Payments for ecosystem services

A case study in urban forests of Celje (Slovenia)

by Robert HOSTNIK

Mediterranean forest ecosystems provide multiple goods and services, and are key to the socio-economic development of rural zones and to the well-being of populations. The Med project SylvaMED intends to facilitate innovative integration of forests environmental services into regional policies. The payments for ecosystem services are one ot the tools for both economical and sustainable management of rural areas, as shown in the case study of urban forests in Celje in Slovenia.

Introduction

The article deals with the development of the policy, perception and management of the urban forests in Celje, the third largest city in Slovenia. Although the country has a high share of forests and comparatively a low level of urbanization, the urban forests are the forests with the most emphasized social functions. During the last two decades the concept of the urban forest governance based on close co-operation between the local unit of the Slovenia Forest Service and the municipality of Celje has evolved. Its results are manifested in the new recreational infrastructure, new areas of public urban forests, long-term oriented and prompt forest management for reasonable costs and established monitoring system. The activities were mainly focused on urban forests on the city's southern fringe.

In recent years the urban development and demands towards forests have increased. The northern urban forest area around the Šmartinsko Lake has become especially attractive for recreation. Due to predominant private ownership in the area and regardless to the Forest Act, which provides a free access to all the forests, conflicts between different forest users and private owners are becoming more prevalent.

Background

The social functions of the forests near the city of Celje were recognized to a large extent more than a century ago. From 1885 to 1892 the municipality bought first 29 hectares of private forests on the slope above the city park and equipped them with new footpaths, benches, pavilions, and a sightseeing tower. At the beginning of the 1990s, local foresters began to survey the current state of the urban forests of Celje and the development of social forest functions in the urban forests. The results of the study, along with the emerging conflicts between private and public interests emphasized the need for a long-term orientated multi-objective forest management.

The City Council accepted the initiative of the local Forest Service unit and commissioned the preparation of a strategy plan for the urban forests of Celje that emphasized the protection of urban forests by law, the improvement of the recreational and other social benefits of the forests, and the assurance of stable financial resources for their management (HOSTNIK, 2005; 2011). Since then, the municipality has been constantly buying up private forests and implementing management measures that promote recreational use (e.g. establishing a new recreational infrastructure). The number of urban forest visitors has tripled in the last fifteen years. The existing governance covers the coordination between the Forest Service, the municipality and the local contractors as the main actors of the urban forest management as well as the users' participation and private forest owners as the most important stakeholders.

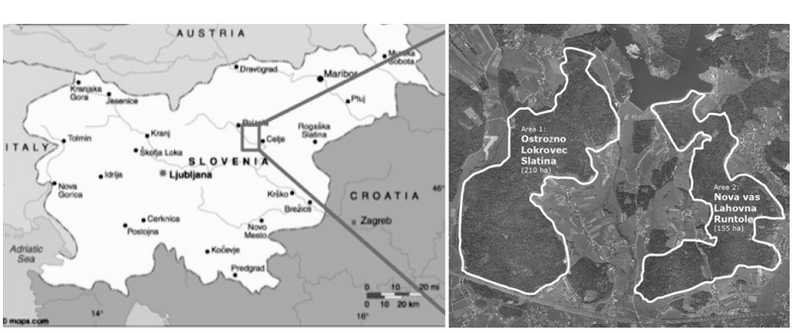

Figure 1: Location of the pilot project in the urban forests of the northern part of the city of Celje, Slovenia.

Development of payments for ecosystem services (PES) instrument on a pilot project in urban forests

In the following years, the urban development and demands towards forests increased, and a broader area around the city became popular for the urban population. The northern peri-urban area around Smartinsko Lake became especially attractive to recreationalists and tourists; investments were made in the recreational infrastructure around the lake (1.4 million euros in the period of 2007-2011), making the area more attractive and bringing in many daily recreationalists and weekend crowds from the city. Due to the private ownership in the area, conflicts among different forest users were becoming more prevalent. For this reason, the Forest Service decided to investigate the options for directing the increased recreational use in order to protect other areas from inappropriate use.

Main objectives of the pilot project

– To examine the willingness of private forest owners to allow for the preparation of a recreational infrastructure on their property in exchange for a certain amount of payment by the municipality;

– To establish a system of PES that would prevent conflicts over land use among public and private owners;

– To support recreational use and provide opportunities for additional economic income from private forests;

– To inform forest policy decision makers on the idea of PES and stimulate them by raising awareness of the multiple use.

Research area survey

Two pilot areas were selected in the urban forests of Celje: the Lokrovec area (210 ha) and the Lahovna area (155 ha). They are characterized by highly fragmented private forest property with an average forest ownership area of 1.72 ha.

Several criteria were used to estimate the suitability of forests for recreational use. Stand characteristics were analyzed using

the data of the forest inventory (the composition of the natural tree species, the structure of forest development phases, and the intensity of the forest management in recent decades). The presence of infrastructure was analyzed using field monitoring and GPS recording. The forest traffic infrastructure was classified into four types based on width, building mode, and current use (Table 1).

Designation of the new potential recreational infrastructure

Two types of recreational infrastructure were designed :

– a 1.2m wide path for walkers,

– a 1 – 1.5m wide path for bikers.

All together, 6.9 km of foot paths and 6.7 km of cycle trails were designated through 216 forest parcels in the hands of 145 forest owners. When selecting the areas for paths and trails, the following criteria were considered:

– the use of the existing infrastructure as much as possible;

– building new paths only for short distances when connecting the existing ones;

– inclusion of the most used but also most logical entrance points to the forests;

– inclusion of interesting forest stand structures from an aesthetic point of view (interesting tree species, trees of a special habitus, large diameter trees, small meadows inside the forest, water ecosystems, etc.);

– avoidance of a large number of forest owners.

The attitude towards visitors and economic expectations of private forest owners

The economic expectations of private urban forest owners were examined through detailed personal interviews with 112 forest owners in the area of four previously designated potential footpaths and mountain bike trails with a total length of 13,6 km. The questionnaire was prepared using the methods of the economic evaluation of ecosystem services (WUNDER, 2005; WUNDER and WERTZ-KANOUNNIKOFF, 2009) and was structured into four main chapters:

– the socio-economic characteristics of the forest owners;

– the general perception of forest values;

– the relationship to their own forest and visitors;

– the willingness to accept the PES scheme (the amount of compensation that would satisfy the owners for allowing a recreational infrastructure in their forest).

Results showed that more than half of the interviewed forest owners agree that wood production in urban forests is less important than in other forests. Forty-two per cent of them disagree with the statutory free access to the forests. Seventy per cent of the interviewed forest owners say that there are many visitors in their forests and 47% of the interviewed claim that they are doing damage.

The amount of payment that would satisfy the owners for allowing a recreational infrastructure in their forest was examined with the use of the contingent valuation method (CVM). By this type of PES each forest owner would receive a certain amount of payment to allow for the preparation of the recreational infrastructure (e.g. paths and trails). Results of contingent valuation showed that mean value of economic expectation of the private forest owners is 619 euros per kilometer of recreational paths/trails, per year. It means that the municipality would have to provide 6,400 euros per year to assure organised recreational use (marked and regularly maintained paths and entrance points) of 6.9 km of walking paths and 6.7 km of cycle trails.

The comparison with the instrument of buying up of privately owned urban forests shows, that the investment for the municipality to buy up private forests in the corridor of 50 meters along 13.6 km of designated paths and trails (68 hectares of forest area) would be close to 550,000 euros. This amount would cover the cost for PES for the next 65 years. The inquiry among forest owners also showed, that 80% of interviewed forest owners are not willing to sell their property to the municipality at this time.

Table 1:
Existing forest infrastructure in the suburban forest of the city of Celje.

Type of infrastructure	Width (m)	Length (m)	Density (m/ha)
Forest roads	3+	2.481	6.8
Skidding trails	2.1 – 3	23.882	65.4
Paths	1.1 – 2	39.934	109.4
Tracks	0.5 – 1	16.773	45.9
Total	/	**83.070**	**227.6**

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Conclusions

The proposed PES scheme can bridge the gap between public and private interests. It may assure sustainable recreational use of forests and bring extra income to forest owners. On the other side it might give an idea of excluding various uses (timber production vs. recreation) instead of combining them by directing the visitors and preventing conflicts. Increased demands for PES in other similar situations could cause conflicts with Forest Service and the municipalities, if there is no PES-generated funding to compensate for the measures

The Forest Service prepared the development proposal for the local municipality with the following key messages:

– Forests around the city of Celje are becoming increasingly important.

– Ignorance of the increased needs and demands of society can bring conflicts, especially in private forests.

– Private forest owners are aware of the problem and seriously concerned on the number of visitors and their negative influence on forest stands. But they are willing to cooperate to find a proper solution.

– Potential conflicts can be mitigated by appropriate multi-objective forest planning.

– PES systems can contribute to the increased implementation of management measures that promote the recreational use in private forests.

– PES-generated funds can bring income to the forest owners and benefits to the inhabitants of the city of Celje and therefore promote the sustainable development of the urban and rural part of the municipality.

– Buying up of privately owned urban forests is the best long-term solution, but it takes time and finances. The advantage of the PES used in the pilot action in comparison with the process of buying up the private properties is that it is faster to implement. In short term it needs less financial sources.

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Summary

The concept of the urban forest governance based on close co-operation between the local unit of the Slovenia Forest Service and the municipality of Celje, the third largest city in Slovenia, has evolved in the last two decades. Its results are manifested in the new recreational infrastructure, new areas of public urban forests, long-term oriented and prompt forest management for reasonable costs and established monitoring system.

In recent years the urban development and demands towards forests around Celje have increased. Due to the prevailing private ownership in the area, conflicts with different forest users were becoming more prevalent. The case study explores possibilities for directing the increased recreational use and examines the willingness of private forest owners to allow organized recreational use in exchange for a certain amount of payment for ecosystem service (PES) by the municipality.

The economic expectations of private urban forest owners were examined through detailed personal interviews with 112 forest owners in the area of four previously designated potential footpaths and mountain bike trails with a total length of 13.6 km. The article deals with specific economic expectations of forest owners and compares proposed PES scheme with another instrument for balancing of private and public instrument in urban forests.