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ANALYSIS OF PES NEEDS AND FEASIBILITY IN SERBIA

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Printed at Geosoft EOOD

Cover photo: © Wild Wonders of Europe / Ruben Smit / WWF
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This study was prepared as part of **THE DANUBE PES PROJECT: PROMOTING PAYMENTS FOR ECOSYSTEM SERVICES AND RELATED SUSTAINABLE FINANCING SCHEMES IN THE DANUBE BASIN.**

This project promotes and supports land managers who help us sustain the benefits that we all get from nature. The project is implemented by the WWF Danube-Carpathian Programme with the financial support of the GEF through UNEP and the European Commission.

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CONTENT

| | |
|---|-----------|
| INTRODUCTION | 01 |
| THE DANUBE BASIN IN SERBIA | 02 |
| PES IN SERBIA – GENERAL REMARKS | 03 |
| DETAILED REVIEW OF EXISTING FINANCIAL SCHEMES RELATED TO NATURAL RESOURCES AND NATURE CONSERVATION | 04 |
| Fund for environmental protection | 04 |
| Fund for waters | 08 |
| Fund for forests | 13 |
| Charges for use of protected areas | 17 |
| Tourism in protected areas | 21 |
| General recommendations for PES schemes in Serbia | 22 |
| Potential case studies for PES schemes in Serbia | 27 |

INTRODUCTION

People have largely underestimated the benefits derived from ecosystems in industrial society. Most often, these gains were seen in the context of culture and spirituality and were, therefore, difficult to value in economic terms.

However, the last decades have witnessed a shift in our thinking about ecological services. The growing concern over the rapid depletion of

natural resources and the relatively poor results of the existing concept for conservation of ecosystems have brought economic assessment of ecosystem services to the forefront of contemporary thinking about nature conservation policies. Global policies have started to acknowledge the immense importance of ecosystem services and to incorporate them in economic systems.

Provisioning (eg. food, water, timber)

Cultural (eg. educational, recreational, spiritual, religious)

Regulating (eg. climate regulation, water purification, flood protection, disease control)

Supporting (primary production, soil formation)

Figure 1. Classification of ecosystem services (based on Millennium Ecosystem Assessment, UN 2005)

Payments for ecosystem services (PES) are incentives for the marketing of services that are provided by natural systems. Nowadays, PES are recognized as one of the most convenient tools for supporting nature conservation and sustainable management of natural resources

in general. Many international programmes and initiatives promote this concept. The United Nations Environmental Programme (UNEP), the Convention on Biological Diversity (CBD) and the International Union for the Conservation of Nature (IUCN) are cooperating closely on

scaling the PES concept with a focus on biodiversity conservation. The

organizations are also working on developing international PES (IPES).

THE DANUBE BASIN IN SERBIA

Serbia is located in southeastern Europe and occupies an area of 88,361 sq. km. Most of its territory (80%) is in the Balkan Peninsula; the remaining 20% stretch into the Pannonian Plain.

The Danube is the largest river in Serbia. Its basin covers almost the entire territory of the country, save for small areas in southern Serbia, which belong to the Adriatic and Aegean Sea basins. Coming from the northwest, the Danube flows through the Pannonian Plain. In the eastern part of the country, the river enters Djerdap gorge (Iron Gate), one of the largest gorges in Europe. The largest tributaries in Serbia are Tisa, Sava, Morava, Tamiš and Timok.



PES IN SERBIA – GENERAL REMARKS

The PES concept is relatively new to Serbia, and it has not been developed and implemented. However, recent laws regulating the use of natural resources have enabled some basic environmental economics mechanisms.

The Law on Environmental Protection (2004) adopted the “user pays” principle and introduced fees for the use of natural resources and some ecological services. Other laws, such as the Law on Waters and Law on Forests, also regulate the payment for natural resource use. The 2010 Law on Forests goes as far as introducing a fee for forest services of public interest (protection of water basins, protection from erosion, non-timber forest products, recreation, etc.), which can be considered a fee for ecosystem services.

However, these laws do not regulate the investment of collected fees. Provisions for the use of these funds are defined broadly, and they do not explicitly ensure the financing of conservation initiatives. As a result, the money is not invested back into the conservation of ecosystems and the improvement of ecosystem services.

Therefore, we cannot fully acknowledge existing financial mechanisms in Serbia as PES

mechanisms, even though certain elements are in place. In addition, the existing financial mechanisms are focused on provisioning services (timber, water, flora and fauna), which leaves out other ecological services of great importance, such as natural flood protection and water purification, for example.

Protected area managers in Serbia are allowed to collect fees for different kinds of use of resources in their parks. This mechanism resembles a PES scheme, but then, again, we run into the problem of loosely defined rules for investing the money collected from such fees. In addition, the ecological services, for which the users are charged, are not always specified, and users are not aware that they are paying for benefits they get from ecological services.

In recent years, there has been a deliberate effort to develop tourism in some protected areas in Serbia. These initiatives also have some characteristics of PES schemes, since they generate income that supports the management of the protected areas.

Obviously, there are solid foundations for the further development of PES schemes in Serbia. Many of the existing financing mechanisms can be adapted so that they enable the

effective and targeted financing of ecosystem conservation. Additional economic analysis should be conducted in order to properly adapt existing mechanisms and to define procedures for the internalization of environmental costs in different sectors.

However, there is little awareness and knowledge about PES in Serbia.

People who are working in sectors related to natural resources (nature conservation, water management, forestry) are acquainted with the general facts and principles of environmental economics, but incentives and organized efforts for promotion of this concept are lacking.

DETAILED REVIEW OF EXISTING FINANCIAL SCHEMES RELATED TO NATURAL RESOURCES AND NATURE CONSERVATION

FUND FOR ENVIRONMENTAL PROTECTION

The Fund for Environmental Protection was established by the Law on Environmental Protection¹, which passed in 2004. A separate Law on Fund for Environmental Protection² was adopted in 2009. The fund aims to secure funding for activities in the area of preservation, sustainable use, protection and advancement of the environment, as well as in the area of energy efficiency and use of renewable energy sources.

The main financial sources of the Fund for Environmental Protection are charges established by the eponymous law (Articles 27, 45 & 85). They include:

- **charge for the use and trade with wild fauna and flora;**
The charge for the use and trade of wild flora and fauna is defined by the Decree on Control of Use and Trade of Wild Flora and Fauna³. The amount of the charge is 10% of the

¹ Official Gazette of the Republic of Serbia no. 135/2004

² Official Gazette of the Republic of Serbia no. 72/2009 & 101/2011

³ Official Gazette of the Republic of Serbia no. 31/2004, 35/2004.

market value of used/traded natural goods.

- **charge for the registration in the European Eco-management and Audit Scheme (EMAS) system;**

The charge for the registration into the EMAS system is currently 66,000 RSD (ca. 600 EUR), paid by the company.

- **environmental pollution charges;**

Environmental pollution charges are defined by the Decree on Types of Pollution, Criteria for Calculating of Charges for Environmental Pollution and Payers, Amount and Way of Calculating and Collecting of Charges⁴ and Rulebook on Determining of Harmonized Amounts for Environmental Pollution Charges⁵. They are calculated by the produced ton of contaminating compounds (ie. SO₂, NO₂, industrial waste, plastic

bags) and by the type and volume of vehicles with internal combustion engines (every vehicle owner pays the charge annually).

- **charges for the use of fishing areas⁶**

Users (management bodies) of fishing areas are charged 15% of the amount collected for issuing of licenses for professional fishermen and 10% of that amount for sport fishermen.

Part of the revenues from the enforcement of provisions of the Law on Waters (charges for water protection) are also used by the Fund (for more details see next chapter).

According to the Fund's report, the total revenue was nearly 4.8 billion RSD (ca. 48 million EUR) in 2010, and 4.2 billion RSD (ca. 42 million EUR) in 2011. The table below shows the revenue structure:

⁴ Official Gazette of the Republic of Serbia no. 113/2005, 06/2007.

⁵ Official Gazette of the Republic of Serbia no. 7/2011.

⁶ Implemented by Law on Protection and Sustainable Use of Fish Fund (Official Gazette of the Republic of Serbia no. 36/2009).

| Source | Amount in RSD | Percent of the total amount |
|---|------------------|-----------------------------|
| Charges for the use and trade with wild fauna and flora | 72,421,465.45 | 1.51 |
| Charges for motor vehicles | 809,516,074.43 | 16.89 |
| Charges for substances that are detriment to the ozone layer | 4,570,299.90 | 0.09 |
| Charges for SO ₂ , NO ₂ emission and industrial waste | 2,541,947,230.26 | 53.04 |
| Charges for special treatment waste | 1,334,484,362.31 | 27.85 |
| Charges for use of fishing areas | 29,265,264.95 | 0.61 |
| TOTAL | 4,792,204,697.30 | 100 |

Table 1. Revenues of the Fund for Environmental Protection in 2011.
(source: Serbian Fund for Environmental Protection)

In addition to these charges, the Fund can tap into the following financial sources:

- revenue obtained in privatization processes;
- international bilateral and multilateral cooperation programmes and projects;
- self-generated income from the management of liquid money assets;
- donations, grants and other sources in compliance with the Law.

The environmental protection activities that can be financed by the Fund are listed in Article 93 of the Law on Environmental Protection. This long, wide-ranging list includes:

- protection, preservation and

improvement of the quality of air, water, soil and forests, mitigation of climate changes and ozone layer protection;

- rehabilitation of waste landfills, encouragement of reduction of waste creation, recycling and waste re-use;
- incentives for cleaner production and early adaptations to environmental needs;
- technology and products that could reduce the burden to and pollution of the environment;
- biodiversity and geodiversity protection and preservation;
- incentives for sustainable use of protected natural areas;
- improvement of existing and

building of new infrastructure for environmental protection;

- incentives for use of renewable energy sources and increased energy efficiency;
- incentives for cleaner transport;
- incentives for sustainable development;
- development of the system of information about the environmental state, monitoring and evaluation of the environmental state, as well as introduction of a system of environmental management;
- preventive and intervention measures in emergency environmental pollution, including restoration and remediation;
- projects and programs for geological research;
- incentives for ecological education and raising awareness of environmental problems and sustainable development;
- co-financing the obligations of the Republic in relation to subsidiary measures.

Fund assets are allocated according to programmes. The mid-term programme is voted by the entire Cabinet. The annual programme is approved by the Ministry of the Environment.

The mid-term programme for the period 2010-2012 lists only 6

priorities for financing. They are:

- activities related to waste management;
- cleaner production, reduction of emissions (pollution);
- protection and improvement of the quality of air, water, soil and forests;
- improvement of protected area management (sustainable development incentives);
- renewable energy sources and energy efficiency;
- educational, research and development incentives in environmental protection.

The annual program for 2011 defines 14 priority fields, of which 5 are related to waste management, 1 to water, air and soil protection each, 1 to nature conservation, 1 to renewable energy sources, 1 to cleaner production, 2 to education and 1 to other activities defined by law.

Among completed projects, the largest investments are in waste management, emission reduction, waste water treatment and other structural measures for pollution reduction and remediation. Nature conservations claims a small portion, amounting to 1 to 2% of the Fund's total annual investment. The trend mirrors the revenue generation pattern: charges for emissions and waste contribute to the fund's budget considerably more than other charges. Charges for the use and trade of flora

and fauna contribute around 2% of total revenue.

The activity of the Fund for Environmental Protection has some elements of a PES scheme because it is partly based on the “user pays” principle. However, it lacks some important aspects to be considered as a comprehensive mechanism that ensures financial support for conservation of ecological services. Those aspects are:

- ecological services are neither explicitly mentioned nor defined;
- the Fund’s objectives do cover

some provisioning service but regulating and supporting services are neglected, ie. ecosystems also contribute to pollution reduction but that is not reflected in the allocation of financial resources;

- users are not well informed about what they pay for and what ecosystem services they actually use;
- there are no clear regulations on using the income generated, i.e. no specific conservation measures (or programmes);
- no clear provisions on monitoring the effect of conservation measures applied are in place.

FUND FOR WATERS

Two ministries share the responsibility of water management in Serbia: the Ministry of the Environment, Mining and Spatial Planning (MEMSP) and the Ministry of Trade, Agriculture, Water Management and Forestry (MTAWMF). In general, MEMSP is responsible for water pollution issues, while MTAWMF is responsible

for water use, flood prevention and for other technical aspects of water management. Certain responsibilities are shared at the provincial or local level.

The graph on the next page shows how the water management sector is financed.

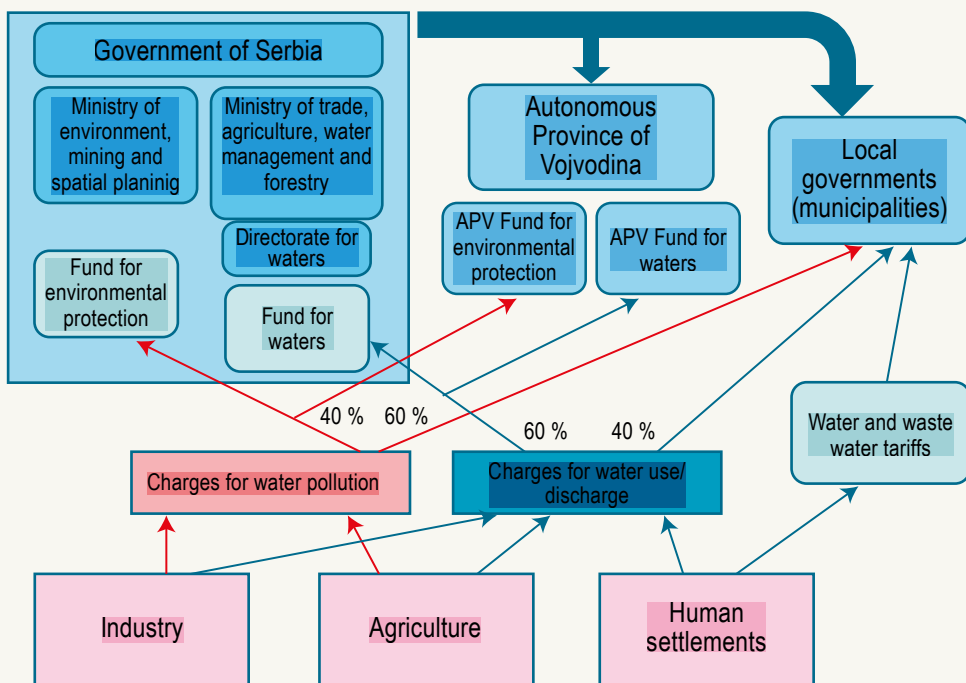


Figure 2. System of charges in the water management sector in Serbia (based on Law on Waters and Law on Environment).

Unlike the Fund for Environmental Protection, the Fund for Water is not an institution, but a separate budget item in the national budget. It was established in 2010 by the Law on Waters⁷. Six types of charges go into the Fund for Water. They are:

- charge for use of water resource;
- charge for water discharge;
- charge for pollution of water;

- charge for drainage;
- charge for use of public water facilities and systems;
- charge for basin water management.

The first three charges are fees for economic instruments related to water protection; the remaining three are water management charges.

⁷ Official Gazette of the Republic of Serbia no. 30/2010.

Charge for use of water resources

This charge is paid for:

- drinking water supply (per m³);
- bottling of water (per m³);
- use of thermal waters (per m³);
- irrigation (per m³ or per ha);
- fisheries (per m³ or per ha);
- energy production in hydro power plants (per kWh);
- other production facilities (per kW);
- use of river sediments (per m³ of extracted sediment);
- use of “water land”⁸ for commercial purposes (per m² or type of activities);
- locating a temporary floating object for commercial purposes (per m² of

an object);

- mooring and placement of floating objects (per m² of an object).

Clearly, many of the activities mentioned above rely on ecosystem services (drinking water supply, fisheries) but no clear link between this financial mechanism and ecosystem services has been established in the Law. According to the Law, revenues from charges for use of water resources are used to finance the management of water courses; management of and protection from the detrimental impacts of water (floods); water use and management; and building, maintenance and management of hydro systems.

Charge for water discharge

This charge is paid for discharging of waste waters in water courses, channels, lakes, accumulations or in canalization systems, and it is calculated per m³ of discharged water. In addition, this charge is paid for water discharged from cooling systems in thermal power plants. In this case, the fee is calculated per kWh of produced energy.

In the context of PES, it is important to note that the fee for water discharge is higher in protected domains that have specific importance for water protection. These protected domains are defined by the Law on Waters and are not to be confused with protected areas established by the Law on Nature Protection.

⁸ any land that is permanently or periodically covered by water (Law on Waters).

Charge for water pollution

This charge is similar to the one for water discharge, but focuses more on the level and type of pollution than on volume of discharged water. It is calculated based on the type, quantity and characteristic of emitted pollution. In the case of dispersed polluters (fertilizers, pesticides) and detergents with phosphates, it is calculated per kg of a polluting substance. This charge is higher in

protected domains as well, and if polluters implement measures for purification, the fee is decreased. Every owner of floating objects pays this charge as well.

Charges for water pollution are directed to the Fund for Environmental Protection and their allocation is under the jurisdiction of the Ministry of Environment.

Charge for drainage

Every owner or user of land, infrastructure, road infrastructure or public land has to pay this charge, unless a drainage system for atmospheric waters is in place. The charge is calculated per area of agricultural land, construction land, living facilities and/or structural facilities, etc. Users who create their own drainage system, may pay up to 50 % less, as specified by the

Law on Waters. Revenues are used for construction, maintenance and management of drainage systems. Because drainage activities can cause great damage to natural ecosystems, it is very important to stimulate biodiversity-friendly **drainage systems and to develop adaptation measures to natural water regimes.**

Charge for use of public water facilities and systems

All users of public water facilities for water supply, for discharge of waste waters and for transport pay this charge. Unlike the charge for water use, this charge focuses entirely on the use of public water facilities and the discharge of waters

in those systems. Mostly it applies to industrial facilities, fisheries and irrigation systems. Revenues are used for construction, maintenance and management of drainage systems and regional and multi-purpose water reservoirs.

Charge for water basin management

Similarly to the charge for drainage, this charge is used for water course management and for flood protection. However, the water basin charge is restricted to parts of catchment areas without drainage systems. The two charges are mutually exclusive: users who pay one are exempt from paying the other. In the context of PES schemes, it is noteworthy that managers of protected areas don't have to pay this charge (Law on Waters, Article 181).

Revenues are used for water management in particular catchment areas and for drainage systems. **Many such areas are natural floodplains and these revenues could be used for their restoration and management.** Floods rank among the top disaster risks in Serbia. In past decades, floods have caused the greatest economic damage and resulted in the largest number of victims of all natural disasters. At the same time, the natural disaster insurance system is not well developed, and few individual households choose to benefit from it.

Since the Fund for Waters is just a budget item in the national budget, detailed reports on the amount collected from water charges are not available. However, revenues can be estimated by looking at the financial plans for water management activities. Revenues from the water management charges (the last three on the list) are used according to annual programs developed by the ministry responsible for water management⁹ and adopted by the Government with a decree. According to the Decree on the Establishment of the Program for Water Management in 2011¹⁰, the planned spending for water management activities was 6,01 billion RSD (ca. 60.1 million EUR). **A significant portion of this budget, however, is used for funding projects that are counterproductive to the maintenance of ecosystem services (eg. dams, drainage systems).** The table on the next page shows the allocation of the Fund for Waters budget.

⁹ currently Ministry of Trade, Agriculture, Water Management and Forestry.

¹⁰ Official Gazette of the Republic of Serbia no. 20/2011.

| Activity | Planned amount / in RSD | % of the total amount |
|--|----------------------------|--------------------------|
| Construction and maintenance of multifunctional dams and accumulations | 1,130,000,000 | 18.53 |
| Use and management of waters | 1,300,000,000 | 21.32 |
| Protection of waters from pollution | 650,000,000 | 10.66 |
| Management of water courses and flood protection | 2,008,287,732 | 32.93 |
| Studies, plans, projects | 830,000,000 | 13.61 |
| International cooperation | 180,000,000 | 2.95 |
| TOTAL | 6,098,287,732 | 100 |

Table 2. Financial plan for water management activities for 2011.

FUND FOR FORESTS

The Fund for Forests is a separate budget item in the national budget, just like the Fund for Waters. It was established in 2010 by the Law on Forests¹¹. The Fund's primary objective, as stated by the Law, is to finance the following activities:

- growth of forest coverage by reforestation;
- improvement of the state of coniferous plantations;
- conversion of coppice forests to high forests;

- production of reproductive material (seed and seedlings).

The Fund's assets come from the following sources:

- fee for forest and forestland use;
- fee for protection, use and improvement of forest services of public interest;
- other sources (national budget, rural development funds, donations, etc.).

¹¹ Official Gazette of the Republic of Serbia no. 30/2011.

Fee for forest and forestland use

Every owner or user of forest pays this fee. The fee is a percentage of the total income from forest management. Forest users (public enterprises that manage public forests) pay 3% of their total annual income, while forest owners pay 5%. Revenues collected

from the territory of the Autonomous Province of Vojvodina are directed to the Provincial Fund for Forests. In addition, 30% of all collected fees are directed to local governments (municipalities).

Fee for protection, use and improvement of forest functions of public interest

Any legal entity in Serbia, except for public enterprises established for forest and national park management, has to pay this fee equal to 0,025% of the entity's gross annual income.

Again, because the Fund for Forests is an item within the national budget, no data about the fund's annual revenues are available. There is no efficient payment enforcement system in place, especially when it comes to the fee for protection, use and improvement of forest functions of public interest.

Currently, it is not known how many public entities actually pay this fee.

Two programmes govern the distribution of the fund's assets: the Programme on Forestry Development and an annual programme for use of the fund's assets. The 2012 annual programme projects spending 1.5 billion RSD (ca. 15 million EUR) of the Funds resources. The table below shows the allocation of these resources.

| Source | Amount in RSD | Percent of the total amount |
|--|----------------------|-----------------------------|
| Protection of forests | 42,200,000 | 2.81 |
| Reforestation | 379,500,000 | 25.30 |
| Forest management | 95,000,000 | 6.33 |
| Construction of forest roads | 277,900,000 | 18.53 |
| Production of seed | 5,652,000 | 0.38 |
| Production of seedlings | 50,000,000 | 3.33 |
| Scientific research in forestry | 30,000,000 | 2.00 |
| National inventory of private forests | 367,818,744 | 24.52 |
| Development of forest management plans for private forests | 3,544,306 | 0.24 |
| Education | 15,000,000 | 1.00 |
| Development plans for forest regions | 30,000,000 | 2.00 |
| Other plans and projects in line with Strategy on forestry development | 12,000,000 | 0.80 |
| Dues from 2011 | 191,384,950 | 12.76 |
| TOTAL | 1,500,000,000 | 100 |

Table 3. Financial plan for activities funded by the Fund for Forests in 2012.

At first glance, the financial plan allocates a significant sum to conservation measures, such as protection, reforestation and management. However, the detailed description of these activities shows that they are primarily technical measures for improvement of forest production. For example, the sum allocated for forest protection is to be spent on fire prevention facilities and disease protection. Similarly, forest management activities mean mostly management of young

forests (clearing of undergrowth) for improvement of timber production.

Although significant funds are allocated for reforestation, that is not necessarily a biodiversity-friendly activity. Sometimes, valuable and biodiversity rich non-forest areas are being forested for economic reasons (extension of forest areas used for intensive timber use).

The Law on Forests (article 77)

mandates funding for forest renewal and reproduction. The law requires forest users and owners to invest at least 15 % of their annual income from forest products into forest management. Management activities are defined in the Forest Management Plan developed every 10 years.

Article 90 of the same law requires forest users and owners to assess the forest value in their forest management plans. The law defines forest value as the value of timber, land, non-timber forest products and forest functions of public interest. This article actually provides basic steps for the development of PES schemes in forestry, and it is very important that it also recognise forest functions (services) of public interest. However, there are no by-laws regarding this issue, and the lack of experience and capacities for integrated valuing of forests has stalled progress on this front.

Almost half (48,6%) of the forests in

Serbia are privately owned. Generally, that is a good opportunity for the development of PES schemes. There is a dearth of knowledge about the exact state of privately owned forests, but an educated guess would qualify it as unfavorable. For a variety of reasons, including small holds, insufficient knowledge and technical capacities, and lack of finances, private owners have used the forests in an unsustainable way, focusing on exploitation and neglecting to invest enough resources in management and regeneration. The improvement of the state of private forests in Serbia is one of the objectives defined in the Strategy for Forestry Development in the Republic of Serbia. The first strategic step would be to collect current and accurate data about forest ownership and to analyze their current state. Expert and financial support is to follow. The strategic plan also proposes to support the associations of private owners and foster the aggregation of small holds.

CHARGES FOR USE OF PROTECTED AREAS

Article 70 of the Law on Nature Protection allows protected area managers to collect fees for different types of use of the protected areas they manage. They can set and collect fees for the following activities:

- activities in the area of tourism, catering, trade, services, craftsmanship, industry, mining, energy, water management, civil engineering, transport, telecommunication, use of wild flora and fauna;
- holiday houses and other non-commercial facilities for rest in nature;
- motor vehicles in use in the protected area;
- tourist, recreational, sports and other activities, advertisements, commercial film, photo and audio recordings;
- use of services, regulated fields, facilities and other property of the manager and of the name and logo of the protected area;
- visit to the protected area, parts and facilities thereof.

Criteria for price setting are as follows:

- degree of use of the protected area;

- degree of damages made to the protected area;
- degree of increased Manager's obligations in maintenance of tidiness and cleanliness, guarding and other activities related to conservation, improvement, presentation and development of the protected area;
- advantages and uses provided by the protected area for performance of allowed business and activities.

All legal or private entities using a protected area in any of the above-mentioned ways have to pay these charges. The protected area manager may reduce or waive the fee for persons who permanently live in the area, disabled persons and persons with special needs, retired persons, users whose activities increase the value of protected area, as well as for persons who have suffered damage or loss from natural disasters.

The charges are set by the Decree of Closer Criteria, Manner of Calculation and Collection of Fees¹² as well as by protected area management decisions. The table to the right shows an example of the set tariffs, in this case for the Kopaonik national Park.

¹² Official Gazette of the Republic of Serbia no.43/10

| Service | RSD per year |
|--|---|
| Tourism agency (incl. hunting, extreme sports, etc.) | 10,000 |
| Hotels | 1,200 per bed |
| Hostels | 770 per bed |
| Mountain houses | 430 per bed |
| Camps | 10 per m ² |
| Restaurants, buffets | 1,000 per m ² |
| Shops | 750 per m ² |
| Mills | 100,000 |
| Mining | 200 per m ³ |
| Exploitation of river sediments | 100 per m ³ |
| Bottled water production | 1 per l of bottled water |
| Fishponds | trout - 40 per m ² carp - 1000 m ² |
| Accumulations for hydro power | 3,600 per ha |
| Wind power | 150,000 per object |
| Transport of energy/ power lines | 30 per m ² of area under power line |
| Road transport | 50 per m of a road |
| Recreation houses | 120 per m ² |

Table 4. Charges collected for the use of Kopaonik National Park.

A fee collection mechanism is not in place in all protected areas. The management of large national and nature parks takes advantage of this revenue-collection opportunity, but the managers of smaller areas often lack the capacity to implement and enforce charges. Political influence is also a factor: the management bodies of national parks are government-sanctioned public enterprises and as such carry a lot of clout on the local level. The managers of other protected

areas have less influence and therefore find it difficult to develop and implement a system of charges that would be accepted and supported by other stakeholders in the region.

All in all, charges for the use of protected areas make a significant contribution to the annual budgets of Serbia's national parks, often higher than funding received from the national budget (see table on the next page).

| National park | Total annual budget (RSD) | Subsidies from the national budget | Collected charges |
|-------------------------------|----------------------------------|---|--------------------------|
| NP Tara (2011) | 305,000,000 | 14,700,000 (4.8%) | 15,500,000 (5.1%) |
| NP Kopaonik (2010) | 113,000,000 | 6,886,000 (6.1%) | 19,249,000 (17%) |
| NP Djerdap (planned for 2012) | 197,591,000 | 60,000,000 (30.4%) | 54,000,000 (27.3%) |

Table 5. Funding of national park management (Source: financial plans of the national parks).

Timber sales are the main source of financing for all national parks in Serbia. That is especially true in National Park Tara where forestry generates more than 60% of the annual budget. Therefore, charges collected for the use of protected areas in this park are a smaller portion of the park's budget. Djerdap and Kopaonik are less forestry-oriented and generate more income from charges. National Park Kopaonik is a prominent tourist destination and owes its higher income to fee-paying tourist industry entities. A hydro-power plant located in National Park Djerdap contributes a significant amount of charges to that park's budget.

Protected area managers are legally mandated to keep separate accounts for funds generated by these charges, and to use them for protection, development and improvement of the protected areas. However, a review of the management plans and financial reports of four national parks lent little information about how the money collected from charges for the use of protected areas were spent.

The table on the right shows the allocation of financial resources as specified in the 2012 Management Plan of National Park Djerdap.

| Activity | Planned amount in RSD | % to total annual budget |
|--|--------------------------|-----------------------------|
| Protection and maintenance (incl. ranger service, staff, developing of documents, cooperation with stakeholders, education, international cooperation) | 121,606,000 | 62.7 |
| Visitor management | 30,774,000 | 15.9 |
| Subsidies for landowners (damage made by wild animals) | 800,000 | 0.5 |
| Monitoring and improvement of the conservation status | 16,174,000 | 8.3 |
| Land use and infrastructure (forest management plans, roads, forest certification) | 22,318,000 | 11.5 |
| Other (information system) | 2,200,000 | 1.1 |
| Total | 193,872,000 | 100 |

Table 6. Allocation of funds for management activities in National Park Djerdap
(Source: 2012 Management Plan of National Park Djerdap).

All activities listed in Djerdap's management plan can be regarded as part of protection, development and improvement of the protected area, but obviously the largest portion of the annual budget is allocated to staff salaries and maintenance. A

closer look reveals a lack of planned activities aimed at improving the conservation status, such as habitat management, restoration, mowing, etc. Most of the planned activities are in the realm forest management and tourism infrastructure development.

TOURISM IN PROTECTED AREAS

The management of some protected areas in Serbia has recently developed tourism programmes that generate additional income. The value of tourism is widely recognized, yet only a few protected areas can boast functional tourism programmes. Among the leaders are the special nature reserves Zasavica and Uvac, Mokra Gora nature park and the natural monument Resavska Pećina (cave).

Tourism activities are best developed in Zasavica. The reserve includes Zasavica river with its flood plains. It is famous for the farming of traditional cattle breeds (Podolsko cow, Mangulica pig and Balkan donkey) and local products, such as sausage, cheese and milk. In addition to the traditional local products, the reserve's management has promoted other exclusive products, such as donkey's milk (ca. 40 euro per litre) and donkey milk cosmetics, sold also through the reserve's online store (<http://www.zasavica.org.rs/en/proizvodi/>). Zasavica's managers also organize visitor tours, boat rides and other outdoor activities.

The special nature reserve Uvac (<http://www.uvac.org.rs>), in south-western Serbia, has been established for the conservation of the colony of griffon vultures. Visitors can

enjoy walking and bike tours, sport fishing, canoeing and other activities. The management has fostered cooperation with tourist organizations in the region as well as with agencies working in nearby tourist centres. They have also improved the reserve's tourism infrastructure (visitor center, trails, boats) with the support of both national and international funds.

Nature park Mokra Gora (<http://www.parkprirodemokragora.org>) is an attractive tourist destination in western Serbia, close to the border with Bosnia and Herzegovina. Its main attraction is Drvengrad (literally, wooden city), which mainly consists of traditional wooden houses. Nature and biodiversity are not the top selling points for the existing tourist industry in the region. It relies on more conventional tourism, such as ski and conference tourism. There are plans for further development of the ski center and other facilities, such as sport fields and pools.

Resavska Pecina (<http://www.resavskapecina.rs>) is a cave system in eastern Serbia. The cave is 4.5 km long. The first 800m are accessible to tourists. Around 50 000 people visit the cave every year. The entrance fee is currently 300 RSD (ca. 2.6 EUR) for adults and 250 RSD (2.2 EUR) for children.

There is no specific data on the revenue generated from tourism in these protected areas. However, it is safe to assume that tourism is a significant source of income, especially for the protected areas that have invested in their tourism capacities. Unfortunately, there is no reliable system to monitor tourist activities and their compliance

with conservational objectives. As a consequence, tourism in those areas can easily cross the line of sustainable, eco-tourism and turn into conventional, intensive tourism. In addition, the use of money generated by tourism is not specifically defined, but most likely is poured back into the development and maintenance of tourism facilities.

GENERAL RECOMMENDATIONS FOR PES SCHEMES IN SERBIA

There are few financial schemes related to natural resources in Serbia. Currently, none of them fully complies with the concept of PES schemes, but most of them have the potential to be adapted into functional PES schemes. Most of these schemes have been in place for many years and are traditional financial mechanisms for the use of natural resources. They were instituted long before modern developments in environmental economy and before the rise of global initiatives on marketing of ecosystem services with the goal of more efficient ecosystem protection. These mechanisms don't internalize environmental costs and they are usually based on provisioning and administrative costs of natural resource use.

Some of the important characteristics of a PES schemes that are generally

absent in existing financial mechanisms in Serbia are:

- explicit internalization of environmental costs;
- transparent pricing system;
- clear indications of purpose of charges;
- control of use of generated income (it should be mainly used for improvement of the state of the ecosystems);
- monitoring the efficiency of financed conservational measures.

The development and adoption of completely new and specific legal instruments for PES schemes in Serbia is unlikely in the near future. Therefore, it would be more efficient, at least at first, to focus on the adaptation of existing instruments. Promoting the value of ecosystems

through existing mechanisms would enable more opportunities for further development of PES schemes.

The coffers of the Fund for Environmental Protection are filled mainly by charging polluters. However, some components that are directly based on payments for ecosystem services are in place, namely taxes for use of flora and fauna species (provisioning services). Funds generated from these charges make up 1 to 2% of the Fund's annual assets (ca. 500,0000 to 1,000,000 euro). Although that's a comparatively small share, these funds could be a significant source of funding for targeted conservation projects. Here are some steps necessary in order to establish a PES scheme using these funds:

- revenues from charges for the use of flora and fauna have to be, at least partly, allocated to financing projects/measures whose explicit objective is improving the conservation state of used species and their habitats;
- additional economic analysis is needed in order to set the percentage of the total revenues which are to be allocated annually to PES schemes;
- responsible institutions (Ministry of the Environment) have to define criteria for project/measures eligibility with a focus on improving the status of used species. Habitat management and conservation

measures should be a priority, though initially monitoring and research are a must, since current knowledge of the population status of many used species is poor;

- a system of control and effectiveness monitoring has to be established. Any activity financed from these funds has to be proven as efficient in the sense of improving conservational status (increased number of individuals, enlarged distribution, enlarged or improved habitat, suppressed pressures, etc.).

Currently, most of the Fund's assets are invested in technical measures for pollution reduction and especially for water purification systems. The importance of natural ecosystems for water purification is not recognized, and there are no financial mechanisms for funding the conservation of such ecosystems. Investing at least part of the revenues from charges for water pollution and water discharge in conservational measures and improvement of ecosystem purification capacities would make a lot of sense.

Determining what portion of these revenues should go to conservation systems requires additional analyses: an assessment and evaluation of the purification capacities of different ecosystems as well as an economic assessment of the contribution of ecosystems to water purification. Admittedly, it is unlikely that the fund would cover the total cost

of ecosystem services for water purification. Still, the analysis would show the importance of these services and would justify the allocation of at least some of the revenues for these purposes.

Identifying specific areas that are of importance to natural purification, or at least criteria for their selection, is a must. Those areas should be the primary targets for conservation measures financed by the fund. Criteria for the effectiveness of implemented projects and measures should be in place as well. Targeting areas that are important for water protection and are already defined by the Law on Water is a good starting point. So are existing protected areas that include water habitats, especially those that provide drinking water.

The Fund for Water also generates significant revenues that could be used for conservation. One opportunity for a PES scheme is the fee for water basin management, which includes flood protection. The fund's main objective is to finance flood protection facilities, such as dykes, retentions, dams, etc. Yet some natural flood areas also play an important role in reducing flood risks due to their ability to accumulate and store large amounts of water. Some flood areas are designated protected areas by the Law on Nature Protection, however, the current policy does not acknowledge their contribution to flood prevention and their conservation is not funded

by revenues generated by the charge for water-basin management.

The following actions would help the development of a PES scheme for natural flood areas:

- assessment and evaluation of natural flood areas' contribution to flood prevention (comparison to the known costs of technical measures);
- identification of the most important sites for flood prevention;
- conducting an economic analysis in order to set the percentage of revenues generated by charges for water basin management to be used for conservation of these areas;
- using allocated financial resources to fund projects that aim to conserve wetland habitats and to improve or restore their natural water regime.

Charges for water use are direct payments for an ecosystem service. It is worth exploring whether PES schemes could be established in cooperation with bottled water producers, which are obliged to pay these charges for every litre of water they bottle. On the national level, there are no specific mechanisms for supporting producers in financing conservational measures. However, some producers have self-initiated conservation activities as part of their corporate responsibility programmes. For example, the Coca-Cola Company funded the restoration of natural wetlands in SRP Gornje Podunavlje.

One possibility would be to establish a subsidy mechanism for water users who finance conservational measures (i.e. low intensive forestry use in water catchments, restoration of wetland habitats, subsidies for farmers to reduce use of fertilizers and pesticides in catchment areas). Such measures are likely to decrease production costs and/or improve water quality, and, therefore, they should be of interest for bottled water producers. However, whether it is feasible to use money from the Fund for Waters to develop public-private partnerships must be subject to additional analysis.

The Fund for Forests has some potential for developing PES schemes as well. For example, payments for less intensive use or non-use of their forests are likely to be a very attractive option for some forest owners. Since forest owners are lacking the capacity for efficient forest management, it could be more profitable for them to set-aside or to implement certain conservation measures (e.g. extensive timber extraction, reforestation, leaving of old/dead trees, conversion of coppice forests). Since this is compatible with objectives set in the Strategy of Forest Development, it seems relatively feasible to allocate financial resources to these purposes from the Fund for Forests. Currently, a quarter of the fund's annual budget is spent for inventory of private

forests. Of course, specific criteria and a control system for the establishment of PES schemes should be in place, just like for the other funds discussed so far.

Serbia is a non-annex I country under the Kyoto Protocol, and therefore, it cannot use the mechanism for joint implementation, which has import on forest conservation. In 2012, Serbia established a Designated National Authority (DNA) for Clean Development Mechanism (CDM). There are four CDM projects in the works so far: three wind farms and one for the reduction of methane leakages in the gas distribution networks operated by JP Serbiagas¹³. Still, it is important to assess the value of forest services and explore possibilities for using the Kyoto flexible mechanisms for PES purposes.

Charges for the use of protected areas seem very suitable for developing PES schemes. Unfortunately, like in the rest of the mechanisms described so far, there are neither clear rules for the allocation of revenue generated from these charges, nor a reliable way to monitor the effectiveness of implemented measures. Lack of transparency marks the entire process of charge collection and re-distribution. Here are some general recommendations for improving these financial mechanisms:

¹³ Source: <http://cdm.unfccc.int>

- establish and promote charges for the use of protected area on the national level, so that all protected managers can benefit from these opportunities;
- establish a transparent pricing system (in agreement with users) with reference to estimated environmental costs;
- account for these charges separately from the rest of the budget and use the revenues for conservational measures only, as mandated by law;
- avoid using the revenues from these charges to finance general management costs;
- focus on the conservation of habitats and species, including proactive measures, such as restoration, reintroduction, repopulation, etc.
- include project/measures slated for financing in the area's management plan;

- measure the effectiveness of all financed activities (with defined indicators);
- present regularly activity results to users (payers).

Tourism is the most important source of financing for conservational efforts in protected areas. Unfortunately, it is underdeveloped in most protected areas in Serbia. Furthermore, in the handful of areas where tourism flourishes, environmental costs are not always internalized. In some areas tourism activities tend to become intense and incompatible with conservational objectives. Often income generated from tourism is reinvested in tourism. There must be national standards for sustainable tourism in protected areas, and these standards should explicitly link revenues generated by tourism to funding conservational efforts in protected areas.

POTENTIAL CASE STUDIES FOR PES SCHEMES IN SERBIA

Fishpond Mala Vrbica (city of Kladovo, eastern Serbia)

The Mala Vrbica fishpond is located next to the Danube river, a couple of kilometers downstream from the Iron Gate gorge. It was built in the 1970s to compensate for the fallout from building a dam on the Danube and cutting the migration routes of sturgeons. The pond was a site for

captive reproduction of sturgeons prior to their reintroduction to the Danube. Sturgeon reproduction in the pond ceased in the early 2000s, and shortly after, the pond was abandoned completely. Currently, the fishpond is state-owned and unmanaged. There isn't even control of access.



Figure 2. Location of the fishpond “Mala Vrbica”.

The fishpond is a breeding place for wetland birds, such as the pigmy cormorant, the little egret, the squacco heron, the garganey, the ferruginous duck and others, and became an Important Bird Area (IBA) in 1999. The area is also interesting because of sandy habitats and rare plant species.

Mala Vrbica was listed as a preliminary special protected area (SPA) site, and an initiative for its designation as a protected area was launched in 2012. Illegal hunting and fishing present the greatest threat to the ecosystem, as do eutrophication and natural succession.

The Electric Power Industry of Serbia, which created the fishpond in the first place, shows no interest in investing in

its development. The Municipality of Kladovo is interested in reestablishing fish production, but there are no potential investors so far.

In any case, Mala Vrbica is suitable for the implementation of a PES scheme. Eco tourism could be a main source of funding. The fishpond is easily accessible from the nearby city of Kladovo, which is one of the stops for Danube cruise ships. Birdwatching opportunities could be the foundation of developing tourism in the fishpond area. Necessary investments include the construction of watching tower and hides (2-3), production of printed materials, installation of information signs on site, purchasing of optical equipment (binoculars & scopes), and training of guides.

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Mala Vrbica fishpond

Revenues from tourism should cover basic site management needs, such as guarding, monitoring and communication with stakeholders, possibly with additional support from the municipality.

The fishpond is valuable not only because of its biodiversity, but also because it could aid flood protection with retention. It's worth exploring whether a portion of charges collected from water basin management could be allocated to the fishpond's habitat management (for example, for the removal of mud and vegetation).

If the pond becomes a fish

production site once again, then the investor should be obliged by contract to implement conservation measures, such as bird-friendly management, especially when it comes to vegetation). In addition, **fish production should be restricted to species that are native to the Danube**. In this case, a portion of the revenues from tourism and, possibly, from charges for water management should go to investor subsidies.

Establishing permanent monitoring of birds in the fishpond is a must. Such monitoring would enable measuring the effectiveness of conservation activities.

Restoration of natural habitats in/around commercial forest plantations in the Danube floodplains

The Danube floodplains are very suitable for plantations of commercial forest species. Large natural areas have been cultivated and used for these purposes. Commercial forest plantations are a very profitable business, and the forest sector largely depends on them. At the same time, they are characterized by a homogenous habitat pattern, low biodiversity and short life cycle (clear-cut every 20 to 30 years), which prevents the establishment of stable

and rich biological communities.

There are some activities that could mitigate the negative impact of commercial forest plantations, such as the creation or restoration of natural habitats along the edges of the plantations and the restoration of wetland habitat patches inside the plantations. Restoration efforts should focus on willow and white poplar riparian forests, natural eutrophic lakes, wet meadows and reed beds.



The Danube floodplains by Belgrade

Many forest managers have already implemented such measures in compliance with the rules set in forest certification contracts (FSC). However, these efforts must be supported by other funds as well, in order to increase their positive impact on conservation. Possible sources of financing include the Fund for Forests, the Fund for Environmental Protection and the Fund for Water (to be used for water-basin management since these forests are usually in the flooding areas).

There are some other activities worth considering. One example is the development of CDM projects aimed

at the restoration of natural forest ecosystems. In addition, since these areas are important water reservoirs, **water supplying companies, agriculture companies and farmers can potentially be involved in financing schemes through public-private partnerships. Last but not least, comes the development of eco-tourism sites within the floodplains.**

The Danube floodplain by Belgrade is one area well suited for the implementation of these measures. Spreading over approximately 2,000 ha, the area has great potential for

timber production. It is an IBA, and protected area designation is underway since 2011. It is important for many bird species, including the white-tailed eagle and the pigmy cormorant. The area's proximity to Serbia's capital make it a good

candidate for the development of eco-tourism as well.

Revenues must be used to finance habitat restoration and the monitoring of the effectiveness of implemented measures.

Feeding places for birds of prey/ removal of animal waste

Many scavenging animals, especially vultures, have lost their feeding base due to the steady decline of traditional open-space cattle breeding. Their population in Serbia decreased significantly in the last decades of 20th century.

Establishing feeding places (sites for disposal of meat industry waste) is one possible way to counteract this trend. Large carnivores also use these feeding places (in addition to vultures and other birds of prey, mainly eagles), which reduces the conflict with cattle breeders. Feeding

places are also great sites for wildlife watching, and are therefore suitable for the development of eco-tourism.

Right now, the largest feeding stations, where hundreds of tons of waste are disposed, are not close to the Danube. They are located in mountainous regions in south-western and western Serbia. Nevertheless, smaller feeding stations do exist along the Danube, namely in Special Nature Reserve Gornje Podunavlje and Deliblatska pescara and National Park Djerdap.



Feeding station for birds of prey in SRP Gornje Podunavlje

Currently, meat producers do not pay charges for waste disposal at these stations. In light of improved food industry and waste disposal control, however, producers are likely to prefer paying less for waste disposal at feeding places compared to what they pay for conventional ways of disposal. Because waste disposal capacities are

limited this mechanism could not generate high income. Still, some of the cost of waste transport and feeding place maintenance could be covered. In addition, this is a very explicit PES scheme, and as such it could be used to promote the concept on a national level.

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