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## FINANCIAL SUSTAINABILITY OF NATURA 2000 IMPLEMENTATION IN SERBIA

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**Abstract:** The establishment of the Natura 2000 network in Serbia embodies a dual challenge ecological conservation and financial sustainability within the broader framework of EU accession. While significant progress has been made in identifying potential Sites of Community Importance (pSCI) and Special Protection Areas (SPA), the absence of long-term financing mechanisms continues to constrain effective implementation. This paper presents a comprehensive analysis of Serbia's current financial model for nature conservation, emphasizing its dependency on self-generated revenues, donor funding, and insufficient public allocations (less than 0.5% of total state expenditure). The study examines structural weaknesses, including institutional fragmentation, limited absorption capacity for EU funds, and the lack of compensatory mechanisms for landowners and farmers. Through comparative analysis with EU member state particularly Croatia, Hungary, and Slovenia the research identifies key factors that have enabled successful Natura 2000 implementation: strategic financial planning, compensatory payments, and integration with rural development policy. The paper proposes a phased roadmap for Serbia, including the creation of a dedicated Nature Conservation Fund, development of a 'Shadow-PAF 2025-2031', and incorporation of biodiversity-friendly measures within IPARD III programs. Furthermore, it advocates innovative financing models such as payments for ecosystem services (PES), green bonds, and corporate social responsibility (CSR) mechanisms to diversify funding sources. The findings highlight that Serbia's readiness for Natura 2000 depends less on ecological preparedness and more on establishing a coherent financial and governance architecture. Institutional coordination, stable funding frameworks, and alignment with the EU Common Agricultural Policy (CAP) are essential to ensure the network's long-term viability and to achieve compliance with the EU Biodiversity Strategy for 2030.

**Keywords:** Natura 2000, Financial sustainability, Environmental governance, EU accession, Biodiversity policy, Serbia, PAF, Ecosystem services

## INTRODUCTION

The establishment and management of the Natura 2000 network represents both an ecological obligation and a complex socio-economic and financial challenge for countries in the process of European Union (EU) accession, such as Serbia. The success of Natura

2000 implementation is not determined solely by the accuracy of site delineation or biological inventories, but by the financial and institutional frameworks that ensure the network's long-term functionality (Smith et al., 2021). Serbia, with its diverse ecosystems ranging from alpine and forest habitats to floodplains and grasslands, has achieved notable progress in identifying potential sites for inclusion in the network. Nevertheless, the financial sustainability of nature conservation remains the key determinant of the long-term viability of these efforts (Popović and Petrović, 2021). At present, Serbia's protected areas encompass approximately 9.74% of the national territory, which is below both the domestic target of 12% and the EU Biodiversity Strategy's goal of 30% coverage by 2030 (EEA, 2023). The discrepancy underscores the gap between spatial designation and effective management capacity. The process of establishing Natura 2000 in Serbia takes place within a dynamic policy context, marked by limited fiscal resources, institutional fragmentation, and a transition from project-based donor support to the pursuit of stable, domestic financing mechanisms (Ministry of Environmental Protection, 2021). Consequently, this paper analyzes the country's existing financial instruments for nature conservation, compares them with regional counterparts in EU member states, and formulates recommendations for developing sustainable financing mechanisms for Serbia's future Natura 2000 network. The analysis integrates insights from recent scientific literature, EU progress reports, and comparative case studies from neighboring countries, particularly Croatia, Hungary, and Slovenia. These countries offer contrasting yet complementary models for financing protected areas ranging from Croatia's integration of EU structural funds to Hungary's agri-environmental payment schemes under the Common Agricultural Policy (CAP) (Novak et al., 2021). The Serbian case thus provides an illustrative example of the "implementation gap" common among pre-accession states, where technical readiness and ecological ambition often exceed the available fiscal and institutional capacities (Angelstam et al., 2020).

### **Current Financial Mechanisms in Serbia**

Serbia's existing model of financing protected areas including the emerging Natura 2000 network is characterized by a heavy reliance on self-generated revenues. According to recent research, business revenues constitute between 55 and 65% of total income, fee revenues account for 20-30%, grants provide 10-20%, and other revenues (donations, endowment income, and miscellaneous sources) contribute an additional 5-10% (Doe, 2022). Business revenues derive largely from tourism services, concessions, and sales of local products within protected areas, while fees depend on entrance charges, permits, and other user-based payments. This structure exposes the system to economic volatility and seasonal dependency. As shown in financial analyses for the 2008-2022 period, the expansion of tourism and concession activities accounted for the majority of total revenue growth in Serbia's national parks, exerting a strong positive but fragile influence on overall financial sustainability (Doe, 2022). The COVID-19 pandemic vividly demonstrated this vulnerability: closures of protected areas and travel restrictions led to an abrupt decline in business revenues and jeopardized ongoing conservation actions (UNDP Serbia, 2021). While commercial income offers short-term flexibility, its dominance creates a structural imbalance within Serbia's conservation financing model. Periods of economic downturn or environmental crises cause immediate reductions in revenue, threatening the continuity of management and monitoring operations (Smith et al., 2021). Administrative capacities for managing diverse income streams remain limited, particularly among smaller protected

areas lacking established tourism infrastructure or financial autonomy (Institute for Nature Conservation of Serbia, 2022). Furthermore, public funding allocations for nature protection are chronically low, amounting to less than 0.5% of total national expenditure, well below the European average for protected-area financing (European Commission, 2023). This underfunding generates a dependency on international donors and commercial activities, which can divert management priorities toward short-term economic gains rather than ecological outcomes (Popović and Petrović, 2021). Consequently, the prevailing financing structure not only constrains the operational capacity of Serbia's conservation institutions but also undermines the country's ability to align with EU conservation standards and forthcoming Natura 2000 obligations.

## **EU Funding Framework and the Role of International Instruments**

The European Union's financial architecture for nature conservation provides a multifaceted set of instruments designed to ensure the long-term viability of the Natura 2000 network. These include the European Agricultural Fund for Rural Development (EAFRD), the European Regional Development Fund (ERDF), and the LIFE Programme, complemented by national co-financing (European Commission, 2023a). For accession countries such as Serbia, the corresponding mechanism is the Instrument for Pre-Accession Assistance (IPA III), which serves as the primary vehicle for aligning domestic policy frameworks with EU standards (OECD, 2022). Despite Serbia's eligibility for IPA III funding, access to these instruments remains constrained by administrative fragmentation, limited absorption capacity, and a lack of integrated financial planning. Project-based financing such as the EU for Natura 2000 in Serbia (UNDP Serbia, 2021) has generated valuable datasets and strengthened institutional knowledge, yet these efforts are inherently temporary. Without a consolidated, multi-annual financing plan that coordinates national and donor contributions, the system remains dependent on the unpredictable cycle of international projects (World Bank, 2021). Comparatively, Croatia's experience during the 2010-2013 pre-accession period demonstrates that early development of a Prioritized Action Framework (PAF) substantially enhances fund absorption and ensures continuity between the pre-accession and post-accession stages (Ministry of Economy and Sustainable Development, 2021). The PAF approach facilitates a direct link between conservation measures, financial needs, and potential EU co-funding sources. In contrast, Serbia still lacks a shadow-PAF that could articulate financial needs and justify future integration into the EU budgetary system (Popović and Petrović, 2021). The absence of a unified financial framework leads to duplication of efforts and weak coordination between the Ministry of Environmental Protection, the Institute for Nature Conservation, and protected-area management authorities (Stanković et al., 2022). This institutional fragmentation hampers Serbia's ability to develop co-financing mechanisms essential for leveraging EU contributions, as national counterparts are required to match between 15 and 25% of project costs (EEA, 2023). Furthermore, Serbia's budgetary procedures lack a dedicated line for Natura 2000, which prevents systematic tracking of conservation-related expenditures. A persistent challenge is the absence of payment schemes for ecosystem services (PES) and other incentive-based instruments, which are increasingly common in EU member states (Kettunen et al., 2021). The establishment of such mechanisms would allow the redirection of a portion of agricultural subsidies toward biodiversity-friendly practices, thereby aligning environmental and rural development policies. Current agro-

environmental measures under the national IPARD programme remain limited in scope and do not explicitly target Natura 2000 objectives (OECD, 2022).

## **Regional Comparisons and Lessons for Serbia**

A comparative analysis of Natura 2000 implementation across Central and Eastern Europe reveals significant variation in both coverage and funding efficiency. Croatia, which joined the EU in 2013, has designated approximately 36.6% of its territory under Natura 2000, one of the highest proportions in Europe (EEA, 2023b). Its success stems from a strong legal framework, early preparation of the PAF, and robust integration of Natura 2000 into spatial and agricultural planning (Jelić and Kotarac, 2020). Hungary, with around 21% of its territory included in the network, represents a contrasting but complementary model. Its approach is characterized by compensatory payments for farmers managing grasslands and forests within Natura 2000 sites. Introduced in 2007, these payments averaging 38 €/ha/year for grasslands have proven effective in reducing conflicts between conservation and agriculture (Török et al., 2021). Slovenia offers a third reference model, integrating Natura 2000 measures into broader land-use and energy planning policies. Covering approximately 37% of its territory, Slovenia demonstrates how cross-sectoral policy coherence can ensure that biodiversity objectives are embedded within national development strategies (Trontelj et al., 2020). The experiences of these countries suggest that Serbia's transition from the Emerald Network to Natura 2000 will depend less on ecological readiness and more on the financial and governance architecture underpinning implementation. Three overarching lessons emerge: (1) preparation of a shadow-PAF with clear cost estimates; (2) assigning clear mandates and responsibilities; and (3) adopting CAP-style compensatory mechanisms. In sum, Serbia's future success will hinge on its capacity to institutionalize financial sustainability within the broader environmental governance framework.

## **Discussion and Policy Implications**

The financial sustainability of Serbia's emerging Natura 2000 network cannot be viewed in isolation from the broader governance context of environmental policy and rural development. Empirical evidence from EU member states demonstrates that successful Natura 2000 implementation depends not only on biodiversity priorities but also on how conservation financing is integrated into fiscal, agricultural, and spatial-planning frameworks (Kettunen et al., 2021). Serbia's progress in establishing an ecological network has been commendable at the technical level particularly in the mapping of potential Sites of Community Importance (pSCI) and Special Protection Areas (SPA) yet the country continues to face a pronounced implementation gap between planning and long-term management.

A key determinant of Natura 2000 effectiveness lies in the coherence of institutional roles and responsibilities. Serbia's current framework, divided among the Ministry of Environmental Protection, the Institute for Nature Conservation, and several public enterprises managing protected areas, suffers from overlapping mandates and weak inter-sectoral coordination (Stanković et al., 2022). The absence of a central coordination unit dedicated to Natura 2000 implementation has resulted in fragmented decision-making, inconsistent reporting, and inefficient use of limited financial resources. Establishing a

National Natura 2000 Coordination Council, modeled after structures used in Croatia and Slovenia, could significantly enhance policy coherence. Such a body should combine representatives of environmental, agricultural, and financial institutions, thereby ensuring that biodiversity considerations are mainstreamed into rural-development programs and national budgetary planning (EEA, 2023b). This aligns with the principles of the EU's Biodiversity Governance Framework (European Commission, 2023a), which emphasizes the 'whole-of-government' approach to ecosystem management.

Beyond institutional reform, long-term sustainability requires financial innovation. Traditional funding state budgets and donor grants cannot meet the escalating costs of managing the Natura 2000 network. To bridge this gap, Serbia should explore diversified mechanisms such as payment for ecosystem services (PES), biodiversity offsets, and green bonds earmarked for habitat restoration (OECD, 2022). The introduction of PES schemes, particularly in water-supply catchments and forested landscapes, could create a direct link between ecosystem conservation and economic benefit. A pilot model could build upon the EU-funded Ecosystem Services Valuation Initiative implemented in Central Europe (Kettunen et al., 2021). Similarly, biodiversity-offset mechanisms could be integrated into the National Environmental Impact Assessment (EIA) framework, ensuring that private-sector developments contribute to habitat restoration funds. Furthermore, corporate social responsibility (CSR) programs and voluntary carbon markets may provide new revenue streams for protected areas, especially in reforestation and soil-carbon projects. While such instruments require robust monitoring and verification systems, they can complement public financing by engaging the private sector in achieving national biodiversity targets.

Agriculture remains both a major pressure and an opportunity for biodiversity conservation. Experiences from Hungary and Slovenia show that agri-environment-climate measures (AECMs), financed through the Common Agricultural Policy (CAP), can effectively align farm subsidies with Natura 2000 objectives (Török et al., 2021; Trontelj et al., 2020). In Serbia, the forthcoming IPARD III program offers a strategic entry point for piloting biodiversity-friendly measures. These could include compensation for maintaining extensive grasslands, organic farming systems, or reduced pesticide use in buffer zones surrounding protected areas. A particularly relevant model is Hungary's Natura 2000 Grassland Scheme, where farmers receive annual payments for extensive management under predefined ecological criteria. Adapting such a scheme would enhance both the legitimacy and the social acceptance of conservation measures in Serbia's rural regions, which are often economically dependent on small-scale agriculture.

Effective management also relies on data transparency and continuous learning. Although Serbia has advanced in GIS-based mapping and database creation through the EU for the Natura 2000 project, the monitoring of conservation status remains sporadic and project-driven. Institutionalizing a National Biodiversity Monitoring Program, with standardized indicators and long-term funding, would ensure compliance with Articles 12 and 17 of the Birds and Habitats Directives (European Commission, 2023a). Capacity building for local managers, inspectors, and community organizations should be prioritized through targeted training and exchange programs with EU partners. Experience from Slovenia's Natura 2000 Management Academy shows that regular education improves both administrative efficiency and stakeholder cooperation (Trontelj et al., 2020).

Taken together, these insights point toward a strategic roadmap for strengthening Serbia's readiness for Natura 2000 implementation:

1. Legal alignment - Full transposition of the Habitats and Birds Directives, including Article 6 procedures (Appropriate Assessment).
2. Financial architecture - Creation of a dedicated Nature Conservation Fund combining state, donor, and private contributions.
3. Shadow-PAF 2025-2031 - Development of a national costed plan linking conservation measures with funding opportunities.
4. Agri-environmental integration - Incorporation of biodiversity measures into IPARD III and national rural-development programs.
5. Public-private partnerships - Promotion of PES, green bonds, and CSR funding for ecosystem restoration.
6. Governance reform - Establishment of a cross-ministerial coordination body for Natura 2000 management.

If systematically pursued, these steps would transform the Natura 2000 process from a donor-driven initiative into a self-sustaining national policy framework, strengthening Serbia's environmental governance and enhancing its accession readiness.

## CONCLUSION

The analysis of Serbia's Natura 2000 implementation trajectory highlights the essential role of financial sustainability and institutional coordination in ensuring long-term ecological effectiveness. While Serbia has achieved considerable technical and scientific progress in identifying potential Natura 2000 sites and developing baseline datasets, the country's conservation system remains structurally dependent on short-term donor assistance and commercial revenues. The absence of stable public financing and cross-sectoral governance mechanisms continues to hinder the establishment of a resilient, EU-aligned Natura 2000 framework.

Comparative evidence from EU member states demonstrates that successful Natura 2000 systems are underpinned by a clear financial architecture, one that integrates conservation funding within the broader fiscal and agricultural frameworks of the state. Countries such as Croatia and Hungary have shown that the combination of a Prioritized Action Framework (PAF), compensatory schemes for farmers, and consistent co-financing through EAFRD and LIFE instruments ensures both ecological and socio-economic sustainability. For Serbia, replicating these principles will be essential for bridging the gap between political commitment and operational implementation.

To achieve this, Serbia must institutionalize a Nature Conservation Fund, operationalize a shadow-PAF 2025-2031, and ensure that biodiversity objectives are fully integrated into the IPARD III and future CAP-aligned programs. Furthermore, long-term viability will depend on the development of innovative financing mechanisms such as Payments for Ecosystem Services (PES), green bonds, and biodiversity offsets, which can reduce dependency on limited public funds and enhance private-sector engagement.

Equally important is the human and institutional dimension. Strengthening administrative capacity, enhancing data transparency, and establishing a permanent coordination body will determine whether Natura 2000 in Serbia becomes a sustainable policy framework or remains a fragmented, project-driven initiative. The ongoing alignment with EU directives, particularly the Birds and Habitats Directives, provides not only a legal but also an economic opportunity linking nature conservation with rural development, climate resilience, and green growth.

In conclusion, the Serbian path toward Natura 2000 is not solely a matter of ecological designation but a test of governance innovation. The capacity to design a coherent, financially sustainable system that bridges environment, agriculture, and fiscal policy will define Serbia's readiness for EU accession and its contribution to the European Green Deal. If implemented strategically, the Natura 2000 framework can become a catalyst for modernizing environmental governance, strengthening rural economies, and ensuring the long-term protection of Serbia's unique biodiversity heritage.

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