals go beyond business-as-usual practices. Payments are conditional on the achievement of verified results, supported by a robust framework for monitoring, reporting, and verification (MRV). The CRCF also sets out clear buyer–seller dynamics, enabling transactions between removal providers (e.g., landowners, project developers) and buyers (e.g., public institutions, private companies), all managed through a centralised EU registry. It allows for hybrid public–private financing, integrating EU funding, e.g. those deriving from CAP, with private payments.</p> <p>While the Regulation primarily focuses on carbon certification, it explicitly encourages the co-generation of additional ES—such as biodiversity conservation and water regulation—which can be qualitatively reported as co-benefits during the certification process. The indicators (qualitative and quantitative) to assess the co-benefits derive from Water Framework Directive, Nature Restoration Regulation and other prominent EU policies.</p> <p>The CRCF is a cornerstone for future PES in carbon. The framework emphasizes result-based payments: land managers will only get credits (and thus payments) for actual carbon removal achieved, which must be quantified, additional, and long-term.</p> |                           |         |

| 16. EU Nature Restoration Regulation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | EU Regulation 2024/1991 | Binding |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|---------|
| <p><b>FES.</b> This “first-of-its-kind” binding regulation sets targets to restore degraded ecosystems (including forests) across the EU. It explicitly links restoration to ES benefits. The EC emphasizes that restoring nature will “<i>secure the things nature does for free, like cleaning our water and air, pollinating crops, and protecting us from floods</i>”. These examples cover regulating services (water purification, air filtration, flood protection) and supporting/provisioning services (crop pollination supporting food provision). The law includes specific forest indicators (increasing trends in deadwood, connectivity,</p> |                         |         |

carbon stock, etc. for forest ecosystems), which are proxies for ecological health and services provision. The regulation combines an overarching restoration objective for the long-term recovery of nature in the EU's land and sea areas with binding restoration targets for specific habitats and species. These measures should cover at least 20% of the EU's land and sea areas by 2030, and ultimately all ecosystems in need of restoration by 2050. EU countries are expected to submit National Restoration Plans to the Commission within two years of the Regulation coming into force (so by mid-2026), showing how they will deliver on the targets. They will also be required to monitor and report on their progress

**PES.** The Regulation emphasizes the need to finance large-scale ecosystem restoration, including through innovative mechanisms. EU officials have highlighted that Member States can use “*market-based instruments... for example fiscal approaches, payments for ES, result-based payment schemes, and others*” to help fund and incentivize restoration efforts. While the regulation itself mandates binding restoration targets, it relies on existing funding (EU and national) and new initiatives like PES to achieve them.

| 17. Roadmap Towards Nature Credits                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | COM/2025/374 final | Not binding |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-------------|
| <p><b>FES.</b> This Communication precisely focuses on the benefits provided by nature, by illustrating them in detail. It also addresses the role of ES for companies: they are presented not merely an externality but as a cost-effective tool. The document implies that it is also in the interest of private actors to ensure that ecosystem services are sustained. “<i>Nature is our strongest ally to support our livelihoods, health and prosperity. It provides essential ecosystem services such as retaining water, ensuring soil fertility and pollination. It contributes to climate mitigation, adaptation and resilience against disasters, often in a very cost-effective manner. For companies, it contributes to determining production processes, credit worthiness, and access to financing</i>”.</p>                                                                                                                                                                                                              |                    |             |
| <p><b>PES.</b> The Communication introduces nature credits—voluntary, certified instruments designed to reward actors (e.g., farmers, foresters, local communities) for maintaining ES. These are aimed to complement public funding in preserving ecosystem health. The policy document envisions a two-step framework: first, the issuance of certificates of compliance for verified ecological actions; second, conversion into tradable credits representing measurable, nature-positive outcomes, enabling private investment in ecosystem stewardship. This document represents a roadmap. It proposes a phased, pilot-led approach—with methodology design, governance frameworks, market analysis, and early testing—toward establishing high-integrity, scalable nature credit systems. The Commission will in 2025 form an expert group - including governments, farmers, local communities and scientists - to work on developing methodologies for “nature credits” and fund a pilot project for these credits by 2027.</p> |                    |             |

#### 4.1.2. Reference to PES elements in the analysed policies

A particular focus of the analysis was to explore the relevancy of PES in the mentioned policy documents. The following Table 4 includes an assessment of the overall approach each of the 18 policies takes towards PES, and indicates whether the following elements are explicitly stated or implicitly addressed in the policy texts: i) The focus on a specific ecosystem service (ES) targeted by the PES, ii) Identification of ES buyers and sellers, iii) Conditionality, iv) Contract duration, v) Other contractual details, vi) Monitoring provisions.

Table 4 PES design elements in the analysed policies

| Policy                                             | Excerpt(s) referencing PES (and similar concepts)                                                                                                                                                   | Policy's approach to PES                                                                                                                                                                                           | ES target                                                                                            | PES design elements | Buyer & Seller                                                                                                                                                                                                                                                      | Conditionality                                                                                                                                                                                                                                                 | Contract duration                                                                                                                                                                    | Other contract details                                                                                                                                                                                      | Monitoring provisions                                                                                                                         |
|----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| <b>1. Nature Directives (Habitats &amp; Birds)</b> | <i>"Polluter pays...limited application...means of Community co-financing should be provided"</i> (Hab. Dir. preamble). <i>"Design and provision of compensation measures... through funding"</i> . | No explicit reference to PES. Relies on regulation. However, encourage compensatory payments.                                                                                                                      | Biodiversity (habitats & species protection).                                                        | No                  | N/A in Directives                                                                                                                                                                                                                                                   | N/A in Directive. Payments for Natura 2000 sites (via CAP) compensate costs/income foregone for conservation.                                                                                                                                                  | N/A in Directives. (typically multi-year via CAP programs).                                                                                                                          | Co-financing for site management; voluntary agri-environment contracts used for Natura 2000.                                                                                                                | Directive requires habitat status monitoring, but not tied to payments directly.                                                              |
| <b>2. Water Framework Directive</b>                | No direct reference to PES. However, Art.9 requires cost recovery of water services including environmental costs. EU documents note WFD goals can be met via "PES schemes" for water issues.       | Allows the uses economic principles to drive water protection. Implicitly encourages PES (e.g. catchment-based payments) as part of the measures to reach good status. Leads to Coasean and Pigouvian arrangements | Freshwater ES: clean drinking water, flow regulation, nutrient retention.                            | No                  | N/A in Directive. However, real cases show that in PES based on the Directive, usually Buyers are water utilities, governments (on behalf of water users); Seller: land users (farmers, foresters) in the watershed who change practices to improve water services. | N/a in Directive. In real cases, typically action-based (farmers paid to adopt practices that reduce pollution) with implied outcome (better water quality). Increasingly results-verified (payment dependent on e.g. nutrient reduction or turbidity levels). | Often multi-annual contracts linked to CAP. (5-year agri-environment schemes focused on water). Some are annual payments through water company funding as long as service is needed. | WFD river basin plans can include PES as voluntary measures. Schemes often negotiated (e.g. Vittel in FR pays farmers to reduce nitrates). Payments calculated to compensate profit loss from restrictions. | WFD requires monitoring of water bodies. PES schemes therefore track water quality metrics. Monitoring data feeds into WFD compliance checks. |
| <b>3. Green Infrastructure Strategy (2013)</b>     | <i>"...in view of establishing Payments for ES (PES) schemes."</i> ; also notes incentives to attract private investment in GI (via PES, offsets, etc.).                                            | Explicitly promotes PES as a means to fund and maintain green infrastructure.                                                                                                                                      | Multi-functional GI services: urban cooling, flood protection, air quality, recreation, biodiversity | No                  | Buyer: beneficiaries of GI (e.g. municipalities, developers, water companies);                                                                                                                                                                                      | N/A in Strategy. Arguably, in case of a PES: payment conditional on GI service provision (e.g. flood risk reduction) or on actions that sustain the service                                                                                                    | N/A                                                                                                                                                                                  | Encourages innovative urban planning tools (e.g. developers required to invest in GI or pay into PES funds). Many                                                                                           | GI benefits are measured via indicators (flood extent, temp reduction, etc.). Not tied                                                        |

|                                         |                                                                                                                                                                                                |                                                                                                                                                                                                                                      |                                                                                                                       |                                         |                                                                                                          |                                                                                                                                          |                                                                                                       |                                                                                                          |                                                                                                                |
|-----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|-----------------------------------------|----------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|
|                                         |                                                                                                                                                                                                |                                                                                                                                                                                                                                      | habitat connectivity.                                                                                                 |                                         | Seller: landowners or managers who install/maintain GI (e.g. farmers upstream of a city).                | (e.g. preserving a wetland).                                                                                                             |                                                                                                       | PES are voluntary/negotiated agreements in this context.                                                 | to payments directly                                                                                           |
| <b>4. EU Bioeconomy Strategy (2018)</b> | No direct PES quote; strategic context)– Emphasizes valuing natural capital. Calls for stable framework for ES programs with stakeholder dialogue.                                             | N/A.                                                                                                                                                                                                                                 | Broad: soil fertility, pollination, water cycle, climate regulation – all services underpinning agriculture/forestry. | No                                      | N/A                                                                                                      | N/A                                                                                                                                      | N/A                                                                                                   | N/A                                                                                                      | N/A                                                                                                            |
| <b>5. European Green Deal (2019)</b>    | <i>“Farmers could...receive payment for [ES]...pave the way for payments for ES”.</i>                                                                                                          | Strategic vision encouraging finance for nature; call for emphasizes integrating natural capital into economy; mobilize private funding (e.g. carbon credits, nature investments). Ensure subsequent laws integrate these provisions | Broad – climate mitigation, biodiversity, water, etc.                                                                 | No                                      | Buyer: public (EU, MS) or private entities; Seller: land managers providing services.                    | N/A Conceptual only                                                                                                                      | N/A                                                                                                   | N/A                                                                                                      | N/A. It relies on subsequent policies to set targets and track progress (e.g. biodiversity status, emissions). |
| <b>6. EU Biodiversity Strategy 2030</b> | <i>“Foster innovative financial incentives, including payments for ES and result-based schemes (‘carbon farming’) for public goods such as carbon sequestration or biodiversity benefits”.</i> | Explicitly endorses PES and result-based payments to reward conservation outcomes.                                                                                                                                                   | Biodiversity conservation, carbon sequestration (also other services like pollination, soil).                         | No, but indirectly via the CAP and CRFC | Buyer: usually public (CAP funds, etc.), potentially private; Seller: farmers, foresters, land managers. | Envisions payments for delivering specified results (e.g. increased species, carbon stored) or engaging in service-providing management. | N/A; likely multi-annual commitments (for carbon farming or habitat measures) via CAP or new schemes. | Links to CAP instruments and new schemes (carbon farming); encourages blending public and private funds. | Calls for measuring outcomes (biodiversity indicators, carbon gains) to ensure payments tied to real results.  |
| <b>7. Climate Adaptation Strategy</b>   | <i>“Europe needs to leverage more investments in nature-based solutions...generate gains for adaptation....”;</i>                                                                              | No explicit PES references. Endorses funding nature-based climate adaptation.                                                                                                                                                        | Climate adaptation services: flood control (wetlands), urban cooling                                                  | No, but indirectly via the CRFC         | N/A                                                                                                      | Envisions payment if service provided or maintained                                                                                      | N/A                                                                                                   | Encourages blended finance (public-private partnerships).                                                | It calls for metrics and data to attract investment. No formal monitoring                                      |

|                                |                                                                                                                                                                                                                              |                                                                                                                                                                                       |                                                                                                                                       |                                            |                                                                                                                                                                                            |                                                                                                                                                                 |     |                                                                                                                                                                                                                  |                                                                                                                                                         |
|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                | <i>"...develop the financial aspects of nature-based solutions and...financial approaches...that cover nature-based adaptation".</i>                                                                                         |                                                                                                                                                                                       | (parks), erosion control, etc., also co-benefit biodiversity.                                                                         |                                            |                                                                                                                                                                                            |                                                                                                                                                                 |     |                                                                                                                                                                                                                  | protocol given, left to MS and project designers.                                                                                                       |
| <b>8. Forest Strategy 2030</b> | <i>"...develop...financial incentives...for private forest owners...for the provision of ES"; "Good examples of public and private payment schemes for ES exist (e.g. drinking water protection, carbon, biodiversity)".</i> | Promotes establishing PES schemes in forests; integrates PES as a policy tool alongside regulation.                                                                                   | Forest ES: carbon sequestration, biodiversity habitat, water regulation, recreation.                                                  | No, but indirectly via CAP and other funds | It includes possible examples. Buyer: could be government (paying via CAP) or private (e.g. water company); Seller: forest owners/managers.                                                | Mention action-based (e.g. set aside forest land, adopt close-to-nature forestry) but aims to move toward result-based (e.g. carbon stored, species protected). | N/A | Encourages blended finance (public-private partnerships). Mentions that usually payments are calculated on income foregone + incentive; reference to new State Aid rules that allow +20% bonus for eco-services. | Emphasizes need for robust monitoring of service delivery (forest condition, carbon metrics)                                                            |
| <b>9. Soil Strategy 2030</b>   | <i>"...farmers should be rewarded for carbon farming, [and] receive payments for ES...for healthy soils".</i>                                                                                                                | Explicitly calls for developing PES for soil health (especially carbon sequestration). Non-regulatory strategy that pushes incentivizing farmers via payments beyond usual subsidies. | Soil-based services: carbon storage (climate), fertility and food production, water retention, erosion control, biodiversity in soil. | No, but indirectly through CRFC            | It includes possible examples. Buyer: public funds (CAP Eco-Schemes, carbon fund) and potentially carbon market actors; Seller: farmers/land managers who improve or preserve soil health. | N/A                                                                                                                                                             | N/A | Encourages development of soil carbon certification (link to CRFC) so farmers can earn tradable credits. Also suggests integrating soil PES into CAP Strategic Plans (many MS included carbon farming pilots).   | Advocates monitoring soil organic carbon and other soil health metrics EU-wide. Soil Monitoring Law (Proposal) will support tracking soil improvements. |
| <b>10. EU Climate Law</b>      | No mention of PES in text.                                                                                                                                                                                                   | N/A. Does not create PES; establishes legal climate targets including natural carbon sinks, which encourages using PES tools externally.                                              | Carbon sequestration (as a climate mitigation service).                                                                               | No                                         | N/A                                                                                                                                                                                        | N/A – encourage to produce robust and transparent carbon accounting to verify the authenticity of carbon removals (also through CRFC)                           | N/A | N/A                                                                                                                                                                                                              | Monitoring is through official GHG inventory and sink accounting at national/EU level.                                                                  |
| <b>11. LULUCF Regulation</b>   | No PES reference in text.                                                                                                                                                                                                    | Requires EU net carbon sink of 310 Mt by 2030; MS must meet binding removal targets, also through private efforts.                                                                    | Carbon sequestration (forests, soils, wetlands) – climate                                                                             | No                                         | N/A                                                                                                                                                                                        | N/A in law (compliance via national policies).                                                                                                                  | N/A | N/A                                                                                                                                                                                                              | About GHG, MS must maintain accounts that are accurate, complete,                                                                                       |

|                                      |                                                                                                                                                                                                                            |                                                                                                                                                                                                                                |                                                                                                                                    |     |                                                              |                                                                                                                                                                                                                                 |                                                                                                                                              |                                                                                                                          |                                                                                                                                                                                                                                                                                  |
|--------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|-----|--------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                      |                                                                                                                                                                                                                            |                                                                                                                                                                                                                                | regulation service.                                                                                                                |     |                                                              |                                                                                                                                                                                                                                 |                                                                                                                                              |                                                                                                                          | consistent, comparable, publicly accessible, and aligned with GHG inventory standards.                                                                                                                                                                                           |
| <b>12. CAP 2023–2027<sup>9</sup></b> | <i>“...protect biodiversity, enhance ES and preserve habitats...”</i> (CAP Specific Objective 6). Introduced <b>Eco-Schemes</b> in Pillar I that pay for climate- and eco-friendly farming, potentially on a result basis. | Agri-environmental measures and Eco-Schemes (Pigouvian arrangements). Reinforces PES principle in CAP: dedicates a share of payments to environmental services. Allows more flexible design (including result-based payments). | Similar range: farmland biodiversity, soil health, carbon sequestration (“carbon farming”), water protection, landscape amenities. | Yes | Buyer: EU/MS; Seller: farmers delivering specified services. | Payment conditional on meeting Eco-Scheme or AECM requirements. Some are action-based (e.g. crop rotation, organic farming), others result-based (e.g. maintaining wildlife on fields) – MS had flexibility in Strategic Plans. | Eco-Schemes are mostly 1-year commitments (farmer can opt in annually, payment for that year). Rural Dev. AECM remain multi-year (5+ years). | New design lets MS pay bonuses for ambitious results. Some Eco-Schemes have tiered payments (higher effort, higher pay). | Each MS must monitor achievement of environment targets in CAP Strategic Plans (using result indicators like share of land with eco-scheme). On-farm checks ensure practices done; some schemes require measuring outcomes (e.g. soil carbon sampling in carbon farming pilots). |
| <b>13. Guidance for PES in</b>       | Whole document about PES                                                                                                                                                                                                   | Comprehensive how-to for PES design in forests. Promotes both public schemes and private schemes. Non-                                                                                                                         | Forest ES: carbon sequestration, biodiversity conservation,                                                                        | Yes | Buyer: could be government (e.g. via RDP), NGO, or           | Emphasizes conditionality either on actions or outcomes. Recommends result-based where feasible.                                                                                                                                | Illustrates that can PES can vary by case. Some                                                                                              | Recommends clarity on property rights, baselines, payment rates. Suggests involving                                      | Stresses the need of robust monitoring and                                                                                                                                                                                                                                       |

<sup>9</sup> CAP 2020-2022' elements are here reported for comparison: Excerpt(s) referencing PES (and similar concepts): “...enhance ES and preserve habitats and landscapes” – CAP Pillar II regs reflect this goal; Policy's approach to PES: Includes Agri-environmental measures (Pigouvian arrangements). Mostly action-based, with some pilots of result-based payments; ES target: Farmland biodiversity, pollination, water quality, soil conservation, landscape, climate mitigation (through e.g. organic farming, buffer strips, extensive grazing); PES design elements: Yes ; Buyer & Seller: Buyer: EU/MS; Seller: farmers/land managers who implement foreseen actions.; Conditionality: Payment conditional on compliance with prescribed management actions Some MS tested result-based pilots; Contract duration: Typically 5-7 year contracts for agri-environment schemes; annual payments under Pillar I with yearly conditions.; Other contract details: Payments based on “income foregone + cost” of practices; no profit element by rule (except some incentive in newer state aid allowance). Farmers sign agreements and can face penalties if non-compliant; Monitoring provisions: Monitoring is mostly focused on checking farmer actions (inspections for compliance). Greening effects were evaluated at policy level.

|                                                                             |                                                                                                                                             |                                                                                                                                   |                                                                                            |     |                                                                                                                                                                                            |                                                                                                                                                           |                                                                                                                                                                                                                                                                               |                                                                                                                               |                                                                                                                                                                                                   |
|-----------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Forests (2023)</b>                                                       |                                                                                                                                             | binding guidance, but sets EU standard for voluntary adoption.                                                                    | water regulation (quality & quantity), soil protection, recreation, landscape beauty, etc. |     | private company (e.g. water utility, carbon credit buyer); Seller: forest owner/manager who commits to practices or outcomes (like conserving old-growth, sustainable forest management).  | Otherwise, well-defined management conditions with monitoring.                                                                                            | public schemes annual payments (e.g. annual premium per ha protected), others long-term (e.g. 20-year conservation contracts or permanent easements with one-off payments). Guidance discusses ensuring contract length aligns with service (longer for carbon/biodiversity). | intermediaries or collectives for efficiency. Allows stacking multiple payments if no double counting. Encourage ES bundling. | enforcement: define indicators for service provision (tree biomass, water quality, species counts), regular reporting by sellers, and independent verification especially for private/market PES. |
| <b>14. Environmental Economic Accounts (Reg. 691/2011 &amp; 2022 amend.</b> | <i>"...introducing...ecosystem accounts" covering extent, condition, and service flows.</i>                                                 | Provides statistical framework to quantify ES in physical and monetary terms at national/EU level.                                | All ES (provisioning, regulating, cultural)                                                | No  | N/A (it focuses on accounting system, not on a transactional scheme). However, accounts identify who uses and who maintains services. This could inform future buyer-seller arrangements). | N/A                                                                                                                                                       | N/A                                                                                                                                                                                                                                                                           | N/A. It standardizes definitions and valuation methods (e.g. euros per service unit) that can be used in PES contract design. | Requires MS to regularly report ES accounts. This provides baseline and trend data.                                                                                                               |
| <b>15. Carbon Removal Certification Framework</b>                           | <i>"...promote a new business model for land-based carbon removals, including financial incentives to roll out nature-based solutions."</i> | Creates framework for certification system for carbon sequestration, enabling PES via tradable carbon credits (voluntary market). | Carbon removal (climate regulation service), with co-benefits (soil health, biodiversity)  | Yes | Buyer: public or private entities; Seller: land managers (farmers, foresters etc.)                                                                                                         | Payment contingent on certified carbon removal delivered (result-based). Must meet quality criteria, i.e. additionality, permanence, no double-counting). | Specified in the methodologies (final delegated acts), which                                                                                                                                                                                                                  | Certificates formalize contract terms: who owns credits, liability for reversal, etc. Framework sets standards but            | Requires stringent MRV – independent verification of carbon stored.                                                                                                                               |

|                                           |                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                            |                                                 |                                                                                                                                                                                                        |                                                                                                                               |                       |                                                                                                                                                    |                                                                                                                                         |
|-------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
|                                           |                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                             | from nature-based solutions).                                                                                                                                                              |                                                 | that remove CO <sub>2</sub> .                                                                                                                                                                          |                                                                                                                               | are activity-specific | transactions are voluntary agreements or via marketplaces. Encourages stacking of payments (farmer can get CAP payment + receive private finance). | Certification process includes monitoring of storage over time, with ground and satellite measurement s.                                |
| <b>16. Nature Restoration Regulation</b>  | <i>"...promote market-based instruments...cover costs of restoration...e.g. fiscal approaches, payments for ES, result-based payment schemes".</i>                   | Relies on existing/new funding tools to achieve restoration targets; encourages MS to use also PES to finance and incentivize ecosystem restoration.                                                                                                                                                                                                                        | Ecosystem restoration benefits: e.g. biodiversity, carbon storage, flood regulation, pollinators.                                                                                          | No, but indirectly through CFRC and other funds | Buyer: public sector (EU/MS funds) and private (e.g. companies compensating impacts); Seller: land managers undertaking restoration.                                                                   | Encourages result-based support and innovative schemes                                                                        | N/A                   | Encourages private and public financing                                                                                                            | Mandates MS reporting on restoration progress.                                                                                          |
| <b>17. Roadmap towards Nature credits</b> | <i>"Several nature financing tools already exist such as green bonds and payments for ecosystem services. Alongside these, nature credits... could add value..."</i> | Encourage certification and credits from Nature. <i>"could open the door to innovative financing mechanisms. Certificates help structure and catalyse nature-positive investment by providing the basis for contractual payments or guarantees, while credits could monetise the demonstrated impact, potentially offering dividends to suppliers and early investors".</i> | All. <i>"MS could for example use nature credits to recognise individual contributions to national targets and obligations under the Nature Restoration Regulation, or under the GBF."</i> | Yes                                             | <i>"Nature credits can be a key tool to reward nature-positive action... including farmers, foresters, landowners and land managers, fishers... conservation area managers and local communities."</i> | Emphasises certification, additionality, measurability, permanence, no double counting, safeguards, and result-based issuance | N/A                   | Calls for governance rules on ownership, registration, transfer, independent verification, and liabilities, but not detailed contract terms        | Call for "Ambitious standards and independent monitoring also with the assistance of the European Space Agency and Copernicus Services. |

## 4.2. EU financial programs

This section presents the findings of the analysis of 31 EU financial programs of main interest for biodiversity and FES and for climate-related services.

### 4.2.1. FES in the 31 EU financial programs

The analysis of the 31 EU financial programs that were selected through a two-step screening process (cf. 3.1.2) reveals **that 18 out of 31 EU financial programs (58%) explicitly mention Forest Ecosystem Services and biodiversity in their structure, policies, objectives, budget allocation, and actions.** 5 out of 31 EU financial programs (16%) indirectly mention or support forest ecosystem services and biodiversity. 8 out of 31 EU financial programs (26%) do not explicitly mention forest ecosystem services or biodiversity in their policies and objectives (Table 5).

The analysis also reveals inconsistencies between identified policy objectives and budget allocation. 4 financial programs, namely the Single Market Program, Connecting Europe Facility Program, CUSTOMS Program, and Next Generation EU Program, do not have a dedicated budget for FES but still mention FES within their policy frameworks and indirectly support FES-related projects or initiatives. Conversely, the European Regional Development Fund (ERDF), the European Maritime, Fisheries and Aquaculture Fund (EMFAF), the Multiannual Financial Framework (MFF), and RescEU, do not explicitly reference FES in their policies but still allocate a considerable budget to support FES and biodiversity through various projects and initiatives. This contrast highlights the complexity of financial allocations for ecosystem services, where policy does not always directly correspond to budgetary commitments and vice-versa.

*Table 5 Financial programs that a) explicitly mention FES in their objectives, budget allocation, and actions; b) do not explicitly mention FES c) indirectly mention or support FES services by indirect approaches*

| Ser. | EU financial program                                                               | Policy sector                                 | Explicit mention to FES (Yes, No, Indirectly) |
|------|------------------------------------------------------------------------------------|-----------------------------------------------|-----------------------------------------------|
| 1    | Just Transition Fund (JTF)                                                         | Environment & Climate Action                  | Y                                             |
| 2    | Program for Environment and Climate Action (LIFE)                                  | Environment & Climate Action                  | Y                                             |
| 3    | European Agricultural Fund for Rural Development (EAFRD)                           | Agriculture, Forestry & Maritime Policy       | Y                                             |
| 4    | Technical Support Instrument                                                       | Recovery and Resilience                       | Y                                             |
| 5    | Recovery and Resilience Facility                                                   | Recovery and Resilience                       | Y                                             |
| 6    | European Space Program                                                             | Space                                         | Y                                             |
| 7    | Single Market Program                                                              | Single Market                                 | Y                                             |
| 8    | Horizon Europe                                                                     | Research & Innovation                         | Y                                             |
| 9    | Invest EU                                                                          | European Strategic Investments                | Y                                             |
| 10   | Connecting Europe Facility                                                         | European Strategic Investments                | Y                                             |
| 11   | Cooperation in the field of customs (CUSTOMS)                                      | Single Market                                 | Y                                             |
| 12   | Cohesion Fund (CF)                                                                 | Regional Development & Cohesion               | Y                                             |
| 13   | REACT-EU                                                                           | Regional Development & Cohesion               | Y                                             |
| 14   | Overseas Countries and Territories                                                 | External Action                               | Y                                             |
| 15   | Pre-Accession Assistance                                                           | Pre-Accession Assistance                      | Y                                             |
| 16   | European Agricultural Guarantee Fund (EAGF)                                        | Agriculture, Forestry & Maritime Policy       | Y                                             |
| 17   | Next Generation EU                                                                 | External Action                               | Y                                             |
| 18   | Global Europe: Neighbourhood, Development and International Cooperation Instrument | External Action                               | Y                                             |
| 19   | Erasmus+                                                                           | Investing in People, Social Cohesion & Values | I                                             |

|    |                                                   |                                               |   |
|----|---------------------------------------------------|-----------------------------------------------|---|
| 20 | European Solidarity Corps                         | Investing in People, Social Cohesion & Values | I |
| 21 | EU4 Health                                        | Recovery and Resilience                       | I |
| 22 | Multannual Financial Framework (MFF)              | External Action                               | I |
| 23 | FISCALIS                                          | Single Market                                 | N |
| 24 | European Social Fund Plus (ESF+)                  | Investing in People, Social Cohesion & Values | N |
| 25 | European Regional Development Fund (ERDF)         | Regional Development & Cohesion               | N |
| 26 | Justice Program                                   | Investing in People, Social Cohesion & Values | N |
| 27 | Creative Europe                                   | Investing in People, Social Cohesion & Values | N |
| 28 | European Maritime, Fisheries and Aquaculture Fund | Agriculture, Forestry & Maritime Policy       | N |
| 29 | Humanitarian Aid                                  | External Action                               | N |
| 30 | Common Foreign and Security Policy                | External Action                               | N |
| 31 | RescEU                                            | External Action                               | N |

Out of the 18 financial programs that directly reference FES, 11 (61%) place a stronger emphasis on regulating FES as they reference a greater number of regulating services compared to provisioning and cultural. Meanwhile, 4 (22%) emphasize provisioning services, while 1 (5%) emphasizes cultural services. Two financial programs (11%) emphasize regulating and provisioning FES equally.

Among the 18 programs that explicitly mention FES, the Recovery and Resilience Program leads with 17 FES classes mentioned in its policies and framework. The LIFE Program and the European Agricultural Fund for Rural Development (EAFRD) both refer to 15 FES classes, whereas Horizon Europe, InvestEU, and the Cohesion Fund are associated with 14, 13, and 12 respectively. The European Space Program, the European Agricultural Guarantee Fund (EAGF), and the Just Transition Fund each show 10 references to FES each (Figure 5).

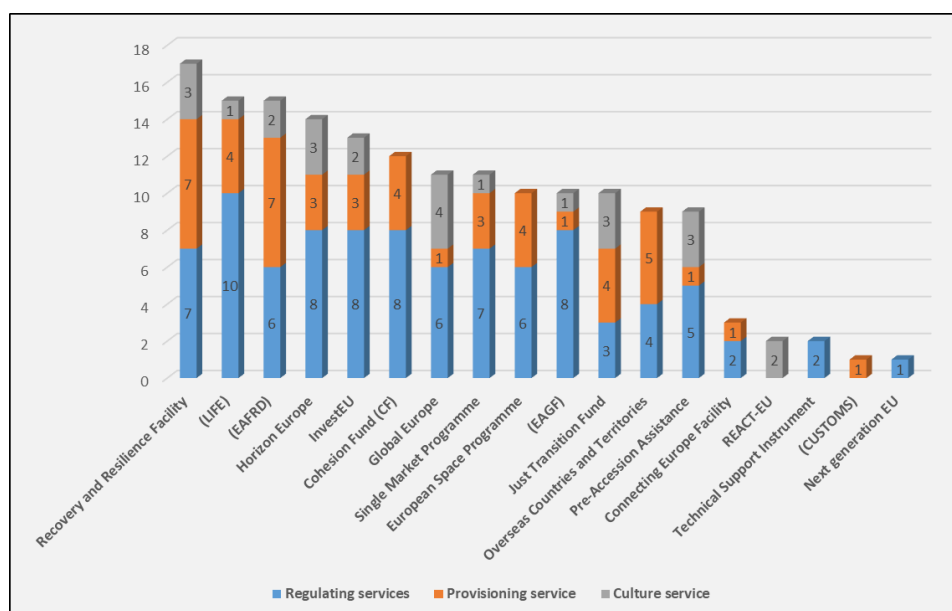


Figure 5 The 18 EU programs that explicitly mention FES

The LIFE Program leads all others, referencing 10 **regulating services** classes. Horizon Europe, the Cohesion Fund, InvestEU, and the European Agricultural Guarantee Fund (EAGF) each mention 8 regulating services classes. Next, the Recovery and Resilience Program and the Single Market Program reference 7 regulating service classes each. The European Agricultural Fund for Rural Development (EAFRD), the Global Europe

Program, and the European Space Program then follow with each mentioning 6 regulating services classes. The Connecting Europe Facility and the Technical Support Instrument reference two regulating services classes each, while the Next Generation EU Program includes only one. In contrast, both the REACT-EU Program and the CUSTOMS Program do not reference any regulating services class.

Looking deeper, the analysis reveals that some regulating services attract considerably more interest in the EU financial programs than others. The most common classes to be cited are the maintenance of physical, chemical, and biological conditions, specifically atmospheric composition and climate regulation (including carbon sequestration), and maintenance of physical, chemical, and biological conditions pertaining to lifecycle maintenance, habitat, and gene pool protection, with each having 15% of the total mentions across the programs under study (Figure 6). This shows a preference for climate regulation, biodiversity maintenance, and hydrological services on the one hand; on the other, relatively less concern for other regulating services such as pest control and storm moderation.

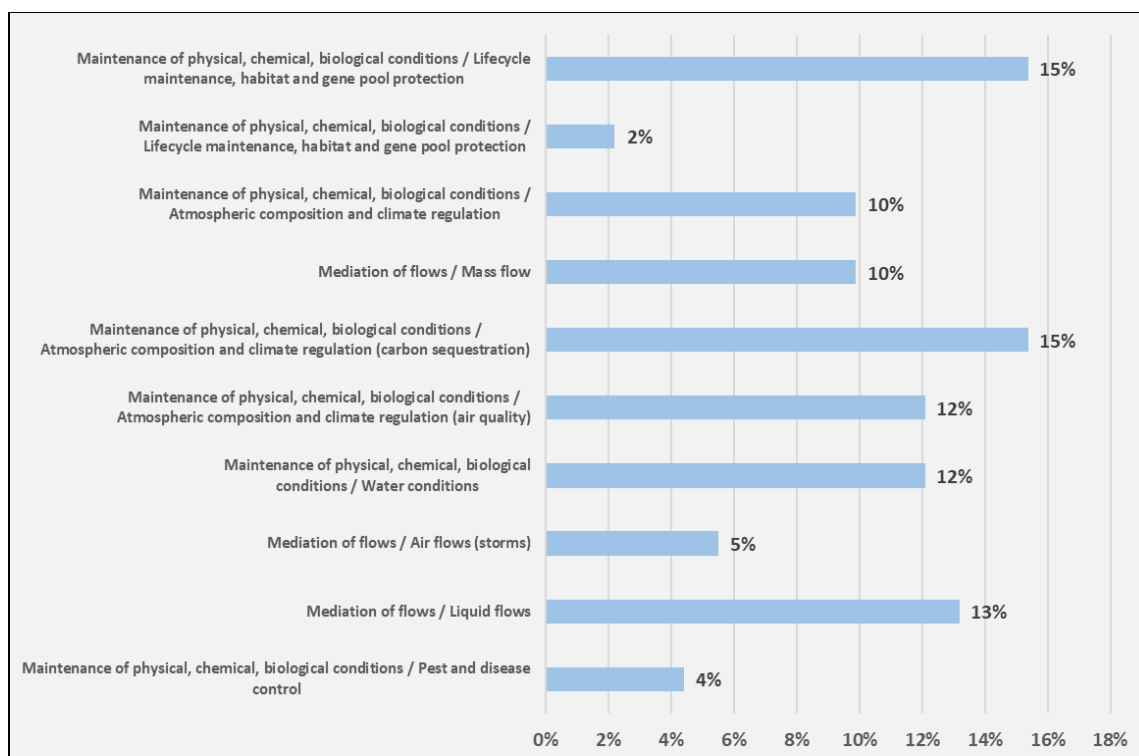


Figure 6 The focus on the regulating services in the EU financial programs

Regarding **provisioning services**, the Recovery and Resilience Program and EAFRD program lead all 18 EU financial programs by mentioning seven provision service classes each. The Overseas Countries and Territories program follows, mentioning five. Four provisioning classes each were mentioned by the Just transition fund, Space program, Cohesion Fund, and LIFE program. The connecting Europe Facility Program, CUSTOMS, and Pre-Accession Assistance programs have the least focus on the provisioning services mentioning only one class each. On the other hand, REACTEU program, technical support instrument, and Next Generation EU program did not mention any provisioning services.

The most referenced class of provisioning services are Materials/water and Materials / Biomass, fiber (genetic resources), which both account for 22%% and 20% respectively of the total emphasis among the programs surveyed. The Nutrition/Water class is then accorded 18% of the mentions. Furthermore, Energy / Biomass-based energy and Materials / Biomass, fiber are cited in 14% and 12% of the programs considered. On the other hand, the provisioning service classes least cited are Materials/Biomass, fiber (4%), and

Nutrition/Biomass (8%). These outcomes are indicative of overt prioritization of water resources, genetic material, and energy from biomass, while other provisioning services are relatively lower in priority (Figure 7).

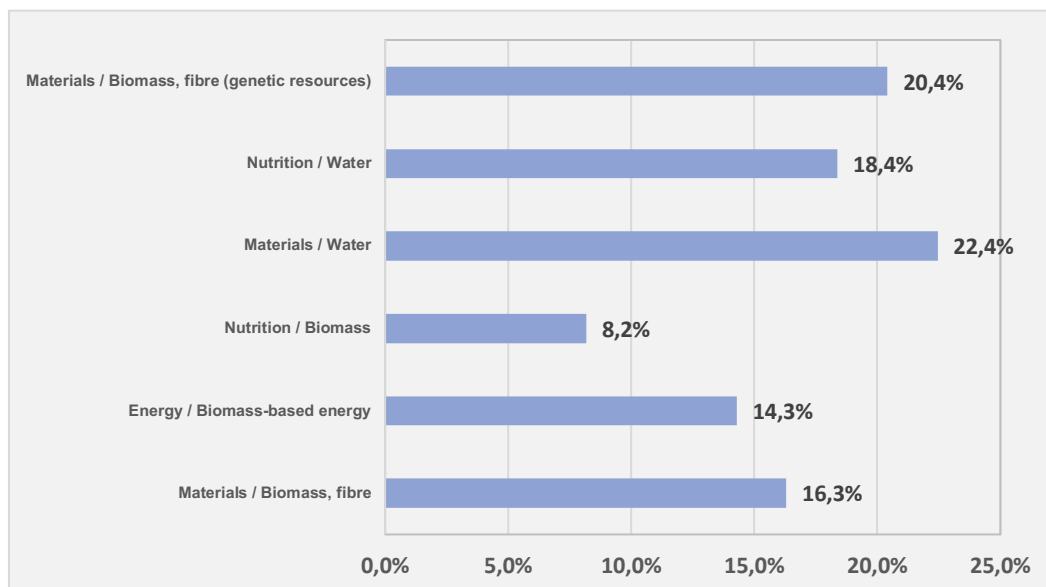


Figure 7 The focus on the provisioning services in the EU financial programs

With respect to **cultural ecosystem services**, the analysis reveals that the Global Europe Program places the most emphasis on this category, referencing four cultural services classes. Similarly, the Recovery and Resilience Program, Horizon Europe, Just Transition Fund, and Pre-Accession Assistance Program each mention four cultural services classes. The Single Market Program, LIFE Program, and the European Agricultural Guarantee Fund (EAGF) each reference only one cultural FES class. Seven out of the 18 analyzed EU financial programs do not reference cultural services at all. These programs include the Cohesion Fund, European Space Program, Overseas Countries and Territories Program, Connecting Europe Facility, Technical Support Instrument, CUSTOMS Program, and Next Generation EU Program.

The most frequently mentioned cultural services classes are Physical and intellectual interactions with Ecosystems and landscapes/Physical and experiential interactions with 44% of the total mentions among the programs. Following these, the Spiritual, symbolic and other interactions with ecosystems and landscapes/Intellectual and representative interactions receive 24%. Moreover, Physical and intellectual interactions with ecosystems and landscapes/Intellectual and representative interactions and Spiritual, symbolic and other interactions with ecosystems and landscapes/Other cultural outputs are mentioned in 16% and 12%

respectively. However, the cultural services that received less attention are Spiritual, symbolic and other interactions with landscapes and ecosystems/Spiritual and/or emblematic (4%) (Figure 8).

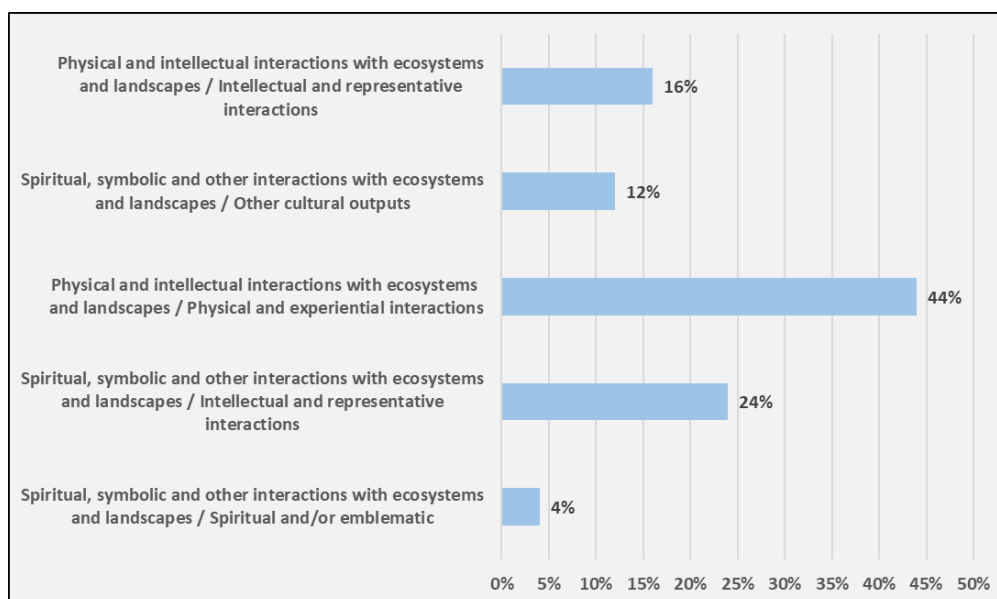


Figure 8 The focus on the cultural services in the EU financial programs

#### 4.2.2. FES focus by policy sector

The analysis of the policy sectors of the 31 EU financial program in relation to the type of FES reveals some patterns (Figure 9). The study shows that **Agriculture, Forestry & Maritime Policy sector** - which is responsible for 3 EU programs - mentions 25 ES classes in total. 14 of these classes are regulating services (56%), 8 are provisioning services (32%), and only 3 are cultural services (12%).

The two programs that fall under the **Environment and Climate action sector** mention 25 ES types in total. Thirteen of these types are regulating services (52%), 8 are provisioning services (32%), and only 4 are cultural services (16%). Then the **External action sector**, under which are 7 EU programs- mentions 21 ES types in total. 11 of these types are regulating services (52%), 6 are provisioning services (29%), and only 4 are cultural services (19%).

The **Recovery and resilience sector**, which has 3 EU programs included in this study, mentions 19 ES classes in total. Nine of these are regulating services (47%), 7 are provisioning services (37%), and only 3 are cultural services (16%). The **European Strategic Investments sector** has 2 EU programs included and mentions 16 ES classes in total. Ten of these are regulating services (63%), 4 are provisioning services (25%), and only 2 are cultural services (13%).

The **Regional Development & Cohesion sector** has 3 EU programs in this study that collectively mention 14 ES classes in total. Eight of these are regulating services (57%), 4 are provisioning services (29%), and two are cultural services (14%). The **Research and Innovation sector** is responsible for one EU program and mentions 14 ES classes in total. Eight of these are regulating services (57%), 3 are provisioning services (21%), and 3 are cultural services (21%).

The **Single market sector**, with 3 EU programs, mentions 12 ES classes in total. Seven of these are regulating services (58%), 4 are provisioning services (33%), and only one is for the cultural services (8%). The **Space Sector**, having one EU program, mentions 10 ES classes in total. Six of these are regulating services (60%), 4 are provisioning services (40%), and no cultural services were mentioned. The **Pre-Accession Assistance sector**, with 1 EU program, mentions 9 ES classes in total. Five of these are regulating services (56%), 1 is a provisioning service (11%), and 3 are cultural services (33%). Finally, the **Investing in People, Social Cohesion & Values sector**, with 5 EU programs, did not mention any class related to any of the three ES sections.

The analysis illustrates that some policy sectors give varying levels of attention to different ES (see Figure 6). **For regulating services**, for instance, the Agriculture, Forestry & Maritime Policy sector refers to regulating areas most frequently (14 times), with the Environment and Climate Action sector coming next (13 times). Both the External Action sector and the European Strategic Investments sectors reference regulating services 10 times, while the Recovery and Resilience sector mentions it 9 times. Lastly, both the Regional Development & Cohesion and the Research and Innovation sectors reference regulating services 8 times.

Regarding **provisioning services**, the Agriculture, Forestry & Maritime Policy sector and the Environment and Climate Action sector both have 8 references of provisioning classes. The Recovery and Resilience sector has 7, and the External Action sector has 6 references of provisioning services. The Space sector, Single Market sector, Regional Development & Cohesion sector, and European Strategic Investments sector all mentioned provisioning services 4 times.

For **cultural services**, the Environment and Climate Action and External Action sectors mention cultural classes most, each with 4 citations. The Agriculture, Forestry & Maritime Policy department, Recovery and Resilience department, and Research and Innovation department, and the Pre-Accession Assistance department each cite cultural classes 3 times.

These findings show that some sectors include forest-related ES in their strategies, others barely or don't prioritize them at all, showing possible gaps in environmental cross-sectoral considerations.

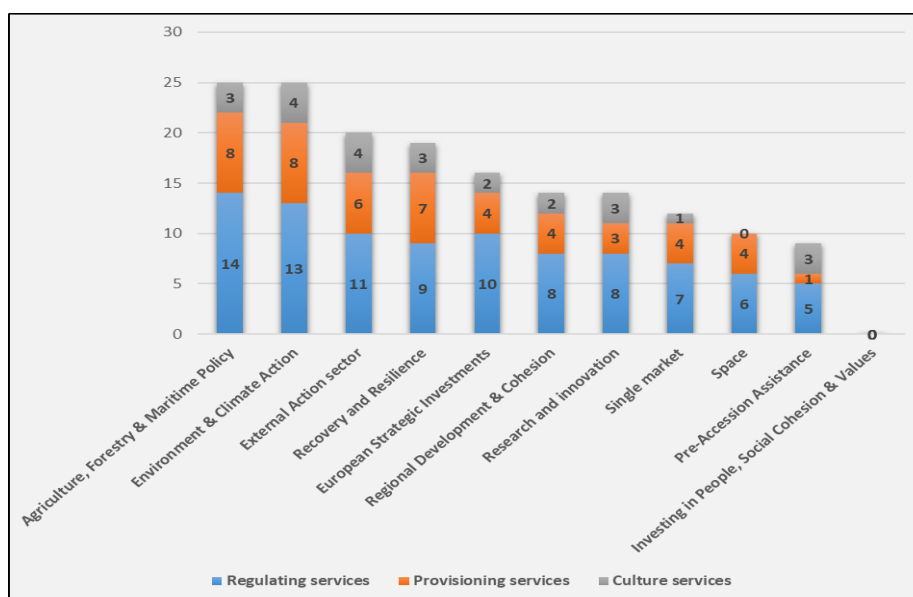


Figure 9 Number of ES classes mentioned for each ES section

#### 4.2.3. Analysis of the budget for biodiversity and climate related services

The budget analysis for the 31 EU financial program for 2021 until 2027 reveals that the total budget of the 31 EU financial programs is € 4,154.6 billion. **€ 1,488.7 billion are dedicated to climate change mitigation, while € 284.1 billion are to be spent on biodiversity protection and conservation** (Figure 10). While no explicit budgetary allocation could be found for the value of FES, actions that could promote the provision of FES are mentioned in certain regard.

The budget **on climate change mitigation** is devoted to projects and initiatives that seek to mitigate and tackle climate change, such as means to achieve climate neutrality, achieve the Green Deal targets, reduce the greenhouse gases emissions, promote and enhance the climate regulation and the green circular economy, achieve net zero carbon, reduce carbon footprints and projects that push towards renewable and efficient green energy.

The actions that **promote biodiversity** include various projects and initiatives such as land restoration and regeneration, ecosystem restoration, tackling the degradation of ecosystems, promoting sustainable forest management, reducing pollution in soil and water. Furthermore, enhancing sustainable water management

and practices, protection of flora and fauna, and conservation and protection of biodiversity. These actions, when applied to forest ecosystems, could foster the provision of FES. However, there is rarely any direct mention of Forest Ecosystem Services.

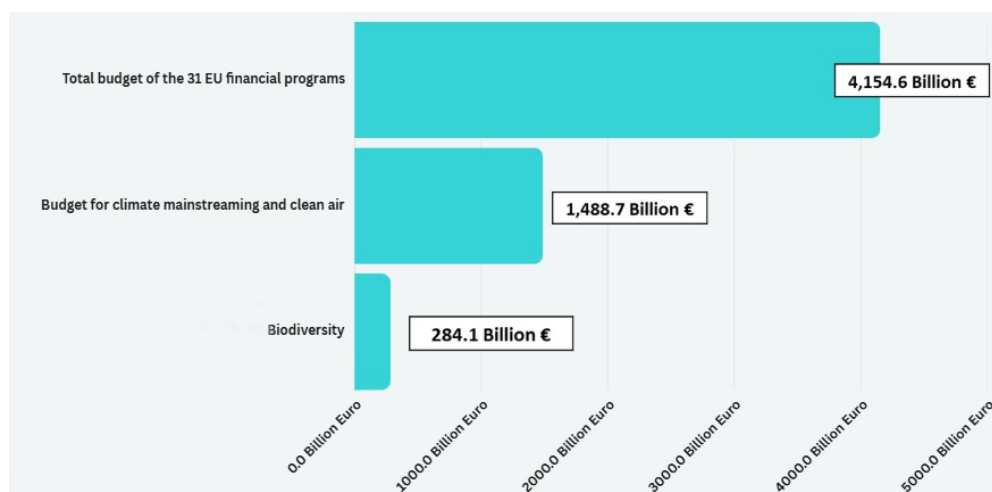


Figure 10 EU Financial programs Budget (2021-2027) in relevance to climate change and biodiversity

#### 4.2.4. Reference to PES in the EU-financial programs

The analysis of EU financial programs shows that **8 out of the 31 analysed programs have introduced PES schemes** (or similar PES instruments) into their policies through various projects and initiatives to support forest ecosystem services and biodiversity (Table 6).

Table 6 List of EU financial programs that introduced and implemented PES

| Ser. | Program name                                              |
|------|-----------------------------------------------------------|
| 1    | Invest EU                                                 |
| 2    | Horizon Europe                                            |
| 3    | Program for Environment and Climate Action (LIFE)         |
| 4    | European Regional Development Fund (ERDF)                 |
| 5    | European Maritime, Fisheries and Aquaculture Fund (EMFAF) |
| 6    | Overseas Countries and Territories (OCT)                  |
| 7    | European Agricultural Guarantee fund (EAGF)               |
| 8    | European agricultural fund for rural development (EAFRD)  |

While five programs explicitly refer to PES schemes, three programs, namely ERDF, Horizon Europe, and EMFAF- have not directly or explicitly mentioned PES implementation in their policies. However, they still fund and support multiple initiatives and projects that implemented PES-like schemes. In the following, the eight programs that refer to PES are described in more detail, accompanied by examples of projects and initiatives associated with each.

| 1. InvestEU                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Regulation (EU) 2021/523 |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| <p><b>PES reference.</b> InvestEU aims at raising investment for key topics. It includes “<i>preservation, protection, conservation of biodiversity and ecosystem services</i>” as one of its intervention fields. Under the Commission Notice regarding the tracking guidance for the funding program, forests are explicitly identified as an ecosystem of interest. It also names specific examples for achieving the intervention field, which includes “<i>payments for ecosystem services; access and benefit sharing mechanism</i>” (European Commission, 2021).</p> |                          |
| <p><b>Project example.</b> An example of projects featuring PES under the InvestEU financial program is the <u>Valle Umbra servizi's water service enhancement</u>. In 2024, the European investment bank with the support of InvestEU program,</p>                                                                                                                                                                                                                                                                                                                         |                          |

has granted a €35 million loan to Valle Umbra Servizi project in Italy. The funding is designated and directed to improve water service resilience and efficiency across 22 municipalities in the province of Perugia through connecting distribution systems, constructing new wells, expanding sewerage networks, enhancing wastewater treatment processes, and increase water supply to forestry and agricultural land to contribute to better water resource management (European Investment Bank, 2024). This initiative is designed to ensure the sustainable and efficient management of water resources which is a crucial factor for both environmental protection and quality of LIFE in the region. These objectives can be achieved by incentivizing and compensates landowners and farmers for their sustainable land management and environmentally friendly ecosystem practices. The sellers are local landowners or land managers, while the buyer is the Umbra Servizi utility company that is funded by local governments, who purchase the ecosystem services provided by the landowners' sustainable practices. Additionally, the scheme is voluntary with both landowners and the utility company, and both can enter into the agreements to ensure long-term improvements in water management. (European Investment Bank, 2024).

| 2. Horizon Europe                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Regulation (EU) 2021/695 |
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| <p><b>PES reference.</b> The Horizon Europe Work Programme 2023–2025 (Cluster 6), include “Improved guidelines on carbon farming and PES design and implementation in Europe,” and topics ask projects to select representative European PES cases and analyse PES design/implementation the program funds a wide range of research and innovation projects on ecosystem services, natural capital, and nature-based solutions, some of which include PES or PES-like mechanisms as part of their research objectives.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                          |
| <p><b>Project example.</b> Two recent projects are described in the following.</p> <ul style="list-style-type: none"> <li>• <b>Small4Good.</b> The Small4Good project aims to help small-scale forest owners to develop multifunctional management and business models using digital and AI solutions. The project promotes biodiversity and carbon farming through PES schemes. Small4Good's seeks to understand the motivations of small-scale forest owners and developing business and management models through a multi-actor living lab approach across Europe, promoting rapid prototyping and implementing realistic, locally adapted pathways towards multifunctionality. The project's outcomes are intended to enable forest owners across Europe to transition towards sustainable and multifunctional management, creating a fair and inclusive bioeconomy. The project was launched in Norway in January 2024 and is planned to finish in December 2027, and is funded under Food, Bioeconomy Natural Resources, Agriculture and Environment ministries of Norway, and Horizon Europe program Cluster 6 – Food, Bioeconomy, Natural Resources, Agriculture &amp; Environment. with total budget almost 6 million Euro. Small4Good is aligned with the work program by providing outcomes contributing to the policy goals of the European Green Deal including increasing the multifunctional role and resilience needs under climate change and contribution to tackle biodiversity loss. This is achieved through better understanding of the motivations of small-forest owners, local small-scale management models based on implementation of carbon farming and PES schemes.</li> </ul> <p><b>Eco2adapt.</b> The Eco2adapt project, titled "Ecosystem-based Adaptation and Changemaking to Shape, Protect and Maintain the Resilience of Tomorrow's Forests," is a five-year research and innovation action funded by the European Union Horizon Europe. It was launched on September 1, 2022, and was coordinated by the French National Research Institute for Agriculture, Food, and Environment (INRAE) and includes 31 experienced organizations from Europe and China with knowledge in forestry, ecology, and climate change. The Eco2Adapt project does not specifically mention PES, but it merges PES-type schemes through its focus on ecosystem-based adaptation (EbA), sustainable forest stewardship, and bioeconomic models that pay to conserve and be resilient. The project is grounded in an Ecosystem-based adaptation (EBA) strategy founded on Nature-Based Solutions (NBS) to maximize the use of biodiversity and forestry ecosystem services to reduce vulnerability and enhance resilience to climate change in social-ecological systems. Moreover, the project establishes Living Labs in climate hotspots in Europe and China to test and implement adaptive forest management practices in collaboration with local communities. The project adopts a participatory approach, co-constructing solutions through discussions with stakeholders, non-governmental organizations, foresters, and landowners. Among these are sustainable forestry practices that enhance the provision of forest ecosystem services like carbon sequestration, biodiversity conservation, and water regulation. PES and PES-like schemes are embedded within its framework by compensating landowners and forest managers for maintaining and restoring these critical ecosystem functions. This framework aligns with the PES mechanism and concept where financial rewards or incentives are given to landowners or managers for maintaining ecosystems that provide public benefits. Furthermore, the participation is voluntary in the climate change adaptation strategies, which make Eco2Adapt aligning with carbon-based PES schemes, where financial rewards are given for carbon sequestration in forests (Costa and Boughman, 2024).</p> |                          |

| 3. Program for Environment and Climate Action (LIFE)                                                                                                                                                                                                                                               | Regulation (EU) 2021/783 |
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| <p><b>PES reference.</b> The Programme for the Environment and Climate Action (LIFE), in its call for proposal, such as LIFE-2021-PREP issued under the LIFE Multiannual Work Program 2021–2024 (C(2021) 4997 final), specifically reference PES. The Program has funded several PES projects.</p> |                          |

**Project examples.** It funds various projects and schemes incorporating PES to support environmental protection, sustainable resource management, and provision of forest ecosystem services. Notable examples include:

- **LIFE+ Making Good Natura.** This project, implemented in Italy in the context of the LIFE program fund, was aimed at developing and testing PES schemes to support the management of Natura 2000 sites. It was aimed at creating market mechanisms for financing biodiversity conservation through compensation of land users and landowners for preserving or enhancing ecosystem services. The project involved wetland and riparian habitat restoration, invasive species eradication, and public awareness activities to promote the awareness of Natura 2000 in expert audiences and the general public (Marino et al., 2021).

**LIFE Viva Grass.** The LIFE Viva Grass project was a collaborative project that was implemented between June 2014 and April 2019 in the Baltic States of Lithuania, Latvia, and Estonia. The primary aim was to prevent the loss of High Nature Value grasslands by developing an Integrated Planning Tool that utilizes the ecosystem services approach to decision-making. Implementation was done in nine demonstration areas in the three Baltic States, i.e., farms, forests, municipalities, and nature reserves. These were the field examples of sustainable grassland management and Integrated Planning Tool implementation. The project was based on partnership between various stakeholders, e.g., farmers, local communities, and policymakers (Villoslada et al., 2018).

| 4. European Regional Development Fund (ERDF)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Regulation (EU) 2021/1058 |
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| <b>PES reference.</b> The ERDF program does not directly mention PES. Despite this, the ERDF supports projects that incorporate PES schemes.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                           |
| <b>Project examples.</b> Insightful examples are: <ul style="list-style-type: none"> <li>• <b>Channel Payments for Ecosystem Services (CPES).</b> The CPES is a new approach launched in November 2017 under the remit of EU Rural Development, and most significantly under the ERDF, intended to create payments for ecosystem services delivery more simplified and enhanced. CPES will compensate land managers for the creation of environmental assets, such as enhancing biodiversity, carbon sequestration, water quality reduction, and soil conservation, not usually accounted for within market prices. Rather than entering direct, person-to-person payment agreements, CPES provides funding to existing, typically regionally established, intermediaries. These intermediaries might include local governments, cooperatives, or specialized agencies with prior experience in rural areas and environmental management (Kaufmann and Wagner, 2018). The project was aimed at water quality improvement in rivers and lakes in Northern France and Southern England. On a €4 million budget, the ERDF funded €2.8 million with CPES executing sustainable PES schemes in six pilot catchments. The project promoted land management practices enhancing water quality, given that it proved practical application of PES at the regional level. If the intermediary verifies that efforts by the land manager translate to agreed ecosystem services (using monitoring, reporting, and verification systems), payment is made. Payment through channelling through established organizations can reduce costs of administration and hassle. It allows upscaling of ecosystem service payment over extensive areas with less inefficiency, especially for many small or medium-sized landholders, dealing with complicated bureaucratic processes can be a limitation (Wiegand et al., 2023).</li> <li>• <b>Seine Normandy water agency project.</b> The Seine-Normandy Water Agency, together with the French Ministry for Ecological Transition and the Green Assist program of the European Commission, designed a pilot program to finance the maintenance and restoration of wetlands in the agriculture and forestry sector across the Seine-Normandy basin. It relies on the sale of biodiversity credits, open to voluntary donation. The project is designed to provide economic benefits for stewards of wetlands and farmers as well as promote sustainable farming and conservation practices. Ultimately, the goal is to create a model replicable across all of Europe. In yet another similar initiative, Eau de Paris, with the Seine-Normandy Water Agency, launched an agricultural support PES scheme in 2020 to protect groundwater and stimulate sustainable and organic cultivation. This plan offers financial incentives to farmers who commit to abandoning or reducing the application of fertilizers and pesticides, adopting sustainable farming practices, or sowing additional grassland. The involved farmers are provided with technical support and subsidies between €150 and €450 per hectare. The project costs €47 million over 10 years, of which 80% will be funded by the Seine-Normandy Water Agency (Even et al., 2007).</li> </ul> |                           |

| 5. European Maritime, Fisheries and Aquaculture Fund (EMFAF)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Regulation (EU) 2021/1139 |
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| <b>PES reference.</b> Even though EMFAF policy does not directly mention PES schemes, it finances several innovative schemes that ensure sustainable use of aquatic and maritime resources and ecosystem services.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                           |
| <b>Project example.</b> The expenditures are building upon PES principles of paying actors for the improvement or maintenance of ecosystem services and can be construed as PES-like schemes (Marine and Coastal Habitat Conservation Programs). Recent examples are: <ul style="list-style-type: none"> <li>• <b>Habitat restoration and conservation in Estuaries:</b> The Project "Estuarine Ecosystem Restoration and PES" in Netherlands Wadden Sea, aims at the restoration and protection of estuarine ecosystems that provide important ecosystem services like water purification, coastal protection, and support to biodiversity. PES is used to incentivize farmers, fishers, and landowners to implement land and water management practices that benefit the estuarine environment. The farmers and landowners are compensated to restore coastal and wetland ecosystems, to maintain</li> </ul> |                           |

some levels of water quality, or to prevent pollution from entering the estuaries. The areas, on their part, receive greater biodiversity and improved water filtration (Van den Bergh et al., 2005).

- **Blue carbon ecosystem services project.** The project is located in various coastal regions across the EU member states. The goal of the project is promoting the restoration and conservation of coastal ecosystems such as mangroves, seagrasses, and salt marshes, which act as "blue carbon" sinks and capture carbon from the atmosphere. PES is used to incentivize the restoration of these ecosystems, which provide benefits such as carbon sequestration, coastal protection, and improved biodiversity. Moreover, payments are provided to landowners or coastal managers who restore or protect blue carbon ecosystems with compensation based on the amount of carbon sequestered and the area of habitat restored (Guo et al., 2025).

| 6. Overseas Countries and Territories (OCT)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Council Decision (EU) 2021/1764 |
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| <p><b>PES reference.</b> The OCT program has explicitly mentioned PES schemes in its policies and has implemented them through various initiatives that encourage sustainable agricultural practices that indirectly contribute to the promotion of forest ecosystem services. Under article 16 of the Council Decision, Sustainable management and conservation of biodiversity and ecosystem services, the document states that "<i>cooperation in the field of sustainable management and conservation of biodiversity, and ecosystem services may concern (e) the development of mechanisms to lever resources, including payments, for ecosystem services</i>".</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                 |
| <p><b>Project example.</b> The schemes under OCT's program provides financial incentives through PES schemes for individuals or organizations to adopt methods that contribute to the preservation or restoration of ecosystems and biodiversity. Examples are:</p> <ul style="list-style-type: none"> <li>• <b>The Caribbean Biodiversity Fund (CBF) – Supporting the design and use of PES schemes in the Caribbean OCTs.</b> In the Caribbean, for instance OCTs Aruba and Curaçao. The CBF supports the development and creation of financial mechanisms like PES to bring long-term sustainability to Caribbean natural resources. It aims to reduce the degradation of key ecosystems like coral reefs, mangroves, and coastal wetlands. The Caribbean Biodiversity fund is funded by the EU and other donors in order to promote the use of PES schemes to finance conservation and management of ecosystems rich in biodiversity. The CBF promotes the use of PES schemes that provide compensation to landowners, communities, and businesses for maintaining or enhancing the services provided by ecosystems. For example, PES can involve payment for protection of coral reefs, watershed protection, or for promoting sustainable agricultural practices that reduce land degradation (Caribbean Biodiversity Fund, 2023).</li> <li>• <b>The BIOPAMA Program – Conservation of marine and coastal ecosystems in OCTs.</b> In OCTs of the South Pacific such as French Polynesia and New Caledonia, the EU-supported Program on Biodiversity and Protected Areas Management (BIOPAMA) contributes to funding for projects which are enhancing protected areas' management. This involves developing sustainable finance strategies such as PES schemes awarding incentive payments for local populations' protection of coral reef and forest natural ecosystems. The program focuses on provisioning Marine conservation, fisheries management, and sustainable land-use. The BIOPAMA Program focuses on grants, technical assistance, and capacity building in support of marine and coastal conservation in OCTs. Interventions by the program in developing improved management practice, encouraging sustainable development, and expanding biodiversity protection are instrumental for conserving the unique ecosystems in these territories (Capitani et al., 2023).</li> </ul> |                                 |

| 7. European Agricultural Guarantee Fund (EAGF)                                                                                                                                                                                                            | Regulation (EU) 2021/2116 |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
| <p>The European Agricultural Guarantee Fund (EAGF) (Pillar I of the CAP) supports EU farmers through various types of interventions that provide payments conditional upon compliance with environmental and climate-related baselines (see Annex II)</p> |                           |

| 8. European Agricultural Fund for Rural Development (EAFRD)                                                                                                                                             | Regulation (EU) 2021/2115 (support rules) and 2021/2116 (financing) |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|
| <p>The European Agricultural Fund for Rural Development (EAFRD) (Pillar II of the CAP) finances rural development programs. It also supports payments for forest ecosystem services (see Annex II).</p> |                                                                     |

### 4.3. Delphi Study

In the Delphi study, round 1, respondents were predominantly from scientific research/academia (73%), with equal representation from policy-making representatives, public administration, and enterprises (each 9%). In round 2, the distribution flattened: scientific research/academia remained the largest group (40%), while the other three sectors each accounted for 20% (Figure 11).

Regarding experts' country: in round 1, Italy accounted for 20% of respondents, while each of the other countries contributed 10%. In round 2, Belgium represented 33% of the panel<sup>10</sup>, with each of the remaining countries at 17%, as displayed in Figure 12.

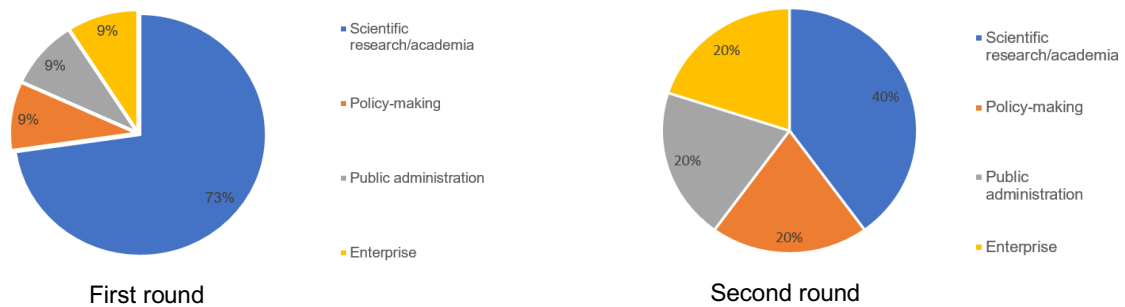


Figure 11 Expert by sector, first and second round of the study

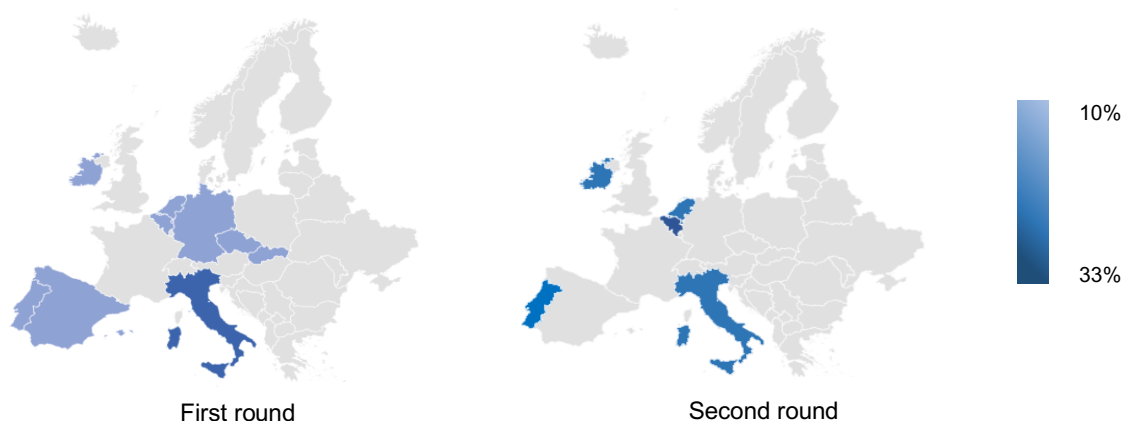


Figure 12 Expert by country, first and second round of the study

Experts were asked to rank, in an open question in two rounds, **the most significant EU funding sources in terms of the amount allocated to the provision of ES**. They ranked:

- i) the Common Agricultural Policy (CAP) as the primary instrument, equally highlighting the European Agricultural Guarantee Fund (EAGF), the European Agricultural Fund for Rural Development (EAFRD), and the Eco-Schemes mechanism as important.
- ii) the LIFE Program
- iii) the Horizon Program.

When asked **which funding program is most effective in fostering the provision of FES**, experts confirmed the same three programs mentioned above, with the LIFE Program identified as the most relevant for delivering environmental benefits, followed by the CAP and the Horizon Program.

<sup>10</sup> Participants indicated Belgium as their country. Please note that this may reflect the location of their employing institution rather than their country of origin.

The LIFE Program was likely ranked first due to its targeted focus, being the EU's dedicated funding instrument for environment and climate action. In contrast, the CAP, which addresses social, environmental, and economic objectives, is perceived to have a broader scope. The experts also pointed out that the CAP is primarily aimed at agriculture, and that, although it includes some forest-related measures, forests are a peripheral scope.

Experts also stressed that effectiveness of a fund depends more on the specific objectives of each project than on the program itself, and that generalisations should be avoided. Both the CAP and LIFE are broad frameworks encompassing multiple sub-themes, not all of which are equally effective from an environmental perspective.

A portion of the experts (20%) highlighted in the open-ended responses that the most effective programs for fostering the provision of ES are those that create space for private businesses to contribute to nature conservation and management. According to this perspective, any funding program could potentially be equally effective in promoting the provision of ES, provided that it allows the inclusion of private funds to supporting these objectives.

The question was then raised: **"What are the main financial programs targeting or enabling PES?"**. The experts agreed that the three programs in order of importance are:

- i. CAP
- ii. the LIFE Program
- iii. Horizon Europe.

20% of experts also answered as second place National Recovery and Resilience Plan.

The experts were then asked in an open question to identify the **favourable conditions that have so far enabled the integration of PES into EU financial programs**. The responses of the first round have been collected and clustered and subsequently submitted during the second round of the survey. During the second round, the panel scored the importance of the drivers emerging from round 1 as follows, with a five-point Likert scale ranging from "not important" to "very important." as follows:

- a) The fact that governments and EU institutions have begun to support and promote market-based instruments, and how these can directly benefit landowners, was considered moderately important by the majority of respondents (67%), with the remaining 33% rating it as very important.
- b) Experts also converged on the view that the increased allocation of funds targeting ES has facilitated also the inclusion of PES mechanisms. This was rated as important by 50% of respondents, and moderately important by 25%.
- c) Another key enabling condition highlighted by the panel was the observation that land managers have increasingly realised that income from traditional land uses (e.g. timber production) is often insufficient, prompting them to seek and lobbying for alternative funding mechanisms. This was rated as moderately important by 50% of experts, important by 25%, and very important by the remaining 25%.
- d) The majority of experts recognised that carbon-related mechanisms in the voluntary market have been decisive in paving the way for PES integration in the EU policy setting. Specifically, 25% rated this factor as very important, 50% as moderately important, (while 25% considered it not important).

Regarding **the main challenges and barriers that have so far hindered the inclusion of PES in EU funding programs**, the experts identified the following key factors:

- a) Difficulties in assigning economic value to ES, which complicates pricing. [*very important for 100% of the panel*]
- b) Insufficient technical and IT infrastructure, spanning from ES measuring and assessment and data collection to the implementation of payment mechanisms. [*very important, 50%; important 50%*]

- c) Challenges in establishing accountability mechanisms, particularly in cases where management actions are not properly implemented, including issues related to enforcement and sanctions. [*very important, 50%; important, 50%*]
- d) Limited availability of financial resources, with existing funds already allocated to other policy priorities. [*important, 75%; moderately important, 25%*]
- e) Lack of trust and political will to support and institutionalise PES schemes within public funding frameworks. [*very important, 75%; important 25%*]
- f) Competition with conventional production systems for land use, which may undermine the attractiveness or feasibility of PES schemes. [*very important, 75%; slightly important, 25%*]
- g) Limited readiness of implementing actors, including both public administrations and private stakeholders, to operationalise PES mechanisms. [*important, 75%; slightly important, 25%*]
- h) Use of not mainstreamed or academic terminology, especially the term “PES” itself, which remains poorly understood, hindering wider adoption. [*moderately important, 75%; not important, 25%*]

The expert panel proposed the **following solutions to overcome the identified barriers** to the integration of PES into EU funding frameworks:

- a) Showcasing cases and best practices that demonstrate the efficiency and effectiveness of PES, also consulting with those that have scaled up the approach. [*very important, 25% of the panel; important 75% of the panel*]
- b) Raising awareness and mainstream the PES idea among landowners and other stakeholders [*very important, 75%; important 25%*]
- c) Facilitate access to funds by simplifying procedures and reducing administrative burdens [*very important, 75%; moderately important 25%*]
- d) Establishing supportive legislative and governance frameworks, to create enabling conditions for the long-term implementation and scaling-up of PES [*very important, 75%; important 25%*]
- e) Promote private-public partnership [*important, 75%; moderately important 25%*]
- f) Adopting a more flexible interpretation of PES, avoiding overly rigid or academic definitions that may limit practical implementation partnership [*moderately important, 75%; slightly important 25%*]

Afterwards, the survey focused on expert opinions (open questions) regarding the **potential inclusion of PES mechanism in the future CAP**. The responses were collected and categorised as follows, and then reproposed in the second round of the survey, for reaching a consensus:

- *25% of experts* indicated that the inclusion of PES poses no problems. Several respondents also pointed out that PES instruments are already embedded within the CAP through agri-environmental measures and Eco-Schemes; the PES concept is not used within CAP, but the mechanisms are similar
- *9% of experts* identified a key constraint in the principle of additionality, which is essential for PES schemes. Ensuring additionality requires rigorous monitoring, which may entail significant public expenditure. Conversely, if payments are not result-based but rather linked to management practices, there remains uncertainty about the actual improvement in ES delivery.
- Another *9% of experts* expressed concern that a potential reduction in the overall CAP budget would likely impact the financial allocation for environmental objectives, including PES schemes.
- *25% of experts* highlighted a structural limitation: while the CAP could effectively promote ES provision from agricultural land, it may be less suitable for supporting forest-based ES. This is due to the fact that agriculture falls under EU competence, whereas forestry remains primarily under the jurisdiction of individual Member States. As a result, national regulations may not align with the PES framework established at the EU level. This misalignment raises doubts about the CAP being the appropriate policy instrument for advancing forest-derived ES.

The panel was subsequently presented with another open-ended question: ***Do you envision an alternative EU policy framework, outside of the CAP, that could enable a more effective integration of PES?*** 60% of respondents answered negatively, while 40% responded affirmatively. Among those who answered *no*, two experts stated that the CAP is a well-established and familiar framework for them, whereas they personally lacked sufficient knowledge of other EU instruments. However, this was not interpreted as a denial of the potential for alternative frameworks. One expert further emphasised that the CAP has the capacity to reach a broad base of beneficiaries and could help mainstreaming PES mechanisms. At the same time, the LIFE framework could also be appropriate. In particular, LIFE could serve as a platform for pilot projects aimed at training project developers and key stakeholders, with the goal of scaling up successful models.

An expert of the panel suggested that instead of funding PES through the CAP, it would be better to **develop an European PES system for land use that centers around forest ES provision**, suggesting that: “*Many environmental outcomes in Europe are affected by large agricultural subsidies through the CAP; an equivalent EU-wide forest PES scale may thus be an effective sectoral counterpart towards a landscape-level policy mix of productive and protective functions*”. The suggestion was supported by references to the scientific literature, notably Winkel et al. (2022) (see Box 1).

The entire panel was consulted on this issue during the second round of the survey. 100% of respondents agreed that the establishment of an alternative framework targeting forest ES, operating alongside the CAP could be a viable option. Supporting arguments included the observation that there is no inherent reason why another EU funding instrument could not operate in parallel with the CAP, with a specific focus on habitat conservation—particularly forest ecosystems. One expert noted that although the CAP includes forest-related measures, their actual uptake has remained low, suggesting that, probably for a variety of institutional and practical reasons, the CAP may not be the best tool to support forest habitats. This reinforces the argument for a complementary framework specifically tailored to the delivery of ES from non-agricultural land.

#### Box 1 A European framework for PES in forests

A paper by Winkel et al. (2022), based on results from European Union research projects, identifies six challenges and three opportunities for prospects of forest ES provision in Europe. It also introduces four distinct but complementary policy pathways for European forest policy to better align forest ES provision and demand, among which, the inclusion of PES. The paper envisions the establishment of an EU-wide forest PES, outside the CAP.

Despite outlining the limitations of the proposed approach—including the legal competence on forestry lying primarily with Member States, the diversity of legal and silvicultural contexts, and the resulting challenges in establishing a common baseline—the paper suggests that, in order to ensure effectiveness, an EU-wide PES system should: i) define shared objectives across sectors and governance levels, clarifying scope and priority ES; ii) Secure multi-level funding, combining EU and national/regional resources, while maintaining voluntary participation, iii) Scale innovative contracts (e.g., auctions) to balance ambition with flexibility, adapting to diverse regulatory contexts; iv) Identify clear FES priorities through participatory and science-based processes at regional levels; v) Ensure long-term commitments to match forest cycles and enhance impact; vi) Target priority areas (e.g. biodiversity hotspots, peri-urban forests, climate adaptation zones); vii) Implement robust monitoring and enforcement, supported by self-assessment tools and impact evaluation to uphold conditionality and credibility.

More than a quarter of the experts spontaneously proposed that an optimal solution would be **blending public–private finance**. This approach would offer several advantages, chief among them the mobilisation of private capital to support ecosystem maintenance, particularly in cases where public funding may be insufficient. Given the relevance of this proposal—both frequently advocated in the literature (e.g. Wunder, 2024) and explicitly referenced in the *Guidance on the development of public and private payment schemes for forest ES* (European Commission, 2023)—the opinion of the full expert panel was further investigated. To this end, a relevant excerpt from the *Guidance* was presented to the experts, including a citation and the direct link to the source: “*The Common Agricultural Policy, private schemes and State aid can complement each other. The CAP can support action-based schemes (i.e. payments to carry out a set of management actions), investment and cooperation costs, advisory services, etc. However, with regard to result-based schemes, the CAP delivery mechanisms could still be adapted further (particularly at the national level) in order to facilitate these new approaches, while ensuring their robustness and controllability. State aid financing and private initiatives can offer additional and, in some cases, more effective mechanisms.*”

We asked the experts, in relation to this statement, whether they considered a scenario integrating CAP instruments, state aid, and private schemes to be desirable. Responses were collected using a five-point Likert scale ranging from "fully agree" to "fully disagree." A total of 33% of experts fully agreed, while 66% somewhat agreed.

We then asked whether they believed such a scenario to be feasible. In this case, 66% of respondents somewhat agreed, and 33% neither agreed nor disagreed.

The final section of the survey focused on specific questions regarding **result-based payments** (RBP) and **action-based payments**. A structured set of questions was administered, and responses were collected during the first round. The responses given by the panel were then presented in the second round, with the aim of fostering consensus among the panel participants.

1. *Payment schemes can more effectively support environmental benefits, if they include more result-based elements in addition to action-based elements.* In the first round 60% of the panel fully agree, 30% agree, 10% somewhat disagree. In the second round, the panel reached a consensus of 100% on fully agree (Figure 13).

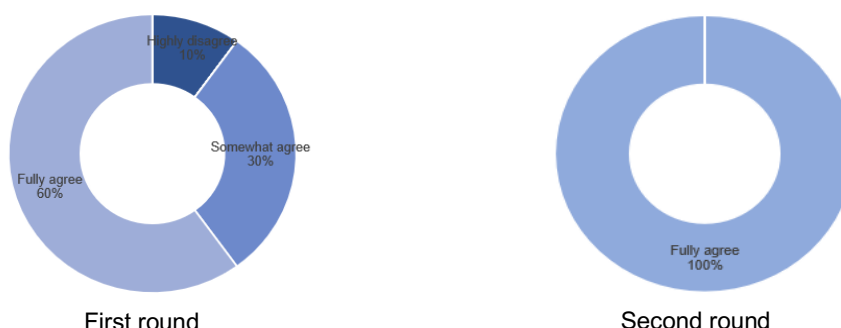


Figure 13 Payment schemes can more effectively support environmental benefits, if they include more result-based elements in addition to action-based elements - answers of the panel in the first and second round

2. *Result-based contracts are more costly to implement (in terms of coordination, monitoring, land managers advice, etc.), than action-based contracts.* In the first round 41,6% of the panel reply somewhat agree, 41,6% of the panel fully agree. In the second round 66% of the panel replied somewhat agree (Figure 14).

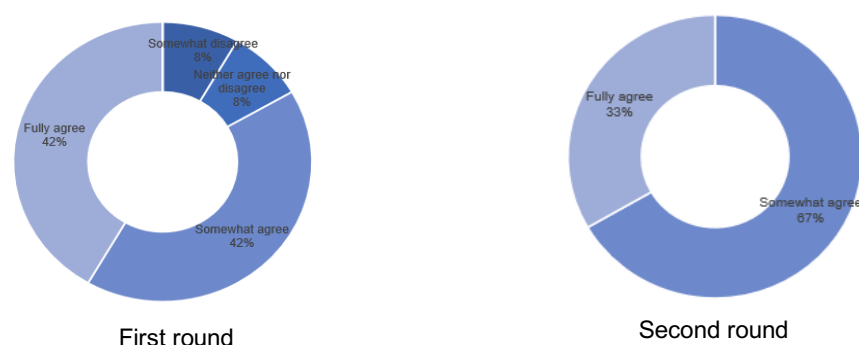


Figure 14 Result-based contracts are more costly to implement than action-based contracts - answers of the panel in the first and second round

3. *Result-based contracts require a broader knowledge base and a more developed infrastructure (including, e.g., suitable indicators, remote sensing, database creation etc.) than action-based contracts* (Figure 15).

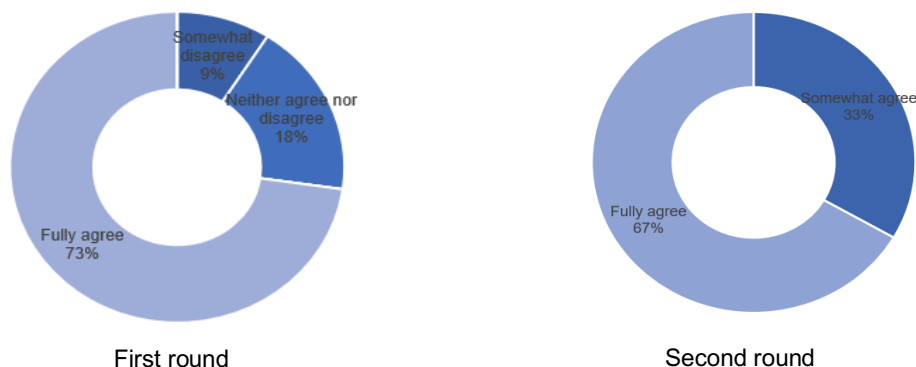


Figure 15 Result-based contracts require a broader knowledge base and a more developed infrastructure than action-based contracts- answers of the panel in the first and second round

For the following two questions, most experts in the first round selected the neutral option “neither agree nor disagree”, that, altogether with the “do not know” response, may indicate insufficient knowledge or familiarity with the topic. Consequently, these questions were not included in the second round, based on the assumption that any subsequent responses might have been biased by group dynamics—i.e., aligning with the majority view—rather than reflecting further individual consideration of the issue.

4. Result-based contracts are less suited to existing institutions (in terms of internal rules, responsibilities, policy processes, etc.) than action-based contracts (Figure 16).

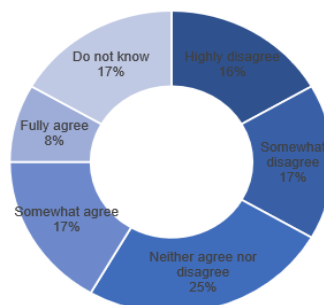


Figure 16 Result-based contracts are less suited to existing institutions than action-based contracts- answers of the panel in the first round

5. Result-based contracts are less suited to the social and cultural context (i.e., how land managers used to work and collaborate, how much they trust each other and the institutions etc.) than action-based contracts (Figure 17).

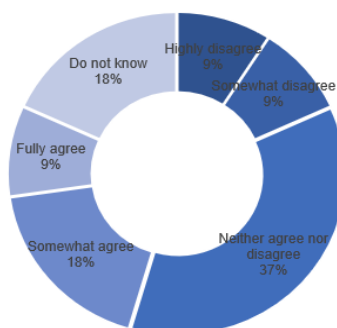


Figure 17 Result-based contracts are less suited to the social and cultural context than action-based contracts answers of the panel in the first round

Experts also provided additional comments on the topic. There was broad agreement that RBP “make a lot of sense” and are desirable, provided they are supported by robust monitoring systems, adequate financing mechanisms, and contract terms tailored to stakeholders’ needs. However, many experts pointed out that if such mechanisms were straightforward to implement—both technically and economically—they would already be widely adopted. The full set of expert comments is presented in (Table 7).

Table 7 Experts’ comments on result based payments

| Theme                                       | Key observations                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|---------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Rationale and added value</b>            | <ul style="list-style-type: none"> <li>• RBP align payments with demonstrable environmental outcomes, improving the cost-effectiveness and public legitimacy of expenditure.</li> <li>• Flexibility allows land managers to choose the most efficient practices, fostering innovation and knowledge exchange.</li> <li>• Digital technologies (e.g. Earth observation, in-field sensors) can lower monitoring costs and increase transparency.</li> </ul>                                |
| <b>Acceptance and behavioural aspects</b>   | <ul style="list-style-type: none"> <li>• Schemes must be tailored to local ecological and socio-economic conditions; generic designs risk rejection.</li> <li>• Farmers require contracts that are realistic, feasible, easy to understand and provide timely cash-flow; persuasive “sales pitches” are insufficient.</li> <li>• Long-term commitments and third-party monitoring can be perceived as intrusive; trust-building and clear incentive structures are essential.</li> </ul> |
| <b>Cost and administrative implications</b> | <ul style="list-style-type: none"> <li>• While outcome verification entails monitoring costs, several experts argued that foregoing monitoring is ultimately more expensive, as ineffective spending goes undetected.</li> <li>• Transaction costs may be reduced through remote sensing and harmonised EU forest monitoring regulations currently under discussion.</li> </ul>                                                                                                          |
| <b>Equity and finance</b>                   | <ul style="list-style-type: none"> <li>• Delayed payments (post-verification) can disadvantage owners lacking up-front capital; bridging finance or staggered payments may be required.</li> <li>• Ground-based indicators still vary across regions, complicating comparability; an EU-level forest-monitoring law could partially close this gap.</li> </ul>                                                                                                                           |
| <b>Hybrid models</b>                        | <ul style="list-style-type: none"> <li>• RBP should complement, not replace, existing CAP action-based instruments, state-aid measures and emerging private schemes in a multi-tier funding architecture.</li> </ul>                                                                                                                                                                                                                                                                     |

#### 4.4. Key insights from the workshop

On 5 May 2025, from 2 p.m. to 5 p.m., the online workshop 'Co-design the future(s) of Payments for Ecosystem Services in the EU' was held on the Zoom Webinars platform.

184 participants registered for the event. 62 effectively participated at the workshop. Participants joined the 12 different breakout rooms (3 for each scenario), distributed as follows: United-we-stand scenario: 13 participants; Wealth-being scenario: 14 participants; Eco-centre scenario: 19 participants; Rural revival scenario: 16 participants.

The participants covered the roles shown in Figure 18, with a predominance of person working in the scientific institutions/academia (34%), followed by project managers (16%), consultants and public administration (each 11%), forest managers (10%) and forest associations (7%).

Participants joined from 16 countries (13 within the EU, plus India, Iran, and Japan). Italy accounted for the largest share, with 12% of all participants, followed by Germany and France (5% and 4%, respectively) (Figure 19).

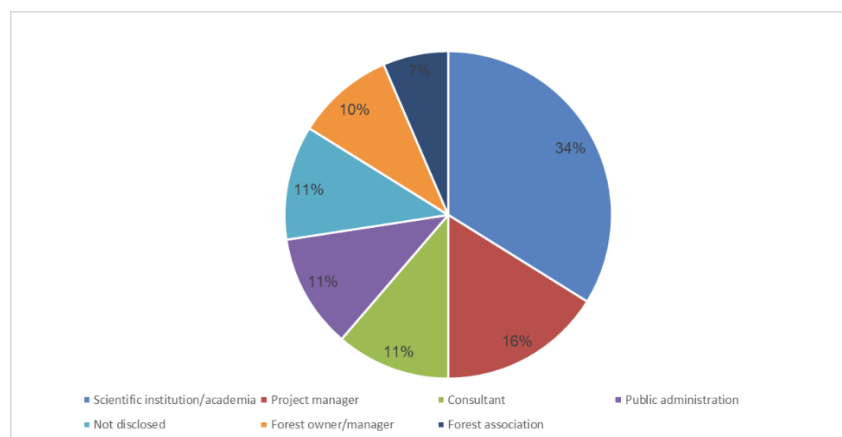


Figure 18 Workshop participants, by sector



Figure 19 Workshop participants, by country

In the 12 breakout sessions, a range of topics was addressed—some pertinent to this document, others more relevant to separate deliverables under the LIFE ProForPES project. For the purposes of this analysis, the main points of interest emerged were extracted and clustered by theme.

- **ES awareness deficit and need for education and communication**

Panellists consistently noted that ES (and FES) are poorly understood by the public, landowners, and many other stakeholders. There is limited communication beyond academic circles, and a lack of clear demonstrations that reach operators of the tangible, day-to-day value of these services. The concept of PES is even less familiar.

Panellists called for sustained awareness raising and education campaigns. These could be done over three to five years, for landowners and public authorities. There was also broad consensus that clear communication to the public is indispensable to stimulate demand. The public, they argued, is more responsive to figures, so quantifying the avoided costs or societal benefits of these services is essential. Consumer-facing branding and storytelling can translate ecological outcomes into social value, strengthening markets for ecosystem conservation and management.

- **Need of clear quantification, certification and monitoring**

Stakeholders emphasised early planning of IT systems so schemes can be implemented rapidly once outcomes are achieved. Clear objectives, targets and indicators, alongside socially inclusive eligibility and funding rules, were seen as essential. Transparent methodological frameworks already exist.

Robust monitoring and accountability should anchor PES, using scientifically grounded ecological indicators that include biodiversity indices and water quality, tracked over mid- and long-term horizons within adaptive management. Because certification and monitoring entail recurrent costs, stable financing arrangements are required.

Quantification must demonstrate both ecological and economic value, with credible indicators, counterfactuals (with/without investment) and clear benchmarks. Insurance companies were cited as natural allies given their interest in risk reduction. Demonstrating scenarios with and without investment in RES could make the financial logic clearer, while also highlighting reputational benefits for private actors who contribute.

Greenwashing is a risk, and this is heightened by the intangibility of many services.

Third party certification can confer credibility, ensure proper conduct and provide marketing advantages, potentially expanding customer bases and supporting longer-term finance. However, participants warned against scheme proliferation and remarked that certification adds value only if transparent, accessible and cost-effective, particularly for small operators

- **A PES framework that allows combining public funds and private financing**

Stakeholders advocated a mixed financing for PES schemes that blends public and private capital. Opinions were based on the scarcity of public funds to entirely sustain the provision of ES Europe-wide. Some also warned that public dominance without any market integration may produce rigidity, inefficiency and financial fragility. Some argued that public-only PES often suffer from time-horizon mismatches with forest management cycles.

Participants noted that corporations, especially if they are large, can mobilise substantial resources at scale and make a great contribution for PES. However, they also cautioned that corporate-led, market-driven PES are exposed to revenue volatility and branding cycles, threatening long-term continuity of ecosystem services. They raised risks of greenwashing under “too market driven” and weak rules and argued that PES intensively adopted in Europe would fail without robust regulation and public oversight.

They suggest to build a PES architecture with EU/State-guaranteed funding paired with voluntary private contributions, to combine public stability and credibility with private flexibility and innovation. Public funds may be used for payment baseline, complemented by targeted market instruments to engage privates

Suggested solutions for private inclusion include minimum co-funding thresholds (e.g. 20–60% of project costs from companies), or structured public–private committees to ensure accountability and transparency.

Some panellists suggest to attract private sector offering some form of tax relief.

On governance, stakeholders called for a balanced model in which EU or state, through regional authorities set minimum standards and ensure accountability, while local adaptation and community participation maintain relevance and buy-in.

Implementation concerns focused on administrative complexity in blended EU–national–private schemes, limited current private participation due to weak incentives and legal ambiguity, and finite public budgets for public sector.

Across all panels, there was strong agreement that a model combining EU-guaranteed funding with voluntary private contributions could be effective. The public sector provides stability, credibility, and a guarantee of continuity, while private participation adds flexibility, innovation, and responsiveness to local needs. This approach was seen as maximising results and supporting multi-actor engagement, including communities, small businesses, and youth initiatives.

- **A dedicated framework for FES**

Across the expert panels, stakeholders broadly support creating an EU-level, dedicated program for FES to raise forestry's visibility, tailor instruments to the sector's distinct timelines, actors and practices, and capture multiple services beyond carbon—such as biodiversity, climate resilience, and cultural and recreational values. This could work in parallel of CAP, that is mostly targeted to agriculture. A minority of stakeholders would prefer relying on the CAP, citing its widespread application, existing guarantees and infrastructure.

The panellists note that creating an EU-wide framework that target forests is challenging, as forestry does not fall under exclusive EU competence. The coexistence of local, regional and national regulations risks overlaps, contradictions and delays, and there are significant differences in baseline conditions, priorities and legal/tax frameworks. Nonetheless, they consider the exercise feasible, given the precedents set by the inclusion of forestry measures within the CAP framework.

The success of a standalone program for FES would also depend on tailored design: transparent indicators, fair allocation across Member States, simple and accessible procedures that lower transaction costs, involvement of regional and local bodies, and room for private co-financing.

Hybrid solutions linking the new fund with CAP, LIFE and cohesion instruments were considered. Risks include duplication, bureaucratic complexity, inadequate monitoring. Persistent concerns about insufficient and unstable long-term public finance led to calls for greater corporate contributions and streamlined rules

- **Result-based, action-based and hybrid models**

The debate on whether PES schemes should be structured around management actions or achieved results reveals a nuanced spectrum of preferences among participants, with experts emphasising the importance of context and balance between the two payment approaches.

On the one hand, action-based payment schemes are widely recognised as simpler to design, implement, and monitor. They provide immediate financial support for landowners, covering the costs of concrete activities such as planting trees and managing forests or adopting sustainable practices. This reduces the financial risks for forest owners, particularly in contexts where outcomes may take decades to materialise, as is often the case in forestry. Action-based payments are also well-suited for transitional phases, where they can stimulate behavioural changes, incentivise additionality, and protect against risks such as forest fires or pest outbreaks. Furthermore, their clarity and verifiability make them attractive for both authorities and landowners, ensuring early adoption of desirable practices. However, the drawbacks are equally evident: action-based schemes do not necessarily guarantee ecological effectiveness, as actions may have variable or even negative outcomes depending on local conditions. They also fail to adequately reward early adopters who already manage their forests sustainably, and they may inadvertently finance inefficient practices.

In contrast, results-based payment schemes directly link compensation to tangible ecological outcomes. This ensures accountability, aligns incentives with conservation effectiveness, and avoids paying for actions that yield little or no impact. By rewarding environmental outcomes, results-based schemes can legitimise and scale up PES markets. Yet, these schemes pose significant challenges in the forestry sector: outcomes are difficult to measure in the short term, monitoring requires costly and reliable indicators, and landowners are exposed to risks from external factors such as climate events. These conditions create high entry barriers and financial uncertainty, which discourage participation. The prospect of passive income without accountability is avoided, but the rigidity of results-based schemes may undermine adoption, especially in rural or small-scale settings.

The discussion across panels converges on the idea that neither approach is sufficient on its own. Action-based schemes provide immediate incentives and lower risks, but they fall short of guaranteeing long-term ecological outcomes. Results-based schemes promise higher environmental integrity but impose heavy monitoring demands and financial risks on forest owners. A hybrid approach emerges as the most viable pathway: beginning with action-based payments to support early implementation and reduce landowner risk, while progressively introducing results-based elements as monitoring capacity improves and outcomes become measurable. Such a staged model balances flexibility with accountability, aligns with both conservation goals and landowner realities, and increases the legitimacy of PES by tying long-term payments to verified ecological improvements. The evidence from expert discussions suggests that a phased, hybrid model that evolves from action-based to results-based payments offers the strongest balance between practicality, fairness, and long-term sustainability.

- **The PES framework should be well designed**

The PES framework must be rigorously designed. Experts stressed equity risks, since funding may cluster in charismatic or commercially attractive landscapes while ecologically important but less visible areas might be neglected.

Other risks are compounded by public perception, as tree planting is intuitive but sustainable forest management, and also agroforestry, are fundamental, and they may be harder to value.

Inclusiveness is essential: eligibility should extend beyond large public owners to the small private holders.

Governance should reflect the diversity of actors. Stakeholders called for simple, user-friendly instruments, clearer national/EU rules, a stronger business case for firms, and early planning for long-term financing and monitoring.

Finally, they stressed the value of creating a platform of examples and demand offer exchange, done at EU level, to provide concrete references and inspiration for effective PES implementation across Europe.

## 5. Summary of the results and discussion

Following, the main findings that emerged from the different methodologies applied in this study are summarised and discussed. This chapter is intended to provide a reasoned synthesis of the results so that ProForPES Working Package 4 can draw on it to formulate guidelines and recommendations.

1. **The concept of ES is increasingly integrated into various European policies, with a growing number of documents referring to ES and fostering their provision. However, it seems that the ES concept is more of policy relevance and of less relevance, or considered, by forest owners and managers as well as the public.**

**Over the past decade, the EU has largely incorporated the concept of ES into policy.** Scientific literature (e.g. Perez-Soba et al., 2025) also highlights that the EU is leading globally in incorporating this concept into policy. Starting with the 2011 Biodiversity Strategy and through the Green Deal, EU initiatives have increasingly recognized that healthy ecosystems provide vital services that are important, if not the basis, for human wellbeing. This inclusion is detectable across a large set of policy sectors: agriculture, environment, water, urban planning, etc. However, arguably, the policy sectors where ES are most frequently referenced are those related to Environment and Climate Action, as well as Agriculture and Forestry. By 2019, **the EU Green Deal further reinforced ES as a cross-cutting priority.** It facilitated the incorporation of ES into a set of policy instruments that go beyond natural resource management, integrating environmental, economic and social dimensions to combat environmental degradation and promote a sustainable and resilient Europe. Within this framework, a landmark was the adoption of the Nature Restoration Regulation in 2024, described as the first EU law explicitly targeting the restoration of ES at a continental scale. The literature suggests that scientific advances (e.g. in ecosystem mapping, valuation) have driven this policy integration (Perez-Soba et al., 2025).

The analysis conducted in this report, as well as in scientific studies (e.g. Maes et al. 2016; Schleyer et al. 2015) have noted that **earlier policy documents often referred to ES in broad terms or as high-level objectives, whereas more recent documents (post-2015) and specific sectoral strategies give more concrete and detailed treatment.** For example, the concept of valuing natural capital and accounting for ES was a general aspiration in 2011, but by 2020 the EU had developed experimental ES accounts and included those in policy evaluation. The Mapping and Assessment of Ecosystems and Services (MAES) project led to detailed national maps of FES, which inform regional planning and financing decisions. However, the uptake of these tools in national forest policies has been uneven, illustrating a gap between EU-level strategy and on-the-ground implementation (Dickinson et al., 2021, Mann et al., 2022). However, new policy documents, such as the EU Regulation on European Environmental Accounts, which specifically require Member States to quantify the flow of ES, are aimed at addressing this gap.

In general, EU policies aim at ensuring that **provisioning services** (like timber supply or biomass for energy) are addressed alongside **regulating services** (carbon sink targets, water and soil protection rules) and **cultural services** (support for recreation and tourism in rural development funding). The balance among these is an ongoing policy debate – with some critics arguing that provisioning uses (wood production) still receive more concrete support than non-market services. The trend, however, especially under the Green Deal, is toward quantifying and rewarding “*other ES than timber production*”.

Concerning the categorization of ES into provisioning, regulating, cultural (and supporting) services, from the analysed texts, we see that EU policies do not always list such categories in a formal way. However, this taxonomy has influenced the way EU policy makers discuss the topic and EU reports, guidelines and other documents frequently include this categorization. For example, the Commission Staff Working Document “EU guidance on integrating ecosystems and their services into decision-making” targets the ES in the whole text, categorizing them, and underlining the wide range of benefits that flow from nature to people, and possible ways to take better account of these benefits in policy, planning and business investment decisions.

Nearly none of the analysed policy instruments —except a few forest-specific policy documents, is explicitly referring to forest ecosystem services (FES). However, it must be noted that when policy documents refer

to ecosystems, forests are almost always mentioned as being centrally important to provide a wide range of ecosystem services, especially in the context of climate mitigation, clean air and biodiversity protection.

In contrast with the evolving situation of policies that refer to ecosystem services, the workshop panellists consistently noted that ES, (and FES) are poorly understood by the public, landowners, and many other stakeholders. They noted that there is limited communication beyond academic circles, and a lack of clear demonstrations that effectively reach operators of the tangible, day-to-day value of these services. Panellists called for sustained awareness raising and education campaigns for forest owners/managers, done every 3-5 years, and clear communication, showcasing examples and reporting figures, to the broad public.

## 2. The most relevant policies and financial sectors for FES are Agriculture & Forestry and Climate & Environment.

Most financial programs that refer to FES are from the **Agriculture and Forestry, and the Environment and Climate Action policy sectors**. Conversely, some sectors, like Investing in People, Social Cohesion & Values, do not mention FES, indicating that there is no explicit connection to forest ecosystems and the goods and services they provide. The lack of recognition of forest ecosystems' inherent contribution to human wellbeing is part of a wider problem that **forest ecosystem services are poorly mainstreamed into non-environment policies** (Primmer et al., 2021).

Experts from the Delphi study identified the CAP (both funds), followed by LIFE and Horizon, as the most relevant programs financing for FES. The CAP supports ecosystem services alongside with other objectives, such as social and economic objectives, while the LIFE Program is perceived as being strongly focused on them. Moreover, the CAP is regarded as being predominantly oriented towards agriculture, with forests not representing its primary focus, while LIFE and Horizon regularly focus on forest ecosystems. However, responses may also reflect personal experience. Horizon is also perceived as effective—ranked third—but its contribution to FES provision is more of indirect nature, as its primary objective is research and innovation.

## 3. EU financial programs mostly target regulating services

The analysis of the 31 EU financial programs reveals **more emphasis for regulating services and considerably weaker consideration of provisioning and cultural services**. Across all policy sectors, regulating services comprise 55% of all FES mentions, provisioning services account for 30%, and cultural services for 15%. This is in line with broader environmental governance discussions, where those ecosystem services playing a direct role in carbon sequestration and climate regulation are being prioritized over other forest benefits (Grêt-Regamey et al., 2017).

The priority accorded to **regulating services over provisioning and cultural services** is confirmed by previous studies, which have argued that policymakers accord priority to those ecosystem processes yielding transparent regulating benefits such as carbon storage and cleaning, at the cost of discounting services with impacts on provisioning the forests and cultural values (Häyhä and Franzese, 2014). This inconsistency may, in addition, be due to EU financial mechanisms prioritizing **quantifiable climate targets** at the cost of provisioning and cultural benefits, which are harder to quantify under policy evaluation.

## 4. Most EU funds are directed towards climate change, while a smaller share is allocated for biodiversity and actions that contribute to (forest) ES provision

The budget analysis of the 31 EU financial programs from 2021 to 2027 shows that 36% of the total budget (€1,488.7 billion) is dedicated to climate change mitigation and clean air, while only 7% (€284.1 billion) is allocated to biodiversity. This is in line with the objectives of the Green Deal that commits the EU to mitigating climate change and achieving climate neutrality. Meanwhile, the finances directed towards biodiversity include actions that could foster the provision of FES. Objectives such as ecosystem restoration and improved sustainability could lead to increased flow of FES. However, this falls short of financing FES according to its value. Establishing a framework for FES provision, which would entail funding options, would contribute to promoting forest multifunctionality and the provision of wide range of FES to the EU (Mann et al., 2022).

## 5. There is a disconnection between policy recognition for ES and financial commitments

The analyses reveal a disconnection between policy recognition of the importance of ES and financial commitments for their provision. While ES are frequently referenced in a set of policy documents, **this is not equally reflected in financial programs**, as also highlighted by Maes et al. (2020).

This supports the argument that policy recognition does not always come with dedicated funding and translates into fiscal commitments, a situation frequently mentioned in the literature on ES (Ring and Schröter-Schlaack, 2011; Primmer and Furman, 2012).

One of the potential reasons why policy-funding imbalances happen, is the **EU's sectoral structure of financial planning**. Policy intervention in environmental sectors usually takes place in particular systems compared to economic and infrastructure-dependent financial projects, leading to disintegration (Primmer and Furman, 2012). Policy offsets among climate protection, economic growth, and preservation of biodiversity could also lead to downgrading of FES as a priority against more urgent economic and social issues (Dendoncker et al., 2018). The prioritization seen in observed regulating services over provisioning and cultural services also backs this up, as regulating services, like carbon sequestration and climate regulation, are more in line with climate change policy and the EU's carbon neutrality targets.

**The absence of FES from leading social and cultural programs**, such as Erasmus+ and the European Solidarity Corps, suggests that ES remain as a side consideration in social policy (European Environment Agency, 2021).

Primmer, et al. (2019) argued and highlighted that while there is growing recognition of FES in policy conversations, there still exists a critical gap between this recognition and the establishment of economic and funding mechanisms within the EU. This fact aligns with observed inconsistencies and the disconnect that exists between **recognition of policy and budgeting for the FES standard** in EU. Primmer et.al., (2019) provided an analysis of the fragmented nature of financial planning in the sectoral structures that consider the environment separate from economics and infrastructure, and that this sectoral approach leads to inconsistencies in how funding for FES is allocated. The paper highlighted the emerging importance of integrated valuation approaches that value provisioning, regulating, and cultural services. The authors suggest that an integrated valuation will improve awareness and steering in agroecological transitions that resonates with findings on EU funding prioritizing regulating benefits over provisioning and cultural benefits.

## 6. The PES concept has entered the policy discourse; but the PES term is heterogeneously used

**The PES concept has entered the language of policy.** Experts engaged in our Delphi study agree that the concept is now on the policy agenda. They believe it has been driven by the large integration of ES into policy frameworks, as well as by the declining profitability of traditional land uses. As a result, there has been growing top-down recognition of the role of land and ecosystem managers in providing ES that are essential to public well-being. At the same time, there is increasing bottom-up interest in PES as a potential complement to income.

**The PES term, however, is not widely and commonly used in policies.** This is a well-known issue also in the scientific community. For example, Kaiser et al. (2021) noted that in the scientific community there is no common understanding of PES and they detected 13 definitions that aimed at providing a reconceptualization of PES<sup>11</sup>. However, in policy documents, it is not only the definition of PES that lacks a shared understanding. A wide range of alternative terms and paraphrases are used throughout policy texts. There is a clear sectoral divide in the language of policies: for example, within the CAP framework, terms such as agri-environmental measures and eco-schemes are employed, some of which align with the concept of PES. The term *result-based payments*, which closely matches the PES concept, is frequently used. In other frameworks, we find expressions like *public-private payments for nature*. In the carbon policy domain, references are made to *carbon removal certification* and to the ecosystem benefits of carbon and other services, but PES is not explicitly mentioned.

<sup>11</sup> By far the most cited definition, which is referred to as a Coasean style PES definition, was published by Wunder (2005) and is often mentioned as a market-close conceptualization with reference to the Coase theorem, which highlights the advantages of voluntary private negotiations (Coase 1960). In contrast, a second famous definition by Muradian et al. (2010) is often described as a Pigouvian conceptualization that incorporates (partly) involuntary and not necessarily strictly conditional positive incentive mechanisms.

Certain policies, such as the Green Deal, do not refer directly to PES but instead recommend the use of *different pricing instruments and sustainable public and private investments*. Similarly, the Climate Law and the LULUCF Regulation do not include PES terminology—although it is not within their scope to define financial instruments.

The study on financial programs found that only eight of the analysed programs (26%) cited and implemented PES and PES-like schemes associated with forests. This shows that the PES concept, though present in the EU financial landscape, needs to be mainstreamed. This is particularly important in practice: without clear, consistent terminology, those seeking to implement a PES and apply for funding may encounter difficulties.

This shortcoming is also underlined by Delphi experts, that the PES terminology is not consistently used. Instead, alternative terms and schemes have been in place for years, especially in the CAP framework that refers to agri-environmental schemes.

Workshop participants confirm this issue reporting limited PES literacy among both forest owners/managers. Owners/managers familiar with the CAP framework may know agri-environmental measures and, more recently, eco-schemes, and they understand both the concepts and terminology. However, the term “PES” itself is neither widely known nor used.

The most recent, relevant EU documents, such as the CRCF and the Roadmap towards Nature Credits refer **to certification and credits for specific ecosystem services** (such as carbon and biodiversity); **or—more simply—to Nature**. Perhaps these could be more appropriate terms to use, as they are more well-known and hence understandable for stakeholders.

All in all, clarifying the terminology and the conceptual framework would certainly support the efforts to advance the agenda.

## 7. Policy documents rarely provide specifications on how PES schemes should be design, with notable exceptions.

The policies analysed are often high-level and conceptual in nature. They refer to PES and similar mechanisms, typically by encouraging their use, but rarely including operational details. However, some policies represent notable exceptions.

The most prominent example, in terms of longevity and EU-wide coverage, is the **CAP framework**. In both pillars, and through the two CAP funds, payments are governed by clearly defined rules and contract timelines.

Another emerging example, that opens the door to an EU-wide PES framework, is the **Carbon Removal Certification Framework (CRCF)**. Already in the text of the Regulation, the rules and boundaries of the contractual arrangements are outlined, with references to baseline, additionality, leakage conditions, conditionality, duration, and monitoring. While the details are delegated to future delegated acts and Member States implementation, the main Regulation already sets out core elements, providing a clear and coherent EU-level framework.

Carbon, which has a relatively long-standing history of ES payments in both compliance and voluntary markets, was also identified by Delphi experts as a key framework in raising awareness of the PES concept among the public (even if the carbon mechanisms often diverge from the original concept of PES and is more closely associated with other market-based instruments, such as those involving crediting mechanisms and cap-and-trade systems).

Moreover, recent documents show a clearer horizontal integration across EU policies than in the past. Although many strategies remain high-level and therefore light on operational detail, they now explicitly refer to the documents where such details are codified—notably the Common Agricultural Policy (CAP), the Carbon Removal Certification Framework (CRCF), and the Nature Restoration Regulation (NRR) for indicators.

## 8. Adopting hybrid PES schemes, combining public and private funding as well as action-based and result-based approaches is considered achievable.

The analysis of EU policies—particularly the most recent ones—, the outcomes of expert opinion gathered through the Delphi method and workshop, as well as a review of the literature, all indicate that the most desirable approach to PES schemes design is a **hybrid model**, in several respects:

- **Blend public and private finance.** Experts pointed out that public financial resources remain finite. Some also warned that public dominance without any market integration may produce rigidity and inefficiency. They advocate for a mixed financing for PES that blends public and private capital. Among public sources, the CAP can certainly serve as a solid foundation. It is a longstanding framework, with full territorial coverage and broad recognition. However, other frameworks are not excluded—for instance, the recent CRFC, which is still pending the final delegated acts but has attracted considerable interest. Alternatively, as already mentioned, a dedicated PES framework specifically for forests could be considered. Another option is the use of State Aid schemes, also in combination, which are perceived as more locally grounded and tailored to territorial needs.

Regarding private funding, participants noted that corporations, especially if they are large, can mobilise substantial resources at scale and make a great contribution for PES. However, they also cautioned that corporate-led, market-driven PES are exposed to revenue volatility and branding cycles, threatening long-term continuity of ecosystem services. They raised risks of greenwashing under “too market driven” and weak rules and argued that PES intensively adopted in Europe would fail. So, they need robust regulation and public oversight.

Nonetheless, experts stress that although a public–private approach is broadly seen as desirable, it requires a significant and careful balance, coordination, governance, and technical capacity.

- **Result-based can complement action-based payments. Action-based payment schemes** are widely recognised as simpler to design, implement, and monitor. They provide immediate financial support for landowners, covering the costs of concrete activities such as planting trees and managing forests or adopting sustainable practices. Moreover, in some cases ES output from a given area of land is determined by a wide range of factors, only some of which are under the direct control of the land manager (White and Hanley, 2016). **Result-based payments** provide multiple advantages: they are linked to achieving specific environmental outcomes, reward farmers who maintain farmland with high biodiversity (O'Rourke & Finn, 2020), empower farmers to use their knowledge and experience, and incentivize adaptive management and innovation (De Snoo et al., 2013). However, result-based approaches require careful design to reduce unnecessary risks to farmers (Herzon et al., 2018; O'Rourke & Finn, 2020), can require broader knowledge and technical effort, especially for monitoring, and high costs. Many experts in the present analysis pointed out that if such mechanisms were straightforward to implement—both technically and economically—they would already be widely adopted. **Experts therefore suggest hybrid solutions that include action-based and result-based approaches.** They specifically suggest structuring payments so that one component is action-based (covering costs and income foregone), with an additional bonus granted for achieving measurable environmental results. Payments could come entirely from the public sector or from a public–private mix. In the latter case, experts propose that the public sector cover the action-based component, while private actors fund the results-based bonus. Another suggested set-up is that PES could begin with action-based payments to support early implementation and reduce landowner risk, then progressively introduce results-based elements as monitoring capacity improves and outcomes become measurable. This staged model has the potential to balance flexibility with accountability and aligns with both conservation objectives and landowner realities.

## 9. What framework for PES?

The CAP has been supporting the sustainable management of forests and improving forest ES through a variety of measures. However, the CAP remains primarily focused on agriculture. Moreover, the uptake of forest-related measures by farmers has been historically consistently low.

Some scholars, including Winkel et al. (2022), argue that a more suitable framework for promoting forest-derived ecosystem services would be an EU-wide forest PES scheme, implemented outside the CAP and specifically tailored to forest habitat management. This perspective was submitted to the Delphi panel, which unanimously considered such a scheme to be a valid and promising alternative.

Stakeholders in the workshop broadly support creating an EU-level, dedicated program for FES to raise forestry's visibility, tailor instruments to the sector's distinct timelines, actors and practices, and capture multiple services. However, they emphasise that there may be technical and legal difficulties.

Alternative mechanisms for sustaining the provision of ES are already emerging at the European level, most notably the one outlined in the Carbon Removal Certification Framework Regulation (CRCF), which aims to establish a voluntary market based on certified credits, including those generated by forests. Although the CRCF focuses exclusively on carbon, the scheme foresees the inclusion of co-benefits for other ecosystem services in the certification process.

Other EU policy documents particularly relevant for the future development of PES schemes are: the revised Environmental Economic Accounting Regulation, which includes provisions for the quantification of ecosystem services with a view to potential monetisation—although the framework through which this will occur has not yet been defined; and the very recent EU Roadmap toward Nature Credits Certification, which lays the foundation for a two-step process involving the certification and creditisation of ES. The specific regulatory framework in which this will be implemented is still under development and will be shaped through expert groups and pilot phases. The Roadmap highlights the relevance of the carbon credit experience in paving the way forward, noting in several instances that this framework could serve as a reference or foundation; however, it highlights that *“Specific features of nature credits need to be taken into account, including metrics, purposes and safeguards, as well as site-specificity, measurability and latency of biodiversity outcomes. Nature credits can also cover a broader scope, as they can apply to interventions and areas non-linked or with limited additional carbon sequestration potential but high biodiversity value, such as supporting pollinators or restoring dry ecosystems.”*

The optimal framework to accommodate PES must be rigorously designed. Experts stressed equity risks, since funding may cluster in commercially attractive ecosystems while ecologically important but less visible areas might be neglected. Additional risks stem from public perception: while tree planting is easily understood, the essential roles of sustainable forest management and agroforestry are less visible and therefore harder to appreciate and value.

In accordance with Prokofieva (2016), and Reed et al. (2017) stakeholders suggest that the PES framework should, when possible, bundle multiple ecosystem services, in order to raise ecological additionality and cost-effectiveness by monetising co-produced benefits, reducing per-service transaction and monitoring costs, and enabling shared indicators for verification. It can also diversify revenue streams and attract a broader mix of buyers.

They also underline the need of carefully assess, monitor and strengthen environmental conditionality.

Finally, they underscored the need for an EU-level, curated repository of PES case studies to catalyse uptake across Member States—complete with standardised templates (contracts, indicators, MRV protocols), lessons learned, and cost data to cut transaction costs—and noted it could also function as a demand–supply exchange platform (marketplace) to match buyers and providers of FES.

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## Annex I: List of the policy documents analysed and explanation of the classification of the documents

Table AI-1 List of the policy documents analysed

| Short name                                    | Full name                                                                                                                                                                                                                                                                              | Link                                                                                                                                                                                                        | Year |
|-----------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| <b>Nitrate Directive</b>                      | Council Directive 91/676/EEC of 12 December 1991 concerning the protection of waters against pollution caused by nitrates from agricultural sources.                                                                                                                                   | <a href="https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:31991L0676">https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:31991L0676</a>                                             | 1991 |
| <b>Natura 2000 (Habitat Directive)</b>        | Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora                                                                                                                                                                         | <a href="https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:01992L0043-20130701">https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:01992L0043-20130701</a>                           | 1992 |
| <b>Forest reproductive material Directive</b> | Council Directive 1999/105/EC of 22 December 1999 on the marketing of forest reproductive material.                                                                                                                                                                                    | <a href="https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:31999L0105">https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:31999L0105</a>                                             | 1999 |
| <b>Water Framework Directive</b>              | Directive 2000/60/EC OF The European Parliament And Of The Council of 23 October 2000 establishing a framework for Community action in the field of water policy                                                                                                                       | <a href="https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:02000L0060-20141120">https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:02000L0060-20141120</a>                           | 2000 |
| <b>Groundwater Directive</b>                  | Directive 2006/118/EC of the European Parliament and of the Council of 12 December 2006 on the protection of groundwater against pollution and deterioration.                                                                                                                          | <a href="https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32006L0118&amp;qid=1695976186351">https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32006L0118&amp;qid=1695976186351</a> | 2006 |
| <b>Green Paper on MBI</b>                     | Green Paper on market-based instruments COM(2007) 140 final                                                                                                                                                                                                                            | <a href="https://taxation-customs.ec.europa.eu/system/files/2016-09/com%25282007%2529140_en.pdf">https://taxation-customs.ec.europa.eu/system/files/2016-09/com%25282007%2529140_en.pdf</a>                 | 2007 |
| <b>Natura 2000 (Birds Directive)</b>          | Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds.                                                                                                                                                             | <a href="https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32009L0147">https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32009L0147</a>                                             | 2009 |
| <b>EU Green Infrastructure Strategy</b>       | Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions — Green Infrastructure — Enhancing Europe's Natural Capital (COM(2013) 249 final).                                              | <a href="https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52013DC0249">https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52013DC0249</a>                                           | 2013 |
| <b>Common Market Organization Regulation</b>  | Regulation (EU) No 1308/2013 of the European Parliament and of the Council of 17 December 2013 establishing a common organisation of the markets in agricultural products and repealing Council Regulations (EEC) No 922/72, (EEC) No 234/79, (EC) No 1037/2001 and (EC) No 1234/2007. | <a href="https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32013R1308">https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32013R1308</a>                                             | 2013 |
| <b>Invasive Alien Species Regulation</b>      | Regulation (EU) No 1143/2014 of the European Parliament and of the Council of 22 October 2014 on the prevention and management of the introduction and spread of invasive alien species.                                                                                               | <a href="https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014R1143">https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014R1143</a>                                             | 2014 |
| <b>Convention on Biological Diversity</b>     | Convention on Biological Diversity                                                                                                                                                                                                                                                     | <a href="https://data.consilium.europa.eu/doc/document/ST-13398-2016-INIT/en/pdf">https://data.consilium.europa.eu/doc/document/ST-13398-2016-INIT/en/pdf</a>                                               | 2016 |
| <b>Future of Food and Farming</b>             | Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions — The Future of Food and Farming (COM(2017) 713 final).                                                                         | <a href="https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52017DC0713">https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52017DC0713</a>                                           | 2017 |
| <b>EU Pollinator Initiative</b>               | Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions — EU Pollinators Initiative (COM(2018) 395 final).                                                                              | <a href="https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52018DC0395">https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52018DC0395</a>                                           | 2018 |

|                                                                         |                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                     |      |
|-------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| <b>LULUCF Regulation</b>                                                | 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                            | <a href="https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02018R0841-20230511">https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02018R0841-20230511</a>                                                                                                                       | 2018 |
| <b>EU Bioeconomy Strategy and action plan</b>                           | A sustainable bioeconomy for Europe. Strengthening the connection between economy, society and the environment. Updated bioeconomy strategy                                                                                                                                                                                           | <a href="https://op.europa.eu/en/publication-detail/-/publication/edace3e3-e189-11e8-b690-01aa75ed71a1/language-en">https://op.europa.eu/en/publication-detail/-/publication/edace3e3-e189-11e8-b690-01aa75ed71a1/language-en</a>                                                                   | 2018 |
| <b>Green Deal</b>                                                       | Communication From The Commission To The European Parliament, The European Council, The Council, The European Economic And Social Committee And The Committee Of The Regions. The European Green Deal                                                                                                                                 | <a href="https://eur-lex.europa.eu/resource.html?uri=cellar:b828d165-1c22-11ea-8c1f-01aa75ed71a1.0002.02/DOC_1&amp;format=PDF">https://eur-lex.europa.eu/resource.html?uri=cellar:b828d165-1c22-11ea-8c1f-01aa75ed71a1.0002.02/DOC_1&amp;format=PDF</a>                                             | 2019 |
| <b>EU Biodiversity Strategy for 2030</b>                                | 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)                                                                                 | <a href="https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52020DC0380">https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52020DC0380</a>                                                                                                                                   | 2020 |
| <b>Primary and Old-Growth Forests</b>                                   | COMMISSION STAFF WORKING DOCUMENT Commission Guidelines for Defining, Mapping, Monitoring and Strictly Protecting EU Primary and Old-Growth Forests                                                                                                                                                                                   | <a href="https://ec.europa.eu/transparency/documents-register/detail?ref=SWD(2023)62&amp;lang=en">https://ec.europa.eu/transparency/documents-register/detail?ref=SWD(2023)62&amp;lang=en</a>                                                                                                       | 2020 |
| <b>Circular Economy Action Plan</b>                                     | Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions — A new Circular Economy Action Plan: For a cleaner and more competitive Europe (COM(2020) 98 final).                                                                          | <a href="https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52020DC0098">https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52020DC0098</a>                                                                                                                                   | 2020 |
| <b>EU Renovation Wave</b>                                               | Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions — A Renovation Wave for Europe – greening our buildings, creating jobs, improving lives (COM(2020) 662 final).                                                                 | <a href="https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52020DC0662">https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52020DC0662</a>                                                                                                                                   | 2020 |
| <b>CAP Transitional Regulation</b>                                      | Regulation (EU) 2020/2220 of the European Parliament and of the Council of 23 December 2020 laying down certain transitional provisions for support from the EAFRD and from the EAGF in the years 2021 and 2022 and amending Regulations (EU) No 1305/2013, (EU) No 1306/2013 and (EU) No 1307/2013 and Regulation (EU) No 1308/2013. | <a href="https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32020R2220">https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32020R2220</a>                                                                                                                                     | 2020 |
| <b>Recommendations To The Member States For The CAP Strategic Plans</b> | Communication From The Commission To The European Parliament, The Council, The European Economic And Social Committee And The Committee Of The Regions Recommendations to the Member States as regards their strategic plan for the Common Agricultural Policy                                                                        | <a href="https://eur-lex.europa.eu/resource.html?uri=cellar:25d60735-4129-11eb-b27b-01aa75ed71a1.0001.02/DOC_1&amp;format=PDF">https://eur-lex.europa.eu/resource.html?uri=cellar:25d60735-4129-11eb-b27b-01aa75ed71a1.0001.02/DOC_1&amp;format=PDF</a>                                             | 2020 |
| <b>Guidance ES into decision Making</b>                                 | Commission Staff Working Document EU guidance on integrating ecosystems and their services into decision-making                                                                                                                                                                                                                       | <a href="https://circabc.europa.eu/ui/group/3f466d71-92a7-49eb-9c63-6cb0fadf29dc/library/69344fc4-de8e-4cfe-b418-4af78e7db690/details?download=true">https://circabc.europa.eu/ui/group/3f466d71-92a7-49eb-9c63-6cb0fadf29dc/library/69344fc4-de8e-4cfe-b418-4af78e7db690/details?download=true</a> | 2020 |
| <b>Farm To Fork Strategy</b>                                            | 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                                                                                           | <a href="https://eur-lex.europa.eu/resource.html?uri=cellar:ea0f9f73-9ab2-11ea-9d2d-01aa75ed71a1.0001.02/DOC_1&amp;format=PDF">https://eur-lex.europa.eu/resource.html?uri=cellar:ea0f9f73-9ab2-11ea-9d2d-01aa75ed71a1.0001.02/DOC_1&amp;format=PDF</a>                                             | 2020 |
| <b>New European Bauhaus</b>                                             | Communication From The Commission To The European Parliament, The Council, The European Economic And Social Committee And The Committee Of The Regions New European Bauhaus Beautiful, Sustainable, Together                                                                                                                          | <a href="https://new-european-bauhaus.europa.eu/system/files/2021-09/COM%282021%29_573_EN_ACT.pdf">https://new-european-bauhaus.europa.eu/system/files/2021-09/COM%282021%29_573_EN_ACT.pdf</a>                                                                                                     | 2021 |
| <b>EU Climate Law</b>                                                   | 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).                                                                                              | <a href="https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32021R1119">https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32021R1119</a>                                                                                                                                     | 2021 |
| <b>EU Forest Strategy for 2030</b>                                      | COMMUNICATION FROM THE 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                                                                                                                                                | <a href="https://commission.europa.eu/document/cf3294e1-8358-4c93-8de4-3e1503b95201_en">https://commission.europa.eu/document/cf3294e1-8358-4c93-8de4-3e1503b95201_en</a>                                                                                                                           | 2021 |
| <b>CAP Strategic Plans Regulation</b>                                   | Regulation (EU) 2021/2115 of the European Parliament and of the Council of 2 December 2021 establishing rules on support for strategic plans to be drawn up by Member States under the common                                                                                                                                         | <a href="https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32021R2115">https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32021R2115</a>                                                                                                                                     | 2021 |

|                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                   |      |
|-------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
|                                                                                           | agricultural policy (CAP Strategic Plans) and financed by the EAGF and by the EAFRD and repealing Regulations (EU) No 1305/2013 and (EU) No 1307/2013                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                   |      |
| <b>CAP Horizontal Regulation</b>                                                          | Regulation (EU) 2021/2116 of the European Parliament and of the Council of 2 December 2021 on the financing, management and monitoring of the common agricultural policy and repealing Regulation (EU) No 1306/2013                                                                                                                                                                                                                                                                               | <a href="https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32021R2116">https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32021R2116</a>                                                                                                                                                   | 2021 |
| <b>Soil Strategy 2030</b>                                                                 | 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)                                                                                                                                                                                                              | <a href="https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52021DC0699">https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52021DC0699</a>                                                                                                                                                 | 2021 |
| <b>Cohesion Policy</b>                                                                    | Regulation (EU) 2021/1060 of the European Parliament and of the Council of 24 June 2021 laying down common provisions on the European Regional Development Fund, the European Social Fund Plus, the Cohesion Fund, the Just Transition Fund and the European Maritime, Fisheries and Aquaculture Fund and financial rules for those and for the Asylum, Migration and Integration Fund, the Internal Security Fund and the Instrument for Financial Support for Border Management and Visa Policy | <a href="https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32021R1060">https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32021R1060</a>                                                                                                                                                   | 2021 |
| <b>8th Environment Action Plan</b>                                                        | Decision (EU) 2022/591 of the European Parliament and of the Council of 6 April 2022 on a General Union Environment Action Programme to 2030                                                                                                                                                                                                                                                                                                                                                      | <a href="https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32022D0591">https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32022D0591</a>                                                                                                                                                   | 2022 |
| <b>EU Deforestation-Free Products Regulation</b>                                          | Regulation Of The European Parliament And Of The Council on the making available on the Union market and the export from the Union of certain commodities and products associated with deforestation and forest degradation and repealing Regulation (EU) No 995/2010                                                                                                                                                                                                                             | <a href="https://data.consilium.europa.eu/doc/document/PE-82-2022-INIT/en/pdf">https://data.consilium.europa.eu/doc/document/PE-82-2022-INIT/en/pdf</a>                                                                                                                                                           | 2023 |
| <b>Guidelines on Biodiversity-Friendly Afforestation, Reforestation and Tree Planting</b> | Commission Staff Working Document Guidelines on Biodiversity-Friendly Afforestation, Reforestation and Tree Planting                                                                                                                                                                                                                                                                                                                                                                              | <a href="https://ec.europa.eu/transparency/documents-register/detail?ref=SWD(2023)61&amp;lang=en">https://ec.europa.eu/transparency/documents-register/detail?ref=SWD(2023)61&amp;lang=en</a>                                                                                                                     | 2023 |
| <b>Guidelines EU Primary and Old-Growth Forests</b>                                       | Commission Staff Working Document Commission Guidelines for Defining, Mapping, Monitoring and Strictly Protecting EU Primary and Old-Growth Forests                                                                                                                                                                                                                                                                                                                                               | <a href="https://environment.ec.europa.eu/publications/guidelines-defining-mapping-monitoring-and-strictly-protecting-eu-primary-and-old-growth-forests_en">https://environment.ec.europa.eu/publications/guidelines-defining-mapping-monitoring-and-strictly-protecting-eu-primary-and-old-growth-forests_en</a> | 2023 |
| <b>Guidance Payment Schemes for Forest Ecosystem Services</b>                             | Commission Staff Working Document Guidance on the Development of Public and Private Payment Schemes for Forest Ecosystem Services                                                                                                                                                                                                                                                                                                                                                                 | <a href="https://agriculture.ec.europa.eu/system/files/2023-07/guidance-dev-public-private-payment-schemes-forest_en.pdf">https://agriculture.ec.europa.eu/system/files/2023-07/guidance-dev-public-private-payment-schemes-forest_en.pdf</a>                                                                     | 2023 |
| <b>Renewable Energy Directive</b>                                                         | Directive (Eu) 2023/2413 Of The European Parliament And Of The Council of 18 October 2023 amending Directive (EU) 2018/2001, Regulation (EU) 2018/1999 and Directive 98/70/EC as regards the promotion of energy from renewable sources, and repealing Council Directive (EU) 2015/652                                                                                                                                                                                                            | <a href="https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L_202302413">https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L_202302413</a>                                                                                                                                                       | 2023 |
| <b>Carbon Removal Certification Framework</b>                                             | Regulation (EU) 2024/3012 of the European Parliament and of the Council of 27 November 2024 establishing a Union certification framework for permanent carbon removals, carbon farming and carbon storage in products                                                                                                                                                                                                                                                                             | <a href="https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=OJ:L_202403012">https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=OJ:L_202403012</a>                                                                                                                                                               | 2024 |
| <b>Nature Restoration Law</b>                                                             | 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                                                                                                                                                                                                                                                                                                                                               | <a href="https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32024R1991&amp;qid=1722240349976">https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32024R1991&amp;qid=1722240349976</a>                                                                                                           | 2024 |
| <b>Environmental Accounting Regulation</b>                                                | Regulation (EU) 2024/3024 of the European Parliament and of the Council of 27 November 2024 amending Regulation (EU) No 691/2011 as regards introducing new environmental economic account modules                                                                                                                                                                                                                                                                                                | <a href="https://eur-lex.europa.eu/eli/reg/2024/3024/oj/eng">https://eur-lex.europa.eu/eli/reg/2024/3024/oj/eng</a>                                                                                                                                                                                               | 2024 |
| <b>Roadmap Towards Nature Credits</b>                                                     | Communication From The Commission To The European Parliament, The Council, The European Economic And Social Committee And The Committee Of The Regions Roadmap Towards Nature Credits                                                                                                                                                                                                                                                                                                             | <a href="https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=comnat%3ACOM_2025_0374_FIN">https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=comnat%3ACOM_2025_0374_FIN</a>                                                                                                                                       | 2025 |

Table AI-2 Policy documents' classification

| Type of document                          | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Regulations</b>                        | Legal acts that are binding in their entirety. They are directly and uniformly applicable to all EU member states as soon as they enter into force, without needing to be transposed into national law                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Directives</b>                         | Set binding objectives upon EU member states to achieve a certain result, but leave them free to choose how to achieve these objectives. Once adopted at EU level, EU member states must adopt measures to incorporate the directive into national law (transpose). National authorities must communicate these measures to the European Commission                                                                                                                                                                                                                                           |
| <b>Decisions</b>                          | Decisions are in their entirety binding. A decision which specifies those to whom it is addressed shall be binding only on them                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Recommendations</b>                    | Non-binding. They allow the EU institutions to make their views known and to suggest a line of action without imposing any legal obligation on those to whom it is addressed                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Opinions</b>                           | Non-binding. They allow the EU institutions to make a statement, without imposing any legal obligation on the subject of the opinion                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Communications</b>                     | Soft law instruments adopted by the Commission with no binding force. They often contain important policy positions, guidance, or recommendations. Communications from the Commission are generally used to explain the Commission's political vision and choices and convince the audience that these are well-founded and justified                                                                                                                                                                                                                                                         |
| <b>Green and White Papers</b>             | Green and White papers are preparatory documents with a pre-legislative function. They have a consultative character, outlining the Commission's ideas and presenting specific proposals for action.<br>– A Green paper is a document that launches a debate with the public. It presents an overview of the facts and regulatory situation in a given area and examines the need to take specific measures.<br>– A White paper aims to stimulate debate among key players by launching a new public consultation and defining a more precise framework for action compared to a Green paper. |
| <b>Commission Staff Working Documents</b> | Factual and informative documents with no legal effect. They reflect the position of the authoring service in the Commission and do not commit the Commission to a position.                                                                                                                                                                                                                                                                                                                                                                                                                  |

## Annex II - PES in the EU Common Agricultural Policy

### Introduction

Within the EU, the discussion on PES as a mechanism to internalize environmental externalities dates back to the 1970s. In 1988, Giessubel-Kreusch discussed the “*stimulation of environmental protection through payments for positive environmental effects emanating from agriculture*”.

The regulation EC 2078/92 introduced Agri-Environmental Schemes (AES) and these instruments were gradually integrated into Pillar II of the CAP, as voluntary options for land managers (Baylis et al., 2006; Baylis et al., 2008).

According to the scholars, AES can be categorised as a subtype of PES. As mentioned in the introduction, they fall under Pigouvian-type agreements, resembling environmental subsidies aimed to address environmental and climate objectives by incentivising farmers to maintain, or move to, management practices that provide additional ES (Engel, 2016; Lastra-Bravo et al, 2020; Wunder et al., 2025). AES consists of a variety of measures. Depending on the measure, both the reduction of negative externalities (e.g. reduction of nitrate and pesticide pollution) and the provision of positive externalities are remunerated (Baylis et al., 2008; Schomers and Matzdorf, 2013). Within the CAP, these instruments have indeed the aim of reducing the negative impacts of agriculture, acknowledging that certain diffuse farming practices are key drivers of biodiversity loss, greenhouse gas emissions, soil erosion, ground and surface water pollution and landscape degradation (Campbell et al., 2017; Pe'er et al., 2022).

To date, most AES in the EU CAP has been targeted action-based, typically because these are thought to be easier to observe, and because the ES output from a given area of land is determined by a wide range of factors, only some of which are under the direct control of the landowner (White and Hanley, 2016). This means that output-based contracts are often riskier for the landowner than input-based contracts (Burton and Schwarz 2013). Moreover, it may be more expensive for the regulator to monitor ES outputs or ecosystem assets compared to inputs.

However, recent changes have been introduced to align with the evolving framework of the CAP, whose objectives have been broadened to encompass more comprehensive environmental and climate-related goals.

The CAP is divided into two Pillars. Pillar 1, comprising “Direct Payments” as the main instrument, is fully financed by the EU. Its main objective is agricultural income support. Pillar 2, the “Rural Development Program”, offers a broader set of instruments that address environmental objectives, rural development, risk management, and investment aid. Unlike Pillar 1, Pillar 2 requires co-financing from Member States and allows greater flexibility in its design and implementation.

The CAP structure has changed over time. The current CAP, adopted in December 2021, aims to contribute to the transition towards a smart, sustainable, competitive, resilient and diversified agricultural sector to ensure long-term food security. Priorities include providing support to boost income and resilience on farms, stepping up climate action, protecting natural resources, preserving and restoring biodiversity as well as strengthening the socio-economic fabric of rural areas. To deliver on these objectives, the CAP tailors support through national CAP Strategic Plans (CSPs), which are programming tools drafted by Member States and approved by the Commission. The 28 CAP Strategic Plans are financed through two funds as part of the EU budget: the European Agricultural Guarantee Fund (EAGF) that provides direct payments support and support to stabilise the internal agricultural markets (Pillar I), and the European Agricultural Fund for Rural Development (EAFRD) that supports rural development measures (Pillar II).

Through time, the CAP’s Green Architecture — the suite of rules and instruments designed to enhance the environmental and climate performance of farming, food production, land management, and rural areas- has changed as well.

## The CAP Green Architecture

The CAP's Green Architecture is the set of rules and tools to improve the environmental and climate performance of farming activities and foster changes towards more sustainable production models. The Green Architecture encompasses both obligations (conditionality) and supported interventions.

In the current period, overall, the **CAP Strategic Plans devote 32% of the total public CAP funding (EUR 97.6 billion) to the Green Architecture, encouraging farmers to invest or implement practices going beyond the conditionality to deliver environmental benefits for climate, water, soil, air, biodiversity, and animal welfare, to help the EU advance towards the Green Deal objectives** (European Commission, 2023b).

Figure AII-1, adapted from European Commission (2023b) and Pe'er et al. (2022), illustrates the differences between the current CAP's Green Architecture and the one of the previous programming period. The intensity of the green shading reflects the potential effectiveness for biodiversity and ES, as assessed by Pe'er et al. (2022).

The following sections present the comparison of the Green Architecture across the two programming periods, structured by Pillar I and Pillar II.

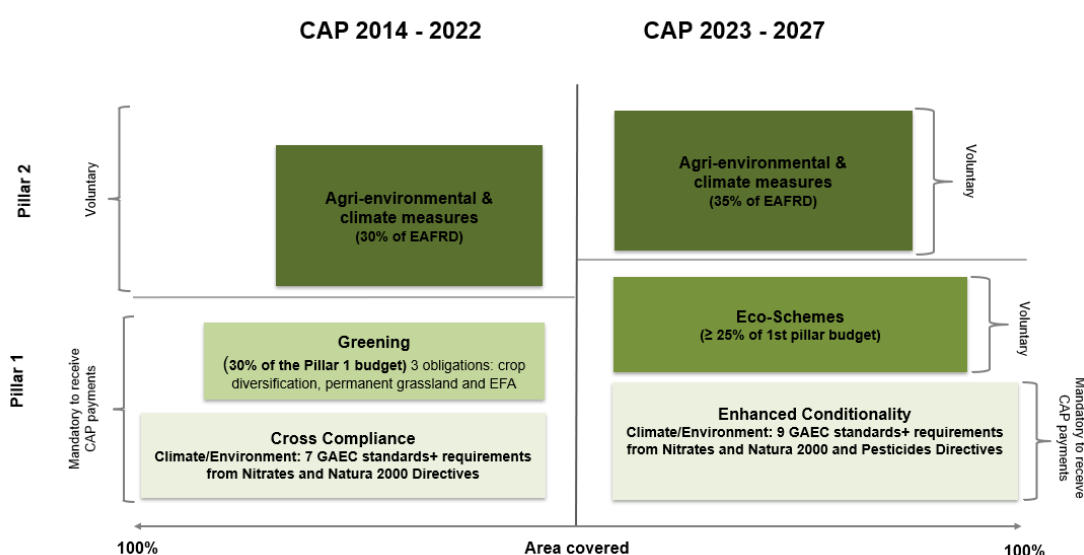


Figure AII-1 CAP Green Architecture

Source: modified from European Commission, 2023 and Pe'er et al. 2022

### Pillar I

In the CAP 2014-2022, the **Cross Compliance** mechanism linked direct payments to compliance with Statutory Management Requirements (SMR)<sup>12</sup> and Good Agricultural and Environmental Conditions (GAEC)<sup>13</sup>. These rules aim to ensure baseline standards for environmental protection, public health, animal welfare, and climate action. Scholars acknowledge that the Cross Compliance mechanism helped reduce some negative environmental impacts of agriculture. However, its effectiveness is considered to be limited due to weak enforcement and modest environmental ambition (Matthews, 2016; Pe'er et al., 2017; European Court of Auditors, 2017).

<sup>12</sup> Statutory Management Requirements (SMRs) are legally binding standards derived from existing EU legislation on the environment, climate, public health, animal and plant health, and animal welfare, which farmers must comply with as part of conditionality to receive full CAP payments.

<sup>13</sup> GAEC (Good Agricultural and Environmental Conditions) are baseline standards under CAP conditionality that farmers must meet to ensure the sustainable management of soil, water, and biodiversity, and to maintain land in good condition.

The **Greening** component of the CAP 2014-2022 allocated 30% of direct payments to practices beneficial for the climate and environment. The Greening component was a scheme that required farmers to implement three practices, to receive 30% of their direct payment allocation: i) crop diversification, ii) maintaining permanent grassland, and iii) dedicated Ecological Focus Areas.

Despite the efforts, the environmental impact of this mechanism is largely considered ineffective, limited by several factors and in particular exemptions<sup>14</sup>, to low ecological ambition, and weak implementation (European Court of Auditors, 2017; European Commission, 2018; Allen et al., 2019; Alliance Environment, 2020).

In the CAP 2023-2027 the mechanism **Enhanced Conditionality** replaces the previous ones. This instrument strengthens the previous Cross-Compliance system by merging it with greening requirements, thereby setting a more coherent baseline of environmental and climate requirements that farmers must meet to receive payments. Enhanced Conditionality still requires farmers to adhere to Statutory Management Requirements (SMRs) and Good Agricultural and Environmental Conditions (GAECs) to receive payments, but these requirements are enhanced, as the mechanism's name suggests, with respect to the previous period. Currently, SMRs include actions connected to the Water Framework Directive's requirements — including controls on diffuse phosphate pollution and on water abstraction and impoundment, as well as from the Sustainable Use of Pesticides Directive. In the Enhanced Conditionality the GAEC standards are also strengthened, notably through measures for the protection of peatlands and wetlands, and the requirement to maintain non-productive areas for biodiversity purposes (European Commission, 2023b).

Scholars have expressed mixed views regarding the effectiveness of Enhanced Conditionality for delivering environmental benefits. As for the positive outlooks, some experts argue that by raising the baseline requirements, conditionality increases accountability and may incentivise better environmental practices, especially when combined with Eco-Schemes and Agri-Environmental-Climate Measures (AECMs) (see the next paragraphs) (Pe'er et al., 2020; Matthews, 2022).

On the other side, this mechanism is considered to be insufficiently ambitious and the environmental requirements under GAEC are seen by many as minimal or too flexible, allowing Member States to dilute ambitions during national implementation<sup>15</sup> (Pe'er et al., 2019; Hart et al., 2022). A study carried out by Midler et al. (2023) in key member states, shows that, overall, the analysed Member States tend to choose the easiest and often less beneficial options for the environment when defining their GAEC standards.

Moreover, scholars report that being Enhanced Conditionality not results-based, there is limited evidence that it directly leads to improved environmental outcomes. It mainly prevents harmful practices rather than incentivising positive change (Petsakos et al., 2022). Studies also underline that monitoring and enforcement of compliance remain challenging, especially given the administrative burden and lack of robust penalties in some countries (ECA, 2023).

**“Eco-Schemes”** are the novelty of the new Pillar 1. They aim at supporting farmers in adopting practices that minimise the negative impact of agriculture and remunerate those providing environmental positive externalities. The EC specifically states that *“Through Eco-Schemes, the EU rewards farmers for preserving natural resources and providing public goods, which are benefits to the public that are not reflected in market prices”*.

Every Member State must allocate at least 25 % of its Pillar I (direct payments) budget to Eco-Schemes (lower levels are possible when Member States spend a share of their Rural Development allocation on the environment and climate higher than 30%)<sup>16</sup>. Each country is responsible for designing its own Eco-Schemes. In practice, Member States chose different approaches, leading to a high heterogeneity in the level of complexity. In most countries, several Eco-Schemes are proposed, each of them targeting either specific

<sup>14</sup> Exemptions granted to small farms, organic producers, permanent crop holdings, and regions with less than 10–20 ha of arable land

<sup>15</sup> Member States have indeed a certain latitude to define the GAEC standards in their CAP Strategic Plans. For instance, for GAEC 1, which aims to maintain permanent grassland, MS can define permanent grassland in a way that allows ploughing, tilling and reseeded and can decide at which level they want to ensure this maintenance.

<sup>16</sup> More specifically, eight CAP Plans (BE-WA, CZ, EE, EL, LV, NL, RO and SK) schedule to spend more than 25% of their direct payments budget on eco-schemes, and eight CAP Plans (BG, FR, IT, LT, LU, PT, IE and PL) plan exactly 25%. The remaining 12 CAP Plans use the “rebate” mechanism to reduce the eco-scheme budget allocation below 25% (AT, BE-FL, CY, DE, DK, ES, FI, HR, HU, MT, SE and SI), while programming higher spending on the environment under Rural Development.

farming practices or systems or a set of different practices, while in other cases, one single framework intervention is offered to farmers. In total, Member States have proposed 158 Eco-Schemes which address at least two thematic areas from the following: climate, soil management, water management, biodiversity, animal welfare and antimicrobial resistance.

The total budget under Eco-Schemes at EU level is EUR 44.7 billion against the background of EUR 190 billion under the entire Pillar I of the CAP 2023–2027 (European Commission, 2023b).

Eco-Schemes are accessible to all farmers meeting basic conditionality (SMR and GAEC) and are built on top of these. Farmers can voluntarily opt into one or more schemes proposed. Most payments are done annually.

Regarding the effectiveness of these schemes, a review of the first year of CAP implementation in selected Member States shows disproportions across the EU, with Eco-Schemes high in some countries and low in others. Moreover, payment rates are often considered not high enough to compensate for the effort required and there is a lack of technical knowledge and support (Nadeu and Godfroy, 2024).

Despite Eco-Schemes, thanks to ringfencing<sup>17</sup>, often benefit from large budgets and target large areas, some scholars remark that their impact is likely to remain low. An analysis for four key Member States conducted by Midler et al. (2023) suggests that, in most cases, the schemes are designed to allow most farmers to receive a payment without having to change their farming practices. This is known as the deadweight effect, a mechanism that occurs when a payment does not alter the recipient's behaviour compared to a baseline scenario (i.e., business-as-usual). It refers to a situation where payments are made to farmers for practices they would have implemented anyway, even without the financial support. This means that public money does not generate additional environmental benefit, resulting in low effectiveness and poor value for taxpayers. Also Pe'er et al. (2022) and European Court of Auditors (2020) have highlighted high deadweight risks in many CAP Eco-Schemes, especially where payments are flat-rate and not results-based. The European Commission acknowledges this risk and therefore encourages Member States to set better targets, conditionality, and additionality in the Strategic Plans (EC, 2023b).

Regarding the modality of payments, the framework allows flexibility. The review carried out by the European Commission – DG Agri (2024) shows that the great majority of Eco-Schemes are based on the action-based payment mechanism, with limited exceptions. In particular, among the 158 Eco-Schemes, 82% provide payments intended to offset/compensate only the additional costs and income loss (and possible transaction costs) incurred by farmers due to these commitments (Figure All-2). 18% provide payments that go beyond the Basic Income Support for Sustainability (BISS)<sup>18</sup>. The Eco-Schemes setting out payments additional to BISS are those with requirements for biodiversity/landscape features that are of a non-productive nature, those following a “whole farm approach” and those not linked to specific land uses. This is for being compatible with the World Trade Organization (WTO) “Green Box” requirements, as required by Article 10 of Regulation (EU) 2021/2115<sup>19</sup>.

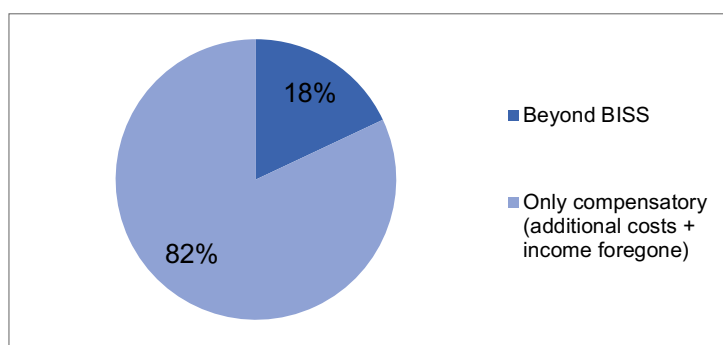


Figure All-2 Distribution of Eco-scheme payment types (CAP 2023-2027)

<sup>17</sup> Ringfencing is a technical term for a budgetary safeguard: it means that a certain proportion of funds must be used for a particular purpose, in this case Eco- Schemes

<sup>18</sup> Article 31(7)(a) of the CSP Regulation

<sup>19</sup> Article 10 sets that Eco- Schemes shall qualify under the relevant criteria of the paragraphs of Annex 2 to the WTO Agreement on Agriculture (Green Box criteria).

## **Pillar II**

Pillar II of the CAP supports environmental and climate objectives via Rural Development measures. Its green component consists of voluntary instruments that go beyond the mandatory requirements.

In 2014-2022 period, Pillar II supported environmental and climate objectives mainly through:

- Agri-environment-climate measures (AECMs), voluntary commitments beyond legal obligations (Art. 28, Reg. 1305/2013), including forest-environmental schemes. Payments are given to farmers and forest managers who voluntarily adopt practices beneficial to biodiversity, water, soil, and climate.
- Organic farming (Art. 29), a support for conversion to or maintenance of organic practices.
- Forestry measures (Arts. 21-25), aligned with environmental goals. Forest-environment and climate services (Art. 34): Similar to AECM but for forest lands, promoting ES.
- Natura 2000 payments (Art. 30), and payments in areas with natural constraints (Art. 31) Compensate for costs and income losses due to management restrictions in protected areas. These payments support the maintenance of high-value natural areas and the implementation of practices that protect water resources, contributing to the provision of ecosystem services.
- Non-productive investments (Art. 17 and 25) for environmental and biodiversity purposes in agriculture and forestry. Funding for restoration and habitat improvements without direct income return.

Payments were mostly based on an action-based logic, by compensating additional costs and income foregone, often linked to specific hectares, with possible transaction cost coverage. Contracts length were from 5 to 7 years.

In the CAP 2023-2027, AECM continues to exist, but must complement Eco-Schemes (Pillar I) and contribute to national environmental targets defined in CAP Strategic Plans. There is a greater focus on biodiversity, carbon sequestration, and climate adaptation in forest and agroforestry support. Stronger conditionality from Pillar I (GAECs) interacts with voluntary Pillar II commitments. Member States must ensure synergy and coherence across all interventions.

Payments for AECM shall be granted annually, for a period of 5-7 years. As defined in Article 70 of Regulation (EU) 2021/2115: *“The payment shall compensate beneficiaries for all or part of the additional costs and income foregone resulting from the commitments made.”* Payments can also cover transaction costs of up to 20% of the premium paid (up to 30% where groups or cooperatives are involved). However, the CAP specifically encourages result-based payments. The Regulation 2021/2115 states that (Article 70(5): *“Member States may promote and support collective schemes and result-based payment schemes to encourage farmers or other beneficiaries to deliver a significant enhancement of the quality of the environment at a larger scale or in a measurable way”*. Recital 71 states that support for management commitments may also be granted in the form of *“... result-based interventions.”*

The Regulation 2021/2115 provides Member States with implementation flexibility. Reconciling result-based payments with the WTO requirement is possible, since even in result-based contracts, payment levels may be pre-calculated based on the average cost a farmer would typically incur to achieve the desired outcome. Here are illustrated two possible options:

- Option 1: The result is rewarded, but the value of the payment is justified using a cost-based rationale. *Example: Ireland's Burren Program (now part of ACRES): A scoring system is used for flower-rich grassland. Higher scores bring higher payments. The payment rates were originally calibrated on the basis of income foregone and costs (ENRD, 2020).*
- Option 2: A hybrid model may be applied, where part of the payment compensates for specific practices (based on costs and income foregone), and an additional bonus is granted for achieving measurable environmental results. This approach remains compliant, provided the total payment stays within the WTO Green Box constraints.

In Box All-1 are summarised selected examples of result-based AEEM from EU Member States, showing how countries are implementing these schemes under the CAP, while complying with the WTO restrictions.

*Box All-1 Selected examples of result-based CAP AEEM in EU Member States*

#### **Ireland – Burren Program- ACRES**

- Result-based scorecards for species-rich grasslands and traditional grazing.
- Payments vary from €0 to €450/ha/year, based on ecological quality score.
- The scoring system uses field indicators (e.g. plant diversity, absence of poaching or invasive species).
- The original payment levels were justified using income foregone and additional costs from low-intensity grazing.

#### **Germany – Saxony-Anhalt and Brandenburg**

- Meadow bird protection schemes (e.g. for lapwings).
- Farmers are rewarded based on the number of chicks fledged, not just management.
- Support is capped to reflect expected costs/income losses due to reduced mowing or delayed grazing.
- Legal workaround: Payments are calibrated ex ante based on expected effort per fledgling, then verified via monitoring.

#### **France – Marais Poitevin**

- Farmers commit to manage wet grasslands with low inputs and late mowing.
- Payments are tiered by outcome, such as presence of target flora (e.g. orchids).
- A simplified ecological scorecard is used.
- Payment justification is based on estimates of foregone income from intensive grassland management.

#### **Austria – “ÖPUL” 2023**

- The Austrian agri-environment scheme includes result-linked bonuses within cost-based measures.
- Example: hay meadow conservation offers a base payment + bonus for high-quality floristic composition.
- Payments remain compliant with cost/income rules but allow farmers to benefit more for better ecological results.

#### **Netherlands – Collective Result-Based Approach**

- Farmers join landscape-scale cooperatives to manage habitats and species.
- Payments are partly tied to performance indicators such as habitat presence or breeding success.
- While payment ceilings are based on foregone income, local flexibility allows greater ecological precision.

#### **Finland – Nutrient Runoff Control (pilot)**

- Pilot AEEM that rewards actual reductions in phosphorus leaching (modelled or measured).
- Payments calculated as average cost of implementing cover cropping, buffer strips, etc.
- Payments remain within the income-foregone logic but performance defines eligibility.

## **The forest focus in the CAP**

The EU CAP, through its European Agricultural Fund for Rural Development (EAFRD) is the EU's primary funding policy for forestry. However, forestry has a lower allocated budget compared to agriculture.

Under the 2014–2022 CAP, most forestry support fell under Rural Development Programs. **92 out of 100 RDPs across EU-28 included at least one forest-related measure.** The main forestry measures supported by the CAP in that period were (European Union, 2025):

- Afforestation/new forest creation – grants for establishing forests on agricultural or other land, plus maintenance support.
- Agroforestry establishment – creating or regenerating mixed tree-agriculture systems on the same land.
- Preventing and restoring forest damage – actions to prevent forest fires, pests or natural disasters and to restore forests after such events.
- Investments in forest ecosystems' resilience and value – improving the environmental value for climate resilience of forests (e.g. ecological thinning, species mix improvements).
- Investments in forestry technologies and processing – support for machinery, processing, brand marketing in the forest sector (often to improve competitiveness of rural SMEs).
- Forest-environment and climate services – payments for voluntary commitments to enhance biodiversity, climate mitigation, or other ES in forests (analogous to agri-environmental schemes).

- Natura 2000 forest payments – compensation for costs or income foregone due to forest protections in Natura 2000 areas (in 2014–20 this was Measure 12.2 in RDPs).
- Forest genetic resources conservation – support for conserving or improving forest genetic material.

The CAP (2023–2027) continues to offer similar forestry interventions through national CAP Strategic Plans. Member States can choose to fund these interventions, aimed at “*protecting the forest, making it more resilient... safeguarding its multiple functions...and supporting investments, innovation and training*”, both in Pillar II, and also in Pillar I, through the new instrument of Eco- Schemes.

Eco-Schemes address a range of objectives (Measures), but only a subset of these is relevant to forest ecosystems. Table All-1 illustrates the thematic coverage of all Eco-Schemes across the CAP Strategic Plans of Member States. In bold are highlighted those measures that may target forest ecosystems. Notably, almost all Member States have activated schemes under the “Landscape and biodiversity” objective, while only a few have implemented schemes related to “Wetlands and peatlands” or “Water management”.

Table All-1 CAP Strategic Plans according to thematic coverage of Eco-Schemes

| Measure                                        | A<br>T | BE<br>-FL | BE-<br>WA | B<br>G | C<br>Y | C<br>Z | D<br>E | D<br>K | E<br>E | E<br>L | E<br>S | F<br>I | F<br>R | H<br>R | H<br>U | I<br>E | I<br>T | L<br>T | L<br>U | L<br>V | M<br>T | N<br>L | P<br>L | P<br>T | R<br>O | S<br>E | S<br>I | S<br>K |
|------------------------------------------------|--------|-----------|-----------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Integrated production/High environmental value |        |           |           |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
| IPM/pesticide management                       |        |           |           |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
| Fertilisation                                  |        |           |           |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
| Soil conservation practices                    |        |           |           |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
| Organic farming                                |        |           |           |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
| <b>Landscape and biodiversity</b>              |        |           |           |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
| Wetlands and peatlands                         |        |           |           |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
| Grassland and grazing                          |        |           |           |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
| Animals and animal welfare                     |        |           |           |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
| Precision agriculture                          |        |           |           |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
| <b>Water management</b>                        |        |           |           |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |

Bold means potentially relevant to forestry. Source: Modified from EC (2023)

Despite the numerous dedicated measures, many studies highlight an overall funding paradox where substantial CAP funds exist for forestry but these are not effectively or widely used by many EU countries and forest owners (Geitzenauer et al., 2017; Weiss et al., 2017; Sarvašová et al., 2019b), with an expenditure less than 50% of the planned budget (Sotirov, 2025).

Explanations for these difficulties include the growing incidence of climate-related issues, which necessitate adjustments in forestry expenditure. Implementation has also been slow for some measures—especially afforestation and agroforestry—owing to administrative burdens and limited awareness. Additional obstacles are budget constraints and rising costs of labour and materials, which undermine project viability. Restrictions on species choice and ownership limitations have further hindered afforestation initiatives (Szedlak, 2023). Scientific assessments indicate that forestry measures have been distributed unevenly: small-scale owners often face barriers to accessing funds, while larger landowners capture a disproportionate share (Haeler et al., 2023).

Moreover, a cross-policy incoherence has been observed. This takes place between the EU’s environmental and climate policies based on command-and-control rules without (substantive) funding, on the one side, and the EU’s agricultural/rural development and bioenergy policies based on substantive funding with only symbolic integration of environmental goals (Winkel and Sotirov, 2016; Weiss et al., 2017). This implies contradicting values and conflict of interests, between the agricultural, forestry, bioenergy and nature protection sectors (Winkel and Sotirov, 2016; Weiss et al., 2017; Fleckenstein, 2024; Sotirov, 2025).

