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INNOVATIVE APPROACHES TO SUSTAINABLE TOURISM IN HIGHLAND WETLANDS: INSIGHTS FROM COMMUNITY-BASED INITIATIVES

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Abstract: Highland wetlands might be considered as an important aspect of ecosystem functioning, preservation of biodiversity, as well as of sustenance of human livelihoods. Delicate nature of these ecosystems, coupled with the necessity for judicious natural resource utilization, has prompted extensive discourse on strategies for fostering sustainable development within highland wetlands. Perception and involvement of the local community members in sustainable development of tourism within these regions are paramount for effective tourism management and preservation of designated protected areas. This research was conducted in Peštersko polje highland wetlands, designated special nature reserve and Ramsar Site in Serbia. Situated within an isolated border region of Serbia, the Peštersko polje Ramsar Site exemplifies the characteristics typical of highland wetlands. The main aim of this study was to provide better understanding of the local community members' perceptions of sustainable development of tourism and the manner in which their perception is affected by socio-demographic profile. The collected data were analyzed on the basis of using descriptive statistics, factor analysis, correlations, ANOVA, and independent samples *t*-test. Findings of this research indicated strong community support for sustainable tourism, coupled with a commitment to nature conservation. However, disparities in attitudes between residents of highland and lowland wetland regions were observed. This underscores the need to account for diverse contextual factors influencing policy formulation and planning for sustainable tourism initiatives, tailored to the specificities of each individual wetland area. Consequently, the study advocates for the adoption of guidelines aimed at fostering sustainable tourism practices within highland wetlands.

Keywords: sustainable tourism; wetland; local community; participation; Peštersko polje

1. Introduction

Wetland habitats are globally recognized as sites for achieving sustainable development goals through the implementation of environmental management policies. Accordingly, their role is acknowledged in many places within the UN Strategy 2030 Agenda (Seifollahi-Aghmiuni et al.,

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2019; United Nations, 2015). Tourism is considered a means through which wetland resources are utilized, based on the attractiveness of such areas for an increasing number of visitors and with significant economic impact (Do et al., 2015; Ramsar & UNWTO, 2012). Sustainable tourism is promoted as one of the prevalent principles in the sustainable development of wetlands with the potential to address issues in the field of nature protection together with socio-economic development of local communities (van der Duim & Henkens, 2007).

High-altitude landscapes are considered as an important aspect of global natural heritage. Besides that, they are recognized as a crucial part of maintaining the overall natural diversity and integrity of biophysical processes (Chakraborty, 2020). Research supported the claim that, even under human influence and in altered conditions, highland wetlands remain essential for preserving natural characteristics (Kull, 2012). However, a lot of threats for highland wetlands are still represented, including degradation of habitats, deforestation, contamination of water, expansion of intrusive species (IUCN, 2006). Environmental degradation in highland wetlands is observed and more pronounced than in other ecosystems. Decision-makers and planners face ongoing challenges due to continuous pressures from population growth and urbanization in such areas (Pan et al., 2022).

Research on the interplay between wetlands and local communities were sporadically conducted (Adhya & Banerjee, 2022; Nath et al., 2017; Wilkins et al., 2019). There are some studies that were focused toward wetlands from the perspective of local communities and their relationship with tourism and sustainable tourism (Obradović et al., 2022; Stojanović et al., 2021;). Regardless the fact, previously conducted research was predominantly oriented toward exploring local communities in wetlands located near larger inhabited areas, positioned close to major settlements and cities, or near busy transportation routes. Therefore, noticeable research gap was noticed regarding the local communities and their attitudes toward sustainable tourism in highland regions dominated by wetlands, especially in peripheral, sparsely populated regions with underdeveloped infrastructure.

Within this research, authors were focused toward perception among representatives of the local communities about sustainable development of tourism in highland wetlands using the example of the Peštersko polje Ramsar Site (Pešter Field Ramsar Site) in the extreme southwest of Serbia, bordering neighboring countries of Montenegro and Bosnia and Herzegovina. The Peštersko polje has been declared a Special Nature Reserve (SNR), and subsequently, a Ramsar Site, that is a part of internationally accepted List of Wetlands. Such recognitions have been instrumental in sparking discussions about the relationship of the local population toward nature conservation and development of tourism that is in line with sustainable principles. The main goals of this paper were the following ones: (1) assessing the local communities' support and involvement in sustainable development of tourism; (2) determining if respondents' socio-demographic profile affects their views regarding sustainable development of tourism; (3) assessing the level of the local communities involvement in further plans and decisions related to tourism; (4) assessing the degree of information that local community members have about the examined Ramsar Site, as well as the willingness to be involved in programs regarding nature conservation; and (5) examining differences in attitudes between the residents of these areas and the residents of wetlands in lowland regions.

2. Literature review

2.1. *The importance and management of highland wetlands*

Mountainous wetlands are defined as a diverse range of lakes, rivers, streams, marshes, and peatlands found at higher altitudes (Enhancing the wise use and conservation of mountain wetlands, 2002) and are simultaneously regarded as crucial biodiversity hotspots and refuges for many plant and animal species worldwide (Bita-Nicolae, 2022). In addition to biodiversity conservation, mountainous wetlands are also considered as a vital function in preserving social, cultural, and economic characteristics when speaking about local communities living within or around them (Gandarillas et al., 2016; Kottawa-Arachchi, 2017). Implementation of nature conservation measures due to their sensitivity, their significance for biodiversity, and their importance for local communities are required for mountainous wetlands. Significant contributions have been made toward protecting wetlands in the developed parts of the world, but simultaneously the inability to achieve this goal is observed in developing countries (Mitsch & Gosselink, 2015). The protection of wetlands is conducted on the basis of several aspects, such as administration, strategy, supervision, rehabilitation, expertise, and financing. To ensure effective wetland management, legislations, directives, as well as politics in line with development of local communities must be adopted within each country (Xu et al., 2019). Future efforts in wetland protection and management should involve a more inclusive approach with well-informed stakeholders. Educating the public should provide a unique opportunity in wetland management by adopting alternative solutions in utilizing their resources (Macharia et al., 2010).

2.2. *Sustainable tourism in wetlands*

Being one of the most effective ecosystems worldwide, numerous wetlands might enable the development of recreation and tourism, which are essential for human well-being (Tourism, recreation and wetlands, 2012). Tourists are attracted to wetland habitats by the opportunity to be engaged in sports and recreational activities on water bodies (Milanović Pešić et al., 2023), to observe wildlife, including the abundant birdlife (van der Duim & Henkens, 2007), as well as the chance to encounter local communities living in the vicinity of wetlands. However, due to their attractiveness, wetlands could be exposed to the pressure of tourism development, leading to environmental degradation and pollution, including the water contamination, insufficient conservation of ecosystem diversity (Jafari, 2017).

Considering the details stated within the Ramsar Convention on Wetlands and the World Tourism Convention, sustainable tourism in wetlands might be seen as a broad collaboration between stakeholders, governmental and non-governmental organizations, and local community members (Ramsar & UWTO, 2011). Tourism could also be considered as an engine for positive changes in wetlands through its connection with nature restoration and conservation efforts (Nevard & Nevard, 2014). Stakeholders (NGOs and local communities) once again have a crucial function in defining patterns of wetland utilization, as they could generate income necessary for nature protection (Ramírez & Fennell, 2014). Plans and programs which reduce harmful effects of tourism on wetlands must be based on environmental monitoring, including nature protection, proper waste, water, and noise management (Diaz-Christiansen et al., 2016).

2.3. Sustainable tourism in wetlands and involvement of local communities

Tourism in wetlands must provide positive impacts for members of the local community, as this kind of circumstances might foster the wetland conservation and prevent the economic decrease (Ramsar & UNWTO, 2012). The support of the local community members' might be considered as an important factor in further tourism development in natural areas, and numerous studies demonstrated complex interactions in such relationships (Buta et al., 2014; Stone et al., 2022). It could be said that members of the local communities' support initiatives focused toward tourism development by sustainable principles in wetlands when development is not perceived as a danger for nature and local culture (Ghoochani et al., 2020). Evaluating wetlands from an economic viewpoint can aid in their preservation and improvement, providing numerous ecological and financial advantages to communities in the vicinity. Sustainable land usage could be both ecologically and economically beneficial for society as a whole (Rusciano et al., 2023). The sustainability of tourism in wetlands is also influenced by whether financial resources are sufficient, requiring stronger and sustainable collaborations between public and private sector in line with involving the local populations. This attitude always accompanies the understanding that local communities are essential in nature conservation (Aazami & Shanazi, 2020). Finally, educating the local communities about wise wetland usage might help in creating environmentally friendly behavior, which, in turn, could lead to an increasing trend in tourists' arrivals, thus reducing negative impacts of tourism sector on wetlands (Khoshkam & Marzuki, 2011).

3. Research area

Peštersko polje is situated within Pešter Plateau, which belongs to the mountain highlands in the extreme southwest of Serbia (Figure 1). Central part of the aforementioned geomorphological zone is also called the Peštersko polje. Altogether in geotectonic terms, it is part of the Inner Dinarides (Nešić, 2015), a mountain range in southern Europe. The Peštersko polje is among the biggest remaining upland peat bog systems in Serbia and the Balkans, serving as a sanctuary for many native, unique, and threatened key species of plants and animals (Puzović et al., 2019).

Peštersko polje is a remarkable example of a unique wetland ecosystem—peatland, which is both extremely rare and endangered in this part of the region. Situated at an altitude of approximately 1,150 a.s.l., it hosts the largest preserved peatbog in Serbia, located on the country's most expansive karst field. In Serbia and across the Balkan Peninsula, the range of peatlands reaches its southernmost extent here. These habitats are biodiversity hotspots, especially notable for their rich plant life and the diversity of vegetation, with a particular emphasis on boreal flora. The peatbog in Peštersko polje stands out as one of the largest and best-preserved in the country. Its considerable size is especially important given the rarity of large peatbogs in this climate. This is a mesophilous peatbog, and historically, the waters flowing through it were rich in mineral salts—an element that has significantly influenced the present-day vegetation of the bog and the surrounding mires (Ramsar, 2024).

Peštersko polje is home to a notable number of species that are threatened at both national and international levels. Among these are the black tern (*Chlidonias niger*), glossy ibis (*Plegadis falcinellus*), aquatic warbler (*Acrocephalus paludicola*), and the thick-shelled river mussel (*Unio crassus*). The area also serves as a critical refuge for the corncrake (*Crex crex*), which relies on the site's consistently wet habitats for nesting—particularly vital during

periods of drought when surrounding areas often dry out. One of the primary threats to the stability of this sensitive ecosystem is peat extraction (Ramsar, 2024).

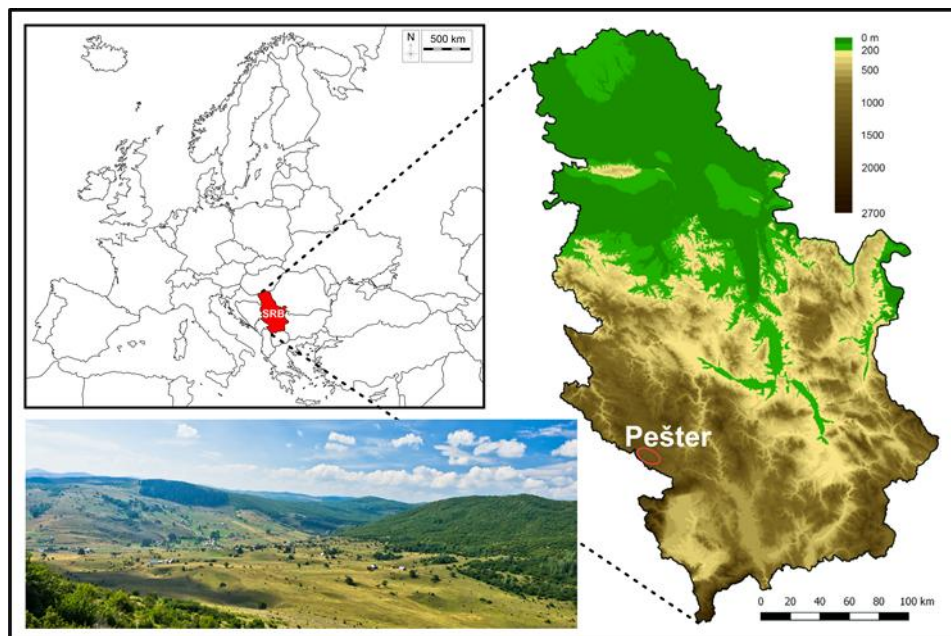


Figure 1. The location of the Peštersko polje Ramsar Site.

Note. Modified according to “Qualitative insights into cultural heritage protection in Serbia: Addressing legal and institutional gaps for disaster risk resilience” by V. M. Cvetković, S. Gole, R. Renner, V. Jakovljević, and T. Lukić, 2024, *Open Geosciences*, 16(1), p. 9. CC BY-NC-ND; Copernicus data and information – www.copernicus.eu, GADM database (version 4.1) – www.gadm.org and www.serbia.travel

The Peštersko polje Ramsar Site (3,421.3 ha) was included in the Ramsar List in 2006 and is one of 11 Ramsar Sites within Serbia (Ramsar, 2024). On a national scale, Peštersko polje is preserved under the Law on Nature Protection (2009, 2010, 2016, 2018, 2021) as a Special Nature Reserve. The boundary of the Peštersko polje Ramsar Site is drawn to bypass inhabited areas and other forms of land use, with the exception of peat exploitation fields. Due to its infrastructural isolation and the small number of inhabitants living “in harmony with nature”, there were previously no initiatives for tourism development and educational programs. By establishing the Peštersko polje as a Ramsar Site, and through it being designated as a protected area, established perceptions have been altered, resulting in the opening of new hospitality facilities (Ramsar, 2024).

4. Data and methods

4.1. Sample

As already mentioned, the present study examined the local community members’ perceptions of sustainable tourism in the Peštersko polje, by using a quota-purposive type of the sample. Individuals from 13 settlements that are the closest to the Ramsar Site were selected.

Table 1. The socio-demographic attributes of Peštersko polje respondents (n = 263)

Gender	Percent (%)
Male	52.9
Female	47.1
Age range	
< 19 years	20.9
20–29 years	41.1
30–39 years	22.1
40–49 years	5.3
50–59 years	5.7
60+ years	4.9
Education	
Elementary school	10.3
High school	57.0
College/University	31.6
PhD	1.1
Length of residence	
Less than 10 years	3.4
10–19 years	20.9
20–29 years	36.1
30–39 years	20.9
40–49 years	7.6
50+ years	11.0
Employment status	
Civil sector	15.6
Entrepreneurship	0.8
Private sector	52.9
Student	12.5
Unemployed	17.9
Retired	0.4
Income	
Less than average (450€)	24.7
Average	31.6
More than average	43.7
Household size	
Less than three	10.6
Three to five	55.9
More than five	33.5

Considering the 2022 Census data (Statistical Office of the Republic of Serbia, 2024), there are 2,914 individuals, who live along the territory of the Peštersko polje in the municipalities of Tutin (six settlements with 1,789 inhabitants) and Sjenica (seven settlements with 1,125 inhabitants). These two municipalities registered a growth in population compared to previously conducted 2011 Census (Statistical Office of the Republic of Serbia, 2014), which is positive in contrast to other regions of Serbia where depopulation was noted.

The sample was formed taking into account the population sizes of the communities. The study sample consisted of 266 respondents, although three questionnaires were deemed incomplete and hence not included in the analysis (total sample 263). The sample sizes for Peštersko polje have 5.65% margin of error with a 95% confidence interval, based on Cochran's sample size formula (Cochran, 1977). A Pearson Correlation test was used to evaluate the questionnaire's validity. The validity test involved comparing the results from each item of the questionnaire with the overall score.

A summary of respondents (Table 1) provides an overview that indicates that males slightly exceeded females. Most of respondents were under 30, with a high-school education degree or higher level. The number of individuals per household in the studied area was three to five members. Earnings above Serbia's average amount of the monthly income (€450) were characteristic for the majority of respondents. Regarding the length of the residence, most respondents had lived in the area for between 20 and 29 years.

4.2. Procedure

A questionnaire was first developed and tested to accomplish the goals of this research, and then it was modified to be as clear and understandable as possible. A Google Docs questionnaire was employed in the study, and it was shared through email and social networks (Facebook, Instagram). In-person (face-to-face) questionnaires (103) were also used in the study. The information was gathered from mid-April till August 2022. Participants were made aware that the survey is anonymous, that taking part is completely optional, and that the data collected from them will be used exclusively for academic and research purposes.

4.3. Instrument

A survey questionnaire was used as a research instrument to determine perceptions of Peštersko polje residents on sustainable tourism development. The questionnaire was separated in three segments: Respondents' socio-demographic traits, Attitudes about tourism development in line with sustainable principles, and Familiarity with the SNR among the local population. The first section of the questionnaire included seven questions regarding the socio-demographic characteristics of the residents, such as gender, age, education degree, size of the household, amount of the monthly incomes, status of employment, and length of residence. In the second section, the 42-item Sustainable Tourism Development Scale (SUS-TAS) tool with a seven-factor framework was used (Choi & Sirakaya, 2005). The assertions were rated by using the five-point Likert scale, with 3 as neutral point from strongly disagree to strongly agree. In the current investigation, SUS-TAS has been used with minor phrasing modifications. In the final section, six questions assessed the local residents' knowledge of the specified SNR. In addition, three interviews were done (with the ranger, the restaurateur, and the director of the regional tourist organization).

4.4. Statistical approaches

Statistical Package for the Social Sciences (SPSS) was utilized to analyze quantitative data (IBM, 2017). Data analysis included reliability assessments, descriptive statistics, factor analysis, correlations, ANOVA, as well as independent samples *t*-test. Two statistical measurements kurtosis and skewness were used to identify the point variation from normal distribution (Hair et al., 2021). Descriptive statistics were employed to understand the characteristics of respondents and their views on sustainable tourism development. A factor analysis utilizing principal component analysis (PCA) was conducted to identify and confirm the underlying factors (Hair et al., 2021). The Kaiser–Meyer–Olkin (KMO) measure and Bartlett's Test of Sphericity were applied to assess the adequacy of the sample and the suitability of the data. The potential common method bias (CMB) was assessed using Harman's single-factor test. After that, the mean values were calculated for all the identified constructs. Finally, correlations, ANOVA, as well as independent *t*-test, were determined for analyzing the attitude of residents' according to their socio-demographic profile in more details.

5. Results

The significance level (Sig.) for the two-tailed test was set at 5%. Kurtosis and skewness of each item in this analysis were within the permissible value range (skewness $-/+3$ and kurtosis $-/+10$) (Kline, 2011). The KMO value for the present study was .721, exceeding the commonly recognized value of .6 required for a robust factor analysis (Kaiser, 1974). The research results showed significance of Bartlett's test of sphericity ($\chi^2(741) = 14000.563$, $p = .000$), putting the focus on data reliability. Harman's single factor test was applied to assess the CMB. The variance identified for a single factor amounts 32.34% (below 50% suggested by Kock et al. 2021), which means that the collected data were not influenced by CMB.

Furthermore, PCA was conducted by using the Varimax rotation on forty-two items of the SUS-TAS scale and it resulted in seven identified domains. Each item's communality was greater than .30, indicating that all of the items have some common variance. Factor loadings above .5 were included in the following analysis. According to minimal factor

loadings value, three items were excluded from further analysis. Final results identified seven factors with 78.45% of explained variance.

Table 2. A factor analysis of the local population perceptions of sustainable tourism development

	1	2	3	4	5	6	7
The ecosystem of the community needs to be preserved for the long term.	.553						
It is important to appreciate and safeguard nature's diversity.	.850						
Environmental protection initiatives should intensify as tourism grows.	.802						
The communal environment must be safeguarded by tourism.	.873						
The growth of tourism must coexist peacefully with the natural and cultural surroundings.	.776						
Protecting animals and natural habitats is always necessary for the growth of tourism in an appropriate manner.	.756						
For the benefit of all tourism stakeholders, tourism development must encourage positive environmental ethics.	.850						
Environmental regulations are required to lessen the effects of tourism growth.	.710						
The ecosystem needs to be improved by tourism for upcoming generations.	.748						
In my community, tourists are causing disruptions to the quality of my life.		.756					
The overall quality of my life declined due to tourism development.		.910					
I get annoyed by the number of tourists quite a bit.		.845					
Tourists abuse the leisure resources available in the area.		.730					
Due to the growth of the tourism industry, my village is congested.		.726					
I don't feel welcome or at ease in the local tourism establishments.		.932					
The growth of tourism is too rapid.		.885					
Because of tourists, social interactions in my community have become less meaningful.		.856					
Because tourism generates additional revenue for the town, I like it.			.790				
The community benefits economically from tourism.			.730				
The municipal government receives a substantial amount of tax revenue from tourism.			.844				
Our economy benefits from tourism.			.902				
New markets are created by tourism for regional goods.			.847				
The local economy is diversified by tourism.			.917				
Other community industries benefit from tourism.			.884				

Table 2. A factor analysis of the local population perceptions of sustainable tourism development (<i>continued</i>)	1	2	3	4	5	6	7
Regardless of background, everyone in my town needs to be involved in a decision-making process in the field of tourism.				.907			
In order to provide tourism growth to be effective, decisions affecting the entire community must be made.				.922			
There are instances when keeping a community's citizens out of tourism development is appropriate.				.552			
Residents of communities should have the opportunity to be involved in tourism development and related administration.				.866			
I think that when we plan the development of tourism, we should have a long-term perspective.					.500		
I think careful planning is necessary for the growth of tourism.					.522		
Plans for tourism growth should be updated on a regular basis.					.715		
Tourism businesses have an obligation to be in line with needs of travellers.						.861	
First component that makes an environment appealing to tourists is community attractiveness.						.895	
Tourism businesses must keep an eye on tourist satisfaction.						.862	
The tourism sector needs to make sure that future travellers have excellent travel experiences.						.843	
Majority of goods and services used in tourism should come from nearby communities.							.858
I believe that locals should make up at least half of the workforce in tourism-related firms.							.840
Residents of communities ought to share fairly in the advantages generated by tourism.							.851
The tourism sector needs to contribute to funding for community development.							.664

Note. 1 – Environmental sustainability ($\alpha = 0.92$), 2 – Perceived social costs ($\alpha = 0.94$), 3 – Perceived economic benefits ($\alpha = 0.96$), 4 – Community participation ($\alpha = 0.85$), 5 – Long-term planning ($\alpha = 0.91$), 6 – Visitor satisfaction ($\alpha = 0.94$), 7 – Community-centered economy ($\alpha = 0.89$).

The internal consistency of the measurements was evaluated by considering the research results represented within Table 2, as the loadings of individual items exceed .5 (Hair et al., 2021). The value of the Cronbach's Alpha Reliability indicator was over .85, (threshold is .70 according to Taber (2018) for desirable reliability, while the overall scale reliability was .86, indicating the scale's internal consistency and dependability by showing a strong or positive correlation between the variables and their corresponding factor groups.

It could be said that community members expressed support for five aspects of sustainable tourism development (Table 3). The strongest consensus was found regarding environmental sustainability (90.2%). Local residents of Peštersko polje disagree with perceived social costs and long-term planning, and agreement with community perception is not much higher either (60%). Residents of Peštersko polje cannot feel that their social interactions have deteriorated because of tourism, due to the current stage of development, when speaking about this sector. It could be concluded that stage of tourism development might also be a reason they believe that they cannot rely on long-term planning of tourism and community participation. On the other hand, they support tourism because of the benefits to environmental sustainability, economic benefits that tourism might contribute to the visitors' satisfaction, and economy oriented toward the local community.

Table 3. Descriptive statistics – Respondents' perspectives on tourism development according to sustainable principles in Peštersko polje

Sustainable tourism development factors	Mean	SD	Level of agreement in %
Environmental sustainability	4.51	.66	90.2
Perceived social cost	1.99	.99	39.8
Perceived economic benefits	4.23	.84	84.6
Community participation	2.99	.99	59.8
Long-term planning	2.23	.33	44.6
Visitor satisfaction	4.19	.82	83.8
Community-centred economy	4.43	.80	88.6

Different tests (ANOVA, *t*-test, and Correlation) were implemented in order to determine the manner in which socio-demographic profile affects residents' perception of sustainable tourism. *T*-test showed the absence of significant differences according to respondents' gender (Table 4). It was also determined through ANOVA test that age does not impact residents' attitudes. Correlation analyses showed that resident's employment status, education, income, and residency period influenced their attitude toward sustainable tourism. Additionally, it was determined that household size did not play a vital role in the determination of attitudes.

Table 4. Correlation analyses – respondents' status of employment, education, income, length of residence, and identified factors of tourism development according to sustainable principles

Factors	Pearson correlation coefficient (<i>r</i>)			
	Employment status	Education	Length of residence	Income
Environmental sustainability	-.020	-.202**	.053	.092
Perceived social cost	.085	-.139*	-.147*	-.125*
Perceived economic benefits	.171	.009	.141*	-.145*
Community participation	.151*	-.092	.037	-.003
Long-term planning	-.072	-.135*	.058	.065
Visitor satisfaction	.030	-.151*	.009	.082
Community-centred economy	.053	-.158*	-.015	.054

Note. *The correlation is significant at the level of $p = 0.05$; **The correlation is significant at the level of $p = 0.01$

Results showed the presence of significant negative correlation between respondents' education and almost all the identified factors (except perceived economic benefits). More precisely, the highest negative correlation was recorded between education and environmental

sustainability. Besides that, slightly lower negative correlation was identified between respondents' education on the one hand and perceived social costs, long-term planning, visitor satisfaction, and community-centered economy on the other. Furthermore, significant positive correlation was observed between respondents' employment status and community participation. The research results showed that employed residents of the Peštersko polje understand the value of community participation and significance of involving all the residents in the process of making decisions regarding sustainable tourism of Peštersko polje. Length of residence was also in positive correlation with economic benefits, but in the negative one with social costs. Resident income was negatively correlated with social costs and economic benefits. Locals with lower incomes believe that tourism can bring social costs to their area and will not benefit them economically.

As the end of the standardized questionnaire, there was a group of questions in which respondents were asked about protection and information regarding Peštersko polje. When asked about the type of natural assets of Peštersko polje, the majority of the respondents (62.1%) knew that Peštersko polje is covered by a certain level of protection, some of them also knew that it is a special nature reserve. However, it is a devastating fact that even 37.9% of all the respondents answered negatively to this question ("No" and "I don't know"), so it could be concluded that in the future, work should be done on the education of the local population, which might be conducted through projects, actions, and even mandatory trips to educational institutions in the area. Over 90% of the respondents were familiar with some plant species in the Peštersko polje, which can also indicate how rich and diverse the flora of this Ramsar Site is.

The most respondents indicated medicinal herbs: thyme (*Thymus spp.*), St. John's wort (*Hypericum perforatum*), dandelion (*Taraxacum officinale*), rosehip (*Rosa canina*), juniper (*Juniperus communis*), pine (*Pinus spp.*), which were the most common answers, because the population of this area believes in the healing effects of nature and has used them for centuries. Most of them are familiar with these properties and also with medicinal plants, which are certainly richly present on the Peštersko polje. In addition, there were also those specific answers such as fallen conifers, peat moss (*Sphagnum sp.*), water lily (*Nymphaea alba*), and those answers were given by respondents who are also connected to Peštersko polje in business, both in the exploitation of peat, farms, in protection as rangers and the like.

The most respondents mentioned wolves (*Canis lupus*) and red foxes (*Vulpes vulpes*) as animal species, followed by many domestic animals such as sheep, buffaloes, cows, which is expected because Peštersko polje is known for livestock. Then, a considerable number of respondents mentioned the species *Gyps fulvus* in their answers as *Griffon vulture*. This species of carrion is certainly a protective sign of the Peštersko polje, and the local population has significantly contributed to the increase in the number of this endangered species, which justifies the fact that it is also known to the population of Peštersko polje. Other types of birds such as the Golden eagle (*Aquila chrysaetos*), meadow harrier (*Circus pygargus*), grey heron (*Ardea cinerea*), stork (*Ciconia ciconia*), and others were also mentioned. Peštersko polje, due to its diverse and rich bird fauna, may be a popular destination for bird watching in the future.

Almost all the respondents (with the exception of five respondents) identified the existence of problems in the field of nature protection in Peštersko polje. Most of them emphasized the problem with reckless waste disposal, hunting, and fishing. Protection of Peštersko polje has been established, but in practice – obvious problems are represented. To investigate this from a different perspective, a conversation was conducted in the form of an interview with a ranger.

The majority of respondents answered negatively to this question related to the involvement in nature protection programs, even three quarters of the respondents. Certain respondents, mostly young people between the ages of 9 and 30, participated in certain projects and actions related to nature protection or some cleaning actions through participation in some projects and the youth office. The majority of respondents answered affirmatively, even 80% of them.

In addition to surveying and statistical processing of the obtained data, three interviews were conducted. The first interview was with the director of the regional tourism organization. Through the conversation, it was learned that tourism is on the rise in the area of western Serbia and the border with Montenegro, which necessarily includes the Peštersko polje. In addition, the interview with the restaurateur showed that the majority of tourists are from abroad and that their reactions are extremely positive and that the tourists are, without exception, enchanted by the nature offered by the Peštersko polje. The interview with the ranger indicated that there is unplanned waste disposal and increasingly popular driving of quad bikes, especially popular with young people.

6. Discussion

6.1. Community involvement and support of sustainable tourism in highland wetlands

High-altitude landscapes are perceived as an important aspect of natural heritage worldwide. Considering their role in maintaining the overall natural diversity and integrity of biophysical processes, it is vital to conserve them, while at the same time providing the local development. The key is sustainable tourism, which in high-altitude wetlands rely on local communities and their participation is one of the most effective methods of conserving these ecosystems. Local populations might significantly influence the wetland usage patterns, since they could provide the funds required to preserve the environment (Ramírez & Fennell, 2014). Based on the research results, it could be said that in Peštersko polje, people also emphasized the importance of resource conservation and a community-centered economy. They highlighted that achieving the financial advantages of tourism and visitor satisfaction are both highly important.

Furthermore, if local governments and communities work together, they could protect the wetlands' resources and ecosystem while averting damage and depletion (Gulte et al., 2023). The main results of this study demonstrated the local community members' inclination toward supporting sustainable development of tourism in wetlands. Fostering an integrated and adaptable approach, where all stakeholders are actively participating within sustainable wetland resource conservation, is considered as an imperative (Musasa et al., 2023). By integrating knowledge, this approach was aimed to improve stakeholders' understanding the societal importance of wetlands. In agreement with local communities in Peštersko polje, it is acknowledged that conservation, as well as maintenance of resources linked to highland wetlands are paramount.

6.2. The socio-demographic profiles of respondents and their perspectives on sustainable tourism development

This study's findings elucidated how socio-demographic attributes of the local community members influenced their perspectives on various facets of sustainable tourism in Peštersko polje, both positively and negatively. Notably, education emerged as the most influential

factor shaping the local residents' attitudes toward sustainable tourism. Locals with lower levels of education exhibit heightened concerns, not only regarding the environmental sustainability of Peštersko polje, but also regarding aspects such as planning, tourism satisfaction, and fostering a community-oriented economy. This finding is opposite to the main claims of Obradović et al. (2024), who pointed to the fact that educated residents were more cognizant of the significance of conserving resources and the environment, in addition to the prudent utilization of low-lands wetlands.

Residents who have lived in the Peštersko polje area for extended periods tend to value the economic advantages that tourism offers, while displaying less concern about potential social drawbacks, such as overcrowding and irritation. These research findings are in line with previously conducted studies indicating that the length of residency significantly shaped residents' attitudes (Obradović et al., 2024; Pathmanandakumar, 2021). Residents with lower incomes tend to perceive tourism as potentially bringing social costs to their area and are skeptical about its economic benefits. According to the research results of this study, residents with lower incomes exhibit a lack of optimism regarding tourism development, likely due to their limited participation in tourism initiatives and subsequent dissatisfaction with the economic outcomes. To foster greater optimism among residents regarding the financial tourism benefits, the management of Peštersko polje and tourism enterprises must devise inclusive plans that involve community residents. This approach will ensure that residents feel more optimistic about the economic prospects associated with tourism.

6.3. The extent of local community awareness regarding Peštersko polje

Although the respondents had a thorough understanding of Ramsar site, over one third was unsure about the status of conservation. Good part is that most of them knew that it is covered by a certain level of protection, but still, it lacks education activities with local population. If more of them know the importance of Peštersko polje, more will they be eager to protect it and preserve it for future generations. So, it could be concluded that work should be done on the education of the local population, which might be done through projects, actions, and even mandatory trips to educational institutions in the area. The improvement of the living environment and the advancement of sustainable social development largely depend on environmental awareness and understanding (Si et al., 2022). Local community was very familiar with flora and fauna of Peštersko polje, especially with medical plants that have been used for healing. It is very valuable to know that local community is ready to protect the resources of Peštersko polje, but management should include them and take care of the problems regarding protection. According to Zhang et al. (2020), community involvement is the most effective strategy for protecting the environment in protected areas. Many locals are not actively committed in protecting the environment, according to information gleaned from a ranger interview. The benefit is that the majority of respondents said that they would be delighted to participate in the efforts to conserve the environment in Peštersko polje.

7. Conclusion and recommendations

Highland wetlands represent an important type of environment that is fragile and susceptible to degradation. The issue of degradation, and even loss, of these wetland habitats is particularly pronounced in developing countries. Simultaneously, tourism as an activity is gradually expanding into areas where it was not present in previous decades,

which particularly applies to developing countries. Due to the sensitivity of highland wetlands, there is a need to study the potential for consistent application of sustainable tourism principles, in which nature conservation and local communities interact in numerous ways. For these reasons, this research was focused on the Peštersko polje in the southwest part of Serbia, a peripheral region at higher altitudes and simultaneously a protected special nature reserve and a Ramsar Site.

The research results contributed to the theory on the basis of spreading the relationship between local communities and sustainable tourism in highlands wetlands. The research results of this study confirmed differences in views among respondents that are living in the vicinity of highland wetlands in comparison with attitudes of those living in lowland regions, at lower altitudes, near large settlements, and busier roads. Moreover, it was found that long-term planning and community involvement in highland wetlands were significantly lower than in lowland wetlands. Furthermore, differences in perceptions of wetland endangerment were noted based on gained education degree. Less educated respondents within highlands perceived a higher risk of wetland degradation than those in lowland regions. At the same time, respondents with lower levels of education were more skeptical about tourism development and the benefits of this activity, which should be further linked in future research with their perception of wetland degradation. However, the majority of the respondents expressed willingness to support sustainable tourism in their initiatives.

Based on gained results, this research also confirmed significance of education in nature conservation and sustainable tourism in wetland habitats, especially since it has already been proven that both improving the environment and promoting sustainable social development depend on knowledge and developed ecological awareness. Findings demonstrated a clear insight into the natural heritage and issues that pose difficulties in nature conservation (e.g., waste disposal, illegal hunting, and fishing) by the residents of highland wetlands.

Limitations of this research are reflected in the absence of better opportunities for comparative and simultaneous analysis of local community attitudes toward wetlands in multiple mountainous regions. Therefore, it is necessary to establish, through cooperation, an international team of researchers who would more intensively work on studying the relationship between residents and wetland habitats in mountainous areas in the future.

However, with the main aim to establish conditions for unhindered sustainable tourism development in highland wetlands, based on strong support for nature conservation, the following recommendations are proposed for adoption in development plans: (1) more active involvement of residents in nature conservation programs based on preserving natural, but also cultural heritage; (2) intensive strengthening of public-private partnerships to connect local government, protected area managers, and tourism companies resulting from entrepreneurial initiatives in the local community for mutual benefit; (3) improvement of measures to initiate education of local community members on nature conservation in highlands wetlands and sustainable tourism continuously and in the long term, rather than sporadically; (4) construction tourist infrastructure for the interpretation of natural and cultural values (e.g., visitor centers, educational trails, information boards) which would simultaneously serve tourists and residents, with the aim of increasing overall awareness of the environmental sensitivity in highland wetlands.

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