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SUSTAINABLE AGRICULTURE AND RURAL DEVELOPMENT III

Thematic Proceedings



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PLACE OF NATURE-BASED TOURISM IN ECOSYSTEM SERVICES VALUATION IN RURAL LANDSCAPE

Milica Luković¹, Danijela Pantović²

Abstract

Ecosystem services (ES) are the subjects of number of studies in recent ten years. There were many attempts to value ecosystem services from ecological, social and economic aspects. The fact is there are limited numbers of studies focused on the place of tourism as a part of cultural ecosystem services in the frame of rural surrounding. The research includes perception of different interest groups (local inhabitants, stakeholders and students) on ES in selected rural areas. The aim of this paper is to identify the most important ES using priority ranking analysis and range of variance between researched groups. The results show that in local inhabitant's perception provisioning ES are still major driving force of rural economy. Cultural ES is finding its place in perception of stakeholders and students. In the range of cultural ES categories, nature-based tourism was recognized as one of important factors of development. The conclusion of the paper indicates the necessity of including cultural ES in the analysis and assesses the need to map places of exceptional cultural value. In addition, the need to use the ES framework for identifying the economic benefits of cultural and natural resources are emphasized.

Key words: *ecosystem services, rural landscape, nature-based tourism*

Introduction

Ecosystem services represent a range of goods and services from nature which has benefits for local people and communities. The EU 2020 Biodiversity Strategy besides comprehensive information referring to the status of biological diversity and ecosystems highlighted the necessity of establishing of capacity to monitor ecosystem services (Maes et al., 2013). A decade in the past efforts

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have been made to gather scientific information and practical knowledge for the best use, operation, decision policy and management of ecosystems and their services across Europe and wider. In that context, several systems of classification ecosystem services were made. The most used classification system proposed by Millennium Ecosystem Assessment (MEA, 2005) work and The Economics of Ecosystems and Biodiversity (TEEB, 2010) and recognizing for categories with sub-categories (1. Supporting ES; 2. Regulating ES; 3. Provisioning ES; 4. Cultural ES). According to Plieninger et al., 2013 knowledge and information on biodiversity and ecosystem services are crucial for the local economy, small biodiversity businesses, employment, and human well-being. There is a range of differences in ecosystem services perception and evaluation. Providing ES (e.g. food, water, fuel) are often the focus of the local community as direct benefits from nature with stronger linkages to human well-being than other ecosystem services categories, while supporting or regulating ES are not enough recognized out of the scientific field. A specific category of ecosystem services is cultural services that represent more nonmaterial than material benefits that could be obtained from nature and put into the function of well-being (Cheng et al., 2019). Cultural ecosystem services people realize through “spiritual enrichment, cognitive development, reflection, recreation and aesthetic experiences” (Hernández-Morcillo et al., 2013, p. 435; MEA, 2005).

Rural areas cover 70% of the total territory which gives a diversity of landscapes and ecosystem services. Assessment and evaluation of ecosystem services are essential for local sustainable development in the increasing trend of depopulation and degradation of nature (Fernández Martínez et al., 2020). Recent studies indicate a problem of poverty in rural areas and a lack of basic infrastructure, access to new technologies, education, and knowledge exchange to improve their economy. The natural advantage of rural areas lies in their natural capacity to use biodiversity at the level of genes (e.g. wild and autochthonous varieties), species (e.g. wild edible plants, mushrooms) and ecosystems (e.g. forest, meadows, rivers). The economy was not oriented to biodiversity business and ecosystem marketplace (Bishop et al., 2009). Ecosystem services could reduce rural poverty through the new biodiversity business models which include eco-friendly energy, authentic food, and a range of cultural services (e.g. recreation, landscape aesthetic, spiritual). Biodiversity business has added-value for rural entrepreneurship and employment. Nature-based tourism, among other conventional rural businesses, depends on ecosystem services (Luković and Kostić, 2022). The studies indicate that new bio prospecting compounds of biodiversity business are genes and wild species, and they are estimated to the worth US\$500 million

in the next 20 years (up to 2050). As well as, the recent report on ecotourism (e.g. sport, recreation, hunting and fishing) already follow a growing trend of expanding at a rate of about 30% per year compared to 9% for conventional tourism.

Despite attempts to valorize cultural ES, there is still a lack of empirical evidence regarding the value of cultural ES and promotion of its role in the green economy, investing base in natural assets, as well as economic, social and environmental benefits (Le Blanc, 2011). This study intends to apply a frequent citation report for assessing the ecosystem services that local people perceive as economically important or enjoy and to find out where the place of nature-based tourism is in their perception with a range of ecosystem services with the accent to cultural ones.

Material and methods

Study area

The study was performed in six villages/rural areas along the geographic gradient, respecting a range of altitudes (0-300m; 300-600m; 600-1500m). Researched sites located from Pannonian plane (Šumarak and Novo Miloševo), across hilly Sumadia (group of villages under the Rudnik mountain- Ramaća and Stargari) to western mountain villages in Serbia- Rudno on Radočelo and Deviči on Golija mountain (Figure 1). The researched sites include populated rural settlements.

Figure 1. *The map of researched sites*



Study design and method

Our study applied a combination of different ecosystem services categories/sub-categories according to Millennium assessment aims (MEA 2005), TEEB classification (TEEB, 2010) and Plieninger et al., 2013 for ecosystem services assessment through local settlements perception and knowledge. Extracted ecosystem services sub-categories include spiritual and religious values, sense of place, aesthetic values, social relationship, cultural heritage/diversity, recreation and ecotourism, walking, bird watching, herbal tours, gathering wild products, bicycling, hunting, knowledge systems and educational values. Semi-structured interviews were conducted with local community representatives with the frequency of mentioning each category without our suggestion. The total number of respondents was 67. As well as, a pre-test was performed, discussed, and refined with students in their final year of studies at the Faculty of hotel management and Tourism.

The relative Frequency of Citation (RFC) index represents the number how many times one sub-category is mentioned by respondents. This parameter was determined for each sub-category as the ratio of respondents who cited a sub-category to the total number of respondents.

$$RFC = \frac{FC}{N}$$

Mentioned ES sub-categories grouped into one of four main categories.

Results and discussion

The respondents included in the research had the opportunity to express subjective attitudes referring to important ecosystem services. The obtained results were gathered and classified into adequate categories. The results show that local respondents in general recognize, value and appreciate provisioning ES with an average RFC index 0.86 and cultural asset of services (0,71), while supporting ecological processes (RFC- 0.36) is not in the focus (Table 1).

Table 1. *Frequency of citation ecosystem services categories by local respondents*

Ecosystem services (ES)	RFC					
	S1	S2	S3	S4	S5	S6
Supporting ES (e.g. biogeochemical cycles, biodiversity, food chain)	0.36	0.29	0.10	0.05	0.12	0.17
Regulating ES (e.g. air/water regulating, pollination, climate regulating, erosion prevention)	0.41	0.51	0.37	0.30	0.61	0.63
Provisioning ES (e.g. food, water, fuel, biomass, medicinal resources)	0.82	0.87	0.79	0.81	0.91	0.94
Cultural ES (e.g. aesthetic and spiritual value, cultural and historical value, recreational value)	0.73	0.71	0.59	0.62	0.75	0.83

Source: author's calculation

Traditionally provisioning ES is the most appreciated by local communities which have direct economic and well-being benefits from natural resources such as crops, fodder, pastures, firewood, cattle breeds and a variety of value-added products like milk, cheese, and meat (Garrido et al., 2017). In rural surroundings resources like wild edible berries, plants and fruits from provisioning ES spectra also play a crucial role in agro-pastoral business and well-being lifestyles and thus provide a growing market linked with tourism (Mansfield & Potočník Topler, 2021). Cultural ES is ranked as the second most valued which confirms other studies that highlighted recreation, rural tourism, eco-tourism activities, and traditional knowledge as highly appreciated by locals (Oteros-Rozas et al., 2014). The possible reason for local respondents' high perception of cultural ES lies in the fact that in the last several years, in Europe as well as in Serbia, there is an evident trend in increasing demands for rural services (Luković et al, 2022).

Special attention was paid to cultural ES to find out how is valued nature-based tourism in locals' perception. From four main ecosystem services categories, it was extracted cultural assets with sub-categories which were especially valued. The results show that the diversity of perceptions is based on geographical and cultural-historical background. The most valued cultural sub-categories were ecotourism and recreational activities (RFC- 0,74), cultural heritage/diversity (RFC- 0,71) and aesthetic values (RFC- 0,66). The knowledge system and education are not highly ranked in locals' perception even though there is interest in traditional knowledge and practices transfer.

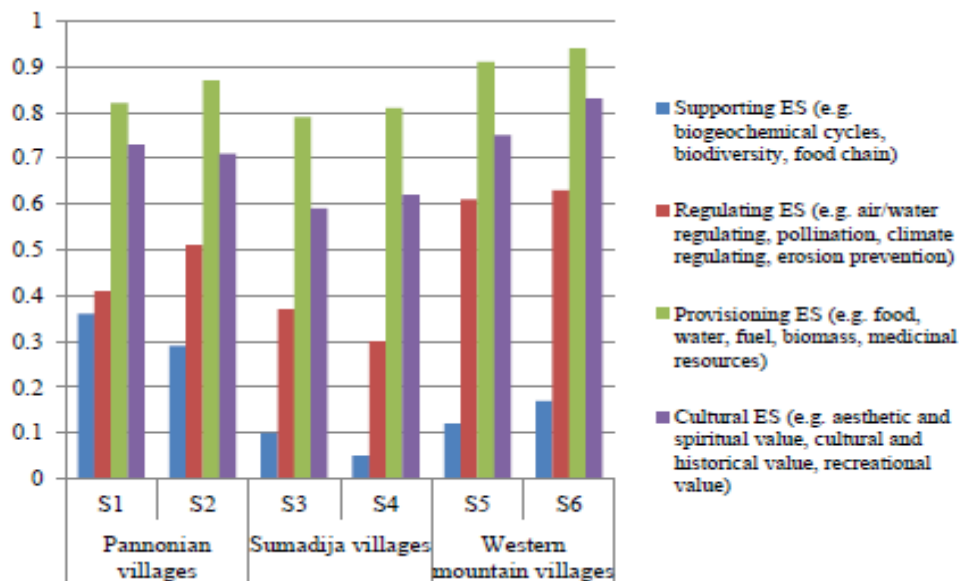
Table 2. *Frequency of citation sub-categories within cultural ecosystem services by local respondents.*

Cultural ES	RFC					
	S1	S2	S3	S4	S5	S6
Spiritual and religious values	0,51	0,50	0,69	0,65	0,70	0,68
Sence of place	0,48	0,39	0,60	0,64	0,67	0,67
Aesthetic values	0,61	0,51	0,62	0,67	0,75	0,71
Social relationship	0,60	0,62	0,58	0,50	0,62	0,63
Cultural heritage/diversity	0,70	0,63	0,63	0,70	0,79	0,80
Recreation and ecotourism activities	0,65	0,69	0,58	0,71	0,90	0,92
• Walking	0,65	0,64	0,59	0,48	0,89	0,84
• Bird watching	0,70	0,75	0,38	0,42	0,65	0,70
• Herbal tours	0,50	0,70	0,50	0,49	0,82	0,85
• Gathering wild products	0,42	0,50	0,71	0,68	0,90	0,95
• Bicycling	0,80	0,71	0,30	0,48	0,60	0,59
• Hunting	0,65	0,60	0,70	0,75	0,64	0,68
• Fishing	0,75	0,72	0,49	0,40	0,70	0,72
Knowledge systems and educational values	0,55	0,45	0,30	0,38	0,50	0,58

Source: author's calculation

Local people's perception of cultural ecosystem services at the level of communities was discussed in different studies and their findings confirm that local respondents appreciate diverse cultural services and their multiple roles at the local level for individual and community well-being. Opposite to our results, according to Plieninger et al., 2013 indicate that half of the respondents identified sites of particular aesthetic values, social relations, or educational values. The reason could be under-appreciated cultural ES compared to other more easily quantifiable ecosystem services such as provisioning ones (Norton et al., 2012). Ten years after this research and under the pressure of Covid-19 over-look of rural ecosystems services changed perception. Some results show an increased demand for rural, natural, untouched areas with the capacity to offer local authenticity experience through the bio-cultural heritage (Luković and Nićiforović, 2021). Recent studies more paid attention to recreation and ecotourism, as well as aesthetic values, and were evaluated more often than other sub-categories. The positive perception of cultural ecosystem services is strong correlation with the well-being of people and communities, especially in developing countries where people are more dependent upon other types of ecosystem services than supporting one (Hernández-Morcillo et al., 2013).

Figure 2. *Comparative analysis in main ecosystem services perception*



Source: author's calculation

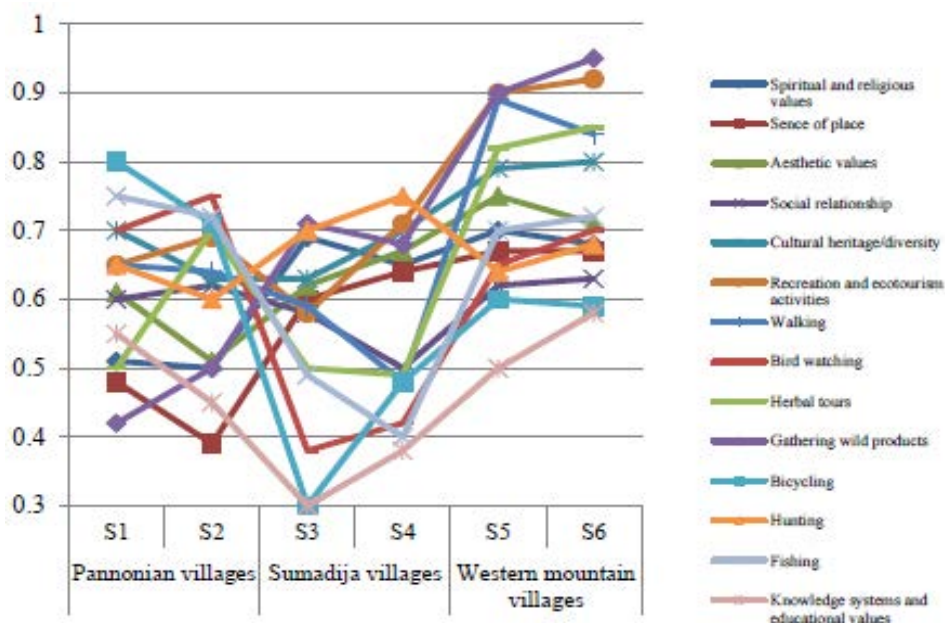
Comparative analysis show clear differences between Pannonia, Sumadia and western mountain villages in perception of the main categories of ecosystem services (Figure 2). Provisioning ES are the most appreciated by respondent along the geographic gradient and with special importance for western mountain villages who highlighted firewood, pastures and cattles. Even though low level of valuation, the significant variations could be seen in supporting ES perception. For example, pannonian respondents highly valued basic ecological processes. Cultural ES follow provisioning as the second important and the greatest significance has to western mountain villages, especially Golija mountain.

Apart from the above, it can be observed that in all investigated regions, the cultural values of the ecosystem have a high perception. Cultural and historical values are especially important. When the epithet WHS (World heritage site) is added to that, the concept and experiences of visitors at such locations are highly positioned (Poria et al., 2013). Individually, precisely because of the WHS location, Western mountain villages have the dominantly highest cultural value.

Locals in mountain regions were most acknowledged in provisioning ES, where livestock grazing was considered a fundamental practice for social well-being

(Garrido et al., 2017). Some studies indicate (e.g. Carmona et al., 2013) that many respondents valued cultural ecosystem services not only from the aspects of bio-physical or economic approaches but then from their sense and special relationship to tradition and culture. Some of the areas researched in this study are under the protection status with a limited range of activities which capitalize on cultural ES as an added value to sustainable rural development and powerful mechanisms in nature conservation and biodiversity business (Daniel et al., 2012).

Figure 3. *The place of nature-based tourism activities in the perception of local respondents*



Source: author's calculation

Figure 3 shows the place of nature-based tourist activities, according to the perceptions of the local population. Looking at rural regions, based on Figure 3, it is noticeable that Bicycling, Fishing and Bird watching dominate in Pannonian villages. On the contrary, local residents in Sumadija villages gave the highest rating to Hunting and Recreation and ecotourism activities. The lowest rating was recorded precisely in these villages, when it comes to cycling, in contrast to the previous geographical area. In the end, as expected, spiritual and religious values, as well as recreation and ecotourism activities, received the highest value in Western mountain villages.

Conclusion

Rural areas with diverse landscapes provide a wide range of benefits to the local community through ecosystem services. Results of this study and previous research confirm that provisioning ecosystem services are the most appreciated giving direct economic benefit. Cultural services asset, as well as high, ranked and valued by locals and recognized as possible source of income, highlighting nature-based activities, cultural heritage and aesthetic sense of place as the most important. Awareness about the positive impact of tourism for biodiversity business and ecosystem marketplace in rural areas through the revealing of traditional knowledge and practices, old recipes-food tourism, herbal tours and finally rational exploitation of biological diversity capacity. Cultural services together with provisioning services could be vital for future sustainable rural development from economic aspects, as well as from the aspect of land use and management. This study was limited to several villages along the geographical gradient and should be spread on a large scale. Positive outputs suggesting to the stronger promotion and raising of awareness about cultural ecosystem potential as generators of economic diversification, nature conservation and preservation of a cultural, historical, and traditional sense of place.

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