

Framework for assessment of PES-related mechanisms

D2.3 SWOT Analysis Report

Edited by

With the contribution of



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Edited by

Francesca Brusa, Luma Vasconcelos, Giulia Amato

Etifor | Valuing Nature

With the contribution of

Mona Nazari, Sylvannisa Putri Nina

Institute of Silviculture, Department of Ecosystem Management, Climate and Biodiversity,
University of Natural Resources and Life Sciences, Vienna

ProForPES contacts:

Email: info@lifeproforpes.eu

Website: www.lifeproforpes.eu

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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 a 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.

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Executive summary

Europe is among the most forested regions of the world – around 40% of its land area is covered by forests. Forested areas play a crucial role in providing a wide range of ecosystem services that benefit society, therefore requiring special attention for preservation and improved management strategies. In this context, Payments for Ecosystem Services (PES) schemes have emerged as valuable economic instruments for diversifying income for forest owners and rural communities while supporting sustainability goals. However, these services are often undercompensated, and PES applications are often limited to small-scale projects. The LIFE ProForPES project aims to address this issue by gathering and integrating knowledge on forest PES and related schemes at both national and European Union (EU) levels.

Under WP2 “Framework for assessment of PES-related mechanisms”, this document will investigate the strengths and weaknesses of PES schemes, along with the opportunities and barriers that could impact their implementation. The analysis, structured within the SWOT framework foreseen by Task 2.3, is based on findings and data collected from Task 2.1 and 2.2, which included a comprehensive analysis of nine selected case studies from national experiences and 2 key-informant interviews with managers and responsible people of PES schemes.

The SWOT analysis was carried out following 4 distinct steps:

1. **Data collection** based on a combination of literature review, input from previous deliverables, and additional information from previous research projects on the topic. This procedure, which considered various scopes of variables, allowed the identification of strengths, weaknesses, opportunities, and threats for each case study from a broader perspective.
2. **Organisation and categorisation of PES scheme parameters** taking into consideration the SWOT approach as the centre of our work. Each strength and weakness identified was listed and evaluated through an individual SWOT analysis to create a matrix of factors with clear criteria. This matrix was designed to help the reader understand the strategies that contributed to success or failure of the PES schemes analysed in the case studies.
3. To complement the individual SWOT analyses, **cross-case SWOT** was developed to provide a more comprehensive perspective and to evaluate the key features observed across the nine case studies. This approach offers a broader view; however, it should not be interpreted as indicative of macro trends. Although the case studies encompassed a wide geographical scope, the sample size is too relatively small to draw representative conclusions at the European level.
4. **Analysis and review of lessons learned** to support decision-making. The information from the SWOT analysis was carefully reviewed and prioritised to highlight the most critical factors that could have the greatest impact when implementing PES and PES-like schemes in Europe. This process enabled the development of recommendations that aim to offer insights to guide decision-makers on best practices through this report.

This analysis provides an overview of the lessons learned, including issues on implementation, best practices, and innovations, when implementing PES and PES-like schemes in Europe. Such approach complements the previous tasks, and function altogether as a background information for the participatory design of future funding programmes within WP4.

Overall, the case studies have established **robust foundations** in governance, funding mechanisms, and participatory community engagement, contributing positively to specific employment opportunities, capacity building, and decentralised funding control. They have also made significant progress towards achieving long-term sustainability, supported by legal and regulatory frameworks that facilitate their implementation. However, the analysis indicates **significant weaknesses**, particularly in their limited impact on human well-being and local socio-economic development. Financial constraints, including challenges in funding arrangements and local financial capital mobilisation, remain persistent barriers. Strengthening these areas is vital for PES projects long-term success.

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Abbreviations

BOKU	Universitaet Für Bodenkultur Wien ¹
CAF	Capital Asset Framework
CE	Central Europe
CIMAC	Comunidade Intermunicipal do Alentejo Central
CSDDD	Sustainability Due Diligence Directive
CSR	Corporate Social Responsibility
CSRD	Corporate Sustainability Reporting Directive
DO	Denominación de Origen
DWPZ	Drinking Water Protection Zone
EAFRD	European Agricultural Fund for Rural Development
EC	European Commission
EIB	European Investment Bank
EIF	European Investment Fund
EEA	European Environment Agency
EPP	European People's Party
ES	Ecosystem Services
ESG	Environmental, Social, and Governance
ESPR	Eco-design for Sustainable Products Regulation
ETS	Emissions Trading System
EU	European Union
FES	Forest Ecosystem Services
FSC	Forest Stewardship Council
GIS	Geographic Information Systems
IED	Industrial Emissions Directive
IFE	Internal Factor Evaluation
NBS	Nature-based Solutions
NGO	Non-Governmental Organisation
PES	Payment for Ecosystem Services
PESTEL	Political, Economic, Social, Technological, Environment and Legal
REACH	Registration, Evaluation, Authorisation, and Restriction of Chemicals
SEE	South East Europe
SFDR	Taxonomy Regulation, the Sustainable Finance Disclosure Regulation
SSRN	Social Science Research Network
US	United States
WP	Work Package

¹ Some names have been kept in their original language to maintain coherence to their respective acronyms.

1. Introduction

Europe's forests cover about 35% of the continent and are vital for providing a wide range of ecosystem services, which benefit society in several ways (Korhonen and Stahl, 2020). Forests, in fact, produce much more than just wood: they provide varied essential services for human well-being, such as carbon sequestration, water protection or climate regulation. Among the services, cultural enrichment and biodiversity conservation have gained importance as environmental, climate, and biodiversity challenges become more frequent and intense. In addition, the COVID-19 pandemic has further revealed their value, increasing demand for such services (Grima et al., 2020; Ugolini et al., 2020). However, the anthropogenic influence is compromising forest health, widening the gap between the growing demand for these services and their availability (IPCC, 2021; Maja and Ayano, 2021; Mina et al., 2016). This represents numerous challenges for forest managers, who require comprehensive and economically sustainable approaches to protect forests while continuing to ensure the provision of ecosystem services (ES).

To address these issues measures, within the European Green Deal framework, policies such as the EU Biodiversity Strategy, the EU Forest Strategy among others, emerged to promote sustainable development and support the provision of forest ecosystem services (FES) (EC, 2020; EC, 2021).

In addition, several EU strategies, including the EU Climate Law, the EU Water Framework Directive, and the Common Agricultural Policies, have also been implemented to support forest conservation and the services they provide. Although these frameworks assure PES can be strategic tools to propagate sustainable forest management (COWI, 2020), they often face **implementation challenges**. These include the limited application of green taxes and insufficient coordinated support for PES at national and international levels.

Since the 1990s, PES schemes have been considered valuable policy tools, increasingly adopted across different countries to improve sustainability outcomes. Over the past 30 years, several of these schemes have proven effective in protecting ecosystems from local and global change risks while promoting socioeconomic development and meeting sustainability requirements (Yan et al., 2022). Within the scope of Forest Ecosystem Services (FES), these innovative market-based instruments that protect natural capital and ES provide a **promising economic option for diversifying the income of forest owners and rural communities, alongside delivering ecological benefits**.

However, these benefits often go unrewarded, and the application of PES is frequently limited to small-scale initiatives, which restricts their broader positive impact (Kazana et al., 2015). Moreover, despite various efforts, challenges persist in effectively implementing PES, such as balancing supply and demand, rewarding forest owners, and understanding the factors that contribute to successful outcomes (Ezzine-de-Blas et al., 2016). Therefore, it is crucial to continue exploring innovative approaches to enhance the implementation of PES and PES-like schemes, including integrating a broader range of stakeholders and organisational models to ensure the sustainable management of Europe's forests.

1.1 Objective of the document

Based on knowledge gathered from varied Horizon projects, including SINCERE, InnoForEST, and Nobel, LIFE ProForPES is dedicated to collecting, synthesising, and integrating the available information on PES and PES-like schemes at both national and EU levels. The project's purpose involves developing diverse methodologies and approaches to achieve a holistic understanding of the current state of these instruments. To this end, LIFE ProForPES has rigorously assessed the strengths and weaknesses of selected case studies to evaluate the ongoing viability and potential for integrating PES into EU financial programmes and state aid frameworks. Examining existing mechanisms and their practical applications allows the identification of eventual gaps and opportunities for enhancing the role of PES within the broader context of EU environmental policy.

Currently, LIFE ProForPES is unfolding actionable recommendations aimed at improving the implementation of PES schemes. This effort not only strives to support the sustainability of FES but also aligns with the targets outlined in the EU Biodiversity Strategy. The insights derived from these assessments will be pivotal in shaping future policies that govern the management of forest resources, ensuring effective integration of PES mechanisms into the decision-making processes of European institutions.

This document is a critical component of the project's efforts to conduct comprehensive policy analysis and engage meaningful stakeholder consultations. The overall objective of this deliverable is to deeply assess the challenges associated with the implementation of PES schemes. For this reason, identifying the strengths and weaknesses inherent in these mechanisms, as well as the opportunities for successful implementation and potential threats should provide a nuanced understanding of the factors influencing PES outcomes across Europe.

It is relevant to mention that this study adheres to the concepts and frameworks established in previous deliverables, particularly aligning with the structure and clustering suggested by the Capital Asset Framework (CAF). This framework offers a systematic approach to categorising and analysing the different assets involved in PES arrangements, including human, social, natural, financial, and institutional capital. Employing the CAF ensures a comprehensive and consistent assessment, capturing the multifaceted nature of PES schemes and their impacts on forest ecosystem services.

Through this analysis, key lessons learned from existing PES and PES-like schemes will be presented, offering insights into best practices and innovative approaches that can enhance future initiatives. Recommendations generated from this deliverable will contribute to the body of knowledge surrounding PES while serving as a vital resource for policymakers, practitioners, and stakeholders engaged in managing forest ecosystems. Ultimately, this work intends to improve the EU financial framework, foster the sustainability of FES, and provide lessons from real case examples that can be adapted into guidelines and recommendations to facilitate the effective implementation of future PES schemes.

1.2 Structure of the document

This document is organised into six main sections, each contributing to a comprehensive understanding of PES and PES-related mechanisms within the European context.

The **Introduction** provides the context background information, offering an overview of the detailed objectives and aims of the document, outlining the significance of PES schemes in promoting sustainable forest management. This chapter highlights the necessity of assessing their effectiveness within existing frameworks and summarises the considerations drawn from previous project deliverables, thereby establishing a context for the subsequent analyses.

The **Methodology** section contemplates the reasoning of the approach taken to select and conduct the SWOT analysis, explaining its general aspects, advantages, and methodological limitations. This part of the work introduces the criteria used to define strengths, weaknesses, opportunities, and threats in the context of PES mechanisms while considering the scope of analysis. It also outlines the individual SWOT analyses performed on the selected case studies, the cross-case SWOT analysis, and the literature review for reference purposes that complements the work developed.

In the **SWOT analysis results**, the findings from both the individual and cross-case SWOT analyses are presented. This section systematically highlights the strengths, weaknesses, opportunities, and threats identified across the selected case studies. It examines each situation in its unique context, providing insights into the current landscape of PES in Europe and accounting for the particularities of the case studies.

The **Discussions and lessons learned** section synthesises the key findings from the SWOT analysis and discusses key findings and best practices derived from the selected case studies that aim to serve as guidance

for positive actions on similar funding schemes. It includes complement with existing literature, providing a broader perspective on the implementation and outcomes of PES schemes in relation to other studies, while also offering insights into the challenges encountered during the development of this deliverable.

In the **Conclusions and recommendations**, the document synthesises the key findings obtained from the SWOT analysis and offers actionable and science-based recommendations for policy and practice. This chapter also identifies areas for further research, encouraging specific and continued investigation into the effectiveness of PES and related mechanisms.

This structured approach has been established to ensure that readers can easily navigate through the document, facilitating a clear understanding of the analysis and its implications for ongoing and future PES initiatives in Europe.

1.3 Consideration from previous project deliverables

To fully grasp the purpose and objectives of this document, it is essential to revisit the steps outlined in the previous deliverables. This includes a review of the theoretical framework that underpinned the evaluation of PES schemes at the project level, as well as its application to the project database of European PES and PES-like case studies. Accordingly, this chapter will summarise the key findings from the earlier deliverables, namely D2.1 “Research framework to guide data collection, data analysis and interpretation” and D2.2 “Analysis of PES and PES-related mechanisms in Europe”.

1.3.1 D2.1 “Research framework to guide data collection, data analysis and interpretation”

The theoretical framework developed in Task 2.1 guided the scope of this work and was used to extract data from 108 PES applied in different European projects. This approach focused on capturing information regarding the operational arrangements, design characteristics, and institutional setups of each PES scheme. In accordance with the methodology, the data collection process was standardised, ensuring consistent analysis across several dimensions to enable a comprehensive evaluation of PES initiatives. As the reasoning behind the theoretical framework has been detailed in previous deliverables (D2.1 and D2.2), this section will briefly outline the selected approach (i.e., the assessment of PES programmes through the Capital Asset Framework - CAF) to provide context for the methods section that follows.

The CAF theoretical framework is based on the study by Hejnowicz et al. (2014), which critically analysed the outcomes of payments for ecosystem services (PES) programmes. This framework, built on previous work by Wunder, Daniels, and Pattanayak, employs a Capital Asset Framework (CAF) to systematically assess PES interventions. The framework examines the interplay between different types of capital and their influence on PES outcomes and it facilitates the identification of barriers and opportunities, enabling an exploration of the challenges when adopting PES schemes and the potential to enhance project design and implementation. The CAF consists of three components:

1. **PES deconstruction** – examining the operational, design, and financial arrangements of PES projects.
2. **Capital Asset Analysis** – evaluating outcomes in terms of Human, Social, Natural, Financial, and Institutional Capital.
3. **Barriers and opportunities** – identifying challenges and areas for improving PES project design and implementation.

These factors and components of the framework guided the data extraction from the selected PES cases, permitting a detailed and structured analysis of the variables that contribute to each project efficiency and success. In particular, data collection occurred in three phases:

1. Extracting data from 200 PES cases using an Excel spreadsheet to gather details on project arrangements and institutional setups.

2. Distributing a survey to project focal points, covering project operations, financial arrangements, capital asset analysis, and challenges. Participants were also invited for a semi-structured interview to explore key aspects in more depth.
3. Conducting semi-structured interviews, to provide a more in-depth analysis of specific PES projects.

Further details on the data collection implementation and the results obtained at the European level can be found in the following section.

1.3.2 D2.2 “Analysis of PES and PES-related mechanisms in Europe: key findings”

Task 2.2 involved the in-depth analysis of over 100 selected case studies of PES across Europe, building on the CAF theoretical framework. The framework provided essential guidance for data collection and analysis, standardising the evaluation of PES arrangements such as operational aspects, country-specific contexts, legislation, stakeholder mapping, and contract agreements.

Task 2.2 selected 108 case studies from an initial pool of 200, drawing from major EU projects like SINCERE, PESFOR-W, and InnoForEST. The selection was based on the classification of schemes as PES or PES-like, geographic relevance, and data availability. Despite challenges in identifying suitable PES cases in Europe, the final selection remained representative of key trends.

Data collection occurred in two phases. The first applied the theoretical framework to extract information on operational and institutional arrangements on the entire list of 108 case studies. The second phase included expert surveys and follow-up interviews, gathering detailed insights on the perception of capital assets, financial structures and project challenges on selected case studies. In total, nine experts provided feedback through surveys, supplemented by 2 interviews for additional qualitative insights.

Below, we summarise the main findings of the detailed analysis conducted for the nine case studies, which are also the subject of the SWOT analysis developed in this document.

1. PES deconstruction

This component analyzes the operational, implementation, design, and institutional aspects of the analyzed PES cases. It has been completed in the first phase of the data collection (Application of the Theoretical Framework for Data Extraction and Analysis).

For deconstructing PES arrangements data were collected on the following:

- Country(ies) of implementation
- The year when the project started
- ES considered
- ES category
- Programme size
- ES buyer
- ES direct beneficiary (ies)
- ES provider/seller
- Project initiator
- Intermediary
- Conditionality
- Monitoring

2. Capital Asset Analysis

The analysed PES schemes demonstrate meaningful contributions to Human, Social, Natural, Financial, and Institutional Capital, though they face notable areas for improvement:

- **Human capital:** PES programmes have enhanced access to essential services like education and clean water, acknowledged by 35-50% of respondents. However, impacts on other social services,

such as healthcare and food security, remain unclear, with many respondents expressing neutrality or uncertainty.

- **Social capital:** PES initiatives are effective in fostering community engagement and decision-making, with over 60% of respondents recognising these benefits. Community-building activities, such as stakeholder meetings and capacity development, further bolster social cohesion. However, there is a gap in the involvement of local NGOs and a need for more robust measurement of broader social impacts.
- **Natural capital:** PES programmes significantly contribute to job creation in natural resource management, noted by 90% of respondents as vital for sustainable resource stewardship. Despite this, only some communities feel adequately empowered in resource management, with 10% strongly disagreeing. The high rate of private forest ownership (70%) restricts community control, with communities primarily involved through employment rather than direct management, pointing to a need for greater community engagement in stewardship.
- **Financial capital:** while PES has bolstered community income and provided alternative revenue streams—such as forest product certification—its impact on household-level income is limited, with only 15% of respondents acknowledging improvements in personal financial capital. The limited effect on material wealth underscores challenges in translating ecosystem services into direct financial gains for individuals, although community-wide financial stability has been positively affected.
- **Institutional capital:** PES schemes support equitable benefit distribution and compliance with legal standards, yet transparency and community involvement are limited. Programs like Germany's Waldaktie have increased forest conservation recognition, but challenges remain with transparency in income distribution and concerns about corruption. Although NGOs play a mediating role, complexities from various organisations add to transparency challenges.

3. Barriers and opportunities

Key opportunities and barriers were identified through qualitative content analysis of in-depth case studies (9). As shown in Table 1 six main categories of opportunities were recognised: capacity building, communications, financial guarantees, project implementation, legal frameworks, and inclusive participation. Conversely, seven barriers emerged: bureaucracy, communication challenges, conflicts of interest, financial constraints, implementation difficulties, participation issues, and scale/time constraints.

Table 1. Opportunities and barriers of the nine selected case studies identified in Deliverable 2.2

Opportunities	Capacity building
	Communication
	Financial guarantees
	Implementation
	Legal framework
	Inclusive participation
Barriers	Bureaucracy
	Communication
	Conflict of interest
	Financial constraints
	Implementation constraints
	Participation issues
	Scale/time constraints

• Opportunities overview

Project implementation emerged as the most frequently cited opportunity, appearing in seven of the nine case studies. However, some respondents provided limited information, particularly those with neutral or minimal engagement in the open-ended sections of the questionnaire. Notably, one respondent highlighted 'green washing' as a motivation for initiating PES projects, pointing out potential pitfalls such as greenwashing, where misleading claims may undermine the integrity of these initiatives.

Several respondents noted that while **climate change** presents challenges, it also opens avenues for integrating PES into climate risk management strategies. The increasing importance of biodiversity and ecosystem services encourages additional opportunities for PES schemes.

The theme of **inclusive participation** was prominent, with seven case studies emphasising the importance of engaging diverse stakeholders. Effective **public awareness** initiatives and tailored communication strategies were identified as critical for garnering support and fostering long-term commitment to PES projects. **Financial guarantees** were mentioned in five cases, emphasising the need for stable funding through international partnerships and public-private collaborations. Legal frameworks and capacity building were noted as areas for improvement, ensuring clarity in stakeholder roles and enhancing knowledge and skills related to PES initiatives.

• Barriers overview

The analysis revealed **seven barriers to PES implementation**, notably including **bureaucracy, communication challenges, conflicts of interest, financial constraints, implementation difficulties, participation issues, and scale/time constraints**. Implementation and participation issues were particularly prominent, with respondents citing challenges in adopting new technologies and maintaining stakeholder engagement over time. Many respondents stressed the need for targeted capacity-building efforts to equip local managers with the necessary skills for effective project execution.

Participation challenges often stemmed from poor inclusion of local communities, with some respondents indicating **a discrepancy between project leaders' definitions of participation and local expectations**. Moreover, communication barriers and conflicts of interest highlighted the necessity of building trust and transparency among stakeholders.

Financial constraints, including high operation and monitoring costs, posed significant challenges to the viability of PES projects. Respondents also expressed concerns regarding reliance on short-term funding from governmental or EU sources, emphasising the need for strategies that ensure long-term sustainability. **Bureaucratic hurdles**, particularly related to government funding, were cited as significant barriers, with respondents advocating for simplified processes and clearer guidelines.

4. Key findings on financial frameworks and future trends

Thanks to the responses collected from the survey, we were able to gain broader insights into the European financial framework in which the scheme operates, as well as how future socio-economic, political, and environmental trends may influence the implementation of PES schemes. Table 2 shows the topics covered in the questions posed to the respondents. As for the European framework, the experts' responses pointed to significant integration challenges, indicating that **there is still considerable room for improvement in the legal and financial context surrounding PES mechanisms**. The responses gathered on the analyzed future trends indicate a significant degree of skepticism toward technological advancement. While its potential to enhance efficiency is acknowledged, concerns focus on the possibility of excessive use slipping beyond the control of regulatory authorities and increasing barriers to communication. Similar doubts are highlighted in economic terms, as experts are not convinced that economic advancement necessarily correlates with an increased demand for PES schemes.

However, the potential of PES schemes is emphasized, particularly in creating new job opportunities and serving as an innovative tool to raise awareness about sustainability and nature protection.

Table 2. Variables analysed on financial frameworks and future trends

PES within the financial frameworks	
Measured category	Variables
Multi-Level Financial Governance Structure	1. EU financial and state aid frameworks' support for PES scheme promotion 2. Gaps and challenges within the EU financial and state aid framework 3. Policymakers and stakeholders support for the growth and effectiveness of PES projects
Future Perspectives	
Measured category	Variables
Growing population in Europe	4. Competition for natural resources 5. Demand for PES schemes 6. Availability of local support and resources 7. Demand for bioenergy 8. Urbanisation
Technology development	9. Adoption of modern technologies and digitalization of operations 10. Awareness on the importance of PES schemes by media networks 11. Global connectivity to scale up PES schemes 12. Use of media networks for PES transparency and trust
Economic development	13. Shift in PES participation due to changes in oil prices 14. Support for PES due to economic growth 15. Changes in pressure on PES due to agricultural yield 16. Changes in societal perspective of non-wood related ecosystem
Climate change	17. Frequency and intensity of climate related extreme events 18. Achievement of project goals 19. Alteration of ecosystem service distribution and availability 20. Adaptive management
Political dynamics	21. Pool of public financial resources for PES 22. Cross-cutting approaches towards policies 23. Policy support and legislation for PES schemes in the EU

1.3.3 Description of the selected case studies

Below, the nine case studies subject to individual SWOT analyses in Austria (1), Belgium (2), Bulgaria (3), France (4), Germany (5), Italy (6), Portugal (7), Spain (8), and Sweden (9) are examined in detail. For each case, a small table is provided citing representative projects where data were retrieved from, useful links, and a description of the implemented scheme. The cases were selected under T2.2 to encompass a wide variety of ecosystem services, geographical locations, and project timelines, including differences in start years and durations. 2 additional cases that are not yet listed in the database were included, **Bourse des Arbres (France)** and **Para la Manchuela (Spain)**, mainly for the reason of geographical distribution, project's characteristics and respondent's availability.

1. [Austria: Water Protection Zone of the City Waidhofen/Ybbs, Guideline for the Management of the Forests in the Watersheds](#)

European Project	Country	Size (ha)	Type of context	Duration	ES (CICES)	Type of PES
PESFOR-W	Austria	500	Urban	2018 - present	Water regulation	Private - Public

The PES scheme for drinking water protection implemented in the Drinking Water Protection Zone (DWPZ) of Waidhofen/Ybbs funds management practices that **enhance water quality and quantity provided by stable forested areas**. The initiative has been funded through a "water prize" fee collected by the Waidhofen/Ybbs water works since 2018, when the first contracts were signed with forest owners in the autumn of that year. Since then, private and public forest owners have had the opportunity to sign formal agreements with the municipality of Waidhofen/Ybbs. Under the guidelines outlined in the "Richtlinie" (a document designed to ensure that the forest management strategies align with the sustainable water regulation goals of the DWPZ) these contracts invite owners to implement specified best practices within their forested areas, such as avoiding clear cuts, that support the regulation of water ES. In return for their commitment, forest owners receive **yearly payments**, with the amount based on the hectares of forests within the DWPZ and also on the type of best practices applied within this defined area. The payment amount varies annually to adjust for inflation, therefore ensuring it remains fair and effective over time.

2. [Belgium: Eerste Vlaamse Houtpark \(First Flemish Timber Park\)](#)

European Project	Country	Size (ha)	Type of context	Duration	ES (CICES)	Type of PES
SINCERE	Belgium	N/A	Urban	2019 - present	Fibre	Private - Private

The first wood park in Flanders represents a significant step towards **promoting the local processing of Flemish timber**, enhancing both sustainability and regional economic development. Launched in February 2019, this innovative initiative aims to solve the local wood supply shortage issue due to the export of timber to Asia. For the first time, felled logs are sold instead of standing trees, preferably to local wood processors in Flanders or neighbouring countries. None of the logs sold are cut solely for the purpose of being sold. **This strategy fosters local businesses and creates shorter, more efficient supply chains**. By encouraging the use of locally sourced materials, the wood park supports the local economy while minimising the environmental impact associated with long-distance timber transportation. Central to the wood park's mission is a **commitment to sustainable forest management**. This involves actively removing invasive exotic species that threaten the biodiversity and health of local ecosystems, as well as promoting natural forest regeneration. These practices are crucial for maintaining the ecological integrity of Flemish forests and ensuring their resilience against climate change and other environmental pressures. As part of this project, approximately 500 m³ of high-quality timber will be available for regional use. This volume will not only provide valuable resources for local industries but also contribute to a more eco-friendly and localised timber sector. Initiatives like the reverse auction, where local processors can competitively bid on timber, foster a transparent marketplace that prioritises sustainability and local engagement, further connecting processors with available timber resources.

3. [Bulgaria: Rusenski Lom Nature Park](#)

European Project	Country	Size (ha)	Type of context	Duration	ES (CICES)	Type of PES
PESFOR-W	Bulgaria	NA	Natural	2010 - 2014	Recreation and ecotourism	Private - Public

The project at Rusenski Lom Nature Park in Bulgaria focuses on **preserving biodiversity by promoting sustainable practices in agriculture, forestry, and tourism, while establishing a local Conservation**

Fund to support the park's management and protect endangered species. Payments for cultural ecosystem services were introduced in Rusenski Lom as a win-win solution to businesses and nature. The instrument contributes to generating income from tourists of the park, which would be invested entirely in enhancing the values of the area for these users. The measures to be implemented include development and maintenance of low-impact biodiversity trails, restoration and management of the habitats and protection of key animal species of global conservation importance, but also of cultural values, such as the European ground squirrel and the Corncrake. In this way, the landscape features and the biodiversity, attracting tourists to the area will be protected, which will also ensure the livelihood of local tourism businesses, but also of small-scale farmers, bee-keepers, aquaculture managers, who supply their products in tourism places, as well as local people employed to provide different services to tourists.

4. [France: Bourse des Arbres](#)

European Project	Country	Size (ha)	Type of context	Duration	ES (CICES)	Type of PES
NA	France	NA	Natural	2024 - present	Not specified	Private - Private

The French pilot project of the NOBEL programme adopts an innovative approach to managing FES in the Grand Est and the Vosges regions. The initiative developed **a platform called Bourse des Arbres, which facilitates transactions between forest owners and companies to promote sustainable forest management.** It focuses on key services such as timber production, carbon storage, and water protection, aiming to create a space that identifies and facilitates access to solutions encouraging engagement in recognising and valuing the ES provided by trees. The platform also serves as an interface for stakeholders, providing tools to evaluate the environmental and economic impacts of changes in forest management. These resources enable informed decision-making and encourage practices that support biodiversity preservation and climate mitigation, positioning the initiative as a proactive response to critical environmental challenges. Although the project may not qualify as a PES scheme in the strictest sense, the Bourse des Arbres platform creates an essential foundation for PES-like interactions. It facilitates communication, offers technical support, and designs tailored projects that ensure stakeholders have the necessary resources and guidance - including financing mechanisms - to implement sustainable solutions for wooded areas. This focus on enabling transactions between service providers (forest owners) and beneficiaries (companies) aligns closely with the principles of PES schemes. Moreover, its emphasis on ecosystem valuation and stakeholder collaboration mirrors the core objectives of PES models, making it a valuable example among the selected case studies, particularly in demonstrating how such systems can be effectively operationalised through a technological tool. In this sense, the broader significance of this project lies in its ability to bridge gaps between conservation goals and economic imperatives. Its efforts to quantify and monetise ES reflect a growing recognition of nature's intrinsic value in both policy and commerce and can act as a powerful strategy to positively impact environmental stewardship through innovation and engagement.

5. [Germany: Waldaktie \(Forest Shares\)](#)

European Project	Country	Size (ha)	Type of context	Duration	ES (CICES)	Type of PES
InnoForEST	Germany	2317.4	Urban	2007 - present	Climate regulation	Private - Private

The Waldaktie (Forest Share) initiative in Mecklenburg-Vorpommern, Germany, **aims to tackle climate change by fostering reforestation and forest conservation efforts.** Launched in 2007, the project enables both individuals and businesses to contribute to the reforestation of local forests, mostly focusing on **climate regulation through carbon sequestration.** The Tourism Association Mecklenburg-Vorpommern sells symbolic "Forest Shares" to tourists in Mecklenburg-Western Pomerania on a voluntary basis. Each "Forest Share" costs 10 Euro. The money is spent by the forest service for an additional afforestation of 5 m² in Mecklenburg-Western Pomerania, and for its silvicultural management during the next 5 years. The

afforestation compensates the CO₂-emissions of an average holiday trip to the state (850 kg CO₂, as caused by a party of four travelling 500 km by car and staying for 2 weeks in a middle class hotel). The money is being administered by a third party, the Northern German Foundation for Environment and Development. The programme is closely tied to the region's tourism industry, particularly along the Baltic Sea coast, **encouraging tourists to offset their carbon footprint by purchasing shares**. The funds raised through Waldaktie are reinvested into forest maintenance and expansion, ensuring that the ES provided by the forest, such as biodiversity conservation and climate mitigation, are sustained and enhanced. The project also promotes sustainable tourism by maintaining forest trails and improving access to natural areas, enhancing the overall experience for visitors. In this way, **the initiative supports** not only environmental sustainability but also the **local economy**, benefiting tourism operators and associated small businesses, such as local producers and service providers.

6. [Italy: BioClima initiative](#)

European Project	Country	Size (ha)	Type of context	Duration	ES (CICES)	Type of PES
LIFE GESTIRE 2020	Italy	300	Urban	2022 - present	Recreation and ecotourism	Private - Public

Launched as part of the LIFE IP Gestire 2020, the [BioClima Initiative](#) in Lombardy, Italy, **focuses on restoring degraded habitats through reforestation and afforestation through 12 different areas**. The initiative implements forest plans covering over 300 hectares. These interventions aim to enhance forest structure, conserve ecotonal elements such as clearings, and maintain or improve biodiversity. It relies on an innovative public-private funding mechanism managed by Etifor in collaboration with Fondazione Cariplo. In this specific case, the model works on two levels:

- **on a regional scale**, the Regional public entity (Lombardy Region) provides grant funding, supplementing it with philanthropic funding of private origin (Cariplo Foundation) for implementing a technical assistance service;
- **on a local scale**, each beneficiary raises private sponsorships from private companies and organisations by generating validated or verified positive (based on the type of intervention and impact) impacts claims from the projects.

Around 5.6 million euros have been invested in 17 projects by December 2022, with contributions from private firms enhancing the ES generated by these forest areas. **The project success is mainly due to public and private investments** via the [WOWnature portal](#), and active participation from local communities, authorities, and stakeholders, guaranteeing that decision-making is inclusive and benefits are shared. In addition, BioClima counts on Forest Stewardship Council (FSC) certifications that guarantee the reforestation and conservation efforts meet high standards of sustainability. Collaborations with farmers and landowners are key to achieving a landscape-scale impact, with voluntary agreements supporting restoration and sustainable land use. The project also **fosters local economic development by integrating conservation with sustainable tourism**. Visitors are encouraged to support these conservation efforts, with funds reinvested into habitat restoration and forest expansion as well as recreational routes and infrastructure are planned to promote nature-based tourism while raising awareness about the importance of biodiversity. This approach presents a model that combines conservation with economic growth, offering scalable solutions for regional climate resilience and ecosystem restoration.

7. [Portugal: the Green Heart of Cork project](#)

European Project	Country	Size (ha)	Type of context	Duration	ES (CICES)	Type of PES
PESFOR-W	Portugal	600	Urban/Natural	2011 - present	Fibre provisioning	Private - Private

The PES initiative for the conservation of cork oak in Portugal was one of the outcomes of the Corporate Social Responsibility (CSR) partnership in the country, as water from the Tagus aquifer is used by Coca-Cola in its

bottling operations. Sustainable management practices in cork oak stands, validated through forest certification, include maintenance of adequate forest cover, reduction or exclusion of grazing to protect oak regeneration, and long-term rotational clearance of understory shrubs. When located in areas sensitive for aquifer water recharge, the stands have the potential to contribute to the quality of the water recharging the Tagus aquifer. Based on this premise, and through its corporate and social responsibility policy, **Coca-Cola committed to paying a fixed amount to the Association of Landholders and Cork Oak Producers in Portugal (APFC), which is then distributed to landowner associates who are FSC certified and located in “hotspot areas for water and biodiversity conservation”**. This commitment is mediated by WWF which identifies the hotspot areas for payments through the WebGIS HABEaS. After identification of eligible APFC associates, the fee to be paid was established at 17 euro/ha. In this PES-like scheme, FSC certification is used as a proxy to validate sustainable management practices in hotspot areas. The financial incentive aims to promote adherence of cork oak landowners to FSC certification, and thereby good forest management practices. The first payments were made in November 2011 and have been maintained until the present date.

8. [Spain: La Manchuela por el Clima](#)

European Project	Country	Size (ha)	Type of context	Duration	ES (CICES)	Type of PES
NA	Spain	N/A	Rural	2019 - present	Climate regulation	Private - Public

The project focuses on ecosystem restoration and sustainable land management across multiple municipalities in La Manchuela, a region that spans Cuenca and Albacete in Spain. Through collaboration with municipalities such as Iniesta, Alcalá del Júcar, and Valdeganga, the initiative prioritises the restoration of degraded lands and the protection of the Júcar and Cabriel river systems. Emphasising environmental education, the valorisation of local identity, regenerative agriculture, and biodiversity conservation, the initiative actively engages local communities in climate-resilient practices that enhance the region's natural assets. The project is supported by a **joint effort between public and private organisations**, in partnership with the Castilla-La Mancha regional government and international climate funds. A key feature of the project's success is its **emphasis on stakeholder involvement, with local farmers, landowners, municipalities, and businesses all contributing to land management decisions**. The initiative also includes voluntary agreements with landowners that encourage sustainable agricultural practices, soil regeneration, and habitat restoration across both agricultural and natural areas. One significant moment where the NGO spreads its values, knowledge, and sustainable products is during the annual event, Feria del Clima. This event promotes the circular economy, regenerative agriculture, biodiversity conservation, and responsible consumption, benefiting both the NGO and the local community in numerous ways.

9. [Sweden: Love the Forest](#)

European Project	Country	Size (ha)	Type of context	Duration	ES (CICES)	Type of PES
InnoForEST	Sweden	N/A	Urban/Natural	2016 - present	Educational	Private - Public

"Love the Forest" is a Swedish project launched in 2016 that engages elementary school students in a competition to **envision the future of forests, aiming to raise awareness of sustainable forest management and its importance for Sweden's economy and ES**. Organised by the Swedish Forest Society Foundation in collaboration with the Universeum Science Centre, the project **fosters collaboration between students and key stakeholders from the forestry sector**, industry, and academia, encouraging dialogue and innovation around forest conservation. By connecting the children with professionals such as industry leaders, forest managers, and researchers, the initiative provides real-world insights into both the environmental and economic value of forests, while promoting sustainable practices needed to preserve them for future generations. The project emphasises hands-on learning, integrating field visits to forests, workshops, and lectures to bridge theoretical knowledge with practical applications. This not only sparks creativity but also **allows industry partners to better understand the environmental priorities of younger generations**. A

key feature of the project is its collaboration with the Swedish Universeum Science Centre, extending its reach to students, teachers, and families and enhancing access to forestry-related knowledge through the use of innovative educational methods. The project aligns with broader European efforts in forest management, such as the InnoForES project, which seeks to transform the European forest sector by stimulating innovations for the sustainable supply and financing of forest ecosystem services.

2. Methodology

2.1 SWOT analysis: general aspects

A SWOT analysis is a reliable method for developing strategy-based decisions that support better decision-making considering internal and external factors (Kazana et al., 2015). It is widely used to identify strengths and weaknesses, as well as opportunities and threats, within an organisation or process. This tool provides an overview of key issues, helping in the identification of eventual problem areas, and encouraging further investigation when necessary. In business, SWOT findings are often used to formulate sustainable management strategies (Pereira et al., 2021), on the other hand, in the forestry and natural resources sectors, the SWOT approach has been recognised for its effectiveness in collecting and analysing qualitative data (Falcone et al., 2020).

When it comes to the elements investigated by a SWOT analysis, they can be defined as follows: **strengths** are internal characteristics that can help to achieve the proposed outcome, while the **weaknesses** are internal characteristics that create challenges to succeed. Internal strengths and internal weaknesses are an organisation's controllable activities that are performed especially well or poorly. **Opportunities** and **threats** are external conditions that can either facilitate or undermine the desired outcome. They refer to economic, social, cultural, demographic, environmental, political, legal, governmental, technological and competitive trends and events that could significantly benefit or harm an organisation in the future (David, F. R. 2011). To this end, it is of major importance to define a precise definition of the internal and external environment and the ability to distinguish them (Pahl and Richter, 2009). **The main aim of the SWOT analysis is to develop a strategy that will benefit from the advantages of the opportunities and overcome the negative impact of threats** (Viszlai I. et al, 2016). All basic possible strategies are described in Figure 1:

Figure 1. SWOT Analysis strategies (Viszlai et al, 2016)

	Strengths "S" (internal, positive)	Weaknesses "W" (internal, negative)
Opportunities "O" (external, positive)	SO: Strength-Opportunity strategies <i>Use the strengths to maximise the opportunities</i>	WO: Weakness-Opportunity strategies <i>Minimise the weakness by using the opportunities</i>
Threats "T" (external, negative)	ST: Strength-Threats strategies <i>Use the strengths to minimise the possible threats</i>	WT: Weakness-Threats strategies <i>Minimise the weaknesses to avoid the threats</i>

The subject of the SWOT analysis presented in this document is the nine case studies described in the previous section 1.3.3. To better understand the foundation on which this analysis is based, it is useful to preface the following sections with a clear list of the sources and references used in developing the analysis:

- The **previous deliverables**, D2.1 and D2.2, provide, respectively, the theoretical framework for structuring the analysis, and an overview of the European context regarding PES case studies, along with a detailed analysis of the nine selected case studies.
- The **questionnaire** developed under Activity 2.2 and distributed to the experts responsible for the nine case studies.
- A **literature review** to further explore the local context in which the nine PES schemes were implemented.

A detailed explanation of the methodology used to conduct the SWOT analysis for the nine case studies is presented below. The first step involved clearly defining and standardising all the variables considered for the analysis, ensuring that they are consistently labelled across the various matrices presented in chapter 3. **Then, two types of SWOTs were carried out.** First, an **individual SWOT** for each case study, where the specific strengths, weaknesses, opportunities, and threats were thoroughly explored. Then, after carefully evaluating the most common and observed characteristics, we present a comprehensive overview of the key challenges and successes of the analysed PES schemes through a **cross-case SWOT analysis**. For the internal components of the SWOT (strengths and weaknesses), an Internal Factor Evaluation (IFE) matrix was applied to prioritise and rank the factors based on their importance and relevance within the scheme. For the external components of the SWOT (opportunities and threats), a qualitative analysis using a PESTEL approach (Christodoulou and Cullinane, 2019) was proposed, focusing on the local context in which the scheme was implemented, as detailed in Section 2.2.

2.1.1 Limitations and assumptions of the methodology

The literature review highlights some criticisms of the SWOT analysis method; however, no major issues were identified regarding the incorporation of decision impacts into strategic planning (Pereira et al., 2021). Nevertheless it is relevant to mention that this approach may lack quantitative backing and relies mainly on the researcher's knowledge and capacity to capitalise on opportunities or mitigate threats. Despite these challenges, the SWOT analysis is valuable to outline key internal and external factors, especially in contexts like forest management initiatives, where external factors and goals are highly variable (Falcone et al., 2020). Regardless, in order to address any potential weaknesses of the study and strengthen the reliability of the methods, an in-depth literature review was supplemented with additional expert contributions on the gathered data to validate the SWOT analysis outcomes. This integrated approach resulted in a comprehensive and balanced methodology that combines distinct variables into a holistic result.

2.2 Criteria for defining strengths, weaknesses, opportunities and threats

Before exploring the methodological steps that led to the definition of the variables used in the SWOT analysis and its development, it is important to make two preliminary clarifications to aid the understanding the present document:

1. In the SWOT analysis, only the variables that are **specifically related to the project**, such as the implementation of the PES scheme, are considered as strengths and weaknesses. External variables, such as opportunities and threats, are those **related to the environment and context** in which the PES scheme was implemented.
2. The term "opportunity" in this document does not have the same meaning as it does within the framework developed in Task 2.1 (CAF) and Deliverable 2.2. Here, opportunities refer to **external factors that positively influence the implementation of the PES scheme**.
3. The **barriers** identified in Deliverable 2.2 and wrapped up in subsection 1.3.2 were categorised as either weaknesses or threats based on whether they have an internal or external scope.

For greater clarity, Table 3 provides an overview of the questions that should guide the development of the SWOT analysis.

Table 3. SWOT analysis matrix with guiding questions. Modified from Rauch, 2006

INTERNAL VARIABLES	
Strengths	Weaknesses
- What is done well within the organisation or by the stakeholders involved in the PES scheme? - What positive consequences have emerged as a result of implementing the PES scheme? - What is the driving force behind the success of the case study?	- What specific areas could be improved to enhance the effectiveness of the PES scheme? - What internal barriers or challenges are preventing the full success of the PES scheme? - What should the organisation avoid in order to prevent undermining the PES scheme?
EXTERNAL VARIABLES	
Opportunities	Threats
- Which external factors (e.g., social, economic, environmental and/or political) positively influence the implementation of the PES scheme? - What new opportunities arise due to these external factors ? - What emerging trends, technologies, or partnerships could positively impact the future of the PES scheme?	- Which external factors (e.g., social, economic, environmental and/or political) negatively affect the implementation of the PES scheme ? - What external barriers (such as regulations, stakeholder opposition and/or market changes) pose challenges to the success of the PES scheme? - What potential risks or challenges could arise if external conditions change?

As for the steps taken to identify the variables, it is important to specify that the **primary goal was to establish a standardised and common nomenclature** that could integrate the structure of the theoretical framework developed with Deliverable 2.1 (CAF), the questions and answers collected in the survey delivered under T2.2, and the verbal responses provided by the interviewees during the interviews carried out under T2.2. This nomenclature is meant to be suitable for the SWOT approach and **was applied uniformly across all the SWOTs**. The following two sections will provide an overview of the methodology employed to collect all pertinent variables for the SWOT components, with the aim of integrating all findings and data collection sources utilised so far under Work Package 2 (WP2).

● Definition of variables relevant to strengths and weaknesses

To define the variables relevant to the **internal components** of the SWOT (strengths and weaknesses), a first step consisted in extracting neutral variables from the survey and interviews in a way in which they could align with the asset and components of the chosen theoretical framework (CAF). We carefully analysed the survey administered to experts from the 9 case studies, successfully identifying **27 relevant variables** for the SWOT analysis on which they provided their positive or negative insights. The sections of the questionnaire that were deemed most interesting for defining these variables pertained to Section 1, "Your Perception on PES and Capital Assets" and Section 2 "Funding Arrangements for Your PES Case." Natural capital was not included in the table and, consequently, in the analysis, as natural capital was not considered an object of investigation in the survey distributed to the experts.

The resulting Table 4 **forms the basis for the classification of strengths and weaknesses**

Table 4. Variables relevant to analyse strengths and weaknesses

D E C O N S T R U C T I N G P E S	Financial and funding arrangements		
	Measured assets		Variables
	Financial and funding arrangements of the implemented PES scheme		1. Reliability of primary funding sources 2. Diversification of funding sources 3. Efficiency of the financial mechanisms within the PES schemes 4. Presence of innovative financial tools or approach within the project 5. Sustainability of the funding sources 6. Responsiveness of PES scheme to financial and funding challenges
C A P I T A L A S S E T A N A L Y S I S	Human and Social Capital		
	Measured assets		Variables
	Living standards	Human well-being	1. Access to clean water 2. Access to food 3. Access to shelters 4. Access to healthcare 5. Access to education 6. Access to social services
		Employment and economic development	7. Creation of employment opportunities (in agriculture, eco-tourism and natural resources management) 8. New jobs 9. Community income 10. Alternative income opportunities
		Social equity and inclusion	11. Equitable distribution of benefits of ecosystem services and inclusiveness
		Long-term sustainability	12. Local community's resilience
	Access to social services	Capacity building	13. Empowerment of the local community
		Participatory process	14. Involvement of local communities in project design, implementation, and monitoring.

CAPITAL ASSET ANALYSIS	Institutional Capital	
	Measured assets	Variables
	Community control over natural resource use	15. Local community's control over area's land use and management of natural resources 16. Involvement of local NGOs
	Organisations' accountability and transparency	17. Organisations' accountability and transparency in operations, including financial management and decision-making
	Legal and regulatory measures	18. Compliance with environmental laws, community rights, and project sustainability goals
	Control of decentralised administration over fund disbursement and contract awards	19. Local administration transparency and accountability in handling funds and contracts
	Financial Capital	
	Measured assets	Variables
	Financial Capital	20. Household's income 21. Material wealth

- **Definition of variables relevant to opportunities and threats**

Regarding the definition of the variables to be used for the **external components** of the SWOT, namely **opportunities and threats**, it was not possible to identify specific opportunities and threats based on the survey results, nor to extract variables in the same way as done for the internal components. Despite the framework covering aspects related to the implementation context of the PES scheme, we deemed it necessary to adapt the methodology to the SWOT purpose.

This is due to both opportunities and threats described in the framework developed in D2.1 and the D2.2 deliverable do not solely pertain to the external dimension of the PES scheme. Nonetheless, we have taken into account the insights and findings from the previous deliverables to guide the analysis. To this end, the first step was to determine the framework from which we would extract the information to understand which external factors may have contributed or not to the implementation of the PES scheme. In developing an individual SWOT analysis for each case study, **it was essential to clarify the local implementation context** in order to fully understand the dynamics and create an analysis that took specific characteristics into account. This led us to reflect on the following key questions, guided by the PESTEL-inspired approach:

1. **Geographical factors:** In which region was the case study conducted? Is the area (i.e., the analysed site within the project's administrative boundary) predominantly rural, urban or a mix? How does geography influence local dynamics (e.g., accessibility, trade or land use)?
2. **Demographic factors:** What are the population characteristics of the area (e.g., age distribution, density, etc.)? Is the area densely populated or is it sparsely inhabited? How do these demographic aspects affect the implementation of local projects or policies?
3. **Political factors:** Does the area frequently experience political turnover or institutional instability? Are political structures supportive of long-term environmental policies or do changes in leadership cause disruptions?
4. **Governance factors:** How effective is coordination between different levels of government in the area? Is there strong local governance or are decisions highly centralised? Is the area able to make independent decisions on environmental matters? How does governance influence environmental management and project implementation?

5. **Economic factors:** Is the area economically developed? Does it serve as a hub for innovation, particularly in technology or sustainable finance? What is the economic capacity to fund and sustain environmental initiatives?
6. **Technological factors:** What level of technological advancement is present in the area? Is there innovation in fields such as sustainable technology or digital tools to support environmental efforts? How does access to technology influence the efficiency of local initiatives?
7. **Social factors:** What is the general education level in the area? Is there widespread awareness of environmental and sustainability issues? How do social factors such as community engagement or urbanisation impact local environmental efforts?
8. **Environmental factors:** Is the area significantly impacted by climate change or other environmental stressors? How vulnerable are local ecosystems to issues like extreme weather, deforestation or biodiversity loss? How does the environmental context shape the area's sustainability priorities?

The result of this strategy is a qualitative analysis of each the context in which the PES scheme is applied. Instead of providing a detailed overview, these considerations helped to identify the opportunities and threats that could influence the scheme's implementation in the case study.

2.3 Individual SWOT analysis of selected case studies

This section will explain how the above-mentioned variables were applied in the individual SWOT analysis, detailing the criteria used to associate them with the SWOT components. The goal of the individual analysis is to highlight the strengths, weaknesses, opportunities, and threats of each of the nine case studies considered, analysing both the responses collected through the survey and interviews administered in activity 2.2 and the local context in which the PES scheme has been implemented. Specifically, the **responses received from the survey and the interviews carried out** were primarily used to identify the **internal factors** of the SWOT, namely strengths and weaknesses. Thanks to the responses, it was possible to provide an accurate evaluation of the positive and negative impacts that the PES scheme had on the variables listed in Table 4. In our analysis, we consider a positive impact, and therefore a strength of the PES scheme, the variables that were rated between 4 and 5 on the Likert scale, while variables in the framework that received a score between 1 and 3 were considered as a negative impact and thus a weakness of the PES scheme. We decided to consider a value of 3 as a negative value since it represents a neutral judgement, indicating that there have been no positive impacts on the variable in question or that if a positive impact occurred it was not perceived by the expert. In other words, **for this SWOT analysis, we are considering the absence (and/or perception) of positive impacts as weaknesses.**

This approach has been used to fill out the matrices in Chapter 3.1. In order to streamline the development of the SWOT and enhance its readability, we have determined that if the variables within an asset of Table 4 are uniformly evaluated (either all positively or all negatively), the entire asset is directly included in the SWOT matrix. However, if they are not consistently evaluated, the following approach was used:

- If only one variable within the asset has been evaluated differently from the others, it was placed individually in the relevant quadrant.
- If more than one variable has been evaluated differently, the name of the entire asset was listed in the quadrant, with the respective variables indicated in parentheses.

As for the **external factors** of the SWOT, which pertain to the environment in which the PES scheme was implemented, we aimed to identify key characteristics of the **local contexts across the nine case studies**. In particular, we sought to contextualise the application of the PES scheme by considering factors such as geographical location, demographic features, technological advancement, level of environmental awareness and education, economic and social development, political and governance frameworks, and potential risks the area may face due to climate change. To avoid overburdening the SWOT with an excessive number of variables, the factors related to the local implementation context of the scheme were included in the matrix by referencing the relevant categories (for instance, geographical and demographic, political, economic and technological, social and environmental - as referred above).

2.4 Cross-case SWOT analysis

This SWOT analysis provides a macro-level assessment of multiple case studies, highlighting the strengths, weaknesses, opportunities, and threats that collectively influence the effectiveness and sustainability of PES schemes across different contexts. By examining shared and contrasting elements among the selected case studies, this analysis offers insights into overall trends, recurring challenges, and unique advantages within PES schemes. This approach goal was to understand how these cases complement each other, in order to identify scalable best practices, and address systemic barriers that may limit the impact of PES initiatives. This cross-case analysis can support stakeholders to make informed decisions regarding policy, management, and resource allocation, maximising the social, environmental, and economic benefits of ecosystem service programmes on a larger scale. For this purpose, building on individual SWOT analysis, a cross-case SWOT was performed following these methodological steps:

1. We analysed which group of variables (Table 4) were the most frequently repeated for each component of the SWOT, considering cases where an asset appeared in at least **5 out of the nine case studies**.
2. Maintaining a quantitative approach for the internal components of the SWOT (strengths and weaknesses), we used the Internal Factor Evaluation Matrix to rank the variables.
3. For opportunities and threats, we conducted a qualitative analysis, summarising which categories of variables were repeated in at least 5 of the nine case studies.

To streamline the analysis, only the main categories of variables were counted, excluding specific details indicated in parentheses. **A single positive or negative variable was not considered representative of the entire asset category.** However, particularly important individual variables were still highlighted qualitatively in the text.

2.4.1 Internal Factors Evaluation Matrix (IFE)

The IFE Matrix is a strategy-formulation tool which summarises and evaluates the major strengths and weaknesses in the functional areas of a business or project, and it also provides a basis for identifying and evaluating relationships among those areas. Developing an IFE Matrix involves intuitive judgement, so it should not be seen as an all-powerful technique. A thorough understanding of the factors included is more important than the actual numbers (David, F. R. 2011). It can be developed following the steps below:

1. List key internal factors. Use a total of from 10 to 20 internal factors, including both strengths and weaknesses.
2. Assign a weight that ranges from 0.0 (not important) to 1.0 (all-important) to each factor. The weight assigned to a given factor indicates the relative importance of the factor to being successful in the project. Regardless of whether a key factor is an internal strength or weakness, factors considered to have the greatest effect on organisational performance should be assigned the highest weights. The sum of all weights must equal 1.0.
3. Assign a 1-to-4 rating to each factor to indicate whether that factor represents a major weakness (rating = 1), a minor weakness (rating = 2), a minor strength (rating = 3), or a major strength (rating = 4). Note that strengths must receive a 3 or 4 rating and weaknesses must receive a 1 or 2 rating.
4. Multiply each factor's weight by its rating to determine a weighted score for each variable.
5. Rank variables based on their final score.

When a key internal factor is both a strength and a weakness, the factor should be included twice in the IFE Matrix, and a weight and rating should be assigned to each statement.

3. SWOT analysis results

3.1 Individual SWOT analysis of selected case studies

The individual SWOT analyses of the nine case studies examined in this document are presented below, represented in nine different matrices. Each analysis is preceded by a description of the local context based on the criteria outlined in section X and followed by a comprehensive overview of all SWOT components.

3.1.1 Austria: Water Protection Zone of the City Waidhofen/Ybbs

- **Local context**

Waidhofen an der Ybbs is a city located in the scenic landscape of Lower Austria, characterised by its rich natural resources, including abundant forests and the flowing Ybbs River, crucial to the region's hydrology. The municipality prioritises the protection of its abundant forests and waterways, vital for biodiversity and water quality, through diverse conservation initiatives and sustainable land management practices, ensuring that natural resources remain viable for future generations. For this reason, Waidhofen an der Ybbs has developed particularly a comprehensive **drinking water protective initiative** to safeguard the high-quality spring water that serves its residents (Magistrat Waidhofen a/d Ybbs, n.d.).

The region operates within Austria's federal structure, which grants significant **autonomy to municipalities** in implementing local policies. This **decentralised system** enables the local government to tailor environmental regulations to meet the specific needs of the community (European Committee of the Regions, n.d.). Local authorities actively promote **sustainability and environmental protection**, aligning their initiatives with national objectives aimed at combating climate change and preserving natural resources. This context fosters collaboration among different stakeholders, including municipal authorities, businesses, and community members, ensuring that environmental policies are both effective and widely supported. Regular consultations and public meetings enhance **transparency** and allow residents to engage in decision-making processes that affect their environment (Federal Ministry Republic of Austria, n.d.).

The **region's economy is diverse**, with strong contributions from the manufacturing, mining, energy supply, and construction sectors, alongside traditional practices in forestry, agriculture and tourism. These sectors provide significant opportunities for residents while supporting local ecosystems. A focus on **sustainable economic practices** ensures that economic growth does not compromise environmental health. Moreover, local businesses increasingly recognize sustainability as a competitive advantage, fostering an economy that values environmental responsibility as well as profitability (Land Niederösterreich, 2023).

Even though Waidhofen an der Ybbs may not be a major centre for innovation, the municipality effectively employs **modern ecological management techniques** to monitor and protect its natural resources. Tools such as Geographic Information Systems (GIS) and water quality monitoring systems are utilised to enhance the management of water resources and forests. These technologies enable local authorities to make informed decisions based on accurate data, improving environmental outcomes and resource management practices (Federal Ministry Republic of Austria, n.d.).

Socially, the community is characterised by strong **civic engagement and participation** in local initiatives, contributing to environmental conservation and community development. **Educational programmes and public awareness** campaigns are crucial in fostering understanding of environmental issues and encouraging sustainable practices (Federal Ministry Republic of Austria, n.d.-a). This social cohesion enhances the community's ability to address environmental challenges and promotes a culture of stewardship towards natural resources.

Table 5. Water Protection Zone of the City Waidhofen/Ybbs's individual SWOT analysis

INTERNAL VARIABLES OF PES SCHEME		
Measured asset	Strengths	Weaknesses
Financial and funding arrangements of the implemented PES scheme	Financial and funding arrangements of the implemented PES scheme (reliability of primary funding sources, diversification of funding sources, efficiency of the financial mechanisms within the PES schemes, sustainability of the funding sources , responsiveness of PES scheme to financial and funding challenges).	Presence of Innovative financial tools or approach within the project.
Human and Social Capital	• Access to clean water. • Employment and economic development (creation of employment opportunities in natural resources management and ecotourism, alternative income opportunities). • Social equity and inclusion. • Long-term sustainability. • Capacity building. • Participatory process.	• Human wellbeing (access to food, shelters, education, healthcare, social services). • Employment and economic development (creation of employment opportunities in agriculture, new jobs, community income).
Institutional Capital	• Legal and regulatory measures. • Control of decentralised administration over fund disbursement and contract awards.	• Community control over natural resource-use. • Organisations' accountability and transparency.
Financial Capital		Financial capital
EXTERNAL VARIABLES OF THE CONTEXT		
Measured asset	Opportunities	Threats
Geographical factors	Abundant natural resources provide a strong foundation for conservation and eco-tourism.	
Demographic factors	Active civic engagement offers chances for community-led sustainability initiatives.	An ageing population may result in reduced participation in long-term environmental projects.
Political factors	Local government autonomy allows tailored environmental regulations that align with community priorities.	Rising far-right political parties can represent a burden for the implementation of environmental policies.
Governance factors		Potential gaps in institutional capacity could affect effective implementation of environmental initiatives.
Economic factors	Growing interest in sustainable practices among local businesses can improve competitiveness and open space for new opportunities.	Limited investment from businesses in innovative sustainability projects may slow progress.
Technological factors	Usage of modern tools (e.g., GIS) enhances resource monitoring and decision-making.	
Social factors		Economic pressures , such as income inequality, may lower public focus on environmental issues.

Environmental factors		Climate change impacts could threaten water quality and biodiversity.
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Overview on strengths and weakness

A key strength of this project lies in its positive impact on water regulation, securing a steady and **clean water supply** for the community and supporting the area's resilience to climate variability. The initiative has successfully fostered a collaborative framework between the city's water works and local forest owners, ensuring a shared commitment to forest management practices that safeguard and enhance water resources.

The PES scheme has contributed to the area's **economic development** by creating space for employment opportunities in eco-tourism and natural resource management. While this potential can be further explored, it has already had a positive impact by helping the local economy expand beyond traditional sectors, providing **alternative income sources** and strengthening economic resilience. Furthermore, the initiative's inclusive approach ensures **ES benefits are distributed equitably** among the involved forest owners, promoting social equity. This fair distribution fosters environmental justice², as well as a sense of shared purpose and mutual investment in sustainable outcomes across the community. Another significant strength of the project is its influence on **community empowerment** through capacity-building initiatives, which strengthens community's skills and involvement in the project, leading to **participatory processes**. Through community engagement in decision-making the project cultivates a sense of ownership and trust, crucial for **long-term sustainability**. Moreover, the scheme's **compliance to environmental regulations** and guidelines provides added legitimacy, reassuring forest management practices aligned with both legal requirements and sustainability targets.

Financially, the PES has established a stable framework backed by **diverse funding sources**, primarily through local water price and EU funding (mostly INTERREG SEE and INTERREG CE), therefore responding well to financial and funding challenges. This combination of regional and EU support ensures the financial reliability and sustainability of the project, allowing for continued investment in ES without an over-reliance on any single source. The local administration plays a key role in handling funds with transparency and accountability, which adds credibility to the initiative and builds local trust.

Despite plenty of positive points, the project faces some limitations such as its **low influence on other dimensions of community well-being** - access to food, education, healthcare, and social services, remains limited. **Economic benefits**, although present, have been modest, with neither new jobs created in traditional sectors like agriculture nor significant improvements in household income. This **limited contribution to financial capital** in the community suggests potential areas for growth if the project aims to push broader economic resilience.

Another area of concern is the degree of **community control over natural resource use**, which can be challenging both to clearly define and to maintain consistently over time. Strengthening local authority in resource management could enhance the project's alignment with community needs and priorities. Additionally, the scheme has yet to fully **integrate innovative financial instruments** that could increase funding adaptability and resilience to economic fluctuations. While the existing financial structure is stable, the limited use of flexible financial tools may restrict the PES scheme's capacity to adapt to future financial demands or to expand its impact. The scenario can be aggravated by the fact there are **low levels of transparency and accountability** displayed by some of the participating organisations, particularly in financial and decision-making processes. This lack of transparency can present challenges in building trust among stakeholders, which is essential for maintaining the project's credibility and support in the long-term.

² Environmental justice ensures fair treatment and meaningful involvement of all people in decisions that affect health and the environment, regardless of income, race, or background. It aims to protect communities from disproportionate risks and promote equitable access to a healthy, sustainable environment. This includes addressing barriers to participation and encouraging input from those most impacted by government actions (Environmental Protection Agency, 2024).

Overview on opportunities and threats

The region counts on rich natural resources and a strong commitment to sustainable development, creating a solid foundation for environmental initiatives. The municipality's emphasis on protecting its abundant forests and waterways has established it as a leader in conservation efforts within Lower Austria. The surrounding landscapes and the flowing Ybbs River provide significant **opportunities for eco-tourism and biodiversity conservation**, enhancing its appeal as a destination for environmentally aware visitors.

The **local government's autonomy** allows tailored policies that directly address community needs, fostering innovative approaches to sustainability. Initiatives aimed at safeguarding high-quality drinking water and promoting sustainable land management highlight Waidhofen's focus on environmental stewardship. In addition, **growing awareness among local businesses** regarding sustainability can provide further opportunities for economic growth tied to eco-friendly practices, especially alongside **technological advancements**. Tools such as GIS and water quality monitoring systems can facilitate effective resource management and enhance decision-making processes.

However, some threats deserve attention, particularly in terms of **governance coordination and institutional capacity**, as effective collaboration among local, regional and national authorities is crucial for the successful implementation of environmental policies. Without proper communication and cooperation, the potential for fragmented approaches may affect progress in addressing complex ecological challenges. Another risk is the **region's vulnerability to climate change** that poses significant risks, particularly concerning water quality and biodiversity, which could compromise the effectiveness of conservation efforts and sustainable practices. Moreover, while strong civic engagement is a local community trait, an ageing population may **limit active participation in long-term projects**, weakening community-driven initiatives. The perception that the government should be shouldering the payment - especially considering social pressures - might represent a limit to participation.

Lastly, the local economy's reliance on small-scale tourism, forestry and agriculture can create vulnerabilities, particularly if **market fluctuations** disrupt the financial stability of businesses committed to sustainable practices. **Economic pressures** (e.g., income inequality), could also lower public focus on environmental issues, challenging the municipality's sustainability goals.

3.1.2 Belgium: Eerste Vlaamse Houtpark (First Flemish Timber Park)

- **Local context**

Belgium consists of three main communities (the Flemish Community, the French Community and the German-speaking Community) and three regions (the Flemish Region, the Brussels Capital Region and the Walloon Region). Each region has their **own political and administrative policy structures** (parliaments and governments) with increasingly specifically allocated competencies in the areas of economics, employment, agriculture, energy, transportation (except for state railways), environment, trade, urban planning, supervision of provinces, municipalities, and inter-municipal companies. Flanders, covering 13,625 km², **is one of the most densely populated regions globally**, with 492 inhabitants per km².

It has a strong economy characterised by **high employment rates** ([76.8% in 2023](#)) and low unemployment rate ([3.3% in 2023](#)). As a highly knowledge-intensive region, Flanders is known for its **high levels of innovation and human capital**. Flanders is convinced that technology, innovation and data are crucial for its future, which is why the Government of Flanders is launching 'Flanders Technology & Innovation' (FTI) in 2024. FTI will put Flanders on the map as a global innovation leader and boost anything related to technology. **Environmental technology and sustainability** are among the targeted sectors of Flanders Government, aiming to excel in cleantech innovation across sectors like energy, circular economy, and sustainable agriculture Invest in Flanders, n.d.). The region boasts high patent activity in clean technologies, strong collaboration between research institutes and businesses, and government support. Flanders is known for pioneering projects in landfill mining, energy storage, sustainable chemicals, and biobased materials.

To better understand the context surrounding timber and wood production in Flanders, as well as the relevant case study, it is worth examining the role that forests and the timber market play in the region. In Flanders, **forests cover only about 11% of the total area**. Forests are often originating from plantations on former heath lands and wet grasslands: pine and poplar plantations make up almost half of the forest area, while only 1/3 of the forest area consists of broadleaved stands of indigenous species. **In Flanders, forests are part of an urbanised and industrialised region**. In this context, forest goods and services are mainly related to socio-cultural and ecological services (Vandekerckhove, K. 2013). Flemish wood biomass primarily comes from forestry, but also as a by-product of various industries. The wood industry's role in processing wood within the Flemish economy is significant, with a substantial amount of wood biomass being exported, representing 30% of total inflows. In this sense, **Flanders plays the role of a trade hub for wood**, leveraging its strategic geographical location: through the Ports of Antwerp, Ghent, and Zeebrugge, Flanders attracts major international biomass streams, including wood products (Ce-center, 2019).

From a climate-environmental perspective, the Flemish government has primarily focused on climate change mitigation, promoting plans to reduce greenhouse gas emissions in alignment with the European Green Deal. Nevertheless, in recent years, Flanders has suffered from droughts and floods. The high population density, urbanisation, and significant changes in water management make Flanders vulnerable to water scarcity and disruptions. **The challenge for Flemish policy is to create more space for natural processes**. With the publication of the [2023 Nature Report](#), **the urgency of nature restoration is highlighted**, emphasising the protection of ecosystem services, integrating biodiversity policies across different sectors.

Table 6. First Flemish Timber Park individual SWOT analysis

INTERNAL VARIABLES OF PES SCHEME		
Measured asset	Strengths	Weaknesses
Financial and funding arrangements of the implemented PES scheme	Financial and funding arrangements of the implemented PES scheme (reliability of primary funding sources , sustainability of the funding sources).	Financial and funding arrangements of the implemented PES scheme (diversification of funding sources , efficiency of the financial mechanisms within the PES schemes, presence of innovative financial tools or approaches within the project, responsiveness of PES scheme to financial and funding challenges).
Human and Social Capital	• Employment and economic development (creation of employment opportunities in natural resources management, community income, alternative income opportunities). • Social equity and inclusion. • Long-term sustainability. • Participatory process.	• Human well-being. • Employment and economic development (creation of employment opportunities in agriculture and ecotourism, new jobs). • Capacity building.
Institutional Capital	• Local community's control over area's land use and management of natural resources. • Organisations' accountability and transparency. • Control of decentralised administration over fund disbursement and contract awards.	• Legal and regulatory measures • Involvement of local NGOs.
Financial Capital		Financial capital

EXTERNAL VARIABLES OF THE CONTEXT		
Measured asset	Opportunities	Threats
Geographical factors	Strategic location that can attract foreign investments.	
Demographic factors		High population density creates challenges in natural resources management and land-use.
Political factors	Flanders have their own government and parliament , together with broad competence and autonomy on the environment.	
Governance factors		The lack of integration of biodiversity policies into sectoral policies can hinder progress toward nature protection and undermine efforts to foster public-private collaboration for biodiversity conservation.
Economic factors	Low unemployment rates and economic dynamism, driven by widespread prosperity, can encourage investments.	The wood (and biomass) market is largely connected to exports . This aspect can create barriers to the sustainable management of raw materials.
Technological factors	Technology, innovation and data are key to Flemish government, striving for excellence in the environmental sector.	
Social factors	Social environment shaped by a strong commitment to education, social wellbeing and inclusion. Strong push towards sustainability and green living (i.e. community-driven initiatives like cycling-friendly cities).	
Environmental factors		Significant vulnerability from water scarcity and disruptions .

Overview on strengths and weakness

The First Flemish Timber Park PES scheme aims at the valorization of high quality wood and it presents a robust framework for [fostering sustainable natural resource management](#) within local communities. The scheme aims to enhance the value of local timber while addressing the supply shortage caused by exports to Asia. It promotes a short supply chain approach, ensuring that timber quality is maintained from environmental, social, and economic perspectives. The timber sold is a byproduct of ecological woodland management practices that prioritise biodiversity, natural regeneration, and the removal of invasive species. This sustainable approach ensures that local timber processors, who face shortages due to exports, can access high-quality logs.

Among its strengths, the initiative contributes to **increasing community income and providing alternative sources of revenue** which, in this case, is the revenue from the sale of the wood. This empowerment is bolstered by the local community's control over land use and resource management, which enhances accountability and transparency in organisational operations, including financial management and decision-making. The participatory nature of the process ensures social equity and inclusion, further supporting long-term sustainability.

However, the **empowerment of the local community** has proven to be weak. Other challenges remain, particularly regarding improving human well-being and financial and funding arrangements such as the need to diversify funding sources and improving the efficiency of financial mechanisms within the PES scheme.

Overview on opportunities and threats

Flanders presents a range of opportunities and threats that can impact the implementation of the PES scheme. On the one hand, the presence of its own government and parliament grants Flanders **significant autonomy and competencies in environmental matters**, allowing for tailored approaches to sustainability and forest management. This can facilitate the planning of specific projects by focusing on a smaller territory, with needs and objectives tailored to the region of interest.

Economic factors also play a positive role, as low unemployment rates and economic dynamism can create a fertile environment for the creation of new jobs and investments in the environmental sector. As a region known for its strategic positioning in biomass flows, Flanders could also attract foreign investments in sustainable projects to be implemented within its territory.

Furthermore, the Flemish government's emphasis on **technology, innovation, and data integrates** very well with the introduction of sustainable finance tools such as PES, which can benefit from the use of technology to facilitate transactions, monitor project activities, and assess ecosystem services. However, these opportunities are counterbalanced by notable threats.

Environmental vulnerabilities, particularly regarding water scarcity and disruptions, pose significant challenges to forest management together with **high population density** that complicates the management of natural resources. In particular, there is a need to **further integrate biodiversity policies into sectoral and land management policies**, promoting a holistic vision that combines human activities (primarily those related to raw material management) with the protection of ecosystems and ecosystem services.

3.1.3 Bulgaria: Rusenski Lom Nature Park

- **Local context**

Rusenski Lom Nature Park is a protected area in the Ivanovo Municipality, in Ruse Province, northern Bulgaria. The Park covers an area of 3,408 hectares and is located in the canyon-like valley of the Rusenski Lom river, the last major tributary of the Danube in Bulgaria, before it spills into the Black Sea. The area was designated a nature park in the 1970s due to its unique and complex canyon relief in the Danube river plain, which is home to a rich diversity of flora and fauna. The area's flat terrain allows easy access to most parts of the park, which has likely contributed to the **significant increase in tourist flows**.

The municipality provides a **strategic location for agriculture and ecotourism**. As of 2023, Ivanovo Municipality has just over 7,000 inhabitants, a decrease from nearly 10,000 in the previous decade. However, it greatly benefits from tourist flows to the Rusenski Lom National Park, which attracts around 10,000 visitors annually (FAO, 2013). **Governance** in the municipality reflects **centralised decision-making system**: local governments have limited autonomy in environmental decisions, relying significantly on national strategies and European Union funding for larger initiatives. EU and national projects are instrumental in Ivanovo's environmental management, helping to foster sustainable practices despite limited local resources. Thanks to European funds, **recent improvements in digital and sustainable agricultural technology** have also been introduced in the region (Ma, L., 2024).

The Park's proximity to the Danube River enriches it with typical wetland habitats, but also makes it highly vulnerable to **climate change**. Projected impacts include decreases in river flows across Bulgaria's major rivers, affecting water availability. In addition to reduced precipitation, changes in regional hydrology can be associated with risk of extreme events such as droughts and flooding (Ministry of Environment and Water, 2020). Climate models suggest that changes in regional precipitation will impact existing patterns of river flow, increasing peak discharge rates for major catchments such as the Danube in Bulgaria's northern border (IPCC, 2021).

At the same time, **one of the most significant river ecosystem restoration projects in Europe is underway in this area**: the Lower Danube Green Corridor (EIB, 2023). This project, focusing on floodplain restoration

for flood protection in Romania and Bulgaria, constitutes the largest area dedicated to nature-based solutions across Europe, covering 11,590 km².

It is worth mentioning that the Lower Danube in Bulgaria is a rare, free-flowing river stretch in Europe, featuring critical ecosystems such as floodplain forests, oxbow lakes, and wetlands that are vital for biodiversity, many of which are protected under the Ramsar Convention and EU Habitat Directive. The region's unique ecological value has attracted nature-focused investments, **leading Bulgaria to experiment with PES schemes, which are supported by both national and private entities** (WWF, 2024).

In Bulgaria, while international and European frameworks are indeed shaping policies and influencing new generations towards environmental awareness, significant social and economic challenges issues are prioritised over environmental concerns. This reflects a societal landscape where **awareness of ecological matters is still developing**. In fact, biomass, particularly wood, is central to Bulgaria's energy issues, as many households depend on wood for heating due to delays in decarbonising the energy sector and the low energy efficiency of homes. This dependence has led to significant **energy poverty**, with approximately 20.9% of households unable to maintain adequate warmth. The demand for biomass in heating is also increasing pressure on forests, leading to **widespread illegal harvesting practices**. In 2023, latest estimates show that illegal logging amounts to 400 thousand cubic metres (CSD, 2024).

From a political and governance perspective, the country faces deep-rooted challenges with **institutional and governance weaknesses** and issues of state capture by vested interests, which discourage private investment. This suppresses productivity and private sector growth, while also resulting in inefficient public services. **A rapid decline of the population - one of the worst globally - also limits the country's economic potential** while increasing pressure on public services (WB, 2024).

Table 7. Rusenski Lom National Park individual SWOT analysis

INTERNAL VARIABLES OF PES SCHEME		
Measured asset	Strengths	Weaknesses
Financial and funding arrangements of the implemented PES scheme	Financial and funding arrangements of the implemented PES scheme (reliability of primary funding sources, diversification of funding sources, efficiency of the financial mechanisms within the PES schemes, presence of innovative financial tools or approaches within the project).	Financial and funding arrangements of the implemented PES scheme (sustainability of the funding sources, responsiveness of PES scheme to financial and funding challenges).
Human and Social Capital	- Human wellbeing (access to education and social services). Social equity and inclusion. Capacity building. Participatory process.	- Human wellbeing (access to clean water, food, shelters, healthcare). - Employment and economic development. - Long-term sustainability.
Institutional Capital	- Organisations' accountability and transparency. - Legal and regulatory measures. - Control of decentralised administration over fund disbursement and contract awards. - Involvement of local NGOs.	Local community's control over area's land use and management of natural resources.
Financial Capital		Financial capital.

EXTERNAL VARIABLES OF THE CONTEXT		
Measured asset	Opportunities	Threats
Geographical factors	The proximity to the Danube makes the Park a favourable context for conservation initiatives.	
Demographic factors	The limited human pressure can benefit projects aimed at nature conservation.	The smaller, ageing population may limit available labour and engagement in long-term projects.
Political factors		
Governance factors		Institutional weakness disincentives private sector's growth and limits private sector's potential which can lead to disincentives in investing in nature.
Economic factors	Bulgaria has already experienced various implementations of PES schemes (public and private).	Lack of dynamic businesses willing to invest significantly in nature can discourage PES scheme implementation + forest management bodies currently rely solely on timber sales for income. If they begin to evaluate and monetize other ecosystem services provided by forests, over time, the value of timber may diminish as these alternative revenue streams become more significant.
Technological factors	Recent advancements in green technologies and sustainable agriculture tech.	
Social factors	Strategies to combat illegal logging can leverage improvements in forest management leading to innovative tools such as PES schemes.	Primary social issues such as energy poverty and income inequality can disincentive the attention from environmental issues.
Environmental factors	The area has a unique natural richness which offers many opportunities for the implementation (and investment) of/in NbS.	The vulnerability caused by the proximity to the Danube River (hotspot for climate change) may hinder the implementation of projects.

Overview on strengths and weakness

The Rusenski Lom National Park PES Scheme aims to enhance cultural ecosystem services by channeling all revenue from the sale of promotional materials by tourism businesses towards improving tourist infrastructure. While the scheme didn't affect access to food, water, shelter, and healthcare, its more **direct influence is on education and social services**. As it was a small-scale project, the **participatory process** and engagement among the involved stakeholders were managed effectively. The local community received extensive training on how the PES scheme operates, and there was collaboration from various actors, including tourism stakeholders, the Park Directorate, protected area managers, the WWF operating in the region, and local NGOs. This cooperation aimed to ensure compliance with the relevant legal framework and to achieve the highest possible level of **transparency**.

The scheme has not produced observable impacts on the economic development of the area, as it **has not created new jobs or employment opportunities**. This is mainly attributable to the small scale of the project, which, if expanded, could generate benefits primarily in the field of natural resource management. In general, the scheme has not had significant impacts on the economic development of the area, as it is a voluntary initiative that did not impose any conditionality on the actors within the tourism sector. The voluntary nature of

the scheme has also made it challenging to ensure long term resilience of the local community and the **long-term sustainability** of the project, which has already concluded. As for **community control over the area**, local communities had significant ease in deciding which tourism infrastructures to fund and where to place them. However, the overall management of natural resources remains in the hands of the Park Directorate.

Overview on opportunities and threats

The strategic location of the Rusenski Lom National Park near the Danube River presents a significant opportunity for nature conservation initiatives, particularly in **implementing Nature-based Solutions (NbS)** and due to the limited human pressure, this area enhances projects that benefit from its unique natural richness. Additionally, Bulgaria's experience with PES schemes and the renewed support by European institutions indicates a promising avenue for funding conservation efforts³.

However, the **vulnerability of the region** to climate change, particularly due to the increasing risks associated with the Danube, may impede the implementation of vital projects. A lack of dynamic businesses ready to invest significantly in ecological initiatives, poses a substantial barrier to the success of PES schemes. Bulgaria faces demographic challenges, including a declining population that limits the country's economic potential and human resources. Social issues such as energy poverty and income inequality can divert attention and resources away from environmental priorities.

3.1.4 France: Bourse des Arbres

• Local context

The Grand Est region, located in northeastern France, is characterised by a diverse landscape that includes urban centres like Strasbourg and Metz, as well as extensive rural areas. This mix of environments influences local dynamics significantly, facilitating trade and accessibility due to its proximity to major transport routes and borders with Germany, Luxembourg, and Belgium. The varied geography supports **agriculture, forestry, and tourism**, which are essential for local economies. Grand Est has a population of approximately 5.5 million, with a demographic distribution that includes both densely populated urban areas and sparsely inhabited rural regions. **The age distribution is slightly unbalanced towards older populations**, particularly in rural areas.

In France, regional authorities have **some degree of autonomy in environmental matters**, allowing them to pursue tailored strategies for sustainability. Generally, regional authorities are responsible for environmental protection, regional natural parks, regional land use planning, sustainable development and equal territories and biodiversity measures, among others. However, there **remains a degree of centralization, particularly concerning funding and regulatory frameworks** (CoR, n.d.).

As a major component of the region's DNA, industry is at the centre of the regional authorities' initiatives: business incubators, industrial zones, financial aid, education and training programmes, transport infrastructures are constantly being developed or adapted to the needs of the economy. This regional economic development strategy focuses on priority sectors (health, mobility, food, renewable energies, environmental technologies, etc.) as well as on the social and solidarity economy. The BAGE (Business Act Grand Est) focuses regional action on three drivers of transformation: **digital, environmental and industrial**. Its objective is to stimulate the transformation of the economy along these lines (Invest Eastern France, n.d.). The Grand Est Region has made **bioeconomy** one of the two pillars of its economic development. The goal is to make Grand Est one of the European leaders in bioeconomy by supporting the development and valorization of regional resources derived from photosynthesis (agricultural biomass, forestry, household

³ The European Investment Bank (EIB) and its European Investment Fund (EIF) are providing significant initiatives. This includes funding for infrastructure improvements, green transition efforts, and projects to financial support to bolster Bulgaria's economy and environment to boost innovation, jobs, and regional growth. Key areas include sustainable energy, urban renewal, and support for small and medium-sized enterprises (SMEs). These efforts aim to advance Bulgaria's environmental goals, increase economic resilience, and support EU climate targets. (EIB, 2024)

organic waste, etc.). With the expertise of agricultural, forestry, and viticultural producers, Grand Est possesses all the assets to become a reference territory in biomass production and transformation (Le Region Grand Est, n.d.).

The Grand Est has a **remarkable potential for marketed innovations and start-up creations** thanks to the presence of major academic and scientific centres. The regional area is covered by Technology Transfer Acceleration Companies (SATT), which have contributed to the creation of 36 companies and resulted in 143 technology transfers (licences) (Le Region Grand Est, n.d.).

Due to its geology and climatic influences, the Grand Est region of France presents a diversity of natural environments that contributes to the value of its heritage in terms of landscape, flora and fauna; **the region has 6 Regional Nature Parks and 25 Regional Nature Reserves**, which cover 15% of the territory (Plateforme pour la Biodiversité du Grand Est, 2024t). With nearly 80% of its territory used for agriculture or forestry purposes, the region ranks first in the national classification for its agricultural and agri-food production and for the number of jobs in the wood industry. **Restoring biodiversity within agricultural and forestry areas is therefore a key challenge.** The Grand Est region is facing a **variety of environmental threats**, including fragmentation of ecosystems, water and air pollution, artificialisation of natural areas, and the spread of invasive alien species. That's why the Region developed a Regional [Strategy for Biodiversity in July 2020](#), with the aim of improving territorial resilience and mitigating climate risks. The combination of this strategy with the regional plan for spatial planning, sustainable development and territorial equality (SRADDET), suggest a **growing awareness of environmental and sustainability issues** among the population.

Table 8. Bourse des Arbres individual SWOT analysis

INTERNAL VARIABLES OF PES SCHEME		
Measured asset	Strengths	Weaknesses
Financial and funding arrangements of the implemented PES scheme	Financial and funding arrangements (reliability of primary funding sources, efficiency of the financial mechanisms within the PES schemes, presence of innovative financial tools or approaches within the project, sustainability of the funding sources, responsiveness of PES scheme to financial and funding challenges).	Diversification of funding sources.
Human and Social Capital	- Human wellbeing. - Employment and economic development (creation of employment opportunities in natural resource management, agriculture and ecotourism, community income, alternative income opportunities). - Capacity building.	- New jobs. - Social equity and inclusion. - Participatory process.
Institutional Capital	- Local community's control over area's land use and management of natural resources. - Organisations' accountability and transparency - Legal and regulatory measures. - Control of decentralised administration over fund disbursement and contract awards.	Involvement of local NGOs.
Financial Capital	Material wealth.	Households' income.

EXTERNAL VARIABLES OF THE CONTEXT		
Measured asset	Opportunities	Threats
Geographical factors	Regional naturalistic richness encourages PES schemes implementations + proximity to major transport routes facilitates exchanges with foreign neighbouring countries.	
Demographic factors		The ageing population may limit available labour and engagement in long-term projects, especially in rural areas.
Political factors	A strong political commitment to top-tier strategic initiatives designed to promote private sector investments in nature and biodiversity. These initiatives include frameworks and certification schemes for carbon markets, whether mandatory or voluntary, such as the Label Bas Carbone and the European regulation on carbon credit certification, which can support future PES funding.	
Governance factors	The regional administration has a moderate autonomy on environmental issues, including competencies on regional park management.	
Economic factors	Advancements in bioeconomy sector can foster PES schemes implementations.	Sustainable or continuous funding availability .
Technological factors	Digital advancements can enhance the efficiency and the transparency of the online platform.	
Social factors	Educated population and growing awareness of sustainability can drive demand for PES and community involvement.	
Environmental factors		Increased extreme weather events due to climate change threaten unique biodiversity richness of the region.

Overview on strengths and weakness

The initiative promotes **human well-being supporting projects** in which access to clean water, food, shelters, healthcare, education and social services have been improved. It can indirectly create valuable **employment opportunities**, leading to increased community income and material wealth. By providing alternative income avenues, it empowers local communities to take control over land use and the management of natural resources. The local community is indeed the lead of the project generally. This empowerment is further enhanced by capacity-building efforts that ensure the long-term sustainability of community initiatives. The staff of the group of municipalities ("communauté de communes" in French) has significantly enhanced their skills in PES and now views it as a key financial tool. They believe it has the potential to replace public subsidies, offering fewer administrative constraints, higher funding rates, and greater alignment with local needs.

Organisations involved demonstrate accountability and transparency in their operations, especially in financial management and decision-making processes. Compliance with environmental laws and community rights underscores the project's commitment to sustainability goals. Additionally, the **local administration's transparency and accountability in managing funds and contracts** reinforce trust within the community. The presence of reliable primary funding sources, alongside innovative financial tools, enhances the efficiency of financial mechanisms within PES schemes. This responsiveness to financial challenges ensures that the PES scheme can adapt and thrive in changing circumstances.

Despite these strengths, certain weaknesses must be addressed. **Social equity and inclusion remain areas needing improvement**, as the **participatory process**: local associations or citizens engagement were not requested for the scheme implementation, but several services of the urban community were included and the project matches with the local transition plan that was built involving local people and actors. Moreover, the diversification of funding sources is necessary to mitigate risks associated with reliance on a limited number of financial streams, ensuring the sustainability of community initiatives in the long term. This may also be attributed to the fact that the project is relatively new and has not yet fully established its business models.

Overview on opportunities and threats

The region boasts an educated population with a growing awareness of sustainability issues. This heightened consciousness can drive demand for PES schemes, encouraging community involvement and participation in environmental projects.

At the European level, France has proven to be one of the leading countries in facilitating private sector investments in biodiversity and nature, as evidenced by the [UK-French Global Biodiversity Credits Roadmap launched in June 2023](#). Through this joint initiative, the two countries have pledged to support private sector biodiversity efforts and mobilize financing towards preventing biodiversity loss and conserving nature. This could be beneficial for the platform, since the experts mentioned the willingness to explore public funding opportunities.

Furthermore, advancements in the bioeconomy sector present a fertile ground for the implementation of PES schemes. As the local economy increasingly embraces sustainable practices, there is an opportunity to integrate PES into broader economic initiatives, fostering sustainable development and resource management.

Digital advancements play a crucial role in enhancing the efficiency and transparency of the Bourse des Arbres online platform. By leveraging technology, the initiative can streamline operations, improve user engagement, and facilitate better tracking of ecosystem services, thus promoting trust and participation among stakeholders.

The region's rich **natural landscape** provides a strong foundation for PES implementations. Additionally, its proximity to major transport routes facilitates exchanges with neighbouring countries, opening doors for collaboration, investment, and knowledge sharing across borders.

The **moderate autonomy** of the regional administration in managing environmental issues, including competencies related to regional parks, offers a supportive framework for advancing PES initiatives. This governance structure enables tailored approaches that can respond effectively to local needs and priorities.

Climate change presents a significant threat, with increased extreme weather events potentially jeopardising the unique biodiversity of the Grand Est region. These environmental challenges could undermine the very ecosystems that PES schemes aim to protect, necessitating proactive strategies to mitigate such risks. At the same time, climate change represents an opportunity to foster investment in nature protection with innovative financial tools such as PES schemes.

3.1.5 Germany: Waldaktie (Forest Shares)

- **Local context**

The German state of Mecklenburg-Western Pomerania, located in the northeast of the country, has a mostly rural landscape, with small towns, a low population density with an ageing population and a higher median age compared to other German states, and large stretches of forests, lakes, and coastline along the Baltic Sea.

The federal state has **24% forest cover**. 39% of the forest is privately owned, 46% by the federal state, and 10% by the communes. Presently, overall 18 climate forests exist across all parts of the federal state. **They cover an area of 120 ha**. This geography allows for significant agricultural activity and eco-tourism but also poses challenges for accessibility and infrastructure, influencing trade and land use (InnoForest EU).

Politically, Mecklenburg-Western Pomerania has a **stable government with consistent support for environmental policies**, though it remains partly dependent on federal initiatives for larger projects. The region can influence local environmental decisions but benefits from federal subsidies and policies to implement significant environmental or sustainability projects. **Regarding the forest sector, afforestation financed by the sale of Waldaktien is carried out according to the state forest law** (InnoForest EU). Governance in this state is centralised, with strong coordination between local and federal authorities.

The economy is largely based on **agriculture, tourism, and small-scale industries**, with limited access to advanced technological industries. However, there is growing interest in green innovation, supported by EU funds and federal incentives, particularly in renewable energy (e.g., wind and solar power). The economic structure, though not heavily industrialised, provides a stable foundation for eco-friendly projects and sustainable development efforts. While technological infrastructure is limited compared to urban centres, **the state is gradually incorporating sustainable technologies**, especially in the energy sector. Investments in digital tools and eco-friendly tech are modest but expanding, focusing on improving efficiency in environmental projects such as **forest management and water conservation**. Digitisation represents a major opportunity for the state: there are six digital innovation centres at the university locations of Greifswald, Rostock, Stralsund, Wismar, Neubrandenburg and the state capital Schwerin (State of Government of Mecklenburg-Vorpommern, 2024).

There is **moderate awareness of environmental issues** within the region, partly due to educational initiatives in schools and local campaigns. However, with a largely rural and ageing population, community engagement in environmental programmes can be limited. Social factors, including limited urbanisation, can enhance community support for conservation efforts.

As a region with coastal ecosystems and forested areas, Mecklenburg-Western Pomerania is vulnerable to climate change impacts, such as rising sea levels and extreme weather events. To implement the European Green deals, Mecklenburg-Vorpommern aims to coordinate its activities more closely with the regions in the Baltic Sea region and promote the democratic Baltic Sea region as a **model for the green transformation of the economy and society** through the development of the [Baltic Sea Strategy](#).

Table 9. Waldaktie (Forest Shares) individual SWOT analysis

INTERNAL VARIABLES OF PES SCHEME		
Measured asset	Strengths	Weaknesses
Financial and funding arrangements of the implemented PES scheme	Presence of innovative financial tools or approaches within the project.	Financial and funding arrangements (sustainability of the funding sources, responsiveness of PES scheme to financial and funding challenges, reliability of primary funding sources, diversification of funding

		sources, efficiency of the financial mechanisms within the PES schemes).
Human and Social Capital	- Human wellbeing (access to clean water, education and social services). Employment and economic development (creation of employment opportunities in natural resources management and ecotourism). - Social equity and inclusion. - Long term sustainability. Capacity building. Participatory process.	- Human wellbeing (access to food, shelters and healthcare). - Employment and economic development (creation of employment opportunities in agriculture, community income, new jobs, alternative income opportunities).
Institutional Capital	Organisations' accountability and transparency. - Involvement of local NGOs.	- Local community's control over area's land use and management of natural resources. Legal and regulatory measures. Control of decentralised administration over fund disbursement and contract awards.
Financial Capital		Financial capital
EXTERNAL VARIABLES OF THE CONTEXT		
Measured asset	Opportunities	Threats
Geographical factors	The strategic location offers opportunities for collaboration and cooperation for green transformation + territorial morphology encourages the development of nature conservation projects.	
Demographic factors		The smaller, ageing population may limit available labour and engagement in long-term projects.
Political factors	Institutional stability can encourage investments and the development of economic potential.	Rising far-right political parties can represent a burden for the implementation of environmental policies.
Governance factors	The federal state owns its competence in forest management and forest law.	
Economic factors	Favourable environment for economic growth in the green sector.	
Technological factors	Digitisation is a key governmental objective and it can foster efficiency in environmental projects.	
Social factors	Limited urbanisation , mean that there is a strong connection to nature, which can enhance community support for conservation efforts.	With a largely rural and ageing population , community engagement in environmental programs can be limited.
Environmental factors		The proximity to the Baltic sea makes the federal state vulnerable to SLR and extreme events.

Overview on strengths and weaknesses

One of the major strengths of the Waldaktie project is its holistic approach to resource conservation, with **positive impacts on public access to clean water, education, and social services**. This scheme not only prioritises environmental benefits but also **creates employment opportunities, particularly in natural resources management and ecotourism**, which bolster the local economy and foster community engagement. The transparent and accountable nature of the organisations involved, demonstrated through sound financial management and inclusive decision-making, reinforces trust among stakeholders and ensures the project's long-term viability. Additionally, Waldaktie is committed to social equity and inclusion, ensuring that diverse community voices are considered throughout the process. **The communication carried out on Waldaktie did improve the recognition of forests as a part of the natural balance**, succeeding, therefore, in positively changing some perspectives on the importance of forests as a natural heritage.

The scheme further strengthens community engagement by empowering local residents through capacity-building initiatives. The participatory process employed by Waldaktie actively involves local NGOs and community members, giving them a significant role in project planning and execution. The engagement and participation of the Academy for Sustainable Development (ANE) contributed to a new discussion between the stakeholders of Waldaktie, implementing new aspects of sustainability. Innovative financial tools are also a notable strength, providing novel approaches to funding and potentially increasing the project's adaptability.

On the contrary, there was **no direct impact on access to food, shelter, and healthcare**, potentially limiting the direct benefits for the local population. Employment growth and broader economic development may be hindered by a lack of resources within the local economy, restricting the scheme's potential to fully support community welfare and financial resilience. Additionally, there are issues regarding local control over land use and natural resource management, as the local communities did not belong to the management group.

The **sustainability of funding** is another pressing concern. The scheme's dependence on limited primary funding sources and the lack of diversified financial mechanisms leave it vulnerable to economic instability. There are questions around the reliability and responsiveness of the PES financial framework to address these funding challenges, which may threaten long-term sustainability. Moreover, ensuring local administration transparency and accountability in handling funds and contracts remains an area for improvement, as inefficiencies in financial management and potential compliance issues with environmental laws could negatively impact the project's integrity and objectives.

Overview on opportunities and threats

In the Waldaktie project, **geographical factors play a significant role**: the state's landscape is conducive to various nature conservation projects, as it has a predominantly rural character, with large forested areas and a great many lakes and rivers - not to mention its long Baltic Sea coastline.

The **social environment** of Mecklenburg-Western Pomerania, characterised by low urbanisation and a strong cultural connection to nature, provides fertile ground for community engagement in conservation efforts. The rural population's inherent closeness to nature can enhance community support. Social factors also pose a challenge. The largely rural, ageing population may have limited capacity for engagement in environmental programmes, potentially affecting the overall level of community participation.

In terms of **technological advancements**, the government's commitment to digital transformation presents opportunities for the project to increase operational efficiency. Digitization could streamline project management, monitoring, and reporting processes, allowing the Waldaktie initiative to enhance its impact on environmental preservation and resource management.

Governance in Mecklenburg-Western Pomerania is also supportive, with the federal state holding exclusive competence in forest management and forest law. This autonomy in environmental governance provides a favourable regulatory framework for implementing conservation projects. Coupled with the **political stability**

in the region, this stability fosters an environment where investments in sustainable development are encouraged, supporting economic growth within the green sector.

Economic conditions in Mecklenburg-Western Pomerania further bolster the potential for the Waldaktie project. The state's favourable economic environment for green initiatives provides room for growth in eco-tourism, conservation efforts, and other nature-based economies, making the project financially viable while promoting regional economic development.

Environmental factors add a layer of complexity, as Mecklenburg-Western Pomerania's proximity to the Baltic Sea makes it particularly vulnerable to sea-level rise (SLR) and extreme weather events.

3.1.6 Italy: BioClima Initiative

- **Local context**

The **Lombardy Region**, located in northern Italy, is one of the most dynamic and developed areas of the country, playing a central role in both the national and European economies. Lombardy is Italy's economic engine, generating about 22% of the national GDP. The region is home to numerous multinational corporations, small and medium-sized enterprises, and excels in the **manufacturing, financial, and service sectors**. Milan, its capital, is one of Europe's major economic and financial hubs, serving as a centre for innovation and start-ups. The region is **densely populated**, with an ageing demographic but a vibrant economy that supports a range of projects, although certain policies are impacted by population density and urban-rural divides.

The region has significant autonomy in environmental policymaking due to Italy's decentralised governance model, but **political turnover can still impact continuity in long-term environmental strategies**. Historically, Lombardy's political structures have been stable and generally supportive of development initiatives, which bolsters consistency in regional sustainability policies.

The region's **high standard** of living is supported by a solid network of infrastructure and social services, including excellent healthcare facilities, making it one of the most advanced regions in terms of overall well-being. **Education** is one of the pillars of Lombardy's growth, with internationally renowned universities which are at the forefront of research and technological innovation, attracting students and researchers from around the world. The region's secondary schools are considered among the best in Italy, with a strong emphasis on technical and scientific training to meet the demands of a rapidly evolving labour market.

Milan, in particular, has become a centre for **sustainable finance**, thanks to the presence of financial institutions that are increasingly investing in ESG (Environmental, Social, and Governance) projects and it is home to innovative initiatives such as [Forum per la Finanza Sostenibile](#). Banks and investment funds are channelling their capital into initiatives that promote sustainable development, with a particular focus on reducing environmental impact and promoting social inclusion. Lombardy is also a leader in **technological advancement**, with strong digital infrastructure and numerous research institutions focusing on sustainable technology, smart cities, and environmental data analytics.

In recent years, Lombardy has shown increasing attention to **environmental sustainability**. The region is committed to programs aimed at reducing emissions and promoting renewable energy, as well as encouraging sustainable mobility through the expansion of bike lanes and the improvement of public transport. The regional government and local administrations have launched projects related to the circular economy, waste management, and urban redevelopment to improve air quality and the overall quality of life for residents. Recently, the region has adopted a climate [change adaptation strategy](#) to address the frequent and intense occurrence of extreme events in the area. It has, in fact, reached the top of the list of Italian regions most affected by drought from 2020 to 2024.

Table 10. Bioclima Initiative individual SWOT analysis

INTERNAL VARIABLES OF PES SCHEME		
Measured asset	Strengths	Weaknesses
Financial and funding arrangements of the implemented PES scheme	Financial and funding arrangements (responsiveness of PES scheme to financial and funding challenges , reliability of primary funding sources, presence of innovative financial tools or approaches within the project, diversification of funding sources).	Financial and funding arrangements (sustainability of the funding sources , efficiency of the financial mechanisms within the PES schemes).
Human and Social Capital	• Employment and economic development (creation of employment opportunities in natural resources management, new jobs, community income). • Capacity building.	• Human well-being. • Employment and economic development (creation of employment opportunities in agriculture and ecotourism, alternative income opportunities). • Long-term sustainability. • Social equity and inclusion. • Participatory process.
Institutional Capital	• Organisations' accountability and transparency. • Legal and regulatory measures. • Control of decentralised administration over fund disbursement and contract awards.	Community control over natural resource-use.
Financial Capital		Financial Capital
EXTERNAL VARIABLES OF THE CONTEXT		
Measured asset	Opportunities	Threats
Geographical factors	The Lombardy Region is situated in the most economically prosperous area of Italy.	
Demographic factors		Intensive urbanisation and the overexploitation of natural resources can significantly hinder efforts for nature conservation.
Political factors		Political turnovers can hinder the longevity of projects + rising far-right political parties can represent a burden for the implementation of environmental policies.
Governance factors	Compared to other Italian regions, the coordination between the national government and the Lombardy Region is relatively efficient, ensuring a high level of transparency in project management.	Ensuring alignment across multiple governance levels can pose significant challenges, and excessive bureaucracy may lead to delays, impacting project timelines.
Economic factors	Lombardy region acts as the national financial engine and sustainable finance is a growing sector.	

Technological factors	Favourable environment for the adoption of modern technologies which can help with the data monitoring.	
Social factors	High living standards and sensibility towards sustainability issues that can increase demand for PES.	
Environmental factors		Lombardy region is mostly hit by drought which already represent a threat for biodiversity.

Overview on strengths and weakness

The BioClima PES scheme in Lombardy leverages employment creation within natural resource management directly benefits local communities by offering stable income and promoting skills in sustainable practices. **Transparency** within the scheme is reinforced by the involvement of multiple public and private organisations, each contributing to clear, accountable structures. The **certification backing the scheme plays a key role in maintaining high transparency standards**, even though private companies can meet requirements relatively easily. This multi-organizational approach, combined with certification, ensures a well-regulated framework that supports trustworthiness across the programme. The **financial resilience** of the project is bolstered by a diverse funding base, which includes dependable primary sources and innovative financing tools, enabling adaptable solutions to funding obstacles. Additionally, the dedicated staff managing funds from regional parks has significantly contributed to this financial robustness. **Capacity-building** initiatives empower communities, fostering long-term, skilled engagement in environmental conservation. In fact, one of the expected results of the project is having more than **150 people trained on responsible forest management** standards and procedures for verifying impacts on ecosystem services. With Bioclima, training sessions were also organised to improve participants' ability to access a variety of funding sources, including EU grants and private funds. Dissemination and awareness on the topic are granted through more than 20 field events open to citizens and businesses.

Despite these strengths, the BioClima PES scheme faces some challenges: first, **the scheme didn't measure impacts on human wellbeing** and, having its application in Lombardy where living standards are already high, it is difficult to define if an additional income for forest managers may result in improved living conditions. Secondly, the scheme **does not have so much impact on the economic system** to allow for a real better raise in households' income, though the Parks to whom the payment is directed are experiencing more economic availability which can result in job creation. **The scheme also struggles with participatory limitations**, as local control over resource management is often constrained: the resources are often controlled by the owner or the manager.

Overview on opportunities and threats

The rich and dynamic local context has played a key role in the successful implementation of the BioClima initiative. This is evidenced by the fact that the Lombardy Region itself serves as the primary funder of the project, which has in turn attracted private co-financing. This success is partly due to the **widespread awareness** of climate adaptation, biodiversity protection and ecosystem services valorization, even within the business sector, which has embraced the initiative's goals.

The **innovative economic and technological environment** of the Region certainly offers excellent opportunities in terms of adopting modern and advanced technologies for operations within PES schemes, as well as fostering a positive shift in social perspectives on the benefits provided by ecosystem services. However, there are also significant challenges that could threaten the progress made in Lombardy. **Climate change** poses an ongoing and escalating risk, potentially undermining environmental and economic resilience and creating critical conditions for tree planting. In the specific context of BioClima, climate change may lead

to diverse impacts across the 12 different activity zones. It's important to note that **several anthropogenic stress drivers** in Lombardy are acting in synergy with these climate impacts, negatively affecting biodiversity. These stressors include habitat loss and fragmentation due to **rapid land development and changes in land use**, as well as air, water, and soil pollution, excessive exploitation of natural resources, and the spread of invasive exotic species. The interplay between climatic and human-induced factors is likely to create conditions that could adversely affect regional forest ecosystems, diminishing their ability to provide vital ecosystem services. Additionally, the Region faces issues related to **excessive urbanisation**, particularly around major attraction hubs like Milan and its surrounding areas, which can strain infrastructure and natural resources and increase pollution.

Furthermore, **governance challenges** might complicate efforts to address these threats, especially given the complexity of managing a multi-level system involving national, regional, provincial and municipal authorities (the Bioclima initiative itself covers 7 different provinces/districts). These overlapping governance structures often lead to coordination difficulties, hindering the effectiveness of long-term strategic planning and policy implementation. This is particularly true for environmental issues where most competencies remain in the hands of the Italian central government rather than the regions, limiting the capacity of local authorities to independently address environmental challenges.

3.1.7 Portugal: The Green Heart of Cork project

- **Local context**

The Green Heart of Cork project is a key initiative in southern Portugal's Alentejo region, particularly in the watersheds of the Tagus (Tejo) and Sado rivers. Alentejo is characterised by its expansive plains and Mediterranean climate, with hot, dry summers and mild winters. The lower valleys of the Tagus and Sado rivers are particularly important for sustaining the area's cork oak forests, as they provide essential water resources in an otherwise arid landscape. These watersheds help regulate the local hydrological cycle, contributing to soil moisture retention and reducing the risk of desertification. The cork oak forests themselves are vital in preventing soil erosion and preserving biodiversity, making them critical for both the local ecosystem and agricultural productivity (Bugalho & Silva, 2014).

Demographically, the Alentejo is **one of the most sparsely populated regions** in Portugal, facing challenges related to an ageing population and rural depopulation. Several young people leave the region for better economic opportunities in urban centres, leading to a decline in the local workforce. This population decline poses a risk to the sustainability of traditional industries such as cork production and agriculture. Projects aimed at diversifying the local economy are essential in addressing these demographic challenges and revitalising rural communities (CIMAC, 2020).

Although cork production is a central industry in the Alentejo, the region has been increasingly exploring **economic diversification** as a means to combat rural decline. By investing in eco-tourism, renewable energy, and sustainable agriculture, the region is creating new job opportunities while reducing reliance on traditional sectors that are vulnerable to market fluctuations (SUWANU Europe, 2021). These initiatives are crucial for stabilising the local economy and providing more resilient livelihoods for the population.

In terms of **political and governance aspects**, the Alentejo benefits from strong national and European support for sustainable rural development. The Portuguese government, in conjunction with the European Union, has implemented policies to encourage sustainable land management, forest conservation and economic diversification. EU programmes such as LIFE and Horizon 2020 provide critical funding for environmental initiatives, ensuring that local projects can expand their impact and engage more stakeholders, including landowners and small businesses. These frameworks also support participatory governance, encouraging local communities to take an active role in decision-making processes related to land use and conservation (SUWANU Europe, 2021).

The region is also adopting advanced tools such as remote sensing, GIS, and precision agriculture to better manage natural resources. These **technologies** play a key role in monitoring the health of the cork oak forests,

tracking environmental changes, and optimising land management practices. Integrating modern technology with traditional knowledge brings the Alentejo area the chance to enhance its conservation efforts while promoting more efficient use of resources (Bugalho & Silva, 2014).

In addition, there is an increasing focus on **education and training** within the region, especially in sustainable land management and green economy sectors. Local schools and vocational programmes are equipping younger generations with the skills needed for emerging industries, such as renewable energy, eco-tourism, and biodiversity conservation. This focus on capacity-building helps to ensure that the benefits of **sustainable development** are felt across the region and contribute to its long-term resilience (CIMAC, 2020; SUWANU Europe, 2021).

Table 11. The Green Heart of Cork project's individual SWOT analysis

INTERNAL VARIABLES OF PES SCHEME		
Measured asset	Strengths	Weaknesses
Financial and funding arrangements of the implemented PES scheme	Financial and funding arrangements of the implemented PES scheme (diversification of funding sources , efficiency of the financial mechanisms within the PES schemes, presence of innovative financial tools or approaches within the project, sustainability of the funding sources).	Financial and funding arrangements (reliability of primary funding sources , responsiveness of PES scheme to financial and funding challenges)
Human and Social Capital	• Access to clean water. • Employment and economic development (creation of employment opportunities in natural resources management and ecotourism, new jobs, increase in alternative income opportunities). • Long-term sustainability. • Capacity building. • Participatory process.	• Human wellbeing (access to food, shelters, healthcare, education and social services). • Employment and economic development (creation of employment opportunities in agriculture, community income). • Social equity and inclusion.
Institutional Capital	• Organisations' accountability and transparency. • Community control over natural resource-use. • Legal and regulatory measures. • Control of decentralised administration over fund disbursement and contract awards.	
Financial Capital	Household's income	Material wealth
EXTERNAL VARIABLES OF THE CONTEXT		
Measured asset	Opportunities	Threats
Geographical factors	Proximity to the Tagus and Sado river watersheds provides critical water resources for sustaining agriculture and cork oak forests.	Urbanisation and land-use changes in nearby areas could create conflicts over resource management and contribute to habitat fragmentation.
Demographic factors	Environmental awareness among younger generations increases support for conservation efforts and eco-tourism initiatives.	Rural depopulation , especially due to youth migration, leads to labor shortages and threatens traditional industries like cork production.

Political factors	Strong national and EU policies supporting sustainable rural development offer financial backing and regulatory support.	
Governance factors		Lack of effective coordination between national, regional, and local governance structures could hinder project implementation and community involvement in decision-making processes.
Economic factors	Increased interest in eco-tourism and sustainable agriculture creates new income opportunities for local communities.	
Technological factors	Advancements in GIS, precision agriculture and remote sensing enhance the monitoring and management of natural resources.	
Social factors	Global demand for sustainable and eco-friendly products could boost market opportunities and support the region's green economy.	
Environmental factors		Climate change threatens the cork oak forests and the effectiveness of the PES scheme.

Overview on strengths and weakness

The project presents several strengths, with a primary positive aspect being its facilitation of the community's **access to clean water**, which is vital for supporting agricultural and forestry activities. This critical resource underpins the health of local ecosystems and contributes to human well-being by fulfilling this essential need for the local population.

Another significant positive aspect is the creation of **employment opportunities** in natural resource management (mostly in biodiversity monitoring and systematisation) and ecotourism. This diversification generates new jobs and increases household income, thereby enhancing the economic resilience of the region. The initiative also promotes **alternative income opportunities**, enabling local residents to engage in sustainable practices that align with conservation goals.

The **participatory process** embedded in the project empowers the local community, granting them **control over land use** and natural resource management. Local workers employed on properties within the scheme also benefit from certification procedures, further fostering a sense of ownership and trust, ensuring that decisions are made in line with the community's needs and priorities. Additionally, the initiative places a strong emphasis on **organisations' accountability and transparency**, particularly in financial management and decision-making. This focus not only strengthens the legitimacy of the project but also encourages community involvement. The WWF plays a crucial role as a broker between payers and receivers, ensuring transparency throughout the process.

Furthermore, the Green Heart of Cork adheres to **environmental laws and sustainability goals**, ensuring compliance with community rights and regulatory frameworks. The involvement of ANP/WWF enhances these efforts, providing valuable support and resources for implementation. The financial and funding arrangements of the PES scheme are also noteworthy, with a focus on **diversifying funding** sources - although being highly dependent on private entities, improving the efficiency of financial mechanisms, and implementing **innovative tools** to secure long-term sustainability.

However, despite these strengths, some weaknesses could hinder the initiative's success. A primary concern is the **reliability of the primary funding sources**. The project lacks strong partnerships between private and public funding and has not identified the sources used for the PES as sufficient and trustworthy, which could lead to dependence on external financial support. This gap can raise questions about the initiative's stability, particularly if market conditions fluctuate affecting the availability of the ongoing subsidies. Moreover, the benefits of **ES appear to be unevenly distributed**, with **no significant employment opportunities in agriculture** or increases in **community income and wealth** identified. If this imbalance persists it may affect trust in the project's ability to advance social equity and inclusion within the community.

Overview on opportunities and threats

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Overview on opportunities and threats

The region's proximity to the Tagus and Sado river watersheds provides **essential water resources** for agriculture and forestry, offering a significant geographical advantage. Coupled with **local expertise in cork production**, this forms a solid foundation for implementing the PES scheme, which supports sustainable land management and conservation. Additionally, the region's proximity to larger urban centres fosters trade, educational collaborations and knowledge exchange, encouraging innovation in sustainable practices.

Growing **environmental awareness** is driving demand for sustainable products like cork and eco-tourism experiences that align with conservation goals. The younger generations in the region are increasingly interested in environmental sustainability, which could lead to greater participation in conservation and rural development initiatives. In addition, eco-tourism offers **new income streams** for the local population, complementing traditional industries such as agriculture and cork production.

On the other hand, the availability of European Union funding programmes, like LIFE and Horizon 2020, alongside **supportive national policies** for sustainable rural development, further strengthens the viability of the PES project. Additionally, advancements in GIS and precision agriculture provide innovative tools to optimise resource management and ensure the long-term sustainability of the region's natural assets. These technologies greatly enhance monitoring capabilities, facilitating better management of cork oak forests, which are crucial for maintaining ecological balance.

However, several threats could undermine the progress of the Green Heart of Cork project. The Alentejo region is highly vulnerable to **climate change**, particularly in terms of increased droughts and extreme weather events, which pose significant risks to cork oak forests and agricultural productivity. These climatic shifts could disrupt local ecosystems, reduce water availability and threaten the long-term viability of the PES scheme. Urbanisation in nearby areas also presents challenges, potentially leading to **land-use conflicts**, over-exploitation of natural resources and ecological degradation. Expanding urban areas could strain water resources, fragment habitats, and reduce land available for traditional industries like cork production and agriculture. **Economic uncertainties**, including market price fluctuations for agricultural products, may deter farmer participation in PES initiatives. If economic incentives weaken, local engagement in the project could decline.

Governance challenges further threaten the success of the PES scheme. Effective coordination between national, regional, and local governments is complex, and failure to manage this could hinder project implementation and reduce community involvement. Moreover, **rural depopulation**, driven by an ageing population and youth migration to urban centres, may reduce the available workforce for traditional industries and conservation activities, complicating efforts to sustain the PES initiative.

3.1.8 Spain: La Manchuela por el Clima

- **Local context**

Based in the eastern part of Castilla-La Mancha, **La Manchuela** is a unique region known for its landscapes, rolling hills, and winding rivers such as the Júcar and Cabriel. The region is characterised by a rich tradition and a strong rural identity, contributing significantly to Spain's agricultural sector, particularly in the production of wines, olive oil, and cereals. The vineyards boast high-quality wines under the DO Manchuela designation, having national and international acclaim (Giddings and Matthew, 2024).

La Manchuela used to be predominantly rural, however lately there has been a diversifying process in its **economy** through developing an agriculture complemented by small and medium-sized enterprises focused on food processing, artisanal products, and agro-tourism. The strategic location near cities like Valencia and Albacete fosters collaboration in trade and **education**, crucial for innovation. Although it lacks the industrial heft of other regions, La Manchuela stands out for its commitment to organic farming and sustainable practices, reflecting a broader trend towards eco-friendly approaches (Centro de Desarrollo Rural la Manchuela, n.d.).

Quality of life in the area is quite high, reinforced by cohesive communities and a strong effort on preserving cultural heritage. The region benefits from solid infrastructure that supports its mainly rural population, offering good access to healthcare and education. Secondary schools focus on preparing students for careers in agriculture, renewable energy, and tourism, with technical training programmes addressing the evolving job market (Portal Estadístico, n.d.).

Political and governance factors play a significant role in La Manchuela's development, with local governments implementing sustainability policies focused on renewable energy and water conservation, particularly in response to the region's vulnerability to drought. These efforts engage the community in environmental stewardship, fostering collective responsibility. In recent years, there has been investments in solar and wind energy aimed to reduce the carbon footprint and promote energy independence. The region also prioritises ecotourism, leveraging its natural landscapes and enhancing public transportation to support sustainable mobility (Centro de Desarrollo Rural la Manchuela, n.d.).

Awareness of environmental issues is on the rise, leading to projects focused on waste reduction and biodiversity preservation, positioning La Manchuela as a potential model for **sustainable rural development**. Furthermore, the region is attracting interest from investors and policymakers as a promising hub for sustainable initiatives. Financial institutions are increasingly exploring opportunities in organic agriculture, renewable energy, and rural tourism, all driven by a growing focus on Environmental, Social, and Governance (ESG) factors (Asociación para el Desarrollo Integral de la Manchuela Coquense, 2023). Through these efforts, La Manchuela is transitioning from a traditional agricultural region into a spot of sustainable rural growth, balancing economic development, environmental conservation, and social well-being.

Table 12. La Manchuela por el Clima's individual SWOT analysis

INTERNAL VARIABLES OF PES SCHEME		
Measured asset	Strengths	Weaknesses
Financial and funding arrangements of the implemented PES scheme	Financial and funding arrangements of the implemented PES scheme (presence of innovative financial tools or approaches within the project, sustainability of the funding sources).	Financial and funding arrangements of the implemented PES scheme (reliability of primary funding sources, diversification of funding sources, efficiency of the financial mechanisms within the PES schemes, responsiveness of PES scheme to financial and funding challenges).
Human and Social Capital	• Employment and economic development (creation of employment opportunities in natural resources management, new jobs, alternative income opportunities, community income). • Participatory process. • Long-term sustainability.	• Human wellbeing. • Employment and economic development (creation of employment opportunities in agriculture and ecotourism). • Social equity and inclusion. • Capacity building. • Involvement of local NGOs.
Institutional Capital	• Legal and regulatory measures. • Local community's control over area's land use and management of natural resources. • Control of decentralised administration over fund disbursement and contract awards.	Organisations' accountability and transparency .
Financial Capital		Financial capital
EXTERNAL VARIABLES OF THE CONTEXT		
Measured asset	Opportunities	Threats
Geographical factors	Proximity to urban centres allows for better trade and educational collaborations.	Urbanisation and resource exploitation might create land-use conflicts and ecological degradation.

Demographic factors	Younger generations growing environmental awareness may lead to more support for PES efforts.	
Political factors		
Governance factors		Ineffective coordination across governance levels can hinder project implementation and community involvement.
Economic factors	Availability of regional government subsidies and investments supports PES funding.	Market price fluctuations for agricultural products could deter farmer participation in PES schemes.
Technological factors	Digital advancements can enhance the efficiency and effectiveness of PES initiatives.	
Social factors	Increased awareness of sustainability can drive demand for PES and community involvement.	Urbanisation may reduce local labour and traditional knowledge, impacting community engagement.
Environmental factors		Increased extreme weather events due to climate change threaten the sustainability of the PES project.

Overview on strengths and weakness

One of the initiative's key strengths is the **creation of employment opportunities** in natural resource management, which has not only generated jobs but also **diversified the local economy** beyond traditional agriculture. This diversification has been essential for strengthening the region's resilience as La Manchuela moves towards a more sustainable model, integrating ecotourism, organic farming, and renewable energy. The region's agricultural heritage alongside its commitment to **sustainability is highly aligned with the private sector**, which has enabled the development of high-quality, internationally recognised products such as wines and olive oil that play a crucial role in generating local income. In addition, a local forest owner association supports **alternative income opportunities**, with the potential for more associations to form in the near future.

The initiative has also introduced **innovative financial tools** to promote sustainability by diversifying income sources and leveraging both regional government subsidies and private investments to ensure long-term financial health. Furthermore, La Manchuela's **compliance to environmental regulations** and sustainability targets reinforces its legitimacy and provides greater legal stability.

Another significant strength lies in the **participatory process** embedded within the project. The **local community actively learns** and builds capacity to manage natural resources, ensuring that decisions reflect their needs and priorities, especially for those most affected by environmental changes. This sense of ownership of the local population fosters trust in the initiative and builds space for **sustainable land and resource management** among all, generating a community-led development.

However, some weaknesses could impact the initiative's long-term success. A major concern is that the PES scheme has not been recognised by improving the community's **wellbeing**, apparently presenting **limited distribution of ES benefits** and no significant increases in locals' **financial capital**. While the initiative has secured support from local and regional funding, its financial stability could be jeopardised if any of these sources were to decrease or fluctuate, especially if market conditions or policy changes reduce the availability of subsidies or investment.

The region also faces **challenges in ensuring that funding mechanisms** remain robust and adaptable to emerging financial needs. While there is a strong framework in place, the efficiency of financial mechanisms within the PES scheme may require improvement, especially to handle future scaling. The reliance on traditional agricultural markets poses additional risks, as fluctuating prices for agricultural products could reduce farmers' willingness to adopt sustainable practices. Should farmers find the economic benefits of sustainable methods insufficient compared to conventional approaches, the initiative's reach and effectiveness may be compromised. In addition, **70% of the forest is privately owned**. While owners hold control, most do not actively manage their land, leading to significant abandonment, hence the vital role of having more forest owner associations.

Furthermore, the organisations involved in the project have presented **low levels of transparency and accountability**, which introduces structural instability due to lack of trust. Finally, the initiative's long-term sustainability could also be at risk if local authorities are unable to adapt to changing financial or environmental conditions, underscoring the need for more flexible and responsive governance systems.

Overview on opportunities and threats

The local agricultural traditions and commitment to **sustainable rural development** provide a solid foundation for the successful implementation of the "La Manchuela por el Clima" initiative. The region's focus on organic farming, renewable energy, and eco-tourism has positioned it as a model for environmentally conscious development in rural Spain. The **proximity to larger urban centres** like Valencia and Albacete plays a critical role, facilitating trade, educational partnerships and innovation in agriculture and sustainability. This dynamic environment creates multiple opportunities for expanding the PES scheme. The **availability of government subsidies** and increased private investment in sustainable agriculture, renewable energy, and rural tourism demonstrate a growing interest in La Manchuela's transition towards a green economy. The region's investments in solar and wind energy further reflect its commitment to reducing its carbon footprint, developing a pathway to energy independence and contributing to broader environmental goals.

Technological advancements, particularly in the fields of precision agriculture and digital monitoring, present additional opportunities for improving the efficiency and scalability of the PES initiatives. These advancements could enhance resource management, boost agricultural productivity, and strengthen the region's resilience to climate variability. Regarding **environmental awareness**, La Manchuela's younger population has grown interest in a shift toward a more sustainable mindset, which may lead to stronger community participation in the initiative. The region's approach to environmental stewardship, mostly through biodiversity conservation, waste reduction, and sustainable water management, could reinforce its reputation as a centre for eco-friendly practices, attracting greater support from both regional and national policymakers.

However, there are a few threats that could affect the progress of La Manchuela por el Clima. The region's **vulnerability to climate change**, particularly in terms of drought and extreme weather events, poses a significant risk to the long-term viability of the PES scheme. As the initiative relies heavily on agriculture, these climatic changes may disrupt local ecosystems, damage crops, and reduce the effectiveness of sustainable practices. Another threat is the **rapid urbanisation** in nearby areas, which could lead to land-use conflicts, strain on natural resources, and the degradation of vital ecosystems. Increased exploitation of natural resources may also accelerate habitat fragmentation, reducing the ability of local biodiversity to adapt to environmental changes.

In addition, while the region benefits from governance structures at the local level, there are concerns about the coordination between **different levels of governance**, similar to what has been seen in other regions. If national, regional, and local authorities fail to effectively collaborate, it could hinder the PES project's implementation and limit its ability to address complex environmental challenges. Apart from that, **market fluctuations** in agricultural prices could also threaten the financial stability of farmers participating in the PES schemes, especially if economic incentives become less attractive over time. Lastly, there is a risk that

urbanisation trends could lead to the **erosion of traditional knowledge** and reduce the availability of local labour, which is crucial for maintaining the cultural and environmental sustainability of the region.

3.1.9 Sweden: Love the Forest

- **Local context**

The project “Love the Forest” started in 2016 as a joint initiative of the Universeum Science Centre and a number of Swedish forest enterprises and forest associations. The competition is held in Gothenburg, with participating schools from a number of different districts.

Gothenburg, Sweden's second-largest city, is located on the country's west coast. Gothenburg is urban, with strategic port access that enables trade and connectivity across the Baltic and North Seas. This location benefits **international partnerships**, such as those with Germany, by allowing easy access to logistical networks, particularly for projects needing cross-border coordination. With a population of over half a million, Gothenburg is **densely populated** compared to Sweden's rural areas. The population is diverse, with **an increasing number of younger residents**, which can drive public interest in sustainability and green innovations. A dense, educated population in an urban setting like Gothenburg creates a receptive environment for sustainable policies, particularly where infrastructure improvement or environmental innovation projects are concerned.

Sweden, including Gothenburg, is known for its stable political environment and progressive governance, particularly regarding sustainability. The local government is supportive of long-term environmental policies, aligning with the EU's green initiatives. Sweden has a unique model of public governance defined by its structure, its consensus-based and collective decision-making principles and by shared responsibilities and **delegation across different public institutions at the central level and across the different levels of government**. Sweden's **decentralisation** allows Gothenburg some independence in decision-making (OECD, 2023).

Gothenburg is economically developed, **known as a hub for innovation in green technology and sustainable finance**, partly due to its significant industrial base, including automotive and biotech sectors. This economic landscape provides funding and capacity for sustaining environmental initiatives (Future Hubs, 2024). **Local wealth and economic stability** also allow for investment in large-scale sustainability efforts. Gothenburg's proximity to substantial forest areas, as well as its role as an innovation hub, **supports forestry-related research and bioeconomy advancements**. Nationally, forest products are increasingly seen as essential for a low-carbon economy, with bio-based products from forestry playing an essential role in Sweden's efforts to reduce fossil fuel dependency (Petersson, H. et al, 2022). For instance, Sweden's National Forest Programme promotes forests as "green gold", essential for creating sustainable growth and a bioeconomy where timber, pulp, and biomass can replace carbon-intensive materials (Ministry of Environment, 2019).

Gothenburg has a **highly educated population with strong environmental awareness**. The region has a history of high community engagement in sustainability, which contributes to a cultural commitment to environmental action. Public support is also driven by the well-developed educational sector that prioritises environmental sciences, creating a strong base for citizen involvement in sustainability projects. Gothenburg's "Equal City 2018-2026" programme focuses on enhancing equality by breaking down city administration silos to improve accessibility for all, especially marginalised groups. The initiative includes action plans aimed at reducing disparities in living conditions and promoting social sustainability across the city (Valencia, S, 2019). The region is **technologically advanced**, supporting innovation in areas like sustainable urban planning and green technology. Access to digital and sustainable technologies enhances Gothenburg's efficiency in implementing environmental policies (Invest in Gothenburg, n.d.).

As a coastal city, Gothenburg faces environmental challenges from climate change, such as rising **sea levels and extreme weather**, which impact its infrastructure and urban planning. The city prioritises resilience, focusing on sustainable development to address these issues.

Table 13. Love the Forest SWOT analysis

INTERNAL VARIABLES OF PES SCHEME		
Measured asset	Strengths	Weaknesses
Financial and funding arrangements of the implemented PES scheme	Reliability of primary funding sources.	Financial and funding arrangements (presence of innovative financial tools or approaches within the project, sustainability of the funding sources, diversification of funding sources, efficiency of the financial mechanisms within the PES schemes, responsiveness of PES scheme to financial and funding challenges).
Human and Social Capital	- Access to education. - Social equity and inclusion. - Long-term sustainability. - Capacity building. - Participatory process.	- Human wellbeing (access to clean water, food, shelters, healthcare, social services). - Employment and economic development.
Institutional Capital	Organisations' accountability and transparency.	- Community control over natural resource-use. - Legal and regulatory measures. - Control of decentralised administration over fund disbursement and contract awards.
Financial Capital		Financial capital
EXTERNAL VARIABLES OF THE CONTEXT		
Measured asset	Opportunities	Threats
Geographical factors	Strategic location that enables and enhances partnerships and collaborations +70% percent of territory covered by forests.	
Demographic factors	Younger generations growing environmental awareness may lead to more support for PES efforts.	
Political factors	Political stability puts the base for long term environmental policies and projects.	Rising far-right political parties can represent a burden for the implementation of environmental policies.
Governance factors	Good coordination between governance levels can support PES schemes implementation in the education sector.	
Economic factors	Local wealth and economic stability also allow for investment in large-scale sustainability efforts, expanding the districts in which the project partnerships operate.	

Technological factors	Digital and innovation advancements can enhance the efficiency and effectiveness of PES initiatives.	
Social factors	A good level of awareness on sustainability and environmental education can drive other schools to participate.	
Environmental factors		Increased extreme weather events due to climate change threaten the sustainability of the PES project, although it is unlikely to harm the entire forest wealth of Sweden, which is so vast.

Overview on strengths and weakness

One of the primary strengths of the Love the Forest PES scheme is its **emphasis on education**, which not only increases collateral knowledge but also empowers the young local community to engage actively in innovation on sustainable use of the forest: in fact, schoolchildren can learn more about the present and future importance of forest ecosystems and the role of forests for society. The programme's operational transparency and accountability - demonstrated through open financial management and decision-making processes - help foster trust and credibility, critical for sustained community support. Additionally, the scheme prioritises **social equity and inclusion**, ensuring that diverse groups can participate and benefit. For instance, besides scholars, teachers have their own professional development and through Love the Forest are also given the opportunity to work across the curriculum including different subjects (biology, social science), with a focus on the competition's mission. By integrating the community through a participatory process, the scheme promotes long-term sustainability and local empowerment, particularly through capacity-building efforts that enable residents to take on leadership roles in conservation activities.

This community-centric approach is bolstered by reliable primary funding sources - which in this case is provided by the participating companies and stakeholders - that provide a stable financial foundation for the programme. This also due to the fact that the forest companies and associations involved have to **devote considerable time and high commitment to the mission** which should be worded in a way that reflects society's challenges, while choosing a participatory approach to work with and understand the target audience, in this case schoolchildren and teachers.

Despite these strengths, the structure of the scheme didn't allow **any direct or indirect impact on access to clean water, food, shelter, healthcare and social services** and the scheme has not produced observable impacts on the economic development of the area, as it has **not created new jobs or employment opportunities**. The project may have sparked interest in the relevant sector, but it has not actually resulted in the creation of new jobs.

The scheme would benefit from greater involvement of local NGOs, which could help bridge gaps in service delivery and community engagement. Additionally, innovative financial tools are notably absent, and the sustainability and diversification of funding sources are currently inadequate, putting the project at risk in the event of financial shortfalls. Finally, the scheme's responsiveness to financial and funding challenges is limited, which threatens its adaptability and long-term viability.

Overview on opportunities and threats

One of the key opportunities lies in the **community's strong awareness** of sustainability and environmental education. This awareness can act as a catalyst, encouraging more schools and organisations to engage in PES initiatives. Gothenburg benefits from **local wealth and economic stability**, which provide the necessary financial resources to invest in large-scale sustainability projects. This economic environment allows for the expansion of the PES scheme into additional districts, promoting a **wider network of partnerships** that can enhance the effectiveness of the initiative. Advancements in **technology and digital innovation** present

another opportunity for the PES program, both in terms of expanding the project, thus being able to reach out to schools at greater distances, and in innovating the educational proposal. The strategic geographical location of Gothenburg, complemented by its extensive forest coverage - approximately 70% of the territory - enables robust foreign partnerships and collaborations. This natural asset not only enhances the PES project's potential but also fosters a sense of community ownership and responsibility towards the local environment. Effective coordination between different levels of governance can facilitate collaboration among stakeholders, coupled with political stability that offers a reliable environment for long-term policies and projects.

Despite the numerous opportunities, increased **extreme weather events**, driven by climate change, pose a risk to the sustainability of the project. While Sweden's vast forest resources are unlikely to be completely decimated, unpredictable climate patterns can disrupt local ecosystems, potentially undermining the PES initiative's goals.

3.2 Cross-case SWOT analysis

Based on the data gathered from individual SWOT analyses, a comprehensive macro SWOT analysis was conducted. As stated in Chapter 2.4 in the methodology section the analysis **focused on categories and variables that were identified in at least 5 of the nine case studies**. The cross-case SWOT analysis results allow us to assess the main characteristics of the nine case studies, though these should not be viewed as representative trends: despite the broad geographical coverage of the case studies, the sample size remains too small to be representative at the European level.

Section 3.2.1 addresses the variables categorised as strengths and weaknesses, which are assessed using the Internal Factors Evaluation (IFE) matrix and subsequently ranked and prioritised as shown in Table 14. Opportunities and threats were analysed qualitatively, with the detailed findings presented in Section 3.2.2.

3.2.1 Cross-case SWOT on strengths and weaknesses

Even with a different combination of internal variables, the most mentioned categories for strengths and weaknesses across all the nine case studies analysed were (frequency is reported in brackets):

Strengths

- Employment and economic development (7)
- Long-term sustainability (7)
- Capacity building (7)
- Participatory process (7)
- Organisations' accountability and transparency (7)
- Financial and funding arrangements of the implemented PES scheme (7)
- Control of decentralised administration over fund disbursement and contract awards (7)
- Legal and regulatory measures (6)
- Social equity and inclusion (5)

Weaknesses

- Human well-being (8)
- Employment and economic development (8)
- Financial and funding arrangements (7)
- Financial capital (6)

The application of the IFE matrix is shown in Table 14, together with the ranking and prioritisation of categories. In terms of factors that are crucial to the success of a PES scheme ("Importance"), we have identified **"Financial and funding arrangements of the implemented PES scheme"**, **"Organisation's accountability and transparency"**, and **"Capacity building"** as the most important. Since PES schemes are economic tools intended for both public and private sectors, they need reliable and transparent funding sources, sustainability, and the ability to effectively address financial challenges. **Legitimacy, transparency**

and accountability in particular are central for successfully building institutional capacity and increasing effectiveness (Lockwood et al., 2010; Ingram et al., 2014). For people to trust new and innovative tools, the transparency and stability of the managing organisation are also essential, as these can foster a trusting relationship with local stakeholders. Greater transparency makes information, decision-making, and operations more accessible and understandable, encouraging stakeholders and community participation in the scheme. **Capacity-building activities** help empower individuals and organisations with the skills and the competencies needed to ensure the project's longevity, providing key knowledge to those directly involved in the scheme at the local level.

With regard to the rating, which reflects the performance and responsiveness of the PES schemes in specific categories, a score of 4 (major strength) was assigned to all categories mentioned seven times and not identified as weaknesses. A score of 3 (minor strength) was given to **“Financial and funding arrangements of the implemented PES scheme”** and **“Employment and economic development”**, as both categories were also recognised as weaknesses for different reasons. “Social equity and inclusion” received a rate of 3 as the asset category was mentioned only five times across the case studies.

Table 14. IFE Matrix application to strengths and weaknesses with respective categorisation ranking

Strengths	Importance (a)	Rating (b)	Score (c = a x b)	IFE matrix ranking
Organisation's accountability and transparency	0,11	4	0,44	S1
Capacity building	0,10	4	0,40	S2
Financial and funding arrangements of the implemented PES scheme	0,13	3	0,39	S3
Long-term sustainability	0,09	4	0,36	S4
Participatory process	0,07	4	0,28	S5
Legal and regulatory measures	0,08	3	0,24	S6
Control of decentralised admin. over fund disbursement and contract awards	0,06	4	0,24	S7
Social equity and inclusion	0,07	3	0,21	S8
Employment and economic development	0,05	3	0,15	S9
Weaknesses	Importance (a)	Rating (b)	Score (c = a x b)	IFE matrix ranking
Human well-being	0,03	1	0,03	W1
Employment and economic development	0,05	1	0,05	W2
Financial Capital	0,03	2	0,06	W3
Financial and funding arrangements of the implemented PES schemes	0,13	2	0,26	W4

What emerges from the ranking and prioritisation in Table 14 is that **“Organisation's accountability and transparency”** is the asset category with the greatest positive impact across the nine case studies, while the greatest weaknesses were found in the **“Human well-being”** asset category. This result, especially regarding

the weaknesses, was perhaps predictable: we are dealing with PES schemes implemented solely in Europe, where the level of human well-being starts from a higher baseline compared to other regions of the world. As noted in other researches, the fact that the main weaknesses of these schemes focus on the area of human and social well-being reflects the **general division within the research community between those who see PES as a development tool** (e.g., Muradian et al., 2010) **and those who argue that its development function is (and should be) secondary to its conservation function** (e.g., Wunder, 2008). This may also explain why financial capital and economic development are identified as key weaknesses, as the regions under consideration - despite some differences - generally start from a medium-to-high level of economic development (nevertheless, the variable regarding the increase in job opportunities within the natural resource management sector shows a positive impact (Table 15). Concerning the increase in income for households and communities, the potential of PES to support livelihood development strategies depends on the programs' financial capacity to meet household and community needs through **direct payments** (Wunder, 2008; Pascual et al., 2010; Narloch et al., 2011). However, **in none of the nine cases analysed are payments made directly to families or local communities**; rather, they prioritise the involvement of forest managers or state and parastatal institutions, such as schools or agencies. In our analysis, we did not consider forest managers as households or part of the local community due to a lack of data. There is no evidence to confirm that the managers of natural areas and forests in the analysed case studies are indeed part of the local community alongside their families. Further clarification should address the meaning of "community," which varies depending on the context (rural/urban settings or developing/developed countries).

Further supporting the idea that the European context is a distinguishing factor in assessing strengths and weaknesses is the fact that the **stakeholder participation process was mostly considered a strength**. Studies have shown that social status and wealth can influence PES participation rates, even when eligibility is not an issue (Mahanty et al., 2013). When examined, those wishing to enroll in a PES scheme tended to be wealthier, better educated, owned larger tracts of land, and were more socially mobile compared to non-participants. This supports the view (Mahanty et al., 2013) that skill level, education, and negotiating ability are key determinants of participation in such schemes.

For a more comprehensive overview, the following Table 15 presents the frequency with which each variable was mentioned across the nine case studies for strengths and weaknesses, whether cited independently or within an asset category. For categories with only one variable, the frequency is the one reported above for the full asset category. Highlighted in green, there are the variables mentioned at least 5 times.

Table 15. Frequency of single variables within strengths

Strengths	
(S1) Organisations' accountability and transparency	Organisations' accountability and transparency in operations, including financial management and decision-making(7)
(S2) Capacity building	Empowerment of the local community (7)
(S3) Financial and funding arrangements of the implemented PES scheme	Reliability of primary funding sources (6)
	Presence of innovative financial tools or approaches within the project (6)
	Sustainability of the funding sources (5)
	Diversification of funding sources (4)
	Efficiency of the financial mechanisms within the PES schemes (4)
	Responsiveness of PES scheme to financial and funding challenges (3)
(S4) Long-term sustainability	Local community's resilience (7)

(S5) Participatory process	Involvement of local communities in project design, implementation, and monitoring (7)
(S6) Legal and regulatory measures	Compliance with environmental laws, community rights, and project sustainability goals (6)
(S7) Control of decentralised administration over fund disbursement and contract awards	Local administration transparency and accountability in handling funds and contracts (7)
(S8) Social equity and inclusion	Equitable distribution of benefits of ecosystem services and inclusiveness (5)
(S9) Employment and economic development	Creation of employment opportunities in natural resources management (7)
	Alternative income opportunities (5)
	Creation of employment opportunities in ecotourism (4)
	Community income (4)
	New jobs (3)
Human well-being	Creation of employment opportunities in agriculture (1)
	Access to clean water (4)
	Access to education (4)
	Access to social services (3)
	Access to food (1)
	Access to shelters (1)
Community control over natural resource use	Access to healthcare (1)
	Local community's control over area's land use and management of natural resources (4)
Financial Capital	Involvement of local NGOs (3)
	Household's income (1)
	Material wealth (1)

Table 16. Frequency of single variables within weaknesses

Weaknesses	
(W1) Human well-being	Access to food (7)
	Access to shelters (7)
	Access to healthcare (7)
	Access to social services (6)
	Access to clean water (5)
	Access to education (5)
	Creation of employment opportunities in agriculture (8)
	New jobs (6)

(W2) Employment and economic development	Community income (5)
	Creation of employment opportunities in ecotourism (5)
	Alternative income opportunities (4)
	Creation of employment opportunities in natural resources management (2)
(W3) Financial capital	Household's income (8)
	Material wealth (8)
(W4) Financial and funding arrangements of the implemented PES scheme	Responsiveness of PES scheme to financial and funding challenges (6)
	Diversification of funding sources (5)
	Efficiency of the financial mechanisms within the PES schemes (5)
	Sustainability of the funding sources (4)
	Reliability of primary funding sources (3)
	Presence of innovative financial tools or approach within the project (3)
Community control over natural resource use	Involvement of local NGOs (6)
	Local community's control over area's land use and management of natural resources (5)
Social equity and inclusion	Equitable distribution of benefits of ecosystem services and inclusiveness (4)
Long-term sustainability	Local community's resilience (2)
Capacity building	Empowerment of the local community (2)
Participatory process	Involvement of local communities in project design, implementation, and monitoring (2)
Organisations' accountability and transparency	Organisations' accountability and transparency in operations, including financial management and decision-making (2)
Legal and regulatory measures	Compliance with environmental laws, community rights, and project sustainability goals (3)
Control of decentralised administration over fund disbursement and contract awards	Local administration transparency and accountability in handling funds and contracts (2)

From these tables it can be seen, for example, that all the variables in the 'Human well-being' and 'Financial capital' categories were identified as weaknesses at least five times, and that in the 'Employment and economic development' asset category, four out of six variables were identified as weaknesses, while only half of the variables in the 'Financial and financing arrangements' asset category were identified as weaknesses. The table on weaknesses (Table 16) also shows that the asset category "Community control over natural resource use" represents a critical issue, as both variables were mentioned more than five times across the nine case studies. This finding is strongly influenced by the fact that defining local community control over forests remains challenging, as most of the forests considered in the case studies are privately managed.

In the following sections, we will delve into the results of the cross-case SWOT analysis, providing a comprehensive overview of the nine case studies in terms of strengths, weaknesses, opportunities, and threats.

3.2.2 Cross-case SWOT on opportunities and threats

As briefly mentioned in the previous section, the European context in which the nine case studies were implemented provides a high degree of homogeneity among the cases in terms of political, governance, economic, technological, demographic, and environmental-climatic factors. On a macro level, it is essential to acknowledge certain trends and scenarios affecting Europe in a fairly cross-cutting way, which can impact the implementation and success of PES schemes. They are described below.

a) Demographic challenges

- **Population decline:** in the EU population growth has slowed down in recent decades, due to a combination of fewer births, more deaths and lower net immigration. The EU's population is now projected to continue to grow, but at a limited pace, until 2029, after which it will start to slowly decline (Eurostat 2024). However, a number of EU Member States are projected to experience a decline in their population already in the next few years, including Bulgaria and Italy. Other countries are, on the contrary, projected to see population growth over the same period, for instance Sweden (European Commission, 2023). **Population decline also varies significantly between regions within countries:** the population in rural areas of Europe is already older, on average, than the population in towns, cities and suburbs. Overall, the EU's share of the global population has declined considerably and is projected to continue falling in future decades as it is expected that the share of the world's population living in the 27 countries that now constitute the EU will fall to below 4% by 2070.
- **Population ageing:** ageing of the population is a long-term trend, which began several decades ago in Europe. It can be seen in an increasing share of older people, coupled with a declining share of working-age people in the total population. **By 2050, about 30% of the European population will be over 65**, and it is expected that there will be fewer than two working age adults for each elderly person, confirming an increasing trend of old-age dependency in the future. At the same time, the share of young people in the EU is decreasing: in the 15-29-year-old age range, the share decreased from 18.1% in 2011, to 16.6% in 2019, and to 16.3% in 2021 and this trend is expected to continue and to become more pronounced in rural regions (Eurostat 2024b).

b) Political scenarios: the June 2024 European elections revealed a mixed picture for the continent's political landscape. On one hand, most Europeans voted for pro-European parties committed to advancing the clean transition, securing a majority of seats in the European Parliament. On the other hand, **Green parties suffered a significant defeat**, weakening the ability of climate-progressive coalitions to challenge the European People's Party (EPP) should it reverse course, as it has in the past. Meanwhile, far-right parties, many hostile to climate action, made the most substantial gains. At the national level, far-right parties either won or performed strongly enough to pose serious challenges to centrist and leftist forces in countries such as Austria, France, Germany, Italy, and Sweden. This surge reflects growing voter dissatisfaction with the status quo and signals potential shifts in European policies, priorities, and economic dynamics.

These developments could complicate efforts to advance environmental and climate priorities in venues like the European Council, where the heads of state of EU member nations convene. Nevertheless, at the national level, it remains unlikely that individual states will retreat from their commitments to decarbonization and climate change adaptation.

c) Due diligence vs. economic and technological development: the EU is increasingly promoting nature-related financial disclosures to integrate environmental considerations into business practices. Through initiatives like the **Corporate Sustainability Reporting Directive (CSRD)**, Europe is setting requirements for companies to disclose impacts on biodiversity, ecosystems, and other natural resources. This regulatory shift can encourage companies to engage in innovative financial tools such as PES as part of their environmental responsibility. By prioritising transparency in natural capital impacts, these nature-disclosure policies support PES schemes by fostering a market where businesses are incentivized to invest in ecosystem services as part of their compliance and sustainability strategies.

Europe's strategic direction is well-defined, yet significant challenges loom on the horizon. Mario Draghi's September report on European competitiveness highlights both the continent's potential to become a global leader in clean and green technologies and the **obstacles posed by excessive regulatory burdens**, which are identified as a key barrier to European economic growth and competitiveness (European Commission, 2024). One major factor harming Europe's competitiveness, according to the report, is the **significantly higher "regulatory flow"** in the EU compared to the U.S., with a much larger volume of new laws and regulations being introduced. The report identifies several areas where regulatory complexity is particularly high, including sustainability reporting and the due diligence framework. These frameworks encompass multiple directives and regulations, such as the Corporate Sustainability Reporting Directive (CSRD), the Taxonomy Regulation, the Sustainable Finance Disclosure Regulation (SFDR), the Corporate Sustainability Due Diligence Directive (CSDDD), the Eco-design for Sustainable Products Regulation (ESPR), the Industrial Emissions Directive (IED), the Emissions Trading System (ETS), and the REACH Regulation (Registration, Evaluation, Authorisation, and Restriction of Chemicals). Among these, the CSRD is specifically identified as "a major source of regulatory burden", underscoring the challenge for businesses and industries to navigate and comply with an increasingly complex legislative environment. While these regulations aim to promote sustainability and responsible business practices, their cumulative impact risks hindering the agility and competitiveness of European firms on the global stage.

d) Climate change: Europe is the fastest warming continent in the world, and climate risks are threatening its energy and food security, ecosystems, infrastructure, water resources, financial stability, and people's health (EEA, 2024). Extreme heat, drought, wildfires, and flooding, as experienced in recent years, will worsen in Europe even under optimistic global warming scenarios and affect living conditions throughout the continent. Climate change presents both a profound threat and a unique opportunity for Europe, as its impacts are felt across all sectors and regions. Europe's commitment to combating climate change has spurred innovation and investment in green technologies and sustainable finance, renewable energy, and sustainable infrastructure, positioning the continent as a global leader in the transition to a low-carbon economy. The nine case studies analysed are therefore situated within this broader context and are all, in some way, affected by the trends discussed. The availability and diversity of ecosystem services depend on the condition of the ecosystem in question. Humans dynamically interact with ecosystems and any changes they cause in ecosystems and the services they provide can affect human well-being. The greater the pressure on ecosystems, the more limited the services they provide (European Commission, 2023b). Table 16 offers an overview of opportunities and threats in Europe for PES-related schemes.

Table 17. Opportunities and threats of analysed case studies

Opportunities	Economic and technological development
	Growing environmental awareness
	Good levels of education
	Widespread access to information
	Medium to high levels of social welfare
	Overall equitable access to natural resources and ecosystem services.
	General transparency and legitimacy of the European and national institutions
Threats	Population ageing
	Urbanisation and simultaneous depopulation of rural areas
	Natural resource exploitation
	Climate change

	Bureaucratic burdens and lack of clarity
	High transaction costs

Population ageing, urbanisation, and the simultaneous depopulation of rural areas, as well as land and natural resource exploitation and climate change, are among the main challenges cited across the case studies. These factors pose a threat to the implementation of PES schemes, as they could, on one hand, permanently damage ecosystems, thus preventing the effective provision of ecosystem service - an essential condition for the creation of a PES scheme is, in fact, the identification of the ecosystem service being provided. On the other hand, even if climate change and biodiversity pressure could present an opportunity to invest in nature conservation, there might not be sufficient resources available, for instance human resources, for the implementation of activities in the long term. The issue of an ageing population also raises challenges related to environmental awareness, knowledge transfer, existing skills, and the participatory potential within the scheme. The definition, understanding, measuring and economic assessment of ecosystem services at appropriate scale and precision remains a basic challenge for the implementation of payment mechanisms. While this requires appropriate scientific knowledge and technical competencies and skills, it also builds on stakeholder consultation (Forest Europe, 2017).

Political factors and governance also frequently emerge as challenging aspects for the implementation of PES, as it can be hindered by issues such as fragmented decision-making, lack of coordination among stakeholders, and insufficient political will to enforce and support long-term environmental initiatives. **A prerequisite for establishing a payment scheme is the existence of institutional and political support** (Forest Europe, 2017). Effective governance is crucial to ensure that PES schemes are integrated into broader policy frameworks and that they can overcome barriers related to local interests, regulatory constraints, and funding availability.

The **economic and technological environment** in which the PES scheme develops significantly influences its efficiency and longevity, either positively or negatively. From an economic perspective, this is tied to the availability of capital for covering associated costs. For example, constraints in market creation are often linked to **high transaction costs**. These include expenses for identifying and selecting service providers, attracting potential demand for buyers, negotiating and developing contracts, training, monitoring, reporting, and follow-up activities. Technological innovation, on the other hand, can enhance operational efficiency, particularly in processes such as monitoring. A failure to monitor the effectiveness of compensation schemes - along with the risks of not meeting performance conditions - can severely undermine their success. Inadequate or absent monitoring and evaluation of PES schemes is frequently cited as a critical limitation, hindering the ability to identify both their direct and indirect impacts on human (socio-economic) and environmental systems. Across the nine case studies, **both economic and technological development were rarely considered as a threat**, confirming the medium-high level of starting conditions which can enhance investments in nature conservation.

The implementation of PES schemes finds **strong opportunities** in various external conditions identified through case study analysis. Key factors include the growing environmental awareness among younger generations, good levels of education, widespread access to information, medium to high levels of social welfare, and an overall equitable access to natural resources and ecosystem services.

Currently, more than three-quarters of Europeans (78%) say that environmental issues have a direct effect on their daily life and their health. And more than four in five respondents (84%) agree that EU environmental legislation is necessary for protecting the environment in their country, affirming the presence of a population that recognizes its well-being is deeply interconnected with the health of the environment (European Commission, n.d.). European citizens consider promoting the circular economy as the most effective way of tackling environmental problems in 11 Member States, followed by **restoring nature**, considered the most important in Portugal, Spain and Bulgaria among others. Public awareness on biodiversity is also on the rise: between 2015 and 2018, recognition and understanding of the term 'biodiversity' increased in the EU, with

71% of those interviewed in 2018 having heard the word and 41% knowing what it means. Importantly, at least 8 out of 10 consider biodiversity loss a serious problem and agree that halting it is important.

In parallel, education systems across Europe are enhancing their focus on environmental sustainability, with curricula increasingly incorporating topics related to sustainable practices, climate change and biodiversity. While approaches vary among countries, this shift highlights the importance of education as a pillar for fostering long-term environmental responsibility and awareness (European Commission, 2021b).

The general **transparency and legitimacy** of the European and national institutions lead to an institutional environment that is sound and governed by controlled processes, giving a good degree of confidence to organisations and companies wishing to invest in nature conservation. Ensuring long-term stability and confidence for investors is a keystone of the Green Deal and the 2030 European Biodiversity Strategy. This approach aims to unlock the substantial investments required to address pressing environmental challenges. By prioritising the protection of nature and the conservation of biodiversity, these initiatives position environmental preservation at the heart of the European investment plan. Nevertheless, experts of the nine case studies noted that an **excessive presence of administrative procedures and bureaucratic requirements** can limit the implementation of PES schemes.

4. Key points and lessons learned

The analysis of PES schemes across nine European countries highlights distinct positive and negative aspects that are shaped significantly by the regional and local context. These findings reflect the prioritisation and evaluation conducted through different approaches, including the SWOT analysis, which assessed mostly internal factors (i.e. weaknesses and strengths), and a PESTEL-inspired contextual analysis (Christodoulou and Cullinane, 2019) that helped define the variables of relevant external factors (i.e. opportunities and threats), considering especially political, economic, social, technological, environmental, and legal dimensions. In addition, to complement the process, the IFE matrix has proven to be valuable for systematically weighing the significance of strengths and weaknesses, supporting the identification of critical factors, such as **organisational accountability and transparency, capacity building, financial arrangements of the implemented PES scheme, and long-term sustainability** which stood out positively among the cases due to their substantial contribution to the success of the schemes. At the same time, it has highlighted how **human well-being, employment, and economic development** and **financial capital** are among the most pressing challenges that continue to affect the overall effectiveness potential of the PES initiatives. This mixed strategy provided structured lens for interpreting the findings, allowing for a more nuanced comprehension of how these factors interact and their implications within the European context, which we detail below.

Forehead it is relevant to emphasise that, as mentioned before, **the same measured assets eventually appear in different scopes of the SWOT matrix**. These assets shift between positive and negative interpretations depending on the local peculiarities and their delivered impact, as indicated by their respective scores collected through the survey. This means that the so-called variables are not always present in every circumstance and might be partially contemplated in one case study, while varying considerably in another. Each project has its specific context and unique characteristics, requiring narrowing the discussion for better understanding. However, this section aims to provide a general overview of the results from the cross-case SWOT analysis, comparing its outcomes with those in Tables 16 and 17, while also incorporating insights from the literature review, in order to offer a broader perspective on the *status quo* in Europe.

4.1 Overview of core strengths

Organisational accountability and transparency appears as high-scoring in the IFE matrix, playing an extremely important role in the success of PES schemes. As this factor can be seen in either strengths and

weaknesses, though more often in the first asset category, in this subsection we are focusing on the positive aspects identified. Strong governance systems and institutional trust are key features of the European context, where accountability and transparency are highly valued (Winkel et al., 2022). Cultural factors also tend to influence behavior across different areas, however among the analysed countries these attributes have been classified extensively as essential parameters for successful trade activities such as PES schemes. Most of the case studies regions are known for highly demanding trust among stakeholders, including local communities, policymakers, and international partners, to ensure consistent participation and support (Schröter et al., 2018). This characteristic is indispensable for fostering stakeholder confidence and maintaining the long-term viability of PES initiatives. Additionally, transparent financial management and decision-making processes mitigate risks of corruption and inefficiency, further reinforcing the schemes' credibility.

Another strength that markedly emerged was **capacity building**, presenting a significant score in the IFE matrix, which reaffirms the critical role in enhancing the skills, knowledge, and organisational capabilities of stakeholders, taking into consideration communities' need to adapt and thrive in a fast-changing world. Community understanding and capacity building are precursory for PES schemes development. Although long-term collaborations and commitment between outside agencies and local authorities are usually needed (Pagdee and Kawasaki, 2020), in Europe this type of bond is frequent and capacity building is supported by established educational and professional systems, enabling training and knowledge exchange (Pes and Porretta, 2015). This strength is particularly relevant as it empowers local communities, government agencies, and other participants to effectively manage and adapt PES schemes. It also aligns with different EU programmes and projects currently being implemented that are fundamentally oriented to consider community strengthening (Haarich and Jaime, 2004; Eufunding, 2024). Having this aspect among the highest punctuations reflects projects' knowledge on the essential value of ensuring the longevity and adaptability of PES initiatives through enabling stakeholders to address emerging challenges and opportunities while fostering social development.

Financial and funding arrangements of the implemented PES scheme was another high-scoring strength in the IFE matrix, with specific variables also appearing in Table 16. Given its central importance in the results and PES projects - and the fact that it can be interpreted as ambiguous due to its presence in both the strengths and weaknesses scope - this asset deserves special attention, being briefly mentioned here but further explored in the subsection - 4.3.

Among the strengths, **long-term sustainability** also received high scores in the IFE matrix, reflecting its fundamental relevance among the cases. European PES schemes tend to benefit from robust institutional frameworks and socio-political stability, which enables consistent governance and strategic planning so projects can continue to operate and achieve their goals beyond the initial funding period (Kluvankova et al., 2023). Meeting sustainability parameters is not just about enhancing local projects; it also involves aligning these initiatives with broader EU policy objectives, such as the Green Deal and the Biodiversity Strategy for 2030, to achieve greater impact through region-wide green strategies (Ascoli et al., 2023). Identifying this asset in the spotlight suggests the schemes' ability to meet their goal while enduring environmental challenges like climate change, habitat loss, and biodiversity degradation, without ignoring future projections and ambitions. Moreover, the focus on sustainability indicates that a considerable number of the PES projects are confident in their ability to deliver enduring benefits to ecosystems while remaining adaptable to changing environmental and socio-economic conditions through the resilience of local communities.

Even though not scoring the same, it is possible to find other relevant variables a few times in Tables 16 and 17. The **involvement of local communities in project design, implementation, and monitoring** joins the list of strengths, being frequently mentioned in the discussions. This is in accordance with the growing trend in Europe to prioritise participatory processes in project development, aiming to reconcile the interests of different stakeholders (Schröter et al., 2018). On the other hand, the **equitable distribution of the benefits from ES and inclusiveness**, considered crucial to achieving environmental justice, is present in most of the

projects. However, at least in the case studies presented in this report, it seems to be a complex factor to centralise within a PES scheme, often showing up as an indirect benefit. Another important aspect seen in the projects is the **transparency and accountability of local authorities in handling funds and contracts** which generally favours the control of decentralised administration over fund disbursement and contract awards. Additionally, legal and regulatory measures, more specifically **compliance with environmental laws, community rights, and project sustainability goals**, are crucial for any European project progress. In the case of PES, these elements are foundational, as they should connect, or at least align, with broader environmental policy objectives (Winkel et al., 2022).

4.2 Overview of core weaknesses

In contrast, weaknesses such as **human well-being, employment and economic development** and **financial capital** received lower scores in the IFE matrix, expressing their relative underperformance. These weaknesses are shaped by the European context, where baseline levels of human well-being and economic development are higher compared to other regions (Ascoli et al., 2023). Likewise, PES schemes in Europe often tend to focus on conservation objectives rather than being explicitly designed to address socio-economic disparities. This contrasts with PES programmes in developing regions, where poverty alleviation is more commonly a central goal. In Europe, payments are typically directed to institutions like forest managers or public agencies rather than directly to households or communities, limiting the schemes' capacity to improve human well-being and socio-economic equity comprehensively (Kluvankova et al., 2023).

The weakness in **human well-being** reflects this structural limitation, with access to clean water being the sole variable exception present in four case studies. The IFE matrix highlights that the schemes' contributions to local broader socio-economic improvements are often indirect, leaving marginalised groups particularly underserved. This outcome suggests an opportunity to redesign PES schemes to include direct other benefits (e.g., food, shelters, education, healthcare, and social services) for households, particularly in rural or economically disadvantaged areas. Addressing this weakness is essential for aligning PES initiatives with broader sustainable development goals that should also not exclude an holistic approach encompassing the multifaceted dimensions of physical, mental, emotional, and social health factors (Pagdee and Kawasaki, 2020).

Similarly, challenges in **employment and economic development** arise from the limited scale and scope of job creation within PES schemes. The IFE matrix reveals that employment opportunities generated by these initiatives are often concentrated in specialised fields, primarily natural resource management in the case studies analysed, leaving agricultural and eco-tourism, among other areas that could be enhanced underdeveloped. While the natural resource management sector does show positive employment trends, the matrix underscores the need for PES schemes to adopt more inclusive economic strategies. This includes not only creating diverse job opportunities but fostering local economic development, particularly in regions facing demographic challenges such as population ageing or rural depopulation that would highly benefit from such strategies (Schirpke et al., 2018). In addition, limited new jobs and alternative income opportunities are identified as missing in the direct benefits from the projects, which points out the need of structuring PES initiatives to deliver broader economic benefits for local communities.

Financial capital also presents a low score, reflecting minimal economic benefits from PES schemes for the community. Only one expert mentioned improved **household income**, and another noted **material wealth** enhancement, though in different case studies. This inconsistency and limited financial return poses risks like weakening stakeholders' engagement (although behavioural determinants can vary considerably depending on the local and involved actors), which may lead to demotivation in project maintenance (Saint-Cyr et al., 2023; Y. Huang et al., 2024). In turn, some variables in **financial and funding arrangements** did not reach good results in the matrix, joining the fragilities identified in the case studies. Such findings indicate a failure to address financial mechanisms in a more sustainable manner. Moreover, such point combined with financial capital challenges can undermine the potential positive impacts of projects from multiple perspectives,

deserving close consideration as highlighted by Reed et al. (2022). These issues are further explored in subsection 4.3, given their complexity and potential ambiguity at first sight.

Finally, **the local community's control over the area's land use and management of natural resources** was frequently discussed and valorised by most of the experts interviewed. This factor is often recognised as integral to fostering inclusive decision-making, promoting environmental stewardship, preserving cultural heritage, enhancing equity, and mitigating conflicts (Kluvankova et al., 2023). However, its low recognition within the projects demonstrated notable inconsistency. In some instances, it was not identified as a direct improvement stemming from the projects, whereas in others, it emerged as a positive variable. One interviewee alluded to the challenge of establishing a clear and widely accepted definition of control over natural resource use. This concept complexity underscores the need for a more structured approach to integrating community control mechanisms into project frameworks. The limited **involvement of NGOs** in the PES schemes was also considered a weakness, revealing a gap in the diversity of stakeholder participation - a critical component of holistic project governance (Huang et al., 2024).

4.3 Critical findings on economic and financial arrangements

The findings are not exhaustive and could lead to broader discussion; however, **this section focuses on one of the core aspects of PES schemes: their economic and financial arrangements**, as viewed through the lens of our report criteria. Within the CAF framework, the analysis examines methods and tools for achieving an optimal balance between an institution's financial assets and associated risks, while addressing the challenges of implementing PES schemes. To this end, it provides here a zoom on key points mostly related to the **financial and funding arrangements of the implemented PES scheme, living standards (employment and economic development), and financial capital assets** for a comprehensive view on the interplay between these interconnected areas, offering a holistic perspective on the financial and socioeconomic impacts of the projects. Therefore, the following points elaborate on these themes, supporting the statements made in previous subsections and providing insights for potential future improvements.

Financial and funding arrangements highlights:

- **Strong financial and funding arrangements** are among the main strengths across the projects, presenting significant scores, particularly regarding the **reliability of primary funding sources, the integration of innovative financial tools, and the long-term sustainability of these mechanisms**, as shown in Table 16. These results clearly indicate the critical role of well-structured funding models in the analysed areas, such as those mentioned by experts, including EU programmes (e.g., INTERREG SEE) and regional subsidies (e.g., European Agricultural Fund for Rural Development - EAFRD), which provided robust financial foundations for different projects.
- Another relevant point is the impact of efficient and transparent fund distribution in strengthening the reliability and equity of PES schemes, thereby ensuring their long-term viability. However, **local values significantly shape behavior, meaning the success of these initiatives also depends heavily on the intrinsic motivations of involved actors**. According to the self-determination theory, projects should account for this factor to sustain themselves without relying exclusively on external control or funding. Integrating local values into governance structures through community interests is, therefore, essential (Kluvankova et al., 2023).

Financial and funding arrangements challenges:

- The **responsiveness of PES schemes to funding difficulties, the efficiency of financial mechanisms, and the diversification of funding sources** are among the projects' main difficulties, as seen in Table 17. Bureaucratic hurdles in accessing EU funding and managing complex private-public financial relationships were frequently cited as obstacles by experts. These issues often hindered the flow of resources, delaying implementation and, in some cases, jeopardising project outcomes. A few schemes count on robust funding sources, others have struggled in securing long-

term financial sustainability, especially those relying heavily on short-term grants or local business contributions.

Overall, reliable and diversified funding sources were widely regarded as key to the stability of PES projects. Experts emphasised the importance of integrating public and private sector support to create more resilient and sustainable schemes. This aligns with the literature review, which highlights the need for strategic and diversified funding mechanisms that extend beyond the initial project phases to ensure long-term viability (Reed et al., 2022). Additionally, the presence of innovative financial tools and mechanisms was recognised as promising to support PES schemes. However, while there is a common agreement that favours mixed private-public funding for large-scale investments, one participant raised concerns that massive financing increases risks and can lower efficiency, citing scandals in the voluntary carbon market. This individual argued that developing PES at the local level - through municipalities, communities, natural parks, and hydrological basins - offers a more resilient and less risky approach.

Economic benefits and living standards:

- The selected PES schemes demonstrated limited job creation, primarily within natural resource management, and offered few alternative income opportunities. These initiatives also often failed to deliver significant financial improvements to local communities. While PES projects can provide supplementary income, the scale of economic returns is generally insufficient to drive long-term community prosperity. Furthermore, **the potential for job creation in areas like agriculture and eco-tourism, sectors with significant growth opportunities in Europe, has not been fully explored.**
- Some experts mentioned the potential for other areas as well, e.g., compliance certification scheme working opportunities, but recognised there has not been much space, and eventually effort, in aligning ecological conservation goals with tangible economic benefits, such as new job opportunities and enhanced community income. Without clear financial incentives, communities might lose interest - especially vulnerable ones, leading to reduced involvement and the risk of project failure. On the other hand, **PES schemes that include plain agreements and well-defined outcomes have greater potential to maintain stakeholder involvement and deliver better results** (Huang et al., 2024). The challenge lies in maximising the monetary and non-monetary benefits of PES initiatives to fully realise their potential while ensuring lasting value for local communities.

Financial capital and long-term viability:

- Although **financial capital** was a valorised strength in some PES projects, it was generally seen as insufficient in creating substantial material gains for local communities. Many of the case studies revealed that while PES schemes could provide additional income streams, they often did not translate into significant improvements in household income, material wealth or broader economic development as a result of PES implementation. This limitation in economic benefits is crucial, as it can raise concerns about PES initiatives potential in the long-term.

The areas examined in this work did not exhibit significant socio-economic vulnerabilities, with intrinsic motivations playing a more crucial role in maintaining engagement. In this type of context, individual payments often prove more effective than community-based approaches in fostering trust and recognising efforts, which are essential for sustaining stakeholder motivation and involvement (Huang et al., 2024). However, on a broader scale, without clear and tangible financial incentives, some actors may lose interest, reducing participation and risking project failure. Moreover, results-based payments do not always function as expected (Saint-Cyr et al., 2023), and this apparent contradiction requires further investigation. In any case, in addition to restructuring the local distribution of economic benefits, ensuring fair distribution and acknowledging stakeholders' contributions can enhance motivation and strengthen long-term commitment to PES initiatives.

4.4 Best practices from the selected case studies

In this section, we aim to identify key best practices (i.e., sets of procedures that lead to optimal efficiency and outcomes) based on the individual case studies examined in this document. To offer varied perspectives aligned with local implementation contexts, we propose a best practice for **each type of context** identified - urban, rural, or natural - and their corresponding type of PES together with few cross-cutting considerations for all case studies. This approach allows us to distinguish between best practices based on spatial context and operational approaches, highlighting the aspects from the descriptions and individual SWOT analysis that have demonstrated the most significant positive impacts. Additionally, by examining the respective weaknesses, we can outline the areas and dimensions that present opportunities for improvement. It is important to note that these best practices are shaped significantly by the European implementation context and the specific focus mostly on FES, which limits the range of stakeholders involved and the scope of the schemes analysed.

Based on this, we have identified the following best practices.

Spatial context:

- Rural areas:** crucial to the effectiveness of the PES scheme is the **involvement of local stakeholders and rural communities**, as demonstrated by the Spanish case “La Manchuela por el Clima”. When working in a rural context, it is essential to recognise that rural communities often rely heavily on natural resources (Herman, R. 2004). These communities maintain a deep connection to the land they inhabit, as it serves not only as their primary source of economic sustenance but also as a key element of their identity, social organisation, and traditional knowledge passed down over generations. While this may be especially true in contexts outside of Europe, there are also European regions where communities, particularly agricultural ones, still depend significantly on nature-based activities. It is therefore crucial to involve these communities not only in the design phase of PES schemes but also in their implementation and decision-making processes. As mentioned earlier, given the presence of older age groups in these areas, it is crucial to incorporate **capacity building and knowledge transfer** activities. This will ensure a clear understanding and sharing of project objectives and information, while also helping to develop new skills that are vital for the long-term sustainability of the scheme.
- Urban areas:** urban areas differ from rural landscapes due to relatively higher land prices, greater fragmentation of land ownership, and higher density of people. The fragmentation of land ownership in urban areas provides a challenge for beneficiaries looking to invest in PES, because they must deal with large numbers of providers. However, the close proximity of private landowners in cities presents an opportunity to establish ‘**provider alliances**’ that can encourage collective action and peer-monitoring of schemes, for instance (Richards and Thompson, 2019). In such a context, PES schemes should be able to represent a **plurality of values**, preferably gathering public and private effort: collaboration between **private and public entities** has proven particularly successful, ensuring alignment between institutional and private sector objectives, such as in BioClima Initiative.
- Areas of high naturalistic value:** recreation and tourism represent a major opportunity for managing human-nature relationships in a way which benefits from nature’s services and, at the same time, cultivates and nurtures nature’s capacities to sustainably provide those ES. As evidenced by the Bulgarian case in Rousenski Lom National Park, in areas with high natural value, such as national parks where tourism is a key economic driver, PES schemes focused on recreational ES can enhance park management plans and create funding sources for conservation efforts, effectively **connecting conservation with sustainable tourism**.

Operational approaches:

Further considerations can be made from a more general perspective on operational approaches, taking into account characteristics that go beyond the specific context in which the PES scheme was influenced. The following best practices characterize all case studies in a cross-cutting manner.

- **Intermediator and knowledge providers:** intermediaries and knowledge providers have proven effective in the implementation of PES schemes, as they offer essential technical and operational support. This can be seen within the BioClima Initiative in Italy or Bourse des Arbres in France. Among the cases analysed, the involvement of multiple buyers and sellers is common. Intermediaries play a key role in facilitating stakeholder aggregation and, when locally based, can serve as a crucial driver for building trust. Intermediaries can be a variety of actors, from individuals to organisations to collaborative groups that are connected in some way to different PES stakeholders and they can span scales including local, regional, national, and international, including organizations from the public, private, civil, and academic sectors. Across the nine case studies analysed, technical facility intermediators were given priority, significantly limiting the **involvement of NGOs**. However, NGOs remain an important local actor that can act as a boundary organisations, i.e., as formal institutions that link the scientific and non-scientific communities, facilitating multi-level collaborations between science and policy actors (academics, business, citizens, government authorities) (Triyanti et al., 2024).
- **Transparency:** transparency has been repeatedly highlighted as a key factor for the successful implementation of PES schemes, as it ensures that the objectives and operations within the project are not misunderstood by stakeholders. Transparency and access to information are **essential to good governance**, as they build trust and ensure that decisions are made in an open manner (Greiber, T., 2009). Transparency makes explicit the decision making process, as well as related information. In projects carried out at smaller and more manageable scales, it is usually easier to achieve appropriate transparency and access to information.
- **Space to the human and social dimension:** PES as a tool for development are widely applied in non-European contexts, often contributing to poverty alleviation as a key objective, adopting a broader perspective on their potential social benefits - such as improving living conditions and human well-being - could offer valuable insights for their implementation in Europe as well. In the context of forest ecosystems, the role of forests in poverty alleviation is often underappreciated, with greater emphasis typically placed on agricultural development. Nonetheless, evidence suggests that forests can contribute meaningfully to sustainable poverty alleviation through various pathways, including the provision of subsistence materials, enhancement of health, income generation, job creation, women's empowerment, in addition to climate change mitigation, and biodiversity conservation (Wang et al., 2023).

4.5 Limitations and considerations

This document provides valuable insights into assessing the challenges associated with the implementation of PES schemes, yet it is essential to acknowledge certain limitations to properly contextualise its findings.

One notable limitation is the **scope of the case studies examined**. With only nine cases included, the broadness of the analysis is inherently constrained, making it challenging to generalise the findings as representative of the diverse contexts across Europe. Apart from that, some case studies presented challenges in the analysis, as it was not easy to get detailed information about the implementation of the PES scheme. To integrate the analysis, other data were used taking into consideration other projects, activities and services carried out by the entitled organisation. These considerations emphasise the need to interpret the report's conclusions as indicative instead of exhaustive.

Moreover, there were some setbacks in the **collection and integration of data**: while Deliverable 2.2 provided valuable insights, its terminology and approach were not fully aligned with SWOT purpose, which methodological foundation was not yet fully developed during the creation of the questionnaire delivered in Task 2.2. and therefore not perfectly incorporated, even if an effort was done at that time with this aim. Nonetheless, Deliverable 2.2 contributions have been integrated effectively in the present document, both as knowledge base and as discussion topics. Methodological differences reflect a natural evolution of the

research, not resulting in any conflict, but rather in a deeper, more refined exploration of the topic as it was foreseen as the aim of this Task since the beginning.

Another limitation lies in the **quantitative analysis of strengths and weaknesses**, which relied on the values provided by experts in the distributed questionnaire. Allowing respondents to express neutrality, marked with a value of 3, created some interpretive challenges. It was unclear whether this neutrality indicated a lack of data, a topic beyond the scope of the evaluated case, or impacts that were not observed. Due to the high number of neutral responses received without clarification, we interpreted the value 3 as negative. However, it is worth noting that some of the weaknesses attributed to the case studies may simply reflect the fact that the schemes had specific objectives that excluded certain aspects emphasised in the theoretical framework.

Finally, a significant challenge was the **limited availability of detailed data on the PES initiatives**, which required a reliance on an extensive literature review to support key discussions and conclusions. This constraint also led to an essential methodological adaptation, as outlined in sections 2, 3, and 4, a fact that highlights the need for robust and contextually rich datasets in future research. While efforts were made to consult experts for clarification, time constraints restricted opportunities for follow-up consultations, which could have enriched the analysis further. Despite these challenges, the findings remain reliable and serve as a valuable foundation for further research - mentioned in section 5.2 alongside other relevant points.

5. Conclusions and recommendations

The mixed strategy of using SWOT analysis, PESTEL-inspired contextual analysis, and the IFE matrix has provided valuable insights into the performance of the selected PES schemes across Europe.

Overall, the **case studies have established robust foundations in governance, funding mechanisms, and participatory community engagement, contributing positively to specific employment opportunities, capacity building, and decentralised funding control**. They have also made significant progress towards achieving long-term sustainability, supported by legal and regulatory frameworks that facilitate their implementation. However, the analysis indicates significant weaknesses, particularly in their **limited impact on human well-being and local socio-economic development. Financial constraints, including challenges in funding arrangements and local financial capital mobilisation, remain persistent barriers**. Strengthening these areas is vital for PES projects long-term success.

To address these weaknesses, the schemes should focus on enhancing their socio-economic contributions by promoting diverse employment opportunities, increasing household wealth, and improving human well-being within communities. Depending on the context, this focus will make these initiatives more appealing and accessible to vulnerable populations. **Expanding PES projects into new sectors, such as agriculture and eco-tourism, and exploring further opportunities like forest certification, can tap into Europe's market potential, creating alternative income sources and fostering inclusivity through broader stakeholder engagement**. In addition, decentralised governance structures and active involvement of local NGOs can further enhance inclusiveness and effectiveness. Clear agreements between stakeholders and effective monitoring are critical for maintaining trust, transparency, and project momentum. Continuous assessment and adaptive management are necessary for responding to evolving socio-environmental contexts, ensuring these initiatives remain relevant and impactful.

In summary, the findings present that while strong governance and transparent financial management have emerged as key strengths, there are still significant gaps in socio-economic development, financial capital, and organisational effectiveness that should be addressed. **Enhancing these areas, diversifying project applications, and ensuring that benefits are equitably distributed will be critical for improving the scalability and broader impact of PES schemes in the future**. In other words, the PES projects analysed demonstrate great potential for fostering ecological and economic resilience if reviewing the identified financial

and organisational shortcomings by strengthening accountability, enhancing inclusivity, and diversifying the scope of the projects. These strategies can help overcome the current barriers and ensure that PES schemes reach their full potential for both environmental protection and local community development.

The results and key findings on financial and funding arrangements from this analysis, along with the trends and scenarios described in this document, will be instrumental for the development of WP4 **"Guidelines and Recommendations for Future Funding Programs"**, which aims to provide actionable guidelines and recommendations for future funding programmes. These guidelines and recommendations will be developed considering several scenarios on how PES schemes could be integrated into EU financial programmes. This will include an overview of best practices for different contexts and insights into how the choice of PES design features may impact their feasibility and sustainability. Moreover, the information gathered through this deliverable and the previous one will form a solid foundation for the potential development of seminars, academic course content, workshops, and webinars.

5.1 Recommendations for policy and practice

Based on the findings of sections 3.1 and 3.2, possible strategies and recommendations can be drawn. These are grounded on combinations of internal strength and weaknesses, with external threats and opportunities as illustrated in Figure 1b, that we report here again. The strategies presented here represent some of the most relevant actions, both at local and policy level, that would be needed to advance in the implementation of the PES scheme at European level.

Figure 2. SWOT Analysis strategies (Viszlai et al, 2016)

	Strengths "S" (internal, positive)	Weaknesses "W" (internal, negative)
Opportunities "O" (external, positive)	SO: Strength-Opportunity strategies <i>Use the strengths to maximise the opportunities</i>	WO: Weakness-Opportunity strategies <i>Minimise the weakness by using the opportunities</i>
Threats "T" (external, negative)	ST: Strength-Threats strategies <i>Use the strengths to minimise the possible threats</i>	WT: Weakness-Threats strategies <i>Minimise the weaknesses to avoid the threats</i>

- **S-O strategies:**

- Leverage the **transparency and reliability** of the organisations involved to further strengthen the already robust European institutional framework and foster an environment of trust in innovative tools such as PES. This can be achieved by disseminating data and information transparently about project results to overcome skepticism, capitalising on the generally high level of access to information accessed by the European population. In this regard, technology can play a key role in effectively sharing extensive information and data about the results.
- Maximise **participatory processes and capacity-building activities** to share knowledge and information, conduct training and awareness-raising, and to clearly communicate the potential of tools like PES to all project stakeholders, benefiting from a population that generally recognizes biodiversity loss as a threat and is already fairly aware of environmental issues.
- Leverage the **strong level of decentralisation and control over fund disbursement** and contract awards by local institutions to strategically anticipate the interests of private companies, in light of the ongoing regulatory evolution within the European Union, particularly with the aim of building solid public-private partnerships for nature conservation.

- **S-T strategies:**

- Leverage and secure the **stability of the main funding source** for PES schemes in terms of duration, availability, and economic sustainability to ensure that it is not undermined by excessive bureaucratic burdens or financial constraints especially during the application and transactions processes.
- Ensure that the **long-term sustainability** of projects involving PES schemes always takes into account how climate change may impact specific project areas or community's resilience, by developing project management strategies that do not solely consider the ecosystem at its initial state of observation.
- Leverage the design of **capacity-building activities** to also guide older or more hesitant populations in understanding the potential of these tools, which can also help create opportunities in rural areas where investment is generally discouraged.
- Exploit more the social potential in terms of **equity and inclusion** of PES schemes to offer innovative alternatives to small local communities that might be adversely affected by pronounced processes of urbanisation and gentrification.

- **W-O strategies:**

- Increase the **number of NGOs involved** in projects by leveraging institutional environments that are generally open to the participation of the third sector. This approach can foster greater collaboration and expand the impact of the initiatives by integrating diverse perspectives and expertise from civil society.
- Integrate a broader reflection on the **human and social benefits of PES schemes** by utilising available information on the application of cross-cutting approaches and the financial resources of key European funding lines.
- Leverage the potential of PES schemes to create **job opportunities** not only in the field of natural resource management, but also in agriculture and ecotourism, thereby revitalising local areas with limited employment opportunities in these sectors, often due to a lack of employable human resources. In Europe, in particular, the ecotourism sector presents significant opportunities, as it is experiencing strong growth (CBI, 2023).

- **W-T strategies:**

- Increase the **diversification of funding sources** to ensure that, if some buyers are unable to honor agreements due to political turnover or sudden capital shortages, the financial coverage needed to keep the project active is secured.
- Acknowledge **the role of the local community** in managing the resource, even if not directly involved in its control. Valuing the relationship between the local community and the resource helps prevent skepticism about the use of an innovative economic tool, fostering local participation, awareness, and engagement. This, in turn, enables the community to express their awareness through the exercise of their voting rights.

5.2 Areas for further research

Although this report provides foundational insights into PES schemes, several areas would welcome further exploration to enhance their understanding and applicability.

Future research could explore **community involvement in resource management**, starting with a clear definition of 'participation' and then examining how local governance and community-led decision-making influence the sustainable management of land and natural resources. This approach may be more feasible in contexts outside Europe, where land-use rights and ownership structures differ. In the European context, where land is often privately owned, the idea of community control over land use might not be feasible or appropriate. Instead, focusing on community involvement in resource management would be more suitable,

as this can encourage long-term engagement and ensure that PES frameworks align with local priorities. Furthermore, addressing the issue of varied definitions of participation in Europe is crucial, as different stakeholders often have differing views on what participation entails, leading to mismatches between what is intended and what local communities expect, as mentioned in the previous deliverable. In addition, **exploring foresighting approaches** would be important to better anticipate potential trends and developments, which would help shape more proactive strategies and prepare for future challenges in the field.

Another important area involves **strategies to engage communities in PES projects**, in this particular point there has been diverse lines of thought that sometimes seem to collide a bit depending on the research scope and context. Identifying ways to include diverse populations and ensure adequate representation of all stakeholders is essential for improving the inclusivity and effectiveness of these initiatives. Clear representation can lead to a stronger sense of ownership and better alignment with the needs of the areas in question. In accordance, the **clarity of transactions and expected outcomes** also requires greater attention. This point was highlighted several times but in a practical and applicable way it is not always present in PES schemes. Transparent agreements, with clearly defined roles, responsibilities, and outcomes for all involved stakeholders, are essential for building trust, encouraging active participation in PES agreements and delivering better results. Research on how best to achieve such plain agreements could have a significant impact on the design and implementation of future schemes and deserve further development.

A critical challenge lies in **balancing economic and sustainable outcomes**, particularly in contexts where financial incentives may conflict with environmental objectives. Investigating how to harmonise these aspects is vital to creating PES schemes that achieve both ecological integrity and tangible economic benefits especially where they can be extremely relevant, such as vulnerable areas that demand a switch in local procedures to meet sustainable standards. Therefore, deeper exploration is needed into **comparative analyses of PES initiatives at the European level, as well as at the global level, especially comparing the Global North and South**. The context plays an essential role and it is not advantageous to develop isolated narratives that do not compromise less wealthy areas. In order to achieve this purpose, examining differences in expectations, challenges, and opportunities, with a focus on key issues such as equity, environmental justice, and control over land use, is crucial. Understanding these regional variations can help tailor PES frameworks to better address unique socio-economic and ecological dynamics.

In addition, **the integration of natural capital dimensions in PES transactions presents a promising avenue for research**. As mentioned in section 4.3 this asset was not covered in our work and has great potential for research to find out more on natural dimensions in PES transactions, from their potentialities to impacts that may suffer in eventual implementations. Exploring how natural capital accounting can enhance the valuation of ES and contribute to more robust PES schemes, which is vital for improving their impact and sustainability.

Least, the **effectiveness of results-based payments** also needs special attention. While such mechanisms are widely used, they do not always deliver the expected outcomes as demonstrated by the presence of criticalities and weaknesses identified in the SWOT analysis. Conversely, the efficiency of this strategy seems to be related to the actors involved, project goals and likely context, though this study has not gone further on this topic to reason on it. Investigating alternative approaches and identifying factors that influence the reaching of the results (lack of monitoring data, inconsistent interventions, too little scale, stakeholders demotivation) is crucial for refining PES frameworks and ensuring they meet their intended objectives.

We trust that by addressing these areas, future research can build upon the findings of this document, advancing the understanding and application of PES schemes in diverse socio-ecological contexts.

List of References

- Ascoli, D., Plana, E., Oggioni, S. D., Tomao, A., Colonico, M., Corona, P., Giannino, F., Moreno, M., Xanthopoulos, G., Kaoukis, K., Athanasiou, M., Colaço, M. C., Rego, F., Sequeira, A. C., Acácio, V., Serra, M., & Barbati, A. (2023). Fire-smart solutions for sustainable wildfire risk prevention: Bottom-up initiatives meet top-down policies under EU green deal. *International Journal of Disaster Risk Reduction*, 92, 103715. <https://doi.org/10.1016/j.ijdrr.2023.103715>
- Asociación para el Desarrollo Integral de la Manchuela Coquense. (2023). Desarrollo Integral de la Manchuela Coquense. Asociación Para El Desarrollo Integral De La Manchuela Coquense. <https://adiman.es/>
- Bugalho, M., & Silva, L. (2014). Promoting sustainable management of cork oak landscapes through payments for ecosystem services: The WWF Green Heart of Cork project. *Unasylva*, 65(241), 29-30.
- Capodaglio, A., & Callegari, A. (2018). Can Payment for Ecosystem Services Schemes Be an Alternative Solution to Achieve Sustainable Environmental Development? A Critical Comparison of Implementation between Europe and China. *Resources*, 7(3), 40. <https://doi.org/10.3390/resources7030040>
- Ce Center Circular Economy and Policy Research Center. (May 2019). Biomass Flows in the Flemish Economy <https://circulareconomy.europa.eu/platform/sites/default/files/8-biomass-flows-in-the-flemish-economy-nl.pdf>
- Center for the study of democracy (CSD). (2024). Mapping Illegal Logging and Timber Trade. Promoting Sustainable Environmental Solutions to Tackle Energy Poverty in Bulgaria https://csd.eu/fileadmin/user_upload/publications_library/files/2024_6/2024-06-20_Illegal-Logging_Publication_V2.pdf
- Centre for the Promotion of Imports (CBI). (2023). What is the market potential for nature tourism? Retrieved from <https://www.cbi.eu/market-information/tourism/nature-tourism/market-potential>
- Centro de Desarrollo Rural la Manchuela. (n.d.). Estrategia Desarrollo Local Participativo 2023-2027 (Versión noviembre de 2023). <https://www.lamanchuela.es/>
- CIMAC. (2020, July 19). [pt]Demografia[:] - Comunidade Intermunicipal do Alentejo Central.
- Comunidade Intermunicipal Do Alentejo Central. <https://www.cimac.pt/visitante/alentejo-central/caracterizacao/demografia/>
- Christodoulou, A., & Cullinane, K. (2019). Identifying the Main Opportunities and Challenges from the Implementation of a Port Energy Management System: A SWOT/PESTEL Analysis. *Sustainability*, 11(21), 6046. <https://doi.org/10.3390/su11216046>
- COWI, Ecologic Institute, & IEEP. (2020). Analytical support for the operationalisation of an EU carbon farming initiative: Lessons learned from existing result-based carbon farming schemes and barriers and solutions for implementation within the EU. Report to the European Commission, DG Climate Action under Contract No. CLIMA/C.3/ETU/2018/007
- David, Fred R. (2011). Strategic management: concepts and cases. https://www.academia.edu/29349645/THIRTEENTH_EDITION_Strategic_Management_CONCEPTS_AND_CASES
- EIB. (2024, February 28). Big boost for Bulgaria's economy and environment with EIB Group deals. European Investment Bank. <https://www.eib.org/en/press/all/2024-089-big-boost-for-bulgaria-s-economy-and-environment-with-eib-group-deals>

Engel, S., Pagiola, S., & Wunder, S. (2008). Designing payments for environmental services in theory and practice: An overview of the issues. *Ecological Economics*, 65(4), 663–674.
<https://doi.org/10.1016/j.ecolecon.2008.03.011>

Environmental Protection Agency. (2024). Learn about environmental justice | US EPA.
<https://www.epa.gov/environmentaljustice/learn-about-environmental-justice>

Eufunding. (2024, September 13). LIFE 2024 Capacity Building. EU Grants and Funding.
<https://eufundingportal.eu/life-2024-capacity-building/>

European Commission. (2020). EU Biodiversity Strategy for 2030: Bringing nature back into our lives (2020/380/EC). Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee, and the Committee of the Regions

European Commission. (2021). New EU Forest Strategy for 2030 (2021/572/EC). Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee, and the Committee of the Regions.

European Commission. (2021b). Education for environmental sustainability: policies and approaches in European Union Member States. Final Report.

European Commission. (2023a). The impact of demographic change in a changing environment.
https://commission.europa.eu/system/files/2023-01/Demography_report_2022_0.pdf

European Commission. (2023b). Guidance on the Development of Public and Private Payment Schemes for Forest Ecosystem Services. https://agriculture.ec.europa.eu/system/files/2023-07/guidance-dev-public-private-payment-schemes-forest_en.pdf

European Commission. (September 2024). The future of European competitiveness Part B. In-depth analysis and recommendations. https://commission.europa.eu/document/download/ec1409c1-d4b4-4882-8bdd-3519f86bbb92_en?filename=The%20future%20of%20European%20competitiveness_%20In-depth%20analysis%20and%20recommendations_0.pdf

European Commission. (n.d.). Standard Eurobarometer 98 – Winter 2022-2023. Retrieved from <https://europa.eu/eurobarometer/surveys/detail/3173>.

European Committee of the Regions. (n.d.). Division of powers: Decentralization Index.
<https://portal.cor.europa.eu/divisionpowers/Pages/Decentralization-Index.aspx?countryName=austria>

European Committee of the Regions. (n.d). [France](https://portal.cor.europa.eu/divisionpowers/Pages/France-Environment-and-fight-against-climate-change.aspx) - Environment & the Fight against Climate Change.
<https://portal.cor.europa.eu/divisionpowers/Pages/France-Environment-and-fight-against-climate-change.aspx>

European Environment Agency. (2024). European Climate Risk Assessment. EEA Report No 1/2024.
<https://www.eea.europa.eu/publications/european-climate-risk-assessment>

European Investment Bank. (2023). Investing in nature-based solutions State-of-play and way forward for public and private financial measures in Europe.
https://www.eib.org/attachments/lucalli/20230095_investing_in_nature_based_solutions_en.pdf

Eurostat. (2024). Population projections in the EU. https://ec.europa.eu/eurostat/statistics-explained/index.php?oldid=497115#Population_projections

Eurostat. (2024b). Population projections at regional level. https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Population_projections_at_regional_level

Ezzine-de-Blas, D., et al. (2016). Innovative mechanisms for financing biodiversity conservation: An exchange of experiences between Europe and Mexico. Summary of the key insights for CBD COP13 side event (16 December 2016), Cancun, Mexico.

Falcone, P. M., Tani, A., Tartiu, V. E., & Imbriani, C. (2020). Towards a sustainable forest-based bioeconomy in Italy: Findings from a SWOT analysis. *Forest Policy and Economics*, 110, 101910.
<https://doi.org/10.1016/j.forpol.2019.04.014>

Federal Ministry Republic of Austria. (n.d.). Regional policy in Austria. Federal Ministry of Agriculture, Forestry, Regions and Water Management. <https://info.bml.gv.at/en/topics/regions-and-spatial-development/regional-policy-in-austria-.html>

Federal Ministry Republic of Austria. (n.d.-a). Education. Regional Policy in Austria. Federal Ministry of Agriculture, Forestry, Regions and Water Management. <https://info.bml.gv.at/en/in-focus/education.html>

Fondazione Lombardia per l'Ambiente (FLA), Regione Lombardia. Rapporto di sintesi sulla strategia regionale di adattamento ai cambiamenti climatici.
https://www.regione.lombardia.it/wps/wcm/connect/841f23be-02ea-423c-b868-052cc92b6578/Allegato+alla+Comunicazione_Rapporto+di+sintesi_DEF.pdf?MOD=AJPERES&CACHEI

Forest Europe Organisation. (2017). Opportunities and risks associated with PES.
https://foresteurope.org/wp-content/uploads/2017/08/Opportunities-and-risks_PES.pdf

Future Hubs. (2024). Gothenburg: A Sustainable Urban Oasis on Sweden's West Coast.
<https://futurehubs.eu/gothenburg-a-sustainable-urban-oasis-on-swedens-west-coast/>

Grand Est. (2024). *L'écosystème régional*. Retrieved from <https://biodiversite.grandest.fr/lecosysteme-regional/>

Giddings, B., & Matthew. (2024, February 20). DO Manchuela. Desoutter & James on Wine.
https://desoutterandjames.substack.com/p/manchuela?srltid=AfmBOooe1nfFOuE0boj78Kgm39cER445HqQ1_97pNKwddi5qVnjrlWNX

Grima, N., Corcoran, W., Hill-James, C., Langton, B., Sommer, H., & Fisher, B. (2020). The importance of urban natural areas and urban ecosystem services during the COVID-19 pandemic. *PLoS ONE*, 15(12), e0243344. <https://doi.org/10.1371/journal.pone.0243344>

Greiber, Thomas (Ed). (2009). *Payments for Ecosystem Services. Legal and Institutional Frameworks*. IUCN, Gland, Switzerland. <https://portals.iucn.org/library/efiles/documents/EPLP-078.pdf>

Government of Flanders, Flemish Reform Programme 2024. (2024)
https://flandersineu.be/sites/default/files/2024-04/Flemish%20Reform%20Programme%202024_0.pdf

Government Offices of Sweden, Ministry of Environment. (2019). Revised National forestry accounting plan for Sweden. <https://www.government.se/contentassets/730d6345a5d745b1bc5f084e2f00ff7/revised-national-forestry-accounting-plan-for-sweden/>

Haarich, S. N., & Jaime, D. C. H. (2004). Development of evaluation systems – Evaluation capacity building in the framework of the new challenges of EU structural policy.
<https://www.econstor.eu/handle/10419/117051>

Herman, R et al. (2004), Compensation for Environmental Services and Rural Communities: Lessons from the Americas. University of Massachusetts. <https://doi.org/10.7275/1281237>

Huang, Y., Zhang, X., Sheng, X., Wang, Y., & Leung, K. M. Y. (2024). The impact of payment for ecosystem service schemes on participants' motivation: A global assessment. *Ecosystem Services*, 65, 101595. <https://doi.org/10.1016/j.ecoser.2024.101595>

Invest Eastern France. (n.d.). A dynamic and innovative economy. Retrieved from <https://www.invest-easternfrance.com/en/a-dynamic-and-innovative-economy/>

Invest in Gothenburg. (n.d.). Gothenburg Green City Zone. Retrieved from <https://www.investingothenburg.com/front-runner-sustainability/gothenburg-green-city-zone>

IPCC. (2021). Climate change 2021: The physical science basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (V. Masson-Delmotte, P. Zhai, A. Pirani, S. L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M. I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J. B. R. Matthews, T. K. Maycock, T. Waterfield, O. Yelekçi, R. Yu, & B. Zhou, Eds.). Cambridge University Press. In press

Le Région Grand Est. (n.d.). Faire du Grand Est un leader européen de la bioéconomie. Retrieved from <https://www.grandest.fr/developper-economie-vertueuse/strategie-bioeconomie/>

Kazana, V., Kazaklis, A., Stamatiou, C., Koutsona, P., Boutsimea, A., & Fotakis, D. (2015). SWOT analysis for sustainable forest policy and management: a Greek case study. *International Journal of Information and Decision Sciences*, 7(1), 32. <https://doi.org/10.1504/ijids.2015.068116>

Korhonen, K., and Stahl, G. (2020). Maintenance and appropriate enhancement of forest resources and their contribution to global carbon cycles. In *FOREST EUROPE, 2020: State of Europe's forests 2020*

Klůvanková, T., Špaček, M., Brnkařáková, S., Louda, J., Janaček, J., Sorge, S., Szabo, T., Horvath, D., Brogaard, S., Gagliano, C., & Mann, C. (2023). Behavioural Approach to Co-Creation of Governance Innovations for Sustainable Forest Management in Europe. *Social Science Research Network (SSRN)*. <https://doi.org/10.2139/ssrn.4425902>

Land Niederösterreich. (2023). ECONOMIC STRATEGY LOWER AUSTRIA 2025. Office of the Lower Austrian Federal Government Department of Economy, Tourism and Technology. https://www.noel.gv.at/noel/Topics-in-English/Economic_Strategy_Lower_Austria_2025.pdf

Ma, L. (2024). Technological Innovations in Agricultural Firms in Bulgaria: What is the Role of EU Funds? *Proceedings of the International Conference on Business Excellence*, 18(1), 1647–1657. <https://doi.org/10.2478/picbe-2024-013>

Magistrat Waidhofen a/d Ybbs. (n.d.). Wasser. Waidhofen a/D Ybbs. <https://waidhofen.at/wasser>

Maja, M. M., and Ayano, S. F. (2021). The impact of population growth on natural resources and farmers' capacity to adapt to climate change in Low-Income countries. *Earth Systems and Environment*, 5(2), 271–283. <https://doi.org/10.1007/s41748-021-00209-6>

Mina, M., Bugmann, H., Cordonnier, T., Irauschek, F., Klopčič, M., Pardos, M., & Cailleret, M. (2016). Future ecosystem services from European mountain forests under climate change. *Journal of Applied Ecology*, 54(2), 389–401. <https://doi.org/10.1111/1365-2664.12772>

Ministry of Environment and Water (Bulgaria). (2020). *Strategy and Action Plan - Full Report*. Retrieved from <https://www.moew.government.bg/static/media/ups/categories/attachments/Strategy%20and%20Action%20Plan%20-%20Full%20Report%20-%20%20End3b215dfec16a8be016bfa529bcb6936.pdf>

OECD. (2023). Overview of the Public Governance System in Sweden. In *Public Governance Monitor of Sweden*, OECD Publishing. <https://doi.org/10.1787/8f7d4ba3-en>

- Pagdee, A., Kawasaki, J. (2020). The importance of community perceptions and capacity building in payment for ecosystems services: A case study at Phu Kao, Thailand. *Ecosystem Services*, 47, 101224. <https://doi.org/10.1016/j.ecoser.2020.101224>
- Pereira, L., Pinto, M., Da Costa, R. L., Dias, Á., & Gonçalves, R. (2021). The new SWOT for a Sustainable world. *Journal of Open Innovation Technology Market and Complexity*, 7(1), 18. <https://doi.org/10.3390/joitmc7010018>
- Pes, G., & Porretta, P. (2015). Microfinance, EU structural funds and capacity building for managing authorities. In *Palgrave Macmillan UK eBooks*. <https://doi.org/10.1057/9781137536020>
- Petersson, H., Ellison, D., Mensah, A. A., Berndes, G., Egnell, G., Lundblad, M., Lundmark, T., Lundström, A., Stendahl, J., & Wikberg, P. (2022). On the role of forests and the forest sector for climate change mitigation in Sweden. *GCB Bioenergy*, 14(7), 793–813. <https://doi.org/10.1111/gcbb.12943>
- Portal Estadístico. (n.d.). Condiciones de vida. Portal Estadístico - *España En Cifras*. https://portalestadistico.com/default.aspx?pn=portalestadistico&pc=AAA00&idp=10003&idioma=&idpl=100023&Id_Territorio=02
- Richards, D. R., Thompson, B. S. (2019). Urban ecosystems: A new frontier for payments for ecosystem services. *People and Nature*, 1(2), 249–261. <https://doi.org/10.1002/pan3.20>
- Reed, M. S., Curtis, T., Gosal, A., Kendall, H., Andersen, S. P., Ziv, G., Attlee, A., Fitton, R. G., Hay, M., Gibson, A. C., Hume, A. C., Hill, D., Mansfield, J. L., Martino, S., Olesen, A. S., Prior, S., Rodgers, C., Rudman, H., & Tanneberger, F. (2022). Integrating ecosystem markets to co-ordinate landscape-scale public benefits from nature. *PLoS ONE*, 17(1), e0258334. <https://doi.org/10.1371/journal.pone.0258334>
- Roser, M., Ritchie, H., & Ortiz-Ospina, E. (2013). World population growth. *OurWorldInData.org*. <https://ourworldindata.org/world-population-growth>
- Saint-Cyr, L. D., Védrine, L., Legras, S., Gallo, J. L., & Bellassen, V. (2023). Drivers of PES effectiveness: Some evidence from a quantitative meta-analysis. *Ecological Economics*, 210, 107856. <https://doi.org/10.1016/j.ecolecon.2023.107856>
- Schirpke, U., Marino, D., Marucci, A., & Palmieri, M. (2018). Positive effects of payments for ecosystem services on biodiversity and socio-economic development: Examples from Natura 2000 sites in Italy. *Ecosystem Services*, 34, 96–105. <https://doi.org/10.1016/j.ecoser.2018.10.006>
- Schröter, B., Hauck, J., Hackenberg, I., & Matzdorf, B. (2018). Bringing transparency into the process: Social network analysis as a tool to support the participatory design and implementation process of Payments for Ecosystem Services. *Ecosystem Services*, 34, 206–217. <https://doi.org/10.1016/j.ecoser.2018.03.007>
- State Government of Mecklenburg-Vorpommern. (2024). Economy and investment. *Government MV*. Retrieved from <https://www.government-mv.de/Mecklenburg%E2%80%93Vorpommern/Economy-and-investment/>
- SUWANU Europe. (2021). State of play analyses for Alentejo, Portugal. In *SUWANU Europe Project*. <https://suwanu-europe.eu/>
- The World Bank. (2024). Inequality of opportunity in Bulgaria. *Policy Note*. <https://documents1.worldbank.org/curated/en/099072424133054872/pdf/P17989018b93e40961997d12cf182864b16.pdf>

Triyanti, A., Dieperink, C., Hegger, D., Vu, T., Luu, T. T., Nguyen, D. C., & Nguyen, H. Q. (2024). Enhancing the role of International NGOs in promoting the implementation of ecosystem-based adaptation policies: insights from an International Union for Conservation and Foundation of Netherlands Volunteers led project in the Vietnamese Mekong Delta. *Ecology and Society*, 29(1). <https://doi.org/10.5751/es-14727-290131>

Ugolini, F., Massetti, L., Calaza-Martínez, P., Cariñanos, P., Dobbs, C., Ostoić, S. K., Marin, A. M., Pearlmutter, D., Saaroni, H., Šaulienė, I., Simoneti, M., Verlič, A., Vuletić, D., & Sanesi, G. (2020). Effects of the COVID-19 pandemic on the use and perceptions of urban green space: An international exploratory study. *Urban Forestry & Urban Greening*, 56, 126888. <https://doi.org/10.1016/j.ufug.2020.126888>

Valencia, S. (2019). Localisation of the 2030 Agenda and its Sustainable Development Goals in Gothenburg, Sweden. https://www.mistraurbanfutures.org/sites/mistraurbanfutures.org/files/gothenburg_final_city_report_sdgs_project-nov_2019-valencia_0.pdf

Vandekerckhove, K. (2013). Integration of Nature Protection in Forest Policy in Flanders (Belgium). *INTEGRATE Country Report*. EFICENT-OEF, Freiburg. https://purews.inbo.be/ws/portalfiles/portal/781073/Vandekerckhove_2013_integrate_country_report_Belgium.pdf

Viszlai, I., Barredo, J.I., San -Miguel-Ayanz, J. (2016) Payments for Forest Ecosystem Services SWOT Analysis and Possibilities for Implementation. *EUR 28128 EN*, doi:10.2788/957929.

Yan, H., Yang, H., Guo, X., Zhao, S., & Jiang, Q. (2022). Payments for ecosystem services as an essential approach to improving ecosystem services: A review. *Ecological Economics*, 201, 107591. <https://doi.org/10.1016/j.ecolecon.2022.107591>

Wang, L., Wang, E., Mao, X., Benjamin, W., & Liu, Y. (2023). Sustainable poverty alleviation through forests: Pathways and strategies. *The Science of the Total Environment*, 904, 167336. <https://doi.org/10.1016/j.scitotenv.2023.167336>

Winkel, G., Lovrić, M., Muys, B., Katila, P., Lundhede, T., Pecurul, M., Pettenella, D., Pipart, N., Plieninger, T., Prokofieva, I., Parra, C., Pölzl, H., Roitsch, D., Roux, J., Thorsen, B. J., Tyrväinen, L., Torralba, M., Vacik, H., Weiss, G., & Wunder, S. (2022). Governing Europe's forests for multiple ecosystem services: Opportunities, challenges, and policy options. *Forest Policy and Economics*, 145, 102849. <https://doi.org/10.1016/j.forpol.2022.102849>

