



Article

# An Analysis of National Park Financing Mechanisms in Serbia

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Abstract: Protected areas are essential for biodiversity conservation, ecosystem services, and protecting different cultural heritage. They are legally designated and managed to safeguard habitats, species, and ecological processes. The EU aims to protect 30% of its land by 2030, while in Serbia 9.74% of land is under protection. One of the important categories of protected areas represents national parks, which cover 17.3% of all protected areas in Serbia. In order to understand the mechanisms of financing national parks in Serbia, the period from 2008 to 2022 was analyzed. The 15-year period was selected due to the availability of data and the necessity for long-term analysis. All revenues are divided in four groups: business, fee, grant and other business revenues. The results of regression analysis show that the growth rate of business revenue is the most significant contributor among the revenue sources, with a very strong positive impact on the growth rate of total revenue in all four national parks. The growth rate of grant revenue also contributes positively to the growth rate of total revenue. However, its impact is much smaller than the growth rate of business revenue and fee revenue but still highly significant. A strong negative correlation (-0.82) is present between the growth rate of business and fee revenue in National Park Kopaonik. This suggests that with an increase in fee revenues, business revenues decrease. The results of this research show that business revenues are the most important, followed by fee and grant revenue.

Keywords: protected areas; national park; financing; Serbia



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# 1. Introduction

Protected areas (PA) are among the most important natural resource, serving as a key instrument for preserving biological diversity. While they play a central role in conservation policy, their implementation often remains a subject of debate and disputes [1]. Defined spatially and managed under legal frameworks, PAs are designated for the long-term conservation of nature, encompassing associated ecosystem services and cultural values [2]. Their management is governed by national legislation, which regulates their establishment, financing, and use. PAs play key role in preserving biodiversity and natural landscapes, store forest carbon, and provide other environmental services [3]. The primary objectives

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of PAs include safeguarding habitats and species while maintaining essential ecological processes that support life and provide ecosystem services [4]. The European Union (EU) Biodiversity Strategy for 2030 aims to protect 30% [5,6] of its land, with 10% under strict protection, and to establish a transnational nature network. This aligns with the goals set during the 2022 UN Biodiversity Conference, which also targeted 30% land protection by 2030 [7]. EU policies place a strong emphasis on halting biodiversity loss and promoting sustainable development through the restoration of degraded habitats, expanding PA networks, and improving their management, governance, and funding mechanisms [8]. In Serbia, various strategic documents [9–12] propose expanding PAs to encompass up to 12% of the national territory. Previous studies indicate that PAs currently cover approximately 7% of Serbia's land [13–15]. However, the official register of PAs maintained by the Agency for Nature Conservation (ANC) estimates this coverage at around 9.4% [16]. Globally, PAs account for approximately 15.9% of the Earth's surface [17].

NPs in Serbia cover approximately 1.6% of the country's total territory, representing 17.3% of all PAs [16]. Table 1 clearly shows that, among all observed countries, Serbia (9.4%) has one of the lowest overall PA coverages. From EU countries, Slovenia (40.4%) has the highest coverage of PAs, compared to North Macedonia (28.2%), as a non-EU member. The average coverage of all selected countries is 23.1%. Romania (1.3%) and Bulgaria (1.4%), as EU members, have a lower percentage of NP coverage relative to their total land area, compared to Hungary (5.2%). Among non-EU members, Bosnia and Herzegovina (1.2%) has the lowest coverage, compared to North Macedonia (6.9%). In these selected countries, the average coverage is 3.5%. On the other hand, when comparing NP coverage relative to total PA coverage, several countries—including Bulgaria, Romania, Croatia, Slovenia, and Bosnia and Herzegovina—have a lower percentage than Serbia. The NP/PA ratio in Serbia (17.3%) is close to the regional average of 17.9%, although countries such as Montenegro, Albania, North Macedonia, and Hungary have higher NP/PA ratios.

**Table 1.** Coverage of national parks and protected areas in surrounding countries.

| Country                              | Country Area<br>(km²) | Protected Area<br>(km²) | National Park<br>(km²) | Protected Area<br>(%) | National<br>Park/Country<br>Area<br>(%) | National<br>Park/Protected<br>Area<br>(%) |
|--------------------------------------|-----------------------|-------------------------|------------------------|-----------------------|---|---|
| Bosnia and<br>Herzegovina<br>[18,19] | 51,209.0              | 4864.9                  | 638.5                  | 9.5                   | 1.2                                     | 13.1                                      |
| Romania [18,20]                      | 238,391.0             | 57,929.0                | 3167.6                 | 24.3                  | 1.3                                     | 5.5                                       |
| Bulgaria [18,21]                     | 110,996.0             | 39,514.6                | 1503.6                 | 35.6                  | 1.4                                     | 3.8                                       |
| Serbia [16,18]                       | 88,361.0              | 8267.6                  | 1429.6                 | 9.4                   | 1.6                                     | 17.3                                      |
| Greece [18,22]                       | 131,694.0             | 14,749.7                | 2909.5                 | 11.2                  | 2.2                                     | 19.7                                      |
| Croatia [18,23]                      | 56,594.0              | 21,794.3                | 1382.0                 | 38.5                  | 2.4                                     | 6.3                                       |
| Slovenia [18,24]                     | 20,271.0              | 8197.6                  | 840.0                  | 40.4                  | 4.1                                     | 10.2                                      |
| Albania [18,25,26]                   | 28,748.0              | 5174.6                  | 1388.1                 | 18.0                  | 4.8                                     | 26.8                                      |
| Hungary [18,27]                      | 93,012.0              | 21,020.7                | 4803.4                 | 22.6                  | 5.2                                     | 22.9                                      |
| North Macedonia [18,28]              | 25,713.0              | 7251.1                  | 1774.6                 | 28.2                  | 6.9                                     | 24.5                                      |
| Montenegro [18,29]                   | 13,821.0              | 2223.7                  | 1063.5                 | 16.1                  | 7.7                                     | 47.8                                      |
|                                      | Ave                   | erage                   |                        | 23.1                  | 3.5                                     | 18.0                                      |

The International Union for Conservation of Nature defines national parks (NPs) as large natural areas designated for the protection of ecological processes occurring across large geographic regions, along with species and ecosystems characteristic of the area,

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which also support spiritual experiences, science, education, and visitation [2]. The law on nature protection of the Republic of Serbia [30] regulates the protection and conservation of nature as well as biological, geological, and landscape diversity, aligning human, economic, and social activities for the sustainable use of natural resources and goods. This law defines seven categories of PAs, one of which is the NP. By this law, a NP is defined as an area of nationally significant natural ecosystems, landscapes, and cultural heritage, where human activity aligns with nature conservation, supporting biodiversity, sustainable development, and a range of ecological, cultural, and recreational functions [30]. Beside this law, the law on NPs [31] regulates the management of one category of PAs, i.e., the boundaries, protection regimes, and objectives of NPs. Also, this law fosters the involvement of different stakeholders and local communities in the process of making and adopting an NP management plan, as well as its adoption through an Expert and Users Council.

The organization of the PA management system in Serbia represents a complex structure of different actors, rules, and responsibilities [32,33]. The main characteristic of the current PA management system in Serbia is the existence of PA managers from both the public and private sectors [33–36]. PA managers can be classified according to their authority to make decisions and the degree of their accountability [37]. One of the managers of PAs in Serbia represent public enterprises (PEs) that manage the areas of NPs [34]. A PE is an enterprise that performs activities of general interest and is founded by the Republic of Serbia, an autonomous province, or a local self-government unit [38]. In Serbia, beside PEs that manage areas of NPs, there are also other PEs that are involved in the management of PAs. The activities of these PEs are diverse, from managing urban greening to communal utilities and civil infrastructure, and there are also PEs established specifically for managing PAs [34]. Financing NPs is an important component of NP management, while the sustainable financing of NPs represents the ability to secure adequate, stable, and long-term funding to meet the full range of PA management and operational costs of the PA [39]. These revenues must be obtained promptly and in a suitable manner to fully cover management and operational expenses and ensure efficient and effective management of the PA, in accordance with conservation goals and other objectives [40,41]. Ensuring sustainable financing can be achieved through revenue diversification [42–46], i.e., by introducing innovative mechanisms and continuous funding for activities within the PA, because without constant investment in the PA, active management of the PA and its processes cannot be achieved, nor can the projected goal of preserving natural heritage be realized [46,47]. Regarding how revenues are collected and used, three categories of financing mechanisms are distinguished [39,46,48]: external financing mechanisms (which include state and donor budgets); mechanisms for raising funds to support nature conservation activities (including cost-benefit exchanges, business investments and funds, fiscal instruments, and agreements on private and joint resource management of the PA); and mechanisms that include revenue from the market for goods and services of the PA.

PAs, as well as NPs, are valuable assets that can be highly productive if appropriately managed [49]. Direct reinvestment in the conservation effort is essential for long-term sustainability [50]. Although PAs generates substantial benefits, the financial support that they receive remains disproportional, and the realization of these benefits depends on effective management [51]. Inadequate funding for PAs is a global concern, and the ability of managing authorities/agencies to secure sustainable financial resources remains a significant barrier to their effective management [52]. Recognizing this challenge, the Convention on Biological Diversity has also identified financial sustainability, particularly in developing countries, as a key objective, essential for enhancing the effectiveness of PAs in conserving biodiversity [53].

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National-level PA financing mechanisms are exclusively used to fund PAs within the country and include various types of taxes and fees at the national level, donations from private companies and individuals, and payments for ecosystem services [39]. Funding sources at the local level (fees for use, various forms of voluntary fundraising mechanisms, donations from corporations and individuals, etc.) are used to finance PAs within that area and for the activities of the local population. This can represent a positive financing mechanism because people are often more motivated to pay and contribute when they feel a close connection to the area. However, if PA financing relies mostly on this approach, its impact will be limited in underdeveloped countries or in areas with low tourism activities [54]. Currently, budget allocations in most countries are limited, since different sectors (agriculture, health, education, environment, and so on) are competing for limited financial resources [55]. Governments in developing countries allocate a certain proportion of funds to manage their PAs, but the funds might not be adequate to cover the costs [56]. The sole dependence upon government budgets can be problematic for PAs because the environmental sector often receives the least priority when revenues are constrained [53]. Because of this, investments by public funding are declining in many countries [43,55,57] and managers of Pas need to generate revenue within its territory and seek external/international funding to successfully carry out their mandate of nature conservation and preservation of cultural heritage [2,54,55,58–60]. Also, public investment in Pas, both new and existing, requires continuous funding to ensure proper management and maintenance [61], while external funding and market-based fees for goods and service are becoming the most common [62]. Other research studies also indicated that park management agencies often lack adequate funding for conservation activities, since most governments do not fully fund PAs' budgets [63], and because of this, the collection of revenue fees represents important financial income. Revenue fees in PAs can be generated as entrance fees, recreation and tourism permits, concessions, payments for ecosystem services, and other fees including scientific research [53]. These revenue sources can reduce the dependency on government budgets and promote the sites' financial self-sustainability. Managers of PAs, through tourism revenues, are trying to expand and diversify their funding portfolios and significantly increase fiscal sources for PA management and conservation [64]. Diversified sources of income can reduce park over-reliance and establish its financial self-sufficiency, which is beneficial for the long-term sustainability of the park [65]. These incomes can be obtained from entrance and activity charges, accommodation, concession and lease fees, and sales of tourist commodities [39,44,56,66–72]. As an example, tourist entry fees, especially in highly attractive sites, can generate significant revenues that can be used for covering most costs of PAs management [73]. Payment for ecosystem services represents an institutional mechanism designed to promote the protection and sustainable use of ecosystem services by aligning stakeholder interests through economic incentives [74–76]. Also, PAs might also generate new income by attracting tourism, investments in infrastructure development, or increasing the provision of economically significant environmental services [77]. In addition to traditional financing mechanisms, emerging approaches, such as impact investments or blue carbon, are increasingly being developed and implemented [78], especially those that can help PAs to secure long-term financing [79–82]. Financing for PAs at the international level can come from various international institutions, foundations, banks, NGOs, etc., which support nature conservation activities and, thereby, PAs' systems of management. These funds may be allocated to governments (public services or management bodies) for financing comprehensive nature protection, to international or regional NGOs, or to PA managers and stakeholders involved in PA management at the local level (local communities and NGOs). Also, one of the revenues that can collected within NPs is from wood mobilization [83-85], although collection of this type of revenue must be restricted only to

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buffer zones and carried out accordingly to principles of sustainable forest management. In Italy, ref. [83] conducted research that highlights the importance of integrating forest management plans with conservation policies to ensure that wood mobilization efforts align with the objectives of PAs. An 85-year analysis of Italian protected forests shows expansion from land abandonment, highlighting the need for active management and sustainable wood harvesting to preserve biodiversity and cultural landscapes [86]. A study across 27 EU countries [84] discusses on the need for balanced policies that consider both the ecological benefits of forest protection and the economic importance of wood production. A study in Spain's Valsaín forest showed that integrated management, combining conservation and timber production, can balance biodiversity preservation with sustainable wood use in PAs [87]. Also, in European PAs, sustainable management practices can increase wood mobilization while maintaining conservation objectives [88].

Based on the introduction and relevant information on NPs in Serbia, the overarching goal of this paper is to analyze different types of revenues in the management of NPs in Serbia for the period 2008–2022. The purpose of this research is to compare the revenue structure in four NPs and to define necessary facts that will enable finding the most appropriate option for financing these categories of PAs in Serbia. The results will contribute to policy discussions on the importance of different revenues in the management of NPs and their financial sustainability.

The central research question addressed in this paper is as follows: "In what ways have various types of revenue influenced the financing of NPs in Serbia between 2008–2022?". The main hypothesis is  $H_1$ : the growth rates of different revenues had a significant impact on the financing of NPs in Serbia between 2008 and 2022.

# 2. Method

### 2.1. Study Area

In Serbia, there are, in total, five NPs, and management of these NPs is overseen by five PEs [31]: PE NP Derdap, PE NP Kopaonik, PE NP Tara, PE NP Fruška gora, and PE NP Šar planina (the PE NP "Šar planina" is located in the autonomous province of Kosovo and Metohija and due to the political situation is not part of this analysis) (Figure 1). The total area of NPs in Serbia amounts to 142,962.9 ha [89], which represents 1.6% of the total territory, or 17.3% of all PAs in Serbia [16]. The area of NPs remained unchanged between 2008 and 2022.

# 2.2. Data Collection

In order to analyze the revenue structure of NPs in Serbia, financial data from four NP have been collected for period of 15 years. The period of 15 years was selected based on the availability of data and need for long-term analysis. The year 2008 was selected as the starting point because data from this year started to be available and previous research also took this year as a first year of analysis [32]. The year 2022 was the last one for analysis, since analysis started during 2023, when data for 2022 was the last data available. The collection of data was conduced based on the financial reports that each PE needs to provide for the previous year [90]. These financial reports are made for each NP and are available only for the last three years. These reports have an accounting structure and is universal for all PEs. In these financial reports, all obtained revenues are grouped in four main categories, and these categories are used for further analysis. These categories include business, grant, fee, and other business revenue as well as one general group (total revenue) [90]. Business revenue includes income from sales (timber production); income from the own use of products, services, and merchandise; and income from change in the value of inventories. Fee revenue includes income from collected revenues from the area

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of the NP. The collection of fee income is regulated by the law on fees for use of public goods [91] and each NP should have its own decision on fees for the use of the PA, which is adopted by the responsible ministry. Grant revenue includes income from donations from state/region/local authorities as well as income from foreign/international donations. Other business revenue includes incomes from rents, income from the cancellation of long-term provisions, income from collected penalties, and income from the sale of intangible assets products. These categories of revenue were chosen because they represent the main income categories in the financial report of each NP, and long-term analysis could be performed only by comparing them (they are main indicators and each NP must fill them). Also, the main goal was to understand differences between different revenues, and through these four groups of revenues, this was possible. In other to obtain measurable values, all revenues were divided by the area of the NP in order to quantify income per ha of land, and the value was calculated from RSD to EUR.

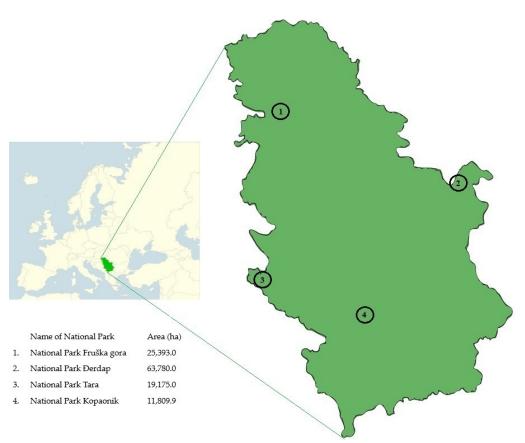


Figure 1. Location of National Parks in Serbia.

## 2.3. Data Analysis

In order to examine the content of the documents, content analysis was employed as a form of partial analysis [92]. Some authors [93,94] categorize content analysis as a non-reactive method. Non-reactive methods are those where the subject is unaware of the research, in contrast to questionnaires, interviews, and experiments, which are considered reactive methods [94]. In addition to content analysis, secondary data analysis is also classified as a non-reactive method, which involves the analysis of quantitative and/or qualitative data that were not collected by the researcher [94]. In accordance with the needs and goal of this research, in this paper, we applied general and specific scientific methods.

As a general scientific method, comparative methods and the method of modeling are used [95,96], as well as multiple linear regression analysis. For the specific scientific method, multiple linear regression analysis was conducted to evaluate the factors influencing the

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total revenue per hectare in the NPs (Tara, Đerdap, Fruška gora, and Kopaonik) for 15 years (2008–2022). This method was chosen to quantify the relationship between total revenue per hectare and several independent variables, which include business revenue per hectare, grant revenue per hectare, fee revenue per hectare, and other business revenue per hectare. The analysis used Statgraphics Centurion XVI (Statpoint Technologies, Inc., Warrenton, VA, USA).

The annual growth rates (GRs) for each revenue group in each NP were calculated using the following formula:

$$GR = \left(\frac{\text{Value in Year}_n - \text{Value in Year}_{n-1}}{\text{Value in Year}_{n-1}}\right) \times 100 \tag{1}$$

where

GR is the growth rate;

Value in  $Year_n$  is the value of the variable revenue for the current year; Value in  $Year_{n-1}$  is the value of the variable revenue for the previous year.

The regression model analyses the GR of total revenue per hectare (GRT) as the dependent variable. All independent variables, business revenue/ha (GRB), grant revenue/ha (GRG), fee revenue/ha (GRF), and other revenu/ha (GRO) are also expressed as annual growth rates. For each NP, the regression model was specified as follows:

$$GRT = \beta 0 + \beta 1 \times GRB + \beta 2 \times GRG + \beta 3 \times GRF + \beta 4 \times GRO + \varepsilon$$
 (2)

where

β0 represents the intercept;

 $\beta$ 1,  $\beta$ 2,  $\beta$ 3, and  $\beta$ 4 are the coefficients for the independent variables;

 $\varepsilon$  is the residual term representing the unexplained variation in the dependent variable.

The goodness-of-fit of the regression models was assessed using the R-squared statistic, which indicates the proportion of variability in the dependent variable explained by the independent variables. Additionally, the adjusted R-squared was reported to account for the number of predictors in the model.

The overall model's statistical significance was evaluated using the F-test in the analysis of variance (ANOVA) table. A p-value less than 0.05 indicates that the model provides a statistically significant fit to the data.

The regression model coefficients were estimated, and their significance was assessed using t-tests. Each coefficient's p-value indicates whether the corresponding variable significantly contributes to the model at a 95% confidence level. Coefficients with p-values greater than 0.05 were considered not statistically significant and potentially subject to removal from the model.

Several diagnostic statistics were used to assess the validity of the regression models: standard error of estimate, mean absolute error, Durbin–Watson statistic, and residual analysis.

The correlation matrix of coefficient estimates was examined to assess multicollinearity among the independent variables. High correlations between predictor variables could indicate potential multicollinearity, which might affect the stability of the coefficient estimates. Correlations with absolute values greater than 0.5 were examined.

For each park, the potential to simplify the model was assessed by examining the significance of individual predictors. Variables with high *p*-values were considered for removal to streamline the model without significantly sacrificing explanatory power.

By applying these statistical methods, we aimed to develop robust models that accurately reflect the relationships between GRT and various revenue sources (GRB, GRG, GRF,

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and GRO) in each NP. These analyses offer insights into the financial dynamics of these NPs and inform future management and policy decisions.

#### 3. Results

Using descriptive statistics, Figures 2 and 3 show changes in revenues for period 2008–2022. The highest values per ha are present for business revenues, while the lowest values are present for other business revenues. Within business revenues (Figure 2a), NP Tara has the highest values (120.9 EUR/ha–181.9 EUR/ha), which is not the case with NP Derdap (13.4 EUR/ha-20.4 EUR/ha). The best results for NP Tara are due to excellent forest habitats for wood production and a mixture of beech, fir, and spruce stands that produce high-value wood products. This is not the case with NP Đerdap, which has the lowest business revenues and a lack of good forest stands. Most of the stands in NP Derdap represent either coppice forests or protective forests, which do not have good forest stands or cannot be used for sustainable forest management. Fee revenues (Figure 2b) follow business revenues, starting from 6.1 EUR/ha (NP Tara) up to 14.3 EUR/ha (NP Kopaonik). The highest values for fee revenues were obtained in 2022 within NP Kopaonik (65.9 EUR/ha), which is not the case with NP Derdap (13.0 EUR/ha). The reasons for such huge differences in obtaining fee revenues lays in fact that NP Kopaonik developed effective and diversified methods of fee collection. These include the collection of fees from both individuals and companies as well as using online and terrestrial/field methods of collection that operate within the area of NP Kopaonik. This was especially evident in 2019–2020, when the online method of collection of fees was developed. An increase in fee revenue is not present for NP Derdap, and one of the reasons could be the area that this NP covers (63,870.0 ha), which is the case with other NPs in Serbia.

Compared to business and fee revenues, grant revenues (Figure 3a) and especially other business revenue (Figure 3b) do not have an even growth amount per year, and in some years, they reach peaks. In the case of NP Fruška gora (22.7 EUR/ha), grant revenues reach peaks in 2012, which is also present for NP Derdap (15.0 EUR/ha) in 2014 and NP Tara (14.9 EUR/ha) in 2015. These peaks in grant revenue are due to governmental financing of infrastructure development in the area of these NPs and are not connected with long-time budget financing. From the other side, a continuous low level of grant revenue is present within NP Derdap, and this is for sure connected with the area of this NP (63,780.0 ha), while the highest level of grant revenue is present in NP Tara. This can be connected with an increase in the interest of the government in financing research and tourism promotion activities. Compared to other revenues, other business revenues have the most uneven distribution, and for NP Kopaonik, this revenue is not present from 2013. Compared to all NPs, only NP Fruška gora and NP Tara obtain revenues over 1.0 EUR/ha, and this revenue is decreasing.

Looking at the total revenues (Figure 4), it can be observed that NP Tara constantly has the highest revenues per ha, followed by NP Fruška gora and NP Kopaonik, while NP Derdap has the lowest revenues per ha. In NP Tara, the peak in 2016 and the decrease in 2017 are connected with better/lower wood production, which is the same for the peak for NP Fruška gora in 2012. From the other side, the peak in revenues (2016) in NP Kopaonik is connected with increase in business revenues and fee revenues, while the peak in 2020 is connected with a drastic increase in fee revenues. As stated before, the growth of total revenues (2014) in NP Derdap for 2014 is connected with high revenues from donations, i.e., governmental revenues received for infrastructure development.

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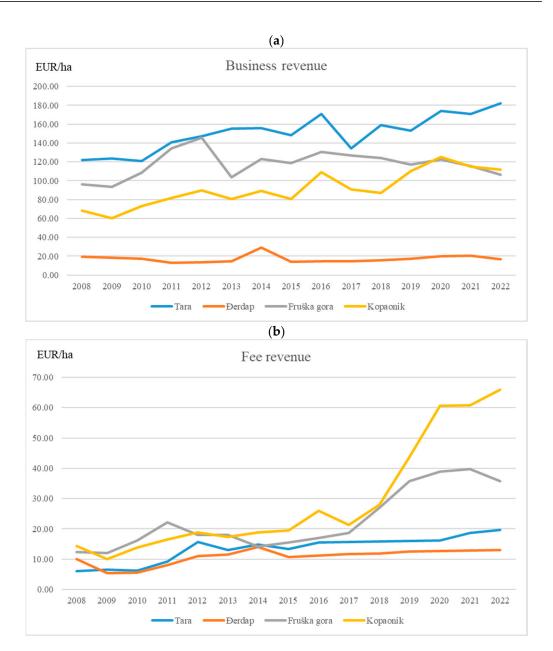


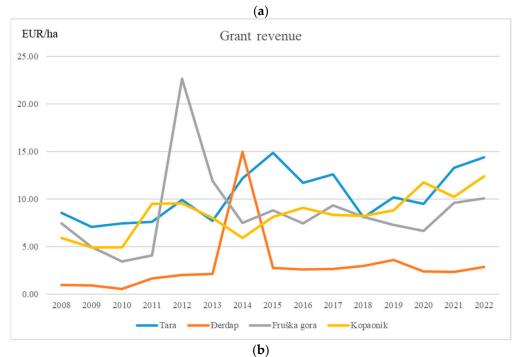
Figure 2. Descriptive statistics of business (a) and fee (b) revenues.

The regression equations are presented in Table 2, while descriptive statistics for the four NPs are given in Table 3.

 Table 2. Regression equations for national parks.

| National Parks | Regression Equations  |
|----------------|---|
| Tara           | $GRT = -0.39 + 0.84 \times GRB + 0.06 \times GRG + 0.06 \times GRF + 0.01 \times GRO + \epsilon$    |
| Đerdap         | $GRT = -1.31 + 0.74 \times GRB + 0.043 \times GRG + 0.27 \times GRF + 0.00 \times GRO + \epsilon$   |
| Fruška gora    | $GRT = -0.99 + 0.79 \times GRB + 0.03 \times GRG + 0.16 \times GRF + 0.04 \times GRO + \varepsilon$ |
| Kopaonik       | $GRT = 0.06 + 0.72 \times GRB + 0.05 \times GRG + 0.20 \times GRF + \varepsilon$                    |

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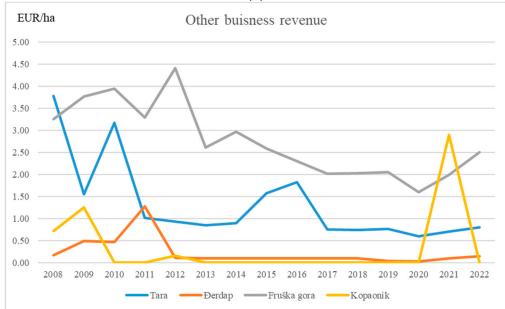


Figure 3. Descriptive statistics of grant (a) and other business (b) revenues.

**Table 3.** Descriptive statistics for national parks.

|           |       | Tara   |        |        |               |                    |       | Đerdap |        |        |               |                    |  |
|-----------|-------|--------|--------|--------|---------------|--------------------|-------|--------|--------|--------|---------------|--------------------|--|
| Indicator | Mean  | Median | Min    | Max    | Stan.<br>Dev. | Coeff.<br>Var. (%) | Mean  | Median | Min    | Max    | Stan.<br>Dev. | Coeff.<br>Var. (%) |  |
| GRB       | 3.42  | 3.04   | -21.26 | 18.44  | 10.52         | 307.82             | 3.54  | 3.18   | -52.71 | 102.70 | 33.54         | 947.46             |  |
| GRG       | 6.89  | 6.52   | -35.91 | 58.22  | 26.45         | 384.07             | 51.51 | 2.78   | -81.64 | 605.86 | 171.20        | 332.39             |  |
| GRF       | 10.62 | 3.56   | -16.51 | 70.14  | 22.68         | 213.64             | 4.33  | 3.19   | -45.90 | 43.76  | 22.08         | 510.41             |  |
| GRO       | 0.66  | 0.17   | -68.22 | 104.54 | 47.74         | 7224.98            | 36.90 | -0.41  | -91.50 | 310.38 | 111.62        | 302.50             |  |
| GRT       | 3.51  | 2.84   | -18.2  | 14.95  | 8.68          | 247.37             | 4.89  | 3.21   | -53.07 | 106.92 | 33.55         | 685.63             |  |

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Table 3. Cont.

|           |             | Tara   |        |        |               |                    |       | Đerdap |        |       |               |                    |  |
|-----------|-------------|--------|--------|--------|---------------|--------------------|-------|--------|--------|-------|---------------|--------------------|--|
| Indicator | Mean        | Median | Min    | Max    | Stan.<br>Dev. | Coeff.<br>Var. (%) | Mean  | Median | Min    | Max   | Stan.<br>Dev. | Coeff.<br>Var. (%) |  |
|           | Fruška gora |        |        |        |               | Kopaonik           |       |        |        |       |               |                    |  |
| GRB       | 1.58        | -2.57  | -28.83 | 23.82  | 13.36         | 844.39             | 4.69  | 3.92   | -16.80 | 34.94 | 16.04         | 342.20             |  |
| GRG       | 26.42       | -9.61  | -47.38 | 455.70 | 126.31        | 478.03             | 8.71  | 0.18   | -26.45 | 92.40 | 30.51         | 350.37             |  |
| GRF       | 9.70        | 8.89   | -21.33 | 45.19  | 20.73         | 213.71             | 14.02 | 11.25  | -29.85 | 56.82 | 24.00         | 171.15             |  |
| GRO       | 0.32        | 0.78   | -40.76 | 33.75  | 20.99         | 6513.12            |       |        |        |       |               |                    |  |
| GRT       | 2.65        | 1.81   | -28.60 | 24.03  | 12.55         | 474.31             | 6.69  | 4.84   | -16.48 | 32.93 | 16.31         | 243.58             |  |

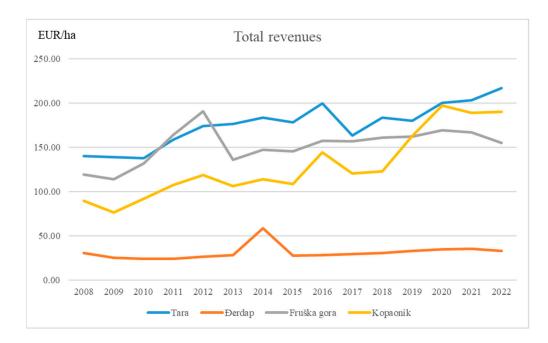


Figure 4. Descriptive statistics for total revenues.

The results of regression analysis (Table 4) show that GRB is the most significant (p < 0.05) contributor among the revenue sources with a very strong positive impact on GRT in all four NPs. The GR of GRG also contributes positively to GRT in the four NPs. However, its impact is much smaller than GRB and GRF but still highly significant (p < 0.05). GRF in all four NP also positively influences (p < 0.05) GRT. Still, its effect is moderate compared to GRB. As stated before, GRO has the slightest positive impact, and it is statistically significant (p < 0.05) only in NP Tara.

Table 4. Regression coefficients for national parks.

|           | Tara            |                            | Đerdap          |                            | Fr              | uška Gora                  | Kopaonik        |                            |
|-----------|-----------------|----------------------------|-----------------|----------------------------|-----------------|----------------------------|-----------------|----------------------------|
| Indicator | <i>p</i> -Value | 95% Confidence<br>Interval | <i>p</i> -Value | 95% Confidence<br>Interval | <i>p-</i> Value | 95% Confidence<br>Interval | <i>p</i> -Value | 95% Confidence<br>Interval |
| Constant  | 0.02            | [-0.72, -0.07]             | 0.12            | [-3.03, 0.41]              | 0.04            | [-1.96, -0.01]             | 0.90            | [-1.00, 1.13]              |
| GRB       | 0.00            | [0.80, 0.87]               | 0.00            | [0.66, 0.83]               | 0.00            | [0.72, 0.86]               | 0.00            | [0.62, 0.82]               |
| GRG       | 0.00            | [0.04, 0.075]              | 0.00            | [0.02, 0.06]               | 0.00            | [0.02, 0.04]               | 0.00            | [0.02, 0.09]               |
| GRF       | 0.00            | [0.04, 0.08]               | 0.00            | [0.19, 0.36]               | 0.00            | [0.12, 0.21]               | 0.00            | [0.13, 0.26]               |
| GRO       | 0.00            | [0.01, 0.02]               | 0.57            | [-0.01, 0.02]              | 0.10            | [-0.01, 0.09]              | /               | /                          |

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The results of goodness-of-fit statistics and ANOVA analysis are presented in Table 5 for the four NPs. The high value of R-squared (99.20%–99.81%) shows that the model provides an excellent fit to the data, capturing almost all of the variation. Also, the high value of adjusted R-squared (99.19%–99.73%) indicates a very strong model fit, suggesting that the model is accurate and efficient without overfitting due to unnecessary variables. A very high F-ratio (278.49–1184.74) and a p-value of 0.00 indicate that the overall regression model is a good fit for the data and that the predictors in the model contribute significantly (p < 0.05) to explaining the variability in GRT. The Durbin–Watson statistic with a value of 1.49–1.82 shows that there is little to no autocorrelation in the residuals. The p-value of 0.14–0.53 further indicates that the residuals do not show significant autocorrelation, supporting the model's validity.

**Table 5.** Model summary statistics and ANOVA analysis for national parks.

|                                |              |                 |              | Nation                  | nal Parks |                 |         |                 |  |
|--------------------------------|--------------|-----------------|--------------|-------------------------|-----------|-----------------|---------|-----------------|--|
| Statistic                      | Tara         |                 | Đerdap       | Đerdap                  |           | Fruška Gora     |         | Kopaonik        |  |
| R-squared                      | 99.81%       |                 | 99.60%       | 99.60%                  |           | 99.20%          |         | 99.38%          |  |
| Adjusted R-squared             | 99.73%       |                 | 99.42%       |                         | 98.84%    |                 | 99.19%  |                 |  |
| F-ratio                        | 1184.74      |                 | 562.87       |                         | 278.49    |                 | 533.05  |                 |  |
| <i>p</i> -value                | 0.00         |                 | 0.00         | 0.00                    |           | 0.00            |         | 0.00            |  |
| Standard Error of Estimate     | 0.45         |                 | 2.54         |                         | 1.35      |                 | 1.47    |                 |  |
| Mean Absolute Error            | 0.29         |                 | 1.43         | 1.43                    |           | 0.96            |         | 0.96            |  |
| Durbin-Watson Statistic        | 1.82 (p = 0) | .53)            | 1.76 (p = 0) | 1.76 ( <i>p</i> = 0.31) |           | 1.49 (p = 0.14) |         | 1.55 (p = 0.23) |  |
| Lag 1 residual autocorrelation | -0.058       |                 | -0.078       | -0.078                  |           | 0.245           |         | 0.203           |  |
| Analysis of Variance (ANC      | OVA) for Na  | tional Parks    |              |                         |           |                 |         |                 |  |
| Source                         | F-Ratio      | <i>p</i> -Value | F-Ratio      | <i>p</i> -Value         | F-Ratio   | <i>p-</i> Value | F-Ratio | <i>p</i> -Value |  |
| Business revenue               | 4384.72      | 0.00            | 2099.56      | 0.0000                  | 1001.81   | 0.0000          | 1527.84 | 0.0000          |  |
| Grant revenue                  | 293.36       | 0.00            | 97.28        | 0.0003                  | 48.73     | 0.0000          | 30.92   | 0.0002          |  |
| Fee revenue                    | 42.49        | 0.00            | 54.29        | 0.0001                  | 60.08     | 0.0000          | 40.38   | 0.0001          |  |
| Other business revenue         | 18.40        | 0.00            | 0.35         | 0.5705                  | 3.31      | 0.1021          |         |                 |  |

The results in Table 5 provide a detailed analysis of the significance of each variable as it was added to the regression model, showing how each contributes to explaining the variance in GRT. GRB explains a substantial portion of the variance in GRT. The extremely high F-ratio and the *p*-value of 0.00 indicate that GRB is highly significant. Adding GRB to the model greatly improves its ability to explain GRT. After accounting for GRB, GRG adds further explanatory power to the model. It significantly improves the model's fit, as indicated by the high F-ratio and very low *p*-value (0.00). GRF also contributes significantly to the model, even though it is less than GRB and GRG. It remains an important factor with a significant F-ratio and a *p*-value below 0.05.

GRO has the smallest effect on the model but still significantly explains the variance in GRT. Despite being the least impactful, it should remain in the model, given its statistical significance for NP Tara. The p-value for other GRB for NP Đerdap and NP Fruška gora is much greater than 0.05, which further confirms that it is not statistically significant and does not contribute meaningfully to the model, while for NP Kopaonik, this revenue is not present.

The results in Table 6 help to identify multicollinearity, which can affect the stability and interpretation of the regression coefficients. The values presented for GRB and GRG

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(0.64) for NP Tara suggest moderate correlations, which indicates that with an increase in GRB, GRG increases also. In this NP, a negative moderate correlation (-0.61) is present between GRG and GRF. This value shows that with an increase in grant revenues, fee revenues decrease. A similar situation is present between GRB and GRF (-0.54), which suggests that with an increase in business revenue, fee revenues decrease. In NP Đerdap, a strong negative correlation (-0.80) is present. This is due to the increase in GRG, which influences the decrease in GRB. A strong negative correlation (-0.82) is present between GRB and GRF in NP Kopaonik. This suggests that with an increase in fee revenues, business revenues decrease. This can be observed in Figure 2a,b and especially for fee revenues after 2017.

| Compared Source - | National Parks |        |             |          |  |  |  |  |
|-------------------|----------------|--------|-------------|----------|--|--|--|--|
| Compared Source - | Tara           | Đerdap | Fruška Gora | Kopaonik |  |  |  |  |
| GRB-GRG           | 0.64           | -0.80  | -0.11       | 0.06     |  |  |  |  |
| GRB-GRF           | -0.54          | 0.23   | -0.28       | -0.82    |  |  |  |  |
| GRB-GRO           | -0.27          | 0.36   | -0.26       | /        |  |  |  |  |
| GRG-GRF           | -0.61          | -0.46  | 0.24        | -0.23    |  |  |  |  |

-0.36

0.33

-0.36

0.30

**Table 6.** Correlation matrix for coefficient estimates for national parks.

-0.44

0.50

#### 4. Discussion

**GRG-GRO** 

**GRF-GRO** 

By analyzing the area of PAs and NPs, it is obvious that Serbia has the lowest level of PAs (9.4%) in the region, especially compared to EU countries (Bulgaria, Croatia, Hungary, Romania, and Greece). From these countries, Bulgaria (41.0%) has the highest area of PAs, and Greece (11.2%) has the lowest. From the other side, coverage of NPs in the region is highest in Montenegro (7.7%) and lowest in Bosnia and Hercegovina (1.2%). In EU countries, the highest coverage for NPs is in Hungary (5.2%), and the lowest is in Romania (1.3%). A major factor contributing to the high coverage of both PAs and NPs in the region is Montenegro's intensive engagement in the EU accession process [97], which has prompted alignment with EU environmental standards and the expansion of its PA network, an approach similarly observed in existing EU member states.

Across all parks, GRB shows the strongest positive impact on GRT. In NP Tara, GRB's high f-ratio and narrow confidence interval of (0.80, 0.87) demonstrate its crucial role. Similar patterns are seen in NP Đerdap, with an f-ratio of 2099.56 and a confidence interval of (0.66, 0.83), while in NP Fruška gora and NP Kopaonik, GRB is consistently the most significant contributor. The fact that GRB's effect is so pronounced across all models highlights its role as the primary driver of financial sustainability in these NPs, as seen in the very low p-values and high f-ratios across all analyses. With regard to the financing of PAs in Serbia, the average number of financing sources was found to be significantly higher with PE Vojvodinašume than other management actors [46]. One of the significant sources of business revenue in NP management is income derived from wood production. In the case of the analyzed NPs, income is realized through business revenue. This revenue is generated through a 10-year forest management plan and an annual management program [98]. These management documents need to be approved by both the responsible ministry for PAs (Ministry of Environmental Protection) and the ANC [30,98]. Additionally, the forest management plan must be approved by the responsible ministry for forestry (Ministry of Agriculture, Forestry, and Water Management). As we can see, this group of

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revenues constitutes the highest share of total revenue and has a strong positive impact. In the case of NP Tara, there is a moderate correlation between GRB and GRG, while a strong negative correlation is observed in NP Derdap. Concerning the use of wood in PA, one study suggested that wood mobilization can be achieved through sustainable forest management in PAs in Italy [83]. In Italy, the current level of resource utilization remains relatively low. However, an increase in timber harvesting combined with the implementation of active management practices within PAs could, in theory, satisfy Italy's wood consumption demands [83]. A study across 27 EU countries found that 10% of the annual theoretical wood supply from total forest areas cannot be harvested from PAs. It also found that protected forests do not necessarily affect wood supply given the current demand for wood in Europe. However, this situation could change if there is a significant increase in material and energy [84]. Moreover, recent research found that logging had been minimal in recent years, with most logging sites located within the buffer zone and within 200 m of roads [85]. This study also emphasized the importance of balancing conservation and utilization in park management by effectively coordinating diverse interests related to wood supply, particularly in selecting logging areas within the buffer zone, which must serve both purposes. In Poland, revenues from NPs also include those from the sale of products, i.e., timber and fish [99].

While GRF and GRG have smaller impacts than GRB, they still contribute significantly to GRT in all models. In NP Tara, GRG effect is smaller but statistically significant, with a confidence interval of (0.04, 0.07), while in NP Đerdap, it plays a moderate role, with a confidence interval of (0.02, 0.06). The contribution of GRF is more substantial than GRG in all models, especially in NP Derdap and NP Kopaonik, where its impact is highly significant. This suggests that parks rely not only on their business activities but also on external funding sources and user fees, which provide supplementary but meaningful support for financial sustainability. NPs' activities in the collection of fees represent important sources of revenue for park operations and maintenance since public budget allocations to PAs are commonly insufficient [100-102]. Also, fees collected by NPs can compensate for the opportunity cost of PAs [67]. NP authorities can collect different types of revenues, such as entrance fees, recreation and tourism permits, concessions, and payments for environmental services, and these revenue sources can reduce the dependency on government budgets and promote the sites financial self-reliance [51]. In particular, tourist entry fees can bring in substantial revenues to cover most costs of PA management if the sites are attractive [73]. In the case of NP Kopaonik, it is obvious that the collection of these fees is very economically productive, and tourist fees have certainly significantly impacted this [103]. Also, issuing licenses to those who operate in PAs can provide another source of revenue beyond visitor fees [102], with commercial tours being the most common target [67,104]. The collection of fee revenue is conducted in Croatia, and 100% of entrance fees collected in NPs and nature parks stays within the park management authority [48]. In Poland, the situation is the same with entrance fees, since more than half of total revenues represent revenues from entrance fees [99]. The collection of a hypothetical entrance fee, based on willingness to pay, in Germany NP Bayerischer Wald is 1.88 million EUR (2007) per year, which equals to 13.9% of the economic impact of park tourism [105]. In the case of Bonaire NP (Netherlands Antilles), the results of one study indicate that mean willingness to pay ranges from USD 61 to USD 134 [106]. During 2024, NPs in Montenegro collected 2.3 million EUR from tourism activities, which gives more importance to NPs for strengthening national ecotourism and the touristic industry [107]. In Mediterranean countries, financial resources for PA management come from fees paid by members of associations and private donors (70% of their budgets) [108]. Looking at the international scale, a study on NP entry fees has been conducted in order to understand index of affordability [109]. This study was conducted in

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62 countries, and the results show that tourist entry fees are lowest in Armenia (USD 1.04), while in Europe, middle- to higher-income tourists spend USD 165 daily. Also, PAs in low-income countries are, on average, 30 times less affordable for local citizens compared to those in high-income countries [109]. Research on the amount of fees collected by NPs over a longer period of time has not been conducted, but some research indicates that tourism revenues in NPs are of increasing importance [43,63,110–112] and that economic benefits in PAs are driven by tourism as the central economic activity in PAs worldwide [113]. From the other side, over-tourism puts strain on the natural environment, disrupts local communities, and reduces tourist satisfaction in many PAs [114]. Also, through developing ecotourism in PAs, additional revenues can be collected [53], while some visitors are willing to pay higher fees only if the money goes for park improvement but not elsewhere [115,116]. Besides fee-generated activities, one of the sources for support can be volunteers and communityoriented work for PA managers [117,118]. Previous research conducted in Serbia indicates that the majority of revenues in NPs comes from business revenues, while fee revenues account for only 12.4% of total revenues [32]. In the case of NPs in Serbia, GRF in all four NPs positively influences GRT, but its effect is moderate compared to GRB. Concerning NP Tara, there is a negative moderate correlation between GRF and GRB/GRG, while in the case of NP Kopaonik, a strong negative correlation is present within GRB and GRF.

One of the most important revenues for NPs represent financing through governmental institutions. The financing of NPs in Croatia is carried out through the Ministry of Environment and Energy, regional and local self-governments, and EU funds [119]. Additionally, one of the potential sources of funding for PAs could be the funds allocated for the Natura 2000 network. The financing of this network in EU countries is carried out through several funds and programs [120]. These funding sources could be used in the future, both as a basis for establishing the Natura 2000 network and as additional sources of funding various activities in NPs, ranging from research to education. However, this requires partnership cooperation between different PA managers, institutions, and stakeholders. Different research studies show that with an increase in the number of PAs, the funding provided by government sources is increasingly inadequate [67,121–124]. Also, effective public expenditure shapes PA management, requiring models of constraints and motivations in site visits [125]. In Serbia, the availability of international funding remains limited [46]. From the other side, Croatia has seen growing reliance on international financing mechanisms, such as grants and loans, to support its PAs system. Despite this trend, conducted research reveals that a considerable number of Croatian PA institutions have yet to utilize these international funding opportunities [126]. Additionally, although the national fund for environmental protection and energy efficiency holds substation financial capacity, only 1.5% of its resources are allocated to PAs [126]. In Serbia, no similar analysis of financial capacities and usage has been conducted. A lack of governmental funding is recognized in former Yugoslavian countries, where central governmental budgets for financing PAs is very low or non-existent [109]. In Poland, NPs receive subsidies from the state budget for activities defined by law (Forestry Fund and National Fund for Environmental Protection and Water Management) but also from the EU budget [99]. Also, these activities can be financed by local municipalities for duties associated with safeguarding the natural and cultural assets of the region [127]. From a European perspective, PAs can contribute to local economies, particularly when they receive adequate funding and attract substantial visitor numbers, since public budgets often absorb most opportunity costs [105]. GRO was found to be the least significant revenue source in the models, and its impact varies across parks. In NP Tara, it has a small but significant positive effect, with a confidence interval of (0.01, 0.02). However, in NP Derdap and NP Fruška gora, it is not statistically significant, with confidence intervals that include zero, indicating its negligible

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impact. The lack of significance for GRO in these parks suggests that it may not be a critical factor in overall revenue generation. This is further evidenced by the exclusion of GRO from the NP Kopaonik model due to insufficient data, reflecting its limited relevance in some cases.

The regression models for all NPs demonstrate an excellent fit, with R-squared values above 99% in each case, indicating that the independent variables (GRB, GRG, and GRF) explain nearly all the variation in GRT. The slightly lower adjusted R-squared values confirm that the models are efficient and avoid overfitting. In NP Tara, for example, the R-squared is 99.81%, and the adjusted R-squared is 99.73%. Similarly, high values are observed in NP Đerdap, NP Fruška gora, and NP Kopaonik, confirming that the models are robust and reliable. The f-ratios across the parks are extremely high, with NP Tara having an f-ratio of 1184.74 and NP Kopaonik showing an f-ratio of 533.05, reflecting the overall significance of the models. The *p*-values of 0.00 further validate the models' ability to explain GRT variability.

The Durbin–Watson statistics for all NPs indicate that there is no significant serial correlation in the residuals, suggesting that the models meet the assumption of independent residuals. For example, in NP Đerdap, the Durbin–Watson statistic is 1.76, with a *p*-value of 0.31, indicating no significant autocorrelation. Similarly, in NP Kopaonik, the Durbin–Watson statistic is 1.55 with a *p*-value of 0.23. While there is some evidence of mild positive autocorrelation in certain models (e.g., NP Fruška gora, with a Durbin–Watson statistic of 1.49), it is not statistically significant, meaning the models are still reliable.

The correlation matrices for each park highlight some potential issues with multicollinearity. In NP  $\oplus$  and GRG ( $\oplus$ 0.80) and between GRG and GRO ( $\oplus$ 0.36). These correlations suggest that there may be some interaction between the variables that could affect the stability of the coefficient estimates, particularly for GRG and GRF. However, the models remain stable, and multicollinearity is not severe enough to invalidate the results. Simplifying the models by removing or combining highly correlated variables could improve the coefficient estimates in future analyses. Research studies dealing with correlations between different revenues have not been found.

# 5. Conclusions

The regression analyses for the four NP consistently demonstrate that GRB is the most significant and influential income source, while GRF and GRG also play important roles. The models fit the data very well, explaining nearly all the variability in GRT, with no significant issues related to residual independence or multicollinearity. These findings provide a strong basis for understanding revenue generation in NPs and offer insights into how the parks can manage and optimize their revenue streams for greater financial sustainability. Within this revenue, NP Tara had the highest income per ha and NP Derdap had the lowest income per ha during the whole period. Besides GRB, GRF also has a positive impact on GRT. Comparing all NPs, fee revenues per ha have the highest values within NP Kopaonik, which is not the case with NP Derdap. Grant revenues show a similar pattern to fee revenues, since NP Derdap received the smallest support (domestic and international). Concerning correlations, a strong negative correlation is present between GRB and GRF in NP Kopaonik. Due to strong increases in fee revenue in this NP, business revenues decreased.

Concerning business revenues in the management of NPs in Serbia, it has to be pointed that majority of this income comes from wood production activities, and although this management is carried out via cooperation with different state institutions, it is a questions whether this type of income should be the main one in NP operations. Experiences in

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different countries are showing that forest management activities and PA activities are separated and independent, due to raised awareness of better protection of NPs. Also, capacities within NPs are usually limited, and more activities should be put toward the management of NPs as PAs, not as forests. From the other side, support from local, regional, and national governments must be much higher, and the financing of NP management plans should be their priority, as we see governmental funding is low, and it is important to increase international funding. This can be managed through building the capacities of managers and hiring some specific agencies who will apply for international funds. Other business revenues, as such, do not have an important role in financing NPs in Serbia.

The importance of this study lays in fact that, although business revenues currently constitute the largest share of total revenue, fee revenues show significant growth potential, which is particularly evident in the case of NP Kopaonik, where fee income has increased since 2019. Despite this positive trend, fee collection remains suboptimal, largely due to user reluctance and lengthy legal procedures. Enhancing collection methods could substantially boost this revenue stream, making it a more effective financial instrument. The experience of NP Kopaonik suggests that similar improvements could be applied across all PAs in Serbia, which is especially relevant given the increasing conservation demands linked to EU accession and emerging biodiversity strategies. NPs and PAs should not rely mostly on business revenues collected from wood production but improve their management strategies and be oriented toward the collection of fees. Also, government funding is typically a vital component of NP financing across Europe. However, in the case of the studied NPs in Serbia, such support remains limited and does not constitute a significant share of total funding. This research highlights a notable discrepancy between Serbia and other European countries, where government contributions are often essential for ensuring the stability and effectiveness of PA management. To align with European standards and meet increasing conservation demands, particularly in the context of EU accession and the implementation of biodiversity strategies, it is crucial to strengthen financial support from all levels of government in Serbia. Enhanced and sustained public investment is necessary to improve the overall financial sustainability and management effectiveness of NPs. To ensure long-term sustainability and management effectiveness, Serbia must adopt a strategic approach that combines stable government funding with the systematic collection of fees. Strengthening these financial mechanisms is essential for supporting conservation objectives, fulfilling international obligations, and advancing toward EU environmental standards.

This financing mix of NP management in Serbia is unbalanced and inadequate, since it especially depends on wood production, which can undermine conservation activities, strain the capacities of managers, and have a negative impact on society. Because of this, a more balanced financing mix is needed between business, fee, and grant revenues. Financing NPs from business revenues may be misaligned with conservations goals, when managers of NPs are expected to prioritize biodiversity protection over wood production. Also, limited governmental funding and international support (grant revenue) create challenge for NP managers who lack resources for the implementation of an NP management plan. This lack of financial support puts additional pressure on managers, who need to balance between conservation and forestry goals. However, inefficient fee collection undermines operational effectiveness, represents a missed revenue opportunity, and likely diminishes the satisfaction of NP managers. In cases where fee revenues have increased, such as in NP Kopaonik, reliance on wood production income has diminished. This shift demonstrates that a more diversified funding structure can promote financially sustainable conservation management on the territories of NPs in Serbia.

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The social acceptability of how NPs are managed was not part of these analysis, although the governance structure of NP management involves the establishment of expert and user councils for NPs. Through these two councils, different stakeholder and local communities are involved in the process of adoption of NP management plans and yearly programs. In order to implement an NP management plan, it is necessary to have adequate financing, and future studies should focus on how NP management plans/programs are executed in practice and identify the level of implementation of biodiversity conservation objectives.

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