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Article

Public–Private Partnership as a Form of Ensuring Sustainable Development of the Forest Management Sphere

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Abstract: This article examines the application of one of the forms of modern public management—public–private partnership (PPP)—in the forestry sector. This contributes to the search for new forms and methods that uphold the principles of sustainable development, decentralization, liberalization and capitalization of natural resources. The purpose of this study is to determine the characteristic features and advantages of PPP as a special partnership between the state and business-entrepreneurial structures, as well as to analyze the prospects and justify the feasibility of using PPP tools to ensure effective forestry. The research methodology was based on the critical analysis of the scholarly literature. Strategic documents, political reports and programs relevant to the forestry sector were also examined. In summary, it can be said that PPP models are a significant addition to other types of cooperation, such as more formal, top-down initiatives. PPP forestry projects can enable the accomplishment of otherwise impossible tasks.

Keywords: public–private partnership; forest management; protected area; climate change



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1. Introduction

Among the most urgent issues of our time is the effective use of resources by states in order to fully perform the functions assigned to them. For the stable maintenance of the course of sustainable development and the effective achievement of its goals, diversification and innovative transformation of socio-economic relations are necessary. Of particular concern are the field of nature management and the reproduction of natural resources (Vision 2040; Hatchwell 2014; European Commission and Directorate-General for Environment 2021; Nature and Forest Strategy Factsheet 2021). Dynamic changes in economic governance, such as the transition to a management system for sustainable development, necessitate a constant search for new forms of sustainable land, forest and water use (European Commission 2021b; European Commission and Directorate-General for Environment 2021; Ministerial Conference on Protection Forests in Europe 2020; United Nations and Food and Agriculture Organization of United Nations 2021; Mills et al. 2022).

PPP can rightly be considered as an active tool for managing transformational processes in the socio-economic and environmental sphere. This makes it possible to attract investment capital and competent entrepreneurship to solve state problems of regional and local development, as well as to distribute risks and obligations between the state and business (UNCITRAL 2019; AFoCO 2022).

In modern public governance, PPP serves as a fairly effective tool for the development of the regional economy and the socio-economic growth of territories, and in many countries, it has gradually taken shape as an independent institution. The experience of these countries testifies to the successful implementation of PPP projects in sectors of the

economy such as energy, telecommunications, water supply and sanitation. In the social sphere, PPP mechanisms are effectively involved in the management of medical and educational institutions and are used in infrastructural sectors (transport, road and municipal infrastructure, sea and river ports) (World Bank 2002; Yescombe 2007; UNCITRAL 2019; World Bank Group 2022).

At the same time, insufficient attention has been given to the socio-economic essence and potential of partnership between the state and business in the field of sustainable environmental governance. The limited scope and forms of implementation of PPP in this field make PPPs uncompetitive. The idea of attracting financial resources and organizational capabilities of business to reduce pressure on budgets at various levels, in order to solve the problems of public governance in the field of nature governance and environmental protection (for example, the field of forest management and expanded reproduction of forest resources), the implementation of a regional environmentally responsible policy, and the development of sustainable nature management remains not fully implemented.

Thus, the wider use of PPP represents a promising and strategic direction for environmental and economic policy in the forestry sector, under the conditions of state and communal ownership of forests. This can help expand the investment potential of forestry and solve budgetary and financial problems. Their possible application requires more systematic consideration, as it is currently fragmented (for example, certain forms of PPP have been defined, including concession, corporatization of forests and financial leasing) (Lausche and Burhenne 2011; Pfueller et al. 2011; De Matteis et al. 2021; UNDP Special Unit for South-South Cooperation 2021).

In general, the development of PPP in the natural resource sector (forest, water and land use) is the result of a search for new forms and methods of public governance and regulation based on the principles of sustainable development. It is also driven by significant structural shifts towards economic liberalization, decentralization, privatization and capitalization of natural resources. In particular, current budgets for the development of the forest resource sector do not provide a proper financial basis for sustainable forest management. Taken together, this highlights the need to improve the economic mechanisms that influence the functioning of the forestry sector. Specifically, efforts should focus on attracting additional sources of funding that meet the market needs of forestry (Widman 2016; Thellbro et al. 2018; The European Forestry House 2019; Winkel et al. 2022).

Given the issues described above, the purpose of this study is to determine the characteristic features and advantages of PPP as a special partnership between the state and business-entrepreneurial structures, as well as to analyze the prospects and justify the feasibility of using PPP tools to ensure effective forestry. Additionally, the goal is to identify obstacles to these public-private initiatives and to identify strategies to stimulate the development of PPPs for sustainable spatial development of the forestry sector. Separate proposals for the introduction of PPP institutions in the field of sustainable management of the forest resource sector have not yet received sufficient scientific, methodological and practical support, which hinders the possibility of their implementation in the near future. PPP represents a synthetic form of entrepreneurship with specific varieties, forms and possibilities of flexible use (for example, in clusters, associations, holdings, etc.). Justification for their possible expansion into certain areas of forestry is still required.

In this study, PPP in the forestry sector is presented as a system of organizational, economic and legal forms, methods and tools. It serves to coordinate the environmental, economic and social interests of society, territorial communities, the state (represented by its central and regional executive authorities, as well as regional and local self-government), civil society institutions and business entities. It works to ensure the sustainable development of forestry by addressing issues of management, control, risks and results among business forestry partners on a long-term and strategic basis.

The use of PPP in the forestry sector (as in any other sector) has certain requirements. It is necessary to take into account sectoral aspects (particularly long-term aspects) and modern principles of forest governance. Additionally, PPP should be considered as a

mechanism for the implementation of integrative programs, i.e., the harmonization of environmental and economic interests and the resolution of emerging contradictions. For example, a form of PPP labeled “lease with transfer of ownership” can be used to reforest erosive or agricultural land (for example, a private partner leases a certain land plot on the basis of a lease agreement, after which a certain part or all of the land can gradually shift to private ownership based on agreed terms). PPP can also be an effective tool for the implementation of programs aimed at the rehabilitation of forests and the renewal of forest resources as a result of hostilities.

2. Literature Review

The emergence and development of PPP resulted from a search for new effective methods of public administration and regulation. This was, in turn, made necessary by significant shifts towards economic liberalization, decentralization and privatization. Another reason for the formation of the PPP system was the fact that the private and public sectors have unique characteristics that provide them with an advantage in socially important areas of management (particularly social and environmental areas). Moreover, PPP formation was also motivated by the desire to change the approach to understanding the functions of public authorities and local government, particularly the awareness of the need to transfer part of them to the private sector to be more efficient and mobile. The first PPP contracts appeared in the UK in the early 1980s under the New Public Administration Initiative (World Development Report 2002).

It should be noted that today, there are many definitions of PPP (World Bank 2002; Davies and Fairbrother 2003; Hodge and Greve 2007; Glasbergen 2011; World Bank Group 2022; Gupta et al. 2022). These range from the most general (e.g., opening government activities to competition from the private sector through PPPs) to the rather narrow definitions (e.g., joint ventures between private and public entities).

For example, according to the United Nations Commission on International Trade Law (UNCITRAL), a PPP means an agreement between a client and a private entity to carry out a project for payment by the customer or users of the facility. This includes those projects that involve the transfer of risk to the private partner (concessionary PPPs) and other types of PPPs that do not involve the transfer of such risk (non-concessional PPPs) (UNCITRAL 2019).

A PPP is defined as a partnership between a public organization and a private company in the form of medium- or long-term relationships, in which the partners agree to work closely with each other to improve the quality of services for the benefit of the population (The World Bank 2021). Based on the experience of developed countries with using partnerships between the public and private sectors, it can be noted that PPPs are implemented in various forms, depending on the method of participation in the PPP, as well as their status regarding the object of the contract, risk distribution and duration of cooperation. According to Davies and Fairbrother in 2003, there are five main PPP models, which are as follows: greenfield projects; separation of assets (divestiture); concessions (concession); management/outsourcing contracts; and leasing. Additionally, within the framework of each model, various forms of state partnership can be used depending on the industry specifics and the specific conditions of the potential project.

Moreover, PPPs can take many different forms with different purposes. In some cases, they are considered as a method of managing and/or pursuing specific goals. In other cases, PPPs are described as institutional schemes for financial cooperation. There are also service contract, operation and management contract, leasing, turnkey procurement and DBFO (design, build, finance and operate) PPPs. In general, there are different approaches to defining the forms and models of PPPs, although they all have some common features (Peters 1998; Glasbergen et al. 2007). The main characteristics of PPPs can be summarized as follows (see Figure 1):

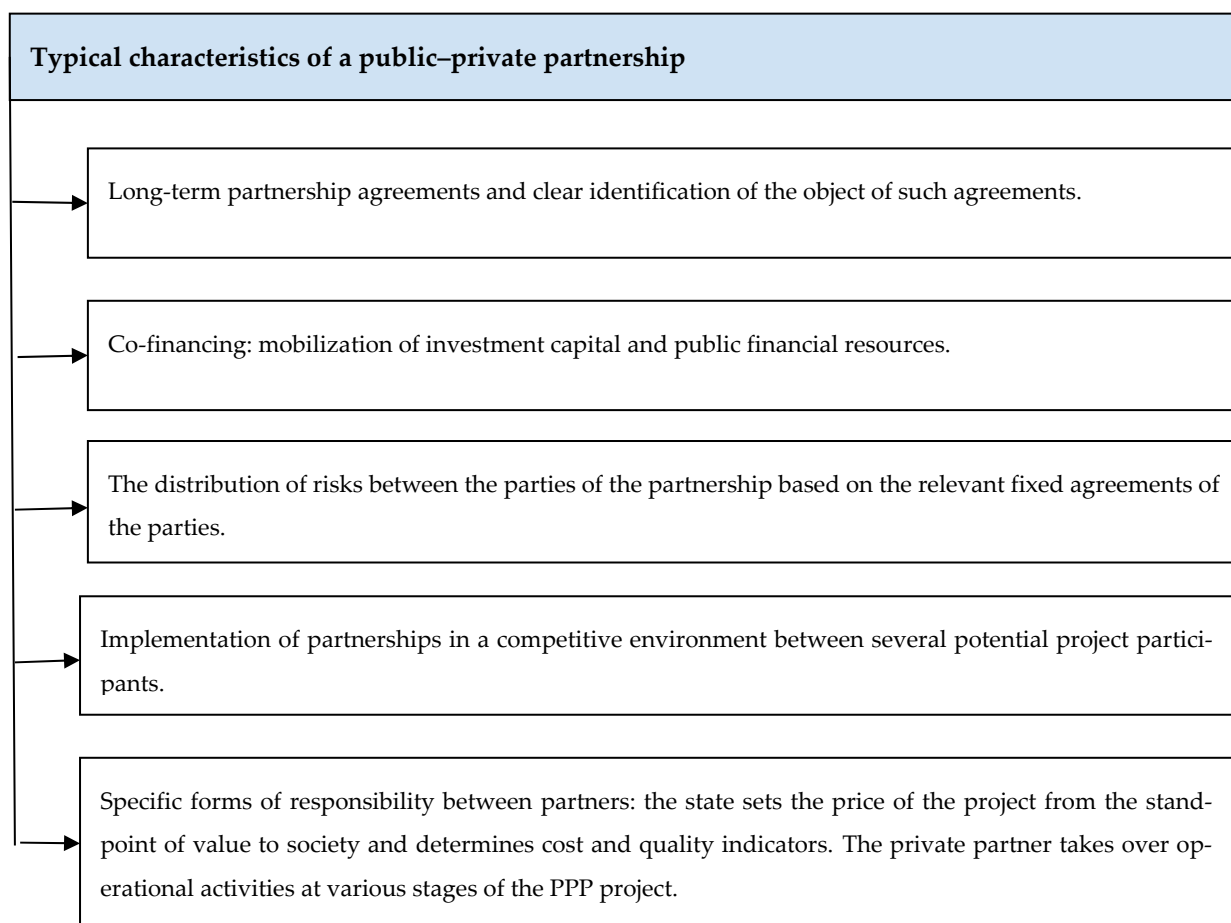


Figure 1. Characteristics of a PPP.

For example, as part of the implementation of PPP models, the public sector retains strategic control over the provision of services and the state of socially significant objects and benefits, and it does not relieve itself of obligations to perform social functions. The mechanisms of such a partnership are designed to ensure the most efficient use of budgetary and other resources of the public sector in the interests of society. At the same time, the state should create conditions for using the financial, managerial and intellectual potential of business structures in such projects. Ultimately, with proper organization of the PPP, both parties achieve their goals. In addition, PPP projects can be implemented in various contexts; there are global, transnational, national, subnational, regional and local partnerships. In some studies ([Local Government Association 2022](#)), corporate joint ventures and contractual partnerships are highlighted. These contractual partnerships are more focused on achieving concrete results. While corporate joint ventures can provide time flexibility, contractual partnerships and concession agreements are suitable for well-defined projects and time-limited tasks.

It should be noted that this variety of forms makes it difficult to understand the full meaning of the concept of PPP because it is used by scientists ([Grimseya and Lewis 2002](#); [Alexander et al. 2007](#); [Patrinos et al. 2009](#); [Kwak et al. 2009](#); [Andonova 2010](#); [Eckerberg et al. 2015](#); [Hellowell 2019](#); [Nduhura et al. 2020](#); [Brugièrè 2020](#); [Wang and Ma 2021](#)) from different fields, and their focus is on completely different research questions.

Studies of global models of PPPs and their adaptation in the European space have been conducted by academic economists ([Davies and Fairbrother 2003](#); [Hodge and Greve 2007](#); [Šutavičienė 2011](#); [Jakaitis and Paliulis 2013](#); [Smith et al. 2018](#); [Šimkutė 2022](#)).

In the forestry sector, it is advisable to consider PPPs within the forestry and recreational forest protection subcomplexes. These determine the efficiency and effectiveness of

forest management in the socio-ecological sphere, as well as the reproduction of forests of public and intersectoral importance.

The justification for the distribution of PPP institutions in the forestry sector is rooted in the works of well-known scientists and practitioners (Alexander et al. 2007; Mishenin et al. 2011; Brugière 2020; Rebelo 2022; Winkel et al. 2022; Becher 2022; Lier et al. 2022; Gupta et al. 2022).

The basis of this study is the theoretical and practical aspects of using PPP tools to achieve sustainable development and environmental management, as set out in the literature (Long and Arnold 1995; Glasbergen et al. 2007; Andonova 2010; Mishenina 2010; Glasbergen 2011; Eckerberg et al. 2015; Mishenina et al. 2017; De Zoysa 2020).

3. Materials and Methods

This study aimed to evaluate PPPs in the forestry sector in modern conditions to determine the need, prospects and potential for their use in the field of sustainable forest management. An additional goal was to identify barriers to implementation. The study was based on various data sources, including official documentation of state bodies and some international NGOs from the countries of the European Union, reports and policy statements of international organizations and sectoral government strategies.

Table 1 summarizes the results of the review of the main documents within the scope of the study. The need for strong partnership guidelines, based on the provisions of designated documents (strategies, agreements, reports, etc.), is crucial for the effectiveness of PPP in the field of sustainable forest management, for strengthening its existing institutional forms and for the emergence of new models.

Table 1. Key documents regarding the study of PPP in the field of sustainable forest management.

Policy Documents and Agreements	Reports	Evaluations, Publication, Regulations
1	2	3
COP26. Presidency Outcomes The Climate Pact. 26th UN Climate Change Conference of the Parties (COP26) in Glasgow, November 2021, 48p. Available online: https://ukcop26.org/wp-content/uploads/2021/11/COP26-Presidency-Outcomes-The-Climate-Pact.pdf (accessed on 28 October 2022)	Private Participation in Infrastructure (PPI), 2021. Annual Report, 29p. Available online: https://ppi.worldbank.org/content/dam/PPI/documents/PPI-2021-Annual-Report.pdf (accessed on 28 October 2022)	Vision 2040 of the European forest-based sector, 2019. Forest Based Vision 2040 Brochure-V9, p. 6. Available at: https://www.forestplatform.org/wp-content/uploads/2019/11/ForestBased-Vision2040-Brochure-V9_final.pdf (accessed on 28 October 2022)
United Nations Framework Convention on Climate Change, 1992. https://unfccc.int/files/essential_background/background_publications_htmlpdf/application/pdf/conveng.pdf (accessed on 28 October 2022)	Public-Private Partnerships (PPPs) in the Forest and Forestry Sector, 2022. The report by the AFoCO Regional Education and Training Center (RETC). Asian Forest Cooperation Organization. 103p. ISBN 979-11-92009-25-4 (electronic copy). Available online: https://afocosec.org/wp-content/uploads/2022/07/KN2022-008-Public-Private-Partnerships-PPPs-in-the-Forest-and-Forestry-Sector-20220708.pdf (accessed on 28 October 2022)	Reference Document No. 25. The inclusive green economy in EU development cooperation. An innovative approach at the intersection of the EU's Planet, People and Prosperity objectives of Directorate, 2018. https://www.switchtogreen.eu/wp-content/uploads/2018/11/MN-06-18-072-EN-N.pdf (accessed on 28 October 2022)

Table 1. Cont.

Policy Documents and Agreements	Reports	Evaluations, Publication, Regulations
1	2	3
New EUSTAFOR Strategy 2022–2026: Strategic Challenges, Strategic Objectives and Success Factors for the Future. Brussels, 9 March 2022. Available online: https://eustafor.eu/uploads/PRESS-RELEASE-EUSTAFOR-Strategy-2022-2026_F.pdf (accessed on 28 October 2022)	European Commission, 2022. FLEGT Regulation: Union-Wide Overview for the Year 2021. Overview based on the analysis of information on the application of the Forest Law Enforcement, Governance and Trade (FLEGT) Regulation (Council Regulation (EC) No. 2173/2005), submitted by EU Member States. https://ec.europa.eu/environment/forests/pdf/FLEGT_Overview_2021_rev%20EUROPA_992811345.pdf (accessed on 28 October 2022)	Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on nature restoration, Brussels, 22 June 2022, COM (2022) 304 final 2022/0195 (COD). https://environment.ec.europa.eu/publications/nature-restoration-law_en (accessed on 28 October 2022)
Work Plan 2018–2022 for the Implementation of the Forest Law Enforcement, Governance and Trade Action Plan. https://ec.europa.eu/environment/forests/pdf/FLEGT_Work_Plan_2018_2022.pdf (accessed on 28 October 2022)	Land Degradation in Climate Change and Land: an IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems, 2019. https://www.ipcc.ch/site/assets/uploads/sites/4/2019/11/07_Chapter-4.pdf (accessed on 28 October 2022)	Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL amending Regulations (EU) 2018/841 as regards the scope, simplifying the compliance rules, setting out the targets of the Member States for 2030 and committing to the collective achievement of climate neutrality by 2035 in the land use, forestry and agriculture sector, and (EU) 2018/1999 as regards improvement in monitoring, reporting, tracking of progress and review, COM/2021/554 final
New EU Forest Strategy for 2030. [SWD(2021) 651 final]—[SWD(2021) 652 final]. Brussels, 16 July 2021. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52021DC0572 (accessed on 28 October 2022)	An IPCC Special Report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems. https://www.ipcc.ch/srccl/ (accessed on 28 October 2022)	Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the making available on the Union market as well as export from the Union of certain commodities and products associated with deforestation and forest degradation and repealing Regulation (EU) No. 995/2010 COM/2021/706 final. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52021PC0706 (accessed on 28 October 2022)
The Paris Agreement, 2015. https://unfccc.int/sites/default/files/english_paris_agreement.pdf (accessed on 28 October 2022)	The State of the World’s Forests 2022. https://www.fao.org/3/cb9360en/online/cb9360en.html (accessed on 28 October 2022)	COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS, Stepping up EU Action to Protect and Restore the World’s Forests, COM/2019/352 final. https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1565272554103&uri=CELEX:52019DC0352 (accessed on 28 October 2022)

Table 1. Cont.

Policy Documents and Agreements	Reports	Evaluations, Publication, Regulations
1	2	3
<p>Nature and Forest Strategy Factsheet, 14 July 2021, Brussels. https://ec.europa.eu/commission/presscorner/detail/en/fs_21_3670 (accessed on 28 October 2022)</p>	<p>COMMISSION STAFF WORKING DOCUMENT Annual Single Market Report 2021. Accompanying the Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. Updating the 2020 New Industrial Strategy: Building a Stronger Single Market for Europe's Recovery {COM(2021) 350 final}—[SWD(2021) 352 final]—[SWD(2021) 353 final]. https://ec.europa.eu/info/sites/default/files/swd-annual-single-market-report-2021_en.pdf (accessed on 28 October 2022)</p>	<p>Reporting of LULUCF activities under the Kyoto Protocol. https://unfccc.int/topics/land-use/workstreams/land-use--land-use-change-and-forestry-lulucf (accessed on 28 October 2022)</p>
<p>Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL amending Regulations (EU) 2018/841 as regards the scope, simplifying the compliance rules, setting out the targets of the Member States for 2030 and committing to the collective achievement of climate neutrality by 2035 in the land use, forestry and agriculture sector, and (EU) 2018/1999 as regards improvement in monitoring, reporting, tracking of progress and review COM/2021/554 final. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52021PC0554 (accessed on 28 October 2022)</p>	<p>State of Europe's Forests 2020. Prepared and published by: Ministerial Conference on the Protection of Forests in Europe—FOREST EUROPE Liaison Unit Bratislava 394p. https://foresteurope.org/wp-content/uploads/2016/08/SoEF_2020.pdf (accessed on 28 October 2022)</p>	<p>COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS, Stepping up EU Action to Protect and Restore the World's Forests, COM/2019/352 final. https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:52019DC0352 (accessed on 28 October 2022)</p>
<p>EU 2030 Biodiversity Strategy (https://environment.ec.europa.eu/strategy/biodiversity-strategy-2030_en). European Commission, Directorate-General for Environment, EU biodiversity Strategy for 2030: Bringing nature back into our lives, Publications Office of the European Union, 2021. https://data.europa.eu/doi/10.2779/677548 (accessed on 28 October 2022)</p>	<p>COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT Accompanying the document COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS. Stepping up Europe's 2030 climate ambition; Investing in a climate-neutral future for the benefit of our people, SWD/2020/176 final. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52020SC0176 (accessed on 28 October 2022)</p>	<p>Land use and forestry regulation (LULUCF) for 2021–2030. https://climate.ec.europa.eu/eu-action/forests-and-agriculture/land-use-and-forestry-regulation-2021-2030_en#:~:text=The%20Regulation%20requires%20each%20Member,the%20%22no%20debit%20rule%22 (accessed on 28 October 2022)</p>

Table 1. Cont.

Policy Documents and Agreements	Reports	Evaluations, Publication, Regulations
1	2	3
The European Green Deal, 2019. COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE EUROPEAN COUNCIL, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS, The European Green Deal, COM/2019/640 final. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2019%3A640%3AFIN (accessed on 28 October 2022)	Forest Sector Outlook Study, 2020–2040. https://unece.org/sites/default/files/2022-05/unece-fao-sp-51-main-report-forest-sector-outlook_0.pdf (accessed on 28 October 2022)	World Bank. World Bank Guidance on PPP Legal Frameworks (English). Washington, DC: World Bank Group, 2022. http://documents.worldbank.org/curated/en/099440006162228966/P17521204fa5900710ba160e9613aa44291 (accessed on 28 October 2022)
A New Industrial Strategy for Europe, Brussels, 10 March 2020 COM(2020) 102 final. https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52020DC0102&from=EN (accessed on 28 October 2022)	Forest Products Annual Market Review 2020–2021. UNECE/FAO. https://unece.org/sites/default/files/2021-11/2114516E_Inside_Final_web.pdf (accessed on 28 October 2022)	OECD Principles for Public Governance of Public-Private Partnerships. https://www.oecd.org/governance/budgeting/PPP-Recommendation.pdf (accessed on 28 October 2022)
EU Climate Target Plan 2030 Key Contributors and Policy Tools, 2020. https://ec.europa.eu/commission/presscorner/detail/en/fs_20_1610 (accessed on 28 October 2022)	Financing Green Ambitions—full report (2020). https://www.local.gov.uk/financing-green-ambitions-full-report#financing-green-projects (accessed on 28 October 2022)	PPP Reference Guide 3.0, 2017. https://ppp.worldbank.org/public-private-partnership/library/ppp-reference-guide-3-0-full-version (accessed on 28 October 2022)
United Nations Strategic Plan for Forests 2017–2030, 2017. https://documents-dds-ny.un.org/doc/UNDOC/GEN/N17/034/53/PDF/N1703453.pdf?OpenElement (accessed on 28 October 2022)		A Guide to Community Engagement for Public-Private Partnerships (June 2019). https://consultations.worldbank.org/sites/default/files/materials/consultation-template/global-guide-community-engagement-pppsopenconsultationtemplate/materials/ppp_community_engagement_guide_fin_for_7-19a.pdf (accessed on 28 October 2022)
UNCITRAL Model Legislative Provisions on Public-Private Partnerships 2019. https://uncitral.un.org/sites/uncitral.un.org/files/media-documents/uncitral/en/19-11011_ebook_final.pdf (accessed on 28 October 2022)		

This research also used a case study methodology to examine joint projects of PPPs related to the management of natural forest resources and rural areas in the field of climate change, the conservation and maintenance of forest ecosystems and the management of protected areas.

This article contains documents related to trends in the modern development of European forests, as well as in the sphere of PPP. Political documents in the period from 2018 to 2022 were mainly collected from the official website of the European Union and the World Bank database, and they were supplemented by resources collected from the official websites of various relevant ministries, departments and organizations.

4. Results

4.1. The Context for the Development of PPPs in the Forest Sector and Its Potential for Sustainable Forest Management in the EU

Forests are known to contain the richest biodiversity of all terrestrial ecosystems. At the 26th UN Climate Change Conference of the Parties (COP26) in 2021, participating countries expressed a commitment to protect valuable natural habitats. Consequently, 91% of the world's forests are now covered by the commitment of 137 countries to stop deforestation by 2030 (for more details, see the *Glasgow Leaders' Declaration on Forests and Land Use*). Additionally, 28 countries launched a roadmap to protect forests through a global transition to sustainable development and trade in agricultural commodities, and 12 developed countries committed to allocate USD 12 billion from 2021 to 2025 to the new Global Forestry Financing Commitment (COP26 2021). The importance of implementing the announced actions at the global level lies in the fact that the protection and restoration of ecosystems and the sustainable management of land and forest resources can reduce annual net greenhouse gas emissions by more than 7 gigatons by 2030. This will, of course, reduce vulnerability to climate change, protect biodiversity and improve the standard of living of the population at the local, regional and global levels.

The territories of the European Union (EU) are 43.5% covered by forests and other wooded lands. Moreover, forest volume continues to grow in all member countries (EU). The forests of Europe provide renewable raw materials, are a source of biodiversity, ecosystem goods and services, and have recreational value for the population. Over the past 20 years, the area of forests designated for biodiversity conservation in the EU has increased by about 65%, and protected forests account for almost a quarter of the total forest area. In Europe, there has also been an increase in the area of protective forests, with protective functions often being integrated into multifunctional forestry outside of designated areas (Ministerial Conference on Protection Forests in Europe 2020). Clearly, the European forestry sector is the largest producer of clean electricity and biofuels. As a well-integrated value chain with three main sub-sectors (wood processing, pulp and paper and forestry), it is also significant as a player and contributor to sustainable development. Notably, the EU has committed itself to implementing the Carbon Farming Initiative, which aims to "generate tradable carbon certificates" for sale in the European Trading System (ETS). The New EU Forest Strategy 2030 (July 2021) clarifies that investments in forestry are included in the Carbon Agriculture Initiative (Winkel et al. 2022).

The European Commission (EC) proposes that the EU Forest Strategy 2030 will improve the quantity and quality of EU forests, which is planned to be achieved by increasing forest cover in an environmentally friendly manner, and will increase the sustainability of European forests. In particular, the general directions of the strategy are presented in Figure 2.

The regulations on land resources, changes in the land-use system and forestry have also been revised in the following matters:

- Restoring degraded ecosystems;
- Promoting the bioeconomy, while conserving biodiversity;
- Increasing carbon stocks in soil and forests;
- Increasing the use of durable wood and bio-products, etc.

Thus, for example, the new target for the restoration and expansion of natural carbon sinks in the EU by 2030 (CO₂eq) assumes an increase in plantings with a height of 310 Mt and above, while the current carbon sink is 268 Mt (Nature and Forest Strategy Factsheet 2021).

It should also be noted that in order to comply with the requirements for the continued and optimal use of the ecological resources of forests, a gradual transition from the system of growing even-aged and conditionally even-aged forest stands to the creation of plantations of different ages is necessary. Such plantations are especially relevant for forests used for nature conservation, scientific, historical and cultural purposes, as well as recreational, health-improving and protective forests, which are quite common in EU countries. For

these forest categories, the constant maintenance of their main functions at an optimal level is highly important.

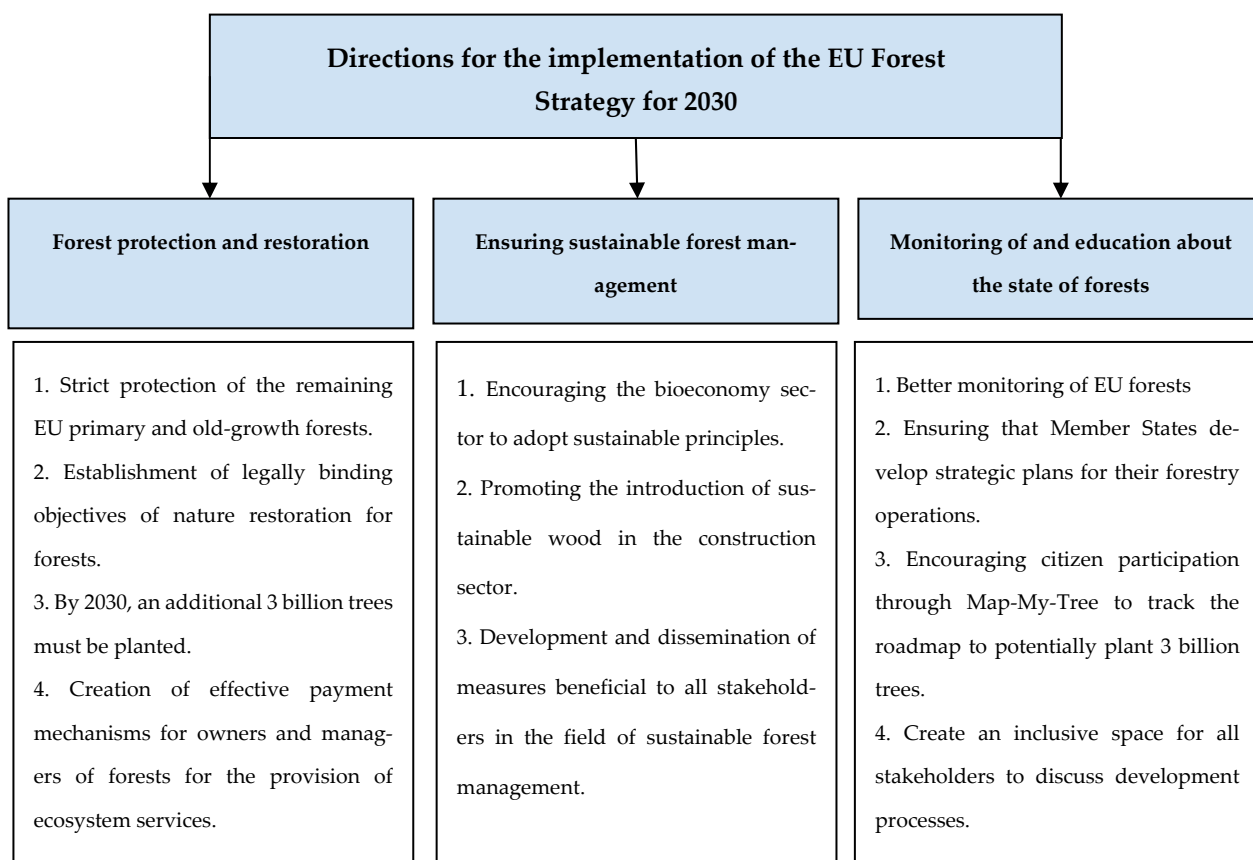


Figure 2. Directions for the implementation of the EU Forest Strategy for 2030. Scheme 2021.

It is also important to pay attention to the policy document of the General Assembly of the European State Forest Association (EUSTAFOR) 2022, the new EUSTAFOR Strategy for 2022–2026 (Brussels, 9 March 2022), which is designed to respond to current and future policy changes in relation to state forests and the demands of society. It brings together the challenges and opportunities identified by the EUSTAFOR member organizations to achieve the strategic objectives of state forests, and it identifies the actions to be taken in the coming years. Today, under the auspices of EUSTAFOR, 36 members in 25 European countries manage 49 million hectares of forests (30% of EU forests) on the principles of sustainability (protected forests comprise about 8.3 million hectares, protective forests comprise about 6 million hectares and forests designated as Natura 2000 areas comprise about 7.9 million hectares). Thus, for the next five years, the strategic agenda of EUSTAFOR will focus on the following policy areas (Eustafor 2022):

1. Climate change impacts on and management of European state forests (balance between mitigation and adaptation requirements);
2. Sustainable circular bioeconomy;
3. Multifunctional forestry as a preferred model for economic, social and environmental benefits in Europe;
4. Biodiversity, including the management of protected areas.

It is worth noting that this strategy states that EUSTAFOR members face numerous political, social and economic demands and contradictions that arise in the management of state forests. In turn, the Forest-based Sector Technology Platform (FTP) presented the “Vision for the European forest sector until 2040”, which considers the maximum use of the potential of research and innovation in the forest resource sector to create sustainable

ecosystems, “smart” products and social growth in order to strengthen the development trends of the circular bioeconomy. The European Forest Sector Vision 2040 is based on the so-called 10 ambitious targets, which are in line with the UN Sustainable Development Goals and the Paris Agreement 2015 (Forest-based Sector 2019) and clearly set out the long-term goals of the forest sector. They highlight the importance of resource efficiency, technology diversification, renewable energy and safe jobs (The European Forestry House 2019).

In summary, objectives related to forest resources and their effective management are found in several EU forest strategies, as are objectives for related sectors or actions in a broader context. Moreover, 24 tasks directly relate to forest issues in EU strategies (Lier et al. 2022). This underscores the importance of studying the problems and prospects for the development of the forestry sector based on a strategic, integrated approach.

Since the Rio Summit in 1992 and since the Johannesburg Summit in 2002, PPPs have been considered as an important tool that can be used to contribute to the achievement of the sustainable development goals. The definition of an environmental partnership specifically has also been described in the following manner: “voluntary, jointly defined activities and decision-making processes between corporate, non-profit and agency organizations that are aimed at improving the quality of the environment or the use of natural resources” (Long and Arnold 1995).

The concept of using PPPs in this area originates from the view that the government alone cannot provide collective goods such as sustainable development and that support must be sought from other sectors of society. Through the partnership process, it is expected that the public and private sectors can benefit by pooling their innovation and experience, as well as financial and other resources, to more effectively deliver collective benefits. Thus, PPP is considered as an alternative to privatization (Hodge and Greve 2007; Mishenina et al. 2017).

In other words, PPP can act as a tool through which one can enhance sustainable development by reconciling seemingly opposing policy goals, such as a strategy to improve rural development, while simultaneously conserving natural resources such as biodiversity, forests, fisheries and water resources (Glasbergen 2011). For countries rich in natural resources, PPPs offer the added benefit of being able to promote sustainable technologies and associated green development (Rebelo 2022).

Thellbro et al. (2018) states that, in Sweden, PPPs have played a minor role. However, thanks to EU cohesion policies, they are now gaining popularity as an effective model for rural natural resource management in a mountainous region (Thellbro et al. 2018). In the same paper, analysis of the opportunities and limitations of PPP forms of governance in rural mountain areas is complemented by questions about the effectiveness of environmental PPPs in a regional context. In another paper (Eckerberg et al. 2015), public-private governance partnerships, used to promote sustainable mountain development in Sweden, are considered in terms of top-down and bottom-up cooperation. Of particular interest is the initiation and implementation of such projects in the field of sustainable environmental management. PPPs related to the management of the environment and natural resources in the mountainous region of Sweden are grouped according to the topic of cooperation. For example, these topics include climate and energy, fisheries, forestry, hunting, landscape, local development, mining, nature and culture, nature conservation, recreation, Sámi and reindeer, tourism, paths and accessibility and water and wind energy (Eckerberg et al. 2015).

Therefore, the use of PPP mechanisms in the forestry sector (as in any other sector) has requirements. It is necessary to consider sectoral aspects (particularly long-term aspects) and modern principles of forest management. PPPs should be considered as a mechanism for the implementation of integrative functions, such as the harmonization of environmental and economic interests, and the resolution of emerging contradictions in the field of forestry.

In the context of our study, we define PPP in the forestry sector as follows: a system of organizational, economic and legal forms, methods and tools for coordinating the environmental, economic and social interests of society, territorial communities, the

state (represented by its central and regional executive authorities, regional and local self-government), civil society institutions and business entities to ensure the sustainable development of forestry through a balanced distribution of areas of management, control, risks and results among business forestry partners on a long-term and strategic basis.

According to (Bjärstig and Sandström 2017), a partnership should be a formalized, long-term or at least mutual commitment between partners with the aim of complementing each other, so that the goals of each partner can be achieved more effectively than would otherwise be possible. This is consistent with the desire to implement PPP projects in the field of forestry in modern conditions. Often, the purpose of using PPP mechanisms is to provide some public service or asset and, as mentioned above, to share risks, resources and rewards between partners.

PPP options in the forest sector can include joint forest management projects between government agencies, various investors and NGOs. Usually, PPP projects involve lease agreements, third-party schemes, crop-sharing contracts, market links and joint forest management. The most attractive PPP models for the private sector are state concessions of forest land for the creation of forest plantations (Cheboiwo et al. 2018). Plantations of wood, fuel wood or agroforestry can be created on a partnership basis within the framework of PPP projects (De Zoysa 2020).

4.2. The Role of Forestry PPPs in Climate Change Mitigation

As mentioned above, a significant reduction in forest loss by 2030 is a critical step to achieving goals related to sustainable development, global climate change, and biodiversity. Protecting and restoring forests offers one of the largest opportunities to combat climate change in the next decade. The implications of climate change for forests and their possible contribution to climate change mitigation are analyzed in detail in the *Forest Sector Outlook Study 2020–2040* (United Nations and Food and Agriculture Organization of United Nations 2021).

Regarding the goals of sustainable forest management pertaining to the socio-economic and environmental aspects of the functioning of European forests, many governments are now faced with the question of how to encourage investment in carbon sinks through the creation of sustainable forest stands. Importantly, 3 billion trees are planned to be planted throughout the European Union (European Commission and Directorate-General for Environment 2021). Therefore, significant growth of the carbon market is expected. One approach with considerable potential is to encourage long-term private investment in slower growing varieties of stands (because fast-growing varieties tend to have limited carbon stock densities). In turn, the commercial attractiveness of reforestation can be enhanced by payments for sequestered carbon, which makes forestry more attractive for the active development of PPPs in this area and for further investments in this activity. The sale of carbon offsets increases the financial attractiveness of reforestation and sustainable forest management. Carbon markets are expected to continue to grow. The size of the voluntary carbon market by project category is presented in Table 2.

Incentives for public and private “green” investments, for active knowledge exchange between regions and cities and for industry structures and owners of forest areas are needed to achieve carbon neutrality.

These types of PPP projects should be aimed at stimulating cooperation between landowners, investors and the government to reduce the impact of greenhouse gases. This is especially true for the creation of plantations located in areas that maximize environmental effects, such as mitigating the effects of salinization, deforestation, ecosystem degradation and erosion of land and agricultural land (Castanho et al. 2019). The prospects, advantages and disadvantages of using PPP projects for reforestation are presented in detail in the work of Alexander et al. in 2007, which also raises some questions about the nature of investments in forestry, as well as the possibilities and directions of this investment. Of particular interest are a number of described initiatives that industry, governments, investors and investment managers have developed together that could contribute to the formation of more formalized PPPs (Alexander et al. 2007). The practical aspects of these

projects are already being successfully implemented in sustainable forest management in countries such as the USA (UNDP Special Unit for South-South Cooperation 2021), Sweden (Widman 2016), Canada (Wellstead et al. 2003), Albania (The Schwarznegger Climate Initiative 2018), Finland (Sustainable Forest Management 2019) and others (Sotirov et al. 2020). The majority of forestry-related PPP investments are now being implemented in Asia, Africa and Latin America (Bouma and Berkhout 2015; Chupezi 2016; Cheboiwo et al. 2018; De Zoysa 2020; Chisika and Yeom 2021; AFoCO 2022). Furthermore, interaction with stakeholders in different sectors and at different levels is a key factor for supporting PPP initiatives regarding reforestation.

Table 2. Voluntary carbon market size by project category, 2019–2021 August.

	2019					2020			2021 August		
	Volume (MtCO ₂ e)	Price per Tonne (USD)	Value (USD Million)	Volume (MtCO ₂ e)	Volume % Change from Previous Year	Price per Tonne (USD)	Value (USD Million)	Volume (MtCO ₂ e)	Volume % Change from Previous Year	Price per Tonne (USD)	Value (USD Million)
Forestry and land use	36.7	4.33	159.1	48.1	30.9	5.60	269.4	115.0	139.4	4.73	544.0
Renewable energy	42.4	1.42	60.1	80.3	89.4	0.87	70.1	80.0	0.3	1.10	88.4
Energy efficiency/fuel switching	3.1	3.87	11.9	31.4	921.0	1.03	32.3	16.1	48.9	1.57	24.2
Agriculture	-	-	-	0.3	-	9.23	2.8	3.4	876.8	1.36	4.6
Waste disposal	7.3	2.45	18.0	8.3	13.0	2.76	22.9	2.7	67.5	3.93	10.6
Transportation	0.4	1.70	0.7	1.1	165.2	0.64	0.7	2.1	99.3	1.00	2.1
Household	6.4	3.84	24.8	3.5	45.4	4.95	17.3	1.8	49.8	5.75	10.4
Chemical processes/industrial manufacturing	4.1	1.90	7.7	1.3	68.7	1.90	2.5	1.1	11.2	3.22	3.5

Source: (Donofrio et al. 2021). State of the Voluntary Carbon Markets 2021. Available at www.forest-trends.org/publications/state-of-the-voluntary-carbon-markets-2021/ (accessed on 28 October 2022).

Considering the development trends of European forests indicated above, it would be useful to analyze PPP projects in the field of plantation afforestation and agroforestry. For example, the experience of the government of the state of Victoria (Australia), which allocated USD 110 million to invest in increasing timber reserves on Victorian plantations under the Gippsland Plantations Investment Program, may be of interest (Plantations 2022). The program will work in conjunction with the VicForests-led farm forestry program to allow Gippsland landowners to participate in plantation development. Government funds will be used to develop new plantations to attract and accelerate private investment and to stimulate the development of new plantations in Gippsland in order to phase out local forest clearance, in accordance with the Victorian Forestry Plan. The importance of this practice lies in the fact that VicForests, in partnership with the government, aims to maximize the contribution of farm forestry by increasing the supply of wood for plantations, as well as by providing a number of other benefits to private landowners and society.

It is also worth noting that some areas that require reforestation may not be suitable for intensive plantation development, but may be suitable for new forms of multipurpose forestry. The key challenge for these areas is deciding how to direct investment to areas where it is most needed. With sufficient political and institutional support, the private sector can become a major investor in landscape restoration projects that generate significant returns. PPP mechanisms can play an important strategic role. For example, a form of PPP labeled “lease with transfer of ownership” can be used to reforest erosion-prone and agricultural land (for example, a private partner leases a certain land plot on the basis of a lease agreement, after which a certain part or all of the plot can gradually shift to private ownership based on agreed terms). In particular, European protective forests, designed to prevent soil erosion, conserve water resources and maintain other ecosystem services, account for about 32% of the forest area in countries that report data on this indicator (Ministerial Conference on Protection Forests in Europe 2020).

Agroforestry has a special role to play in increasing biodiversity and carbon in landscapes and in increasing the income and resilience of smallholders. However, it requires

incentives to cover the risks and upfront costs. Globally, more than one billion ha (43%) of agricultural land has at least 10% tree cover (Zomer et al. 2016), and the components of agroforestry (animals, crops and trees) can be combined in a wide variety of production processes.

The integration of the farming system and agricultural land with forest plantations leads to the formation of potential waste products of agroforestry. Waste treatment includes heat treatment, decomposition and disposal, each of which has its drawbacks. A channel for collecting, transporting and processing waste into products such as biofuels, fertilizers, biochar and industrial chemicals is necessary to maintain a sustainable circular bioeconomy (Shpak et al. 2020; Kotseva-Tikova and Dvorak 2021; Gupta et al. 2022). This research confirms that it is possible to achieve sufficient waste and product management to obtain economic and environmental benefits through PPP mechanisms. In our opinion, PPP can also become an effective tool for implementing programs for the rehabilitation of forests and the renewal of forest resources in areas damaged by military operations, e.g., in Ukrainian forests.

Measures to manage climate change mitigation can be generally described as better management of natural forests, better management of artificial forest plantations, prevention of the extraction and use of wood for energy and better management in the field of forest fire prevention. This may include encouraging volume gains, planting fast-growing or better-adapted tree species or adopting carbon-conserving management practices, such as clear forestry or reduced logging.

One must note that mitigation and adaptation are rarely considered together when considering national strategies for implementing climate change measures. The concept of climate-smart forestry (CSF) has emerged as a holistic approach that links mitigation and adaptation measures and that guides European forest management to improve the resilience of forest resources and ecosystem services to meet the needs of a growing population (United Nations and Food and Agriculture Organization of United Nations 2021). CSF is based on the concepts of sustainable forest management with a particular focus on climate and ecosystem services.

4.3. PPP in the System of Forest Ecosystem Functions Management

Recently, increasing scientific research, government and public programs, strategies in the field of sustainable forest management and reproduction of forest resources have been aimed at developing a coordinated European policy framework to maximize the societal value of forest ecosystem services (FES) and their sustainable provisions. Market opportunities for FES are often associated with the “experience economy”, and demand continues to grow for ecosystem services related to culture, recreation (recreation and outdoor tourism), education, health and well-being and even spiritually oriented activities conducted in forests. In turn, non-timber ecosystem goods also play an important role in society and in local economic development. However, this importance is not always visible in market statistics or other information systems, which are often oriented towards accounting for wood production. The increasing attention given to this topic is due to the presence of unresolved problems associated with the need to integrate socio-economic, cultural and aesthetic assessments of various forest ecosystems into traditional modeling tools for forest management planning.

It is estimated that the wealth represented by some forest ecosystem services (e.g., recreation and hunting, habitat and non-timber forest products and water services, excluding wood and carbon) has increased from USD 5 trillion to USD 7.5 trillion between 1995 and 2018, which represents 21% of the total wealth of land assets (including arable land, pastures, forest timber, forest ecosystem services and protected areas) (World Bank 2021). Some large sectors such as travel, tourism, real estate and retail have an implicit dependency on ecosystem services through their supply chains (Sakalauskaitė et al. 2020; FAO 2022). Forests and trees are important to the traditions of many communities, as

well as to the spiritual and cultural values of indigenous peoples and individuals. These intangible factors are difficult to quantify, but are an important part of human well-being.

Understanding and uncovering the core values that underlie the various decision-making processes regarding the effective management of FES is also essential to raising public awareness, given that FES face competing and conflicting demands that will be further exacerbated by increased pressure on forests in the context of climate change (Winkel et al. 2022).

Given the significant potential of PPPs to achieve sustainable management of FES, it is worth pointing out a number of problems that may hinder the activity and effectiveness of PPP mechanisms in this area (see Figure 3).

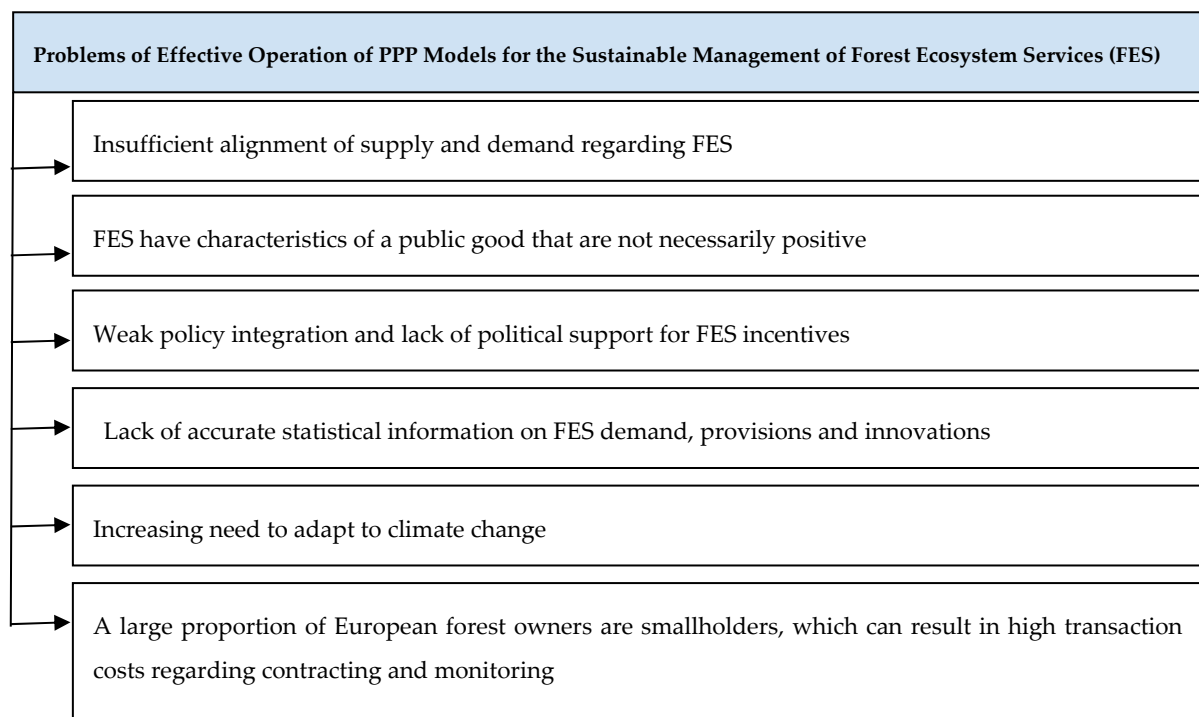


Figure 3. Problems of effective operation of PPP models for sustainable management of forest ecosystem services (FES).

To solve the identified problems and more actively involve private partners in the sustainable management of FES, the following may be necessary:

- Understand the main relationships involved in the development of management mechanisms, including the principles of PPP (and the institutional framework for their support) at all levels;
- Ensure availability of knowledge and necessary information for all interested parties, including subjects of management, forestry planners and FES consumers who receive direct or indirect benefits;
- Adjust criteria and indicators of sustainable forest management to provide information on progress towards certain quantitative and qualitative targets regarding the provision of FES, and ensure the information is understandable to decision makers, all stakeholders and the general public (Linser and Wolfslehner 2022).

The provision of forest biomass, ecosystem products and services of the bioeconomy also depends on the actions of forest owners to a reasonable extent. Differences in the state of deforestation of public and private forest categories serve as an indicator of the results of forest management. As is well known, the private and public ownership of forest land in Europe is balanced. About 53.5% of Europe's forests are publicly owned and 46.5% are privately owned (State of Europe's Forests 2020).

According to the report *Who Owns our Forests* (2020), public ownership includes public ownership by the state at national level, public ownership by the state at a sub-national government scale and public ownership by local governments. Private ownership includes private ownership by individuals and families, private ownership by private business entities, private ownership by private institutions, private ownership by tribal and indigenous communities and other types of private ownership.

These categories imply a growing disconnect between ownership of forests and agricultural land, which often leads to fragmentation of forest holdings, alienation, increased separation of owners from their forest land and reduced participation in forest management (United Nations and Food and Agriculture Organization of United Nations 2020). This worsens the state of forest ecosystems. In our opinion, PPP mechanisms may have the potential to eliminate negative trends in such cases.

Overall, the implementation of opportunities to facilitate multi-stakeholder processes at the regional and local levels will enable further exploration of key factors for FES prioritization. It will also provide training and help people to develop skills and the capacity for demand-based partnerships between forest owners and forest managers, businesses, society, politicians and scientists (Winkel et al. 2022).

Efforts are underway to obtain more reliable and comparable estimates of the economic value of natural ecosystems. Wood, a variety of forest crops, wood fuels, resins and other non-wood products have markets of local, national and international importance. They provide income, employment and production value that is recorded in national registries and accounting systems. Despite recent attempts to expand the international classification of forest products to include non-timber products (Sorrenti 2017), reporting on them is still insufficient for adequate quantification. Given the underdevelopment of markets for forest ecosystem goods and services, capturing their benefits to society is even more difficult (and those that exist, such as for water and carbon, are at an early stage). This naturally hinders the possibility of active inclusion of private capital in the creation, conservation, restoration of forest ecosystems.

An example of a successful PPP project in this area is the Chesapeake Bay Forestry PPP project (UNDP Special Unit for South-South Cooperation 2021). In this project, the Chesapeake Forest Partnership (CFP) and the Maryland Department of Natural Resources, a charitable foundation and a non-profit community group, have been able to create ecologically clean and sustainably managed forests by bringing together diverse resources, skills and abilities. Importantly, these forests not only contribute to the local and regional economy, but constitute rich ecosystems with great ecological, cultural and historical interest.

4.4. Protected Forests and Areas Managed by PPP

As mentioned above, protected forests account for almost a quarter of the total area of European forests. A protected area, as defined by the International Union for Conservation of Nature (IUCN), is an area of land or water established by law in order to protect and maintain biological diversity, as well as natural and cultural resources. The IUCN defines six categories of protected areas (Lausche and Burhenne 2011). There are many types of territories, and their level of protection differs widely depending on the status established by national laws and international treaties. Given the ability of PPPs to accumulate resources over time, such arrangements seem to be the most appropriate in cases where the government is unwilling to invest directly in protected area management, due to political stances or budgetary constraints.

Thus, in the field of PPP research for protected areas, the terms “delegated management” and “joint management” are very often used (Baghai et al. 2018; Brugière 2020; Epler Wood 2010; Hatchwell 2014; Pfueller et al. 2011; Spenceley et al. 2017). They are supposed to determine the division of power and managerial responsibilities between the two partners, with the “delegated control” model transferring most of the powers to the private partner.

In practice, the distinction between the two models is considered difficult. This topic is explored in more depth in the work of [Brugière \(2020\)](#).

National parks and protected areas provide significant economic opportunities, as evidenced by the growing popularity of ecotourism. For example, before the COVID-19 pandemic, protected areas around the world received about eight billion nature tourism visits annually, generating about USD 600 billion per year in direct domestic spending. Additionally, “consumer surplus” (which measures the economic value of an environmental benefit to the visitor) is estimated at USD 250 billion per year ([Balmford et al. 2015](#)).

Most of the protected areas (Maputo Special Reserve in Mozambique Anvil Bay; Kruger National Park, South Africa; Network of New Protected Areas (NPA) in Madagascar; and the case of the Porto Cesareo Marine Protected Area, Puglia) currently managed by PPPs have historically developed tourism activities, and some have had significant success. The mechanisms of PPP projects (or their elements) in the field of management of these protected areas, as well as approaches to their formation and evaluation of effectiveness, can be used to resolve some conflicts in the management of the national park, e.g., the Curonian Spit (Lithuania) ([Burksiene and Dvorak 2020](#)). However, from a financial point of view, even parks with exceptional ecosystem goods and services are not always able to generate a sufficient flow of tourists to make a profit. At best, it is simply possible for them to cover investment and operating costs. Therefore, a PPP is a good alternative in terms of effective protected area management. In general, the determinants of the function of PPPs in the practice of protected area management are presented in Figure 4.

To summarize, we note that the management of forest protected areas through PPP includes the following three main elements: a contractual agreement signed between a public and private partner; delegation by the state to a private partner of all or part of its prerogatives; and a private partner that provides or manages all the necessary funding for the management of the protected area. It is important to emphasize the fact that in some situations, the cooperation agreements underlying PPPs can be terminated by either party, meaning they are relatively unstable. In order to consolidate partnerships, some governments may institutionalize these agreements by delegating protected area management not directly to a private partner, but to intermediary legal structures in the form of funds ([Meyer 2014](#); [Brugière 2020](#)). Naturally, the choice of a PPP model for protected area management is highly dependent on the local situation (social, cultural, environmental, security and so on). As these situations evolve over time, the model may also evolve. However, in certain cases, PPP mechanisms increasingly form a model that provides the greatest management efficiency.

We believe that in the implementation of PPP projects in other sectors and areas, particularly in the context of the management of protected forests and territories, the interactions with stakeholders and public participation in decision-making processes throughout the entire duration of such PPPs are critical.

Research has shown that this important factor for the successful implementation of PPP projects is often regarded as a secondary activity. However, public engagement, as an inclusive concept, should cover all parties, including individuals or entities that are interested or potentially interested in the project and its results. This may include non-governmental organizations (NGOs) and local communities, and it should consider gender equality and the needs of marginalized populations. The best approach to stakeholder engagement and public participation is generally to find ways for the government and the private sector to establish relationships with all stakeholders (including the public) in a way that makes them feel as if they are part of the project.

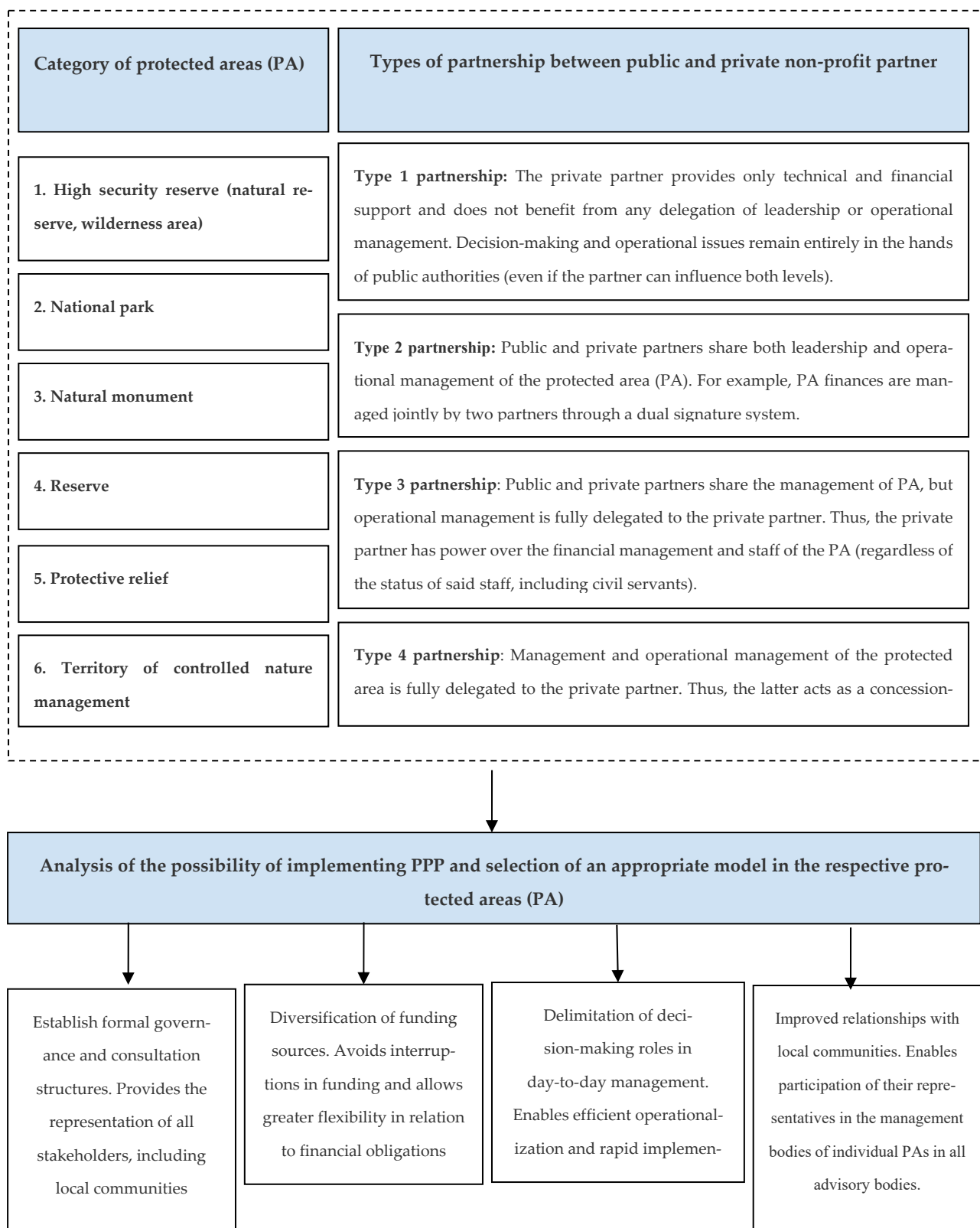


Figure 4. Determinants of PPP functioning in protected area management practices. Source: Prepared according to the work of (Lausche and Burhenne 2011; Brugière 2020).

5. Discussion

In our opinion, PPP models are a significant addition to other types of cooperation, such as formal top-down initiatives. By providing partners with access to external funding,

PPP forestry projects can accomplish objectives that would otherwise be impossible. It is important to note that the organization of projects in the form of PPPs in the field of environmental management is an additional advantage due to access to funding, especially EU funding.

Considering the need to attract private capital into the sphere of responsible nature management, reforestation and sustainable forest management is necessary both at the global level (in policies, agreements) and in sectoral and intersectoral programs and strategies (land use, forestry and agriculture, which are related industries that require an integrative approach for further development in modern conditions). For example, the [European Commission \(2021a\)](#) states that in order to increase greenhouse gas removal, individual farmers or forest managers need a direct incentive to store more carbon on their land and in their forests. By 2030, new business models based on incentives for carbon farming and carbon removal should be actively implemented to help mitigate climate change in the bioeconomy. This could include, for example, the use of durable harvested wood products. Such business models should be encouraged in full respect of environmental principles that promote biodiversity conservation and the circular economy ([European Commission 2021a](#)).

Well-coordinated cooperation and interaction between the public and private sectors is the main platform for cluster policies (in particular, this is observed in the emergence and development of territorial production intersectoral agroforestry complexes). It should be noted that neither the state nor the private sector nor non-profit structures alone (in isolation) are able to achieve the diverse (sometimes contradictory) goals of optimizing forest cover and sustainable forest management determined by the state forest and agrarian policy. Therefore, only through cooperation, on a partnership basis, can the public and private (entrepreneurial) sectors achieve positive social, environmental and economic results in forestry.

The development of PPP in the field of forest relations clearly necessitates its institutionalization, for example, through the development and adoption of relevant concepts or programs. The effective design of PPPs can help to create more jobs in rural areas, while also enabling endogenous development of fringe communities and the surrounding areas, for example, forest reserves and reforestation sites. Further research on the role of PPPs should focus on the following directions of the future green forest ([United Nations and Food and Agriculture Organization of United Nations 2021](#); [FAO 2022](#)):

- Wood and energy production;
- Agroforestry and mountain forestry;
- Social and urban development;
- Forest management, inventory and planning;
- Biodiversity and ecosystem functioning;
- Health and recreation.
- Education and research.

As part of the implementation of PPP, it is often the private sector that develops new business models that enable several sources of financing to be combined.

An example is the experience of Sealaska, a corporation owned by natives of Alaska (USA). The corporation is taking an integrated land management approach for its old-growth forest concession in the Tongass National Forest. Sealaska has traditionally relied heavily on logging revenue, but in 2015, it gained access to California's carbon markets, allowing the company to diversify. Between 2015 and 2019, the company made USD 100 million by selling carbon credits to oil companies ([Elbein 2020](#)).

In general, the financial mechanism of PPP in the forestry sector (due to the complexity and variety of instruments and the multifunctionality of forests) is the subject of a separate extensive discussion. In this study, we note that the Public-Private Finance Initiative is working with public and private sector partners to create innovative mechanisms that would increase financial flows for forest conservation, eco-economic optimization of agri-

culture with low deforestation levels, etc. This may, for example, manifest itself in the following directions:

1. Use of public funds to mitigate risks for the private sector when investing in forest conservation and agricultural models that conserve and restore forests and degraded land (for example, bonds issued for major debt markets, the proceeds of which are used to protect forests). This makes it possible to provide low-cost loans to farmers in order to keep a certain proportion of their land in the form of forest and, therefore, help them to meet the necessary socio-economic requirements for forestry;
2. The ability to link forest ecosystem conservation to sustainable product markets and supply chains through mechanisms such as certification and REDD+ credit revenue (e.g., Brazil is working with local entrepreneurs, project developers and international asset managers to explore ways to include small farmers in the coffee and cocoa supply chains). The methods used are links with European specialty markets, guarantees from development finance institutions and income from the REDD+ (Public-Private Finance Initiative) project and jurisdictional loans.
3. Realizing opportunities for farmers to more easily access international climate finances that will enable them to increase the productivity of their agricultural operations. (For example, in the state of Mato Grosso, Brazil, the Forests, Farms and Finance initiative is developing a zero-deforestation certification scheme and associated high-level financial mechanisms that will reward farmers for conserving forests and increasing the productivity of existing land).

This type of financing refers to models that combine various sources of capital with different returns and expected maturities. In these PPP approaches, public finances help mobilize private capital, thereby increasing the funding available for investments that traditional investors consider too risky. Thus, financing features and typical PPP structures are studied in detail on an ongoing basis by the Public-Private Partnership Legal Resource Center, as part of the World Bank. Additionally, [Yescombe \(2007\)](#) provides extensive examples of structures and models for different types of PPPs and proposes a systematic and integrated approach to financing PPPs within this public policy.

6. Conclusions

High socio-economic and environmental values in terms of resource intensity, biodiversity, culture, landscape, as well as frequent conflicts related to the use, conservation and reproduction of forest resources, require adequate management approaches. International and national bodies increasingly rely on various forms of governance cooperation between public and private partners to resolve environmental disputes and improve natural resource management ([Eckerberg et al. 2015](#)). One must note that the European Commission (EC) is the traditional source of funding for the European forestry sector. However, PPPs and national initiatives, such as the European Research Area (ERA), funding agencies and other funding mechanisms also offer valuable funding opportunities to promote innovation in the forestry sector. However, the use of PPPs for sustainable forestry still requires clarification of some issues and identification of current trends in EU forest policy, where these forms of interaction between the public and private sectors can bring the greatest benefit to the community and themselves.

The directions for the development of PPP in the forestry sector, in comparison with the existing partnerships, provide a wider range of forms of management and relevant mechanisms (for example, lease with transfer of ownership, perpetual lease, leasing, depositary compensation system of forest management and reforestation, integrated business structures (clusters), concession, creation of ownership-management transfer, separation of assets, management contract), which ultimately should improve the financial support for the expanded reproduction of forest resources and their social and environmental functions in the context of market transformations.

In general, in the forest sector, these measures can contribute to the following:

- Afforestation or creation of forest areas;

- The emergence of new agroforestry systems (agroforestry complexes);
- Prevention of damage to forest resources caused by natural disasters, fires, and restoration of damaged forests;
- Enhancing climate resilience and the ecological value of forest ecosystems;
- Investment in forest technologies, mobilization, processing and marketing of forest products;
- Land management contracts for forest, environment, climate and forest maintenance;
- Conservation and promotion of forest genetic resources.

Naturally, the so-called unsolicited proposals (USPs) for PPP projects have recently attracted research interest. These are proposals that are not a response to the government's request for proposals in the PPP process, but instead are put forward by a private organization on its own initiative (World Bank Group 2022). USPs now represent both risks and opportunities for forest governance. Their use presupposes a sufficiently developed institutional and organizational framework, which is just beginning to take shape. For example, on the one hand, USPs can help governments identify and prioritize projects. However, if USPs are not sufficiently integrated with government policy and strategy, they can divert government attention or resources away from priority projects. USPs must be properly managed and valued under conditions no less stringent than those applicable to PPPs established in the public sector. The legal framework for PPPs should establish clear procedures in this regard.

In general, it should be noted that the creation of the necessary conditions for the development of PPP in the forestry sector requires a rather long time, during which understandable economic, social, environmental and other incentives to comply with environmental friendliness and social responsibility, as well as supporting subsystems, should be identified and created. As the study showed, a sufficient institutional framework already exists and is in place. An important aspect of the sustainable development of PPP in the field of entrepreneurial forestry is also the introduction of monitoring of integrated regulations and the effectiveness of the PPP mechanism.

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