IMPROVEMENT OF RURAL TOURISM IN THE AREA OF BOSNIA AND HERZEGOVINA USING MULTI-CRITERIA ANALYSIS

Miroslav Nedeljković[1], Adis Puška[2], Minja Vlajković[3], Vesna Miletić [4]
Corresponding author E-mail: miroslavnedeljkovic2015@gmail.com

A B S T R A C T

The aim of the study was to evaluate rural households from five different regions of Bosnia and Herzegovina based on predetermined economic, ecological, and sociological criteria, using assessments from five expert professionals in the field. The study employed the fuzzy multi-criteria decision-making method called TOPSIS to ensure research accuracy. The results indicated that the rural household "Radoja" received the highest rating, which could serve as a solid foundation for future rural tourism development in Bosnia and Herzegovina. Based on the obtained results, it is possible to conduct future research in other regions of the country, providing appropriate guidelines for the development of rural tourism in Bosnia and Herzegovina.

Introduction

In the era of global digitalization of work processes and lifestyles, there is an increasing need for an active way of relaxation in natural surroundings. Rural destinations have become a refuge for many people seeking a break, and their development and offered amenities serve as a draw for an increasing number of visitors from nearby and distant areas or regions. According to Cvijanović et al. (2021), rural tourism is a broader concept than rural tourism alone, as it encompasses areas outside settlements. On the other

1   Miroslav Nedeljković, PhD, Research Associate, Institute of Agricultural Economics, Volgina Street no. 15, 11060 Belgrade, Republic Serbia, Phone: +381654471201, E-mail: miroslavnedeljkovic2015@gmail.com, ORCID ID (https://orcid.org/0000-0002-7393-2146)

2   Adis Puška, PhD, Assistant Professor, Faculty of Agriculture, Bijeljina University, Pavlovica put 024, 76300 Bijeljina, Republic of Srpska, BiH, Phone: +38761305535, E-mail: adispuska@yahoo.com, ORCID ID (https://orcid.org/0000-0003-3274-0188)

3   Minja Vlajković, PhD, Assistant Professor, Faculty of Culture and Media, Megatrend University, 11070 Belgrade, Serbia, Phone: +38169120799, E-mail: minjavlajkovic@gmail.com, ORCID ID (https://orcid.org/0009-0009-0072-1434)

4   Vesna Miletić, PhD, Associate Professor, Faculty of Business and Law Belgrade, MB University, Teodor Dreiser street 27, 11000 Belgrade, Serbia, Phone: +381 64 234 54 89, E-mail: vmiletic68@gmail.com, ORCID ID (https://orcid.org/0000-0003-1287-5800)

hand, Blešić et al. (2021) highlight that rural areas significantly differ in their specific characteristics from other natural areas, especially urban and suburban environments. Rural tourism has become a driver of economic development in these areas, as tourists visiting rural regions stay there and purchase local products, thereby influencing the economic growth of the region (Nedeljković, et al., 2022). Ezung (2011) provides perhaps the most precise definition of rural tourism, defining it as a form of tourism that allows visitors to have personal contact with the warmth of home, physical and human environments, and, as much as possible, participate in activities, traditions, and the way of life of the local population.

When considering tourism offerings, it is necessary to take into account the social, economic, and environmental background of the local community (Puška et al., 2020). According to Prevolšek et al. (2020), in the implementation of this type of tourism, it is important to utilize not only accommodation facilities but also other forms of content in rural areas, such as sports and recreational facilities, themed attractions, ethno-parks, adventure parks, eco-villages, ethno-villages, and more. This way, tourists receive a complete service, leading to higher satisfaction and loyalty (Pantić et al., 2022; Dileep Kumar, et al., 2020; Pantović et al., 2023).

Bosnia and Herzegovina is a rural country with a rich cultural tradition of its local population, which gives it the right to strive for further development of rural and agritourism. More and more people of different profiles and income statuses are showing interest in the rich traditions and customs of local areas across the country. In line with this, Puška et al. (2020a) conclude that there is progressive investment in improving the tourism offerings in rural regions of Bosnia and Herzegovina. On the other hand, the supply is still relatively scarce and should undergo more intensive development (Puška et al., 2022). A good example can be found in Italy, where over 23,000 farms offer some form of agritourism/rural tourism, contributing to an annual revenue of over one billion euros (Stevanović et al., 2022; Stankov & Roganović, 2022; Palmi and Lezzi, 2020). Similarly, in Poland, services of this kind of tourism were provided on over 8,200 rural households in 2016. (Roman, et al., 2020).

For the development of rural tourism, it is crucial to evaluate the development level of rural settlements based on specific criteria and their assessment (Nedeljković et al., 2022a). Nedeljković et al. (2022) argue that due to the importance of these criteria for tourism development, a holistic approach should be applied when evaluating tourism capacities. Therefore, the main objective of this study is to assess the offering of rural tourism in Bosnia and Herzegovina based on predetermined criteria and employing expert assessments and a multi-criteria research method, as well as selecting the most attractive rural tourist destination. The research subject consists of five selected rural households located in different regions of Bosnia and Herzegovina. They were chosen by five experts from local tourism organizations with extensive work experience in this field.

Literature review

In previous research, many authors have focused on the development of rural tourism. Puška et al. (2021) observe in their study that rural tourism becomes a promoter of rural development, with tourism emerging as one of the main industries in the development of rural populations (Puška et al., 2019). Some authors view it as a representation of rural way of life and the values that this form of tourism provides in its natural environment, offering tourists an alternative to urban lifestyles (Zolfani et al., 2015; Sagić et al., 2019). Podovac et al. (2019) examined the improvement of rural tourism in the Goč region, where they found a need to enhance the quality of accommodation facilities and additional amenities. Puška et al. (2019), on the other hand, evaluated the tourism potentials of four rural settlements in the Brčko District and provided guidelines for their future development.

Kostić and Stanišić (2022) explore rural tourism in Serbia in their study. They find that the studied areas have preserved natural environments and emphasize the need for appropriate valorization of available potentials. Maksimović et al. (2018) investigate rural tourism in the Stara Planina region, while Šarković (2018) examines the impact of media on the development of rural tourism in Serbia. Ristić (2013) studies the importance of state development policies in certain rural areas, as well as the revitalization of rural areas in Serbia. Wang (2021) explores the impact of the internet on improving conditions in rural areas through a case study of rural tourism in China, while Zhang et al. (2022) identify rural settlements as the main carriers of quality rural tourism in China, emphasizing the need to utilize the spatial arrangement of rural settlements to enhance this form of tourism. Additionally, it is worth noting that some authors have recently conducted research on the development of agrotourism as one form of rural tourism in specific countries (Giaccio et al., 2018; Roman et al., 2020; Tseng et al., 2019; Adamov et al., 2020, etc.).

When it comes to the application of multi-criteria decision-making and analysis in this field, there are several examples of research by foreign and domestic authors (Park, et al., 2017; Muhacir and Tazebay, 2017; Anabestani, 2016; Jeong, et al., 2016; Mahboban and Talebi, 2015; etc.). Nikolić, et al. (2015) utilize SWOT analysis and the Analytic Hierarchy Process (AHP) method for research and providing guidelines for further development of tourist destinations in the Stara Planina region. Prelovšek, et al. (2020) use the DEX method to assess the state of tourist offerings in ethno villages in Bosnia and Herzegovina. Nedeljković, et al. (2022), using the DEX multi-criteria decision-making method, provide guidelines and recommendations for further development of rural tourism in the Republic of Srpska. Through the application of multi-criteria analysis of rural tourist capacities, based on a random sample of four tourist facilities, they obtain results from which they conclude that they have adequately utilized the natural resources available in the Republic of Srpska. This method is also employed by Puška, et al. (2020) in their research, justifying its role in managing rural tourist offerings. Nedeljković, et al. (2022a), using the fuzzy SWARA multi-criteria analysis method, recommend measures to strengthen certain criteria in order to further enhance rural tourism in the Brčko District, using it as an example.

Materials and methods

The TOPSIS method (Technique for Order Preference by Similarity to Ideal Solution) was used as the working method. The method used is based on the fact that the chosen alternative has the shortest distance from the positive ideal solution as well as the longest distance from the negative ideal solution. It is considered one of the best techniques for selecting alternatives based on their similarity to the ideal solution. Additionally, it has been found to be satisfactory in various areas of analysis (Yavuz, 2016). To obtain a larger rating interval for decision-makers, which enhances accuracy in the selection process, we expand this method by using triangular fuzzy numbers to replace the numerical linguistic scale for evaluation and weighting.

The following stages in the application of the method used are presented below:

Stages 1: Create a decision matrix

Stages 2: Create the normalized decision matrix

$$\tilde{r}_{ij} = \left(\frac{a_{ij}}{c_j^*}, \frac{b_{ij}}{c_j^*}, \frac{c_{ij}}{c_j^*}\right); \quad c_j^* = max_i \; c_{ij}; \; \textit{Positive ideal solution}$$

$$\tilde{r}_{ij} = \left(\frac{a_j^-}{c_{ij}}, \frac{a_j^-}{b_{ij}}, \frac{a_j^-}{a_{ij}}\right); \quad a_j^- = min_i \; a_{ij}; \; \textit{Negative ideal solution}$$

Stages 3: Create the weighted normalized decision matrix

Taking into account the weights of each criterion, the weighted normalized decision matrix can be calculated according to the following formula.

$$\tilde{v}_{ij} = \tilde{r}_{ij}.\widetilde{w}_{ij}$$

Where $\widetilde{w}_{ij}$ represents weight of criterion c_j.

Stages 4: Determine the fuzzy positive ideal solution (FPIS, A*) and the fuzzy negative ideal solution (FNIS, A⁻).

$$A^* = \{\tilde{v}_1^*, \tilde{v}_2^*, \dots, \tilde{v}_n^*\} = \left\{\left(\max_j v_{ij} \; | i \in B\right), \quad \left(\min_j v_{ij} \; | i \in C\right)\right\}$$

$$A^- = \{\tilde{v}_1^-, \tilde{v}_2^-, \dots, \tilde{v}_n^-\} = \left\{\left(\min_j v_{ij} \; | i \in B\right), \quad \left(\max_j v_{ij} \; | i \in C\right)\right\}$$

Where $\tilde{v}_i^*$ is the max value of i for all the alternatives and $\tilde{v}_1^-$ is the min value of i for all the alternatives. B and C represent the positive and negative ideal solutions, respectively.

Stages 5: Calculating the distance and the distance between each alternative and the fuzzy positive and negative solutions A* and A⁻.

The distance between each alternative and FPIS and FNIS are according to the following expression:

$$S_i^* = \sum_{j=1}^n d(\tilde{v}_{ij}, \tilde{v}_j^*) \qquad i=1,2,...,m$$

$$S_i^- = \sum_{j=1}^n d(\tilde{v}_{ij}, \tilde{v}_j^-) \qquad i=1,2,...,m$$

d is the distance between two fuzzy numbers, when given two triangular *fuzzy* numbers (a_1, b_1, c_1) and (a_2, b_2, c_2), e distance between the two can be calculated as follows:

$$d_v(\tilde{M}_1, \tilde{M}_2) = \sqrt{\frac{1}{3}[(a_1 - a_2)^2 + (b_1 - b_2)^2 + (c_1 - c_2)^2]}$$

In this case $d(\tilde{v}_{ij}, \tilde{v}_j^*)$ and $d(\tilde{v}_{ij}, \tilde{v}_j^-)$ are crisp numbers.

Stages 6: Closeness coefficient and ranking of alternatives

The closeness coefficient can be obtained based on the following formula:

$$CC_i = \frac{S_i^-}{S_i^+ + S_i^-}$$

We can find sources for constructing appropriate criteria in previous studies by various authors (Romao et al., 2018; He et al., 2019; Muresan et al., 2019; Spenceley, 2019; Zhang et al., 2019; Prevolšek et al., 2020; Hopkins, 2020; Puška et al., 2020). Due to the significance of sustainability in this industry, ecological criteria are also included in the study. The criteria are divided in the following manner:

- Economic criteria: Price of tourism services/products, quality of offered services and organization, accommodation facilities, transportation connectivity, attractiveness of services for tourists.

- Ecological criteria: Availability of natural resources, quality of natural resources, landscape/environment, diversity of agricultural resources, geoFigureic characteristics.

- Sociological criteria: Offer of local products, possibility of organizing new tourism activities and events, accessibility of tourist facilities, transfer of knowledge from tradition to consumers, importance of local community development.

The research sample consisted of rural households from five different regions of Bosnia and Herzegovina engaged in rural tourism. The selection of these households was based on the expert opinions of five decision-makers with extensive experience in the field. The following selected households were used as alternatives for the research purposes:

- Household „*Ostrovica*", (Kulen Vakuf Municipality),

- Household „*Šadrvan*", (Vareš Municipality),

- Household „*Grabovica*", (Tomislavgrad),

- Household „*Dedić*", (Srebrenica Municipality),

- Household „*Radoja*", (Šipovo Municipality).

Additionally, available and accessible professional and scientific literature in the analyzed field was used as a data source in the study, and the results were presented in tabular and Figureical form.

Results and discussion

As previously mentioned, in the study, we utilized the expert assessment of five experts in the field based on 15 predefined criteria. The following Table 1 shows the types of criteria and their weights, which were assessed as equal by the experts for the purposes of this research, assuming that each criterion has equal importance.

Continuing with the study, the results of the remaining steps of the applied research method are presented.

Table 1. Criteria used

	The name of the criteria	Category	Criteria weight
1	Price of tourism services/products	-	(0.067, 0.067, 0.067)
2	Quality of offered services and organization	+	(0.067, 0.067, 0.067)
3	Accommodation facilities	+	(0.067, 0.067, 0.067)
4	Transportation connectivity	+	(0.067, 0.067, 0.067)
5	Attractiveness of services for tourists	+	(0.067, 0.067, 0.067)
6	Availability of natural resources	+	(0.067, 0.067, 0.067)
7	Quality of natural resources	+	(0.067, 0.067, 0.067)
8	Landscape/environment	+	(0.067, 0.067, 0.067)
9	Diversity of agricultural resources	+	(0.067, 0.067, 0.067)
10	GeoFigureic characteristics	+	(0.067, 0.067, 0.067
11	Offer of local products	+	0.067, 0.067, 0.067)
12	Possibility of organizing new tourism activities and events	+	(0.067, 0.067, 0.067)
13	Accessibility of tourist facilities	+	(0.067, 0.067, 0.067)
14	Transfer of knowledge from tradition to consumers	+	(0.067, 0.067, 0.067)
15	Importance of local community development	+	(0.067, 0.067, 0.067)

Source: Authors

In the following Table 2, the fuzzy scale used in the study is presented.

Table 2. Fuzzy Scale

Code	Linguistic terms	L	M	U
1	Very low	0	0	1
2	Low	0	1	3
3	Moderately low	1	3	5
4	Moderate	3	5	7

Code	Linguistic terms	L	M	U
5	Moderately high	5	7	9
6	High	7	9	10
7	Very high	9	10	10

Source: According to Mijajlović et al., 2020

The following table 3 shows the results of the decision matrix.

Table 3. Decision Matrix

	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15
A1	3.400, 5.400, 7.400	3.400, 5.400, 7.400	3.200, 5.000, 7.000	3.000, 5.000, 7.000	4.600, 6.600, 8.400	3.800, 5.800, 7.800	3.200, 5.000, 7.000	3.400, 5.400, 7.400	3.400, 5.400, 7.400	1.800, 3.400, 5.400	4.600, 6.600, 8.600	4.200, 6.200, 8.200	3.800, 5.800, 7.800	2.200, 4.200, 6.200	2.600, 4.600, 6.600
A2	5.000, 7.000, 8.800	3.800, 5.800, 7.800	3.200, 5.000, 7.000	3.000, 5.000, 7.000	5.000, 7.000, 9.000	4.200, 6.200, 8.000	3.000, 5.000, 7.000	3.400, 5.400, 7.400	4.200, 6.200, 8.000	2.000, 3.800, 5.800	3.400, 5.400, 7.400	4.200, 6.200, 8.000	4.600, 6.600, 8.600	1.600, 3.400, 5.400	1.800, 3.400, 5.400
A3	5.400, 7.400, 9.200	5.000, 7.000, 8.800	4.600, 6.600, 8.200	4.600, 6.600, 8.600	5.000, 7.000, 8.400	4.600, 6.600, 8.200	4.200, 6.200, 8.000	3.400, 5.400, 7.400	3.200, 5.000, 6.800	3.400, 5.400, 7.400	3.800, 5.800, 7.800	4.600, 6.600, 8.200	5.000, 7.000, 8.400	3.400, 5.400, 7.200	3.600, 5.400, 7.200
A4	4.600, 6.600, 8.400	5.400, 7.400, 8.800	4.600, 6.600, 8.400	4.200, 6.200, 7.800	5.800, 7.800, 9.200	3.800, 5.800, 7.600	5.400, 7.400, 9.200	4.600, 6.600, 8.400	4.200, 6.200, 8.000	5.400, 7.400, 9.000	5.000, 7.000, 8.800	4.600, 6.600, 8.600	4.600, 6.600, 8.400	5.000, 7.000, 8.600	3.400, 5.400, 7.400
A5	5.000, 7.000, 8.600	5.200, 7.000, 8.400	3.800, 5.800, 7.800	2.800, 4.600, 6.600	6.200, 8.000, 9.400	5.000, 7.000, 8.600	5.400, 7.400, 9.000	5.800, 7.800, 9.200	4.600, 6.600, 8.400	5.000, 7.000, 8.800	6.200, 8.200, 9.600	5.000, 7.000, 8.600	5.400, 7.400, 9.200	5.400, 7.400, 9.200	4.600, 6.600, 8.400

Source: Authors

The normalized decision matrix is shown in the table below.

Table 4. Normalized decision matrix

	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15
A1	0.459, 0.630, 1.000	0.386, 0.614, 0.841	0.381, 0.595, 0.841	0.349, 0.581, 0.833	0.489, 0.702, 0.894	0.442, 0.674, 0.907	0.348, 0.543, 0.761	0.370, 0.587, 0.804	0.405, 0.643, 0.881	0.200, 0.378, 0.600	0.479, 0.688, 0.896	0.488, 0.721, 0.953	0.413, 0.630, 0.848	0.239, 0.457, 0.674	0.310, 0.548, 0.786
A2	0.386, 0.486, 0.680	0.432, 0.659, 0.886	0.381, 0.595, 0.833	0.349, 0.581, 0.814	0.532, 0.745, 0.957	0.488, 0.721, 0.930	0.326, 0.543, 0.761	0.370, 0.587, 0.804	0.500, 0.738, 0.952	0.222, 0.422, 0.644	0.354, 0.563, 0.771	0.488, 0.721, 0.930	0.500, 0.717, 0.935	0.174, 0.370, 0.587	0.214, 0.405, 0.643
A3	0.370, 0.459, 0.630	0.568, 0.795, 1.000	0.548, 0.786, 0.976	0.535, 0.767, 1.000	0.532, 0.745, 0.894	0.535, 0.767, 0.953	0.457, 0.674, 0.870	0.370, 0.587, 0.804	0.381, 0.595, 0.810	0.378, 0.600, 0.822	0.396, 0.604, 0.813	0.535, 0.767, 0.953	0.543, 0.761, 0.913	0.370, 0.587, 0.783	0.429, 0.643, 0.857
A4	0.405, 0.515, 0.739	0.614, 0.841, 1.000	0.548, 0.786, 1.000	0.488, 0.721, 0.907	0.617, 0.830, 0.979	0.442, 0.674, 0.884	0.587, 0.804, 1.000	0.500, 0.717, 0.913	0.500, 0.738, 0.952	0.600, 0.822, 1.000	0.521, 0.729, 0.917	0.535, 0.767, 1.000	0.500, 0.717, 0.913	0.543, 0.761, 0.935	0.405, 0.643, 0.881
A5	0.395, 0.486, 0.680	0.591, 0.795, 0.955	0.452, 0.690, 0.929	0.326, 0.535, 0.767	0.660, 0.851, 1.000	0.581, 0.814, 1.000	0.587, 0.804, 0.978	0.630, 0.848, 1.000	0.548, 0.786, 1.000	0.556, 0.778, 0.978	0.646, 0.854, 1.000	0.581, 0.814, 1.000	0.587, 0.804, 1.000	0.587, 0.804, 1.000	0.548, 0.786, 1.000

Source: Authors

The following table 5 shows the weighted normalized decision matrix

Table 5. The weighted normalized decision matrix

	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15
A1	0.031, 0.042, 0.067	0.026, 0.041, 0.056	0.026, 0.040, 0.056	0.023, 0.039, 0.055	0.033, 0.047, 0.060	0.030, 0.045, 0.061	0.023, 0.036, 0.051	0.025, 0.039, 0.054	0.027, 0.043, 0.059	0.013, 0.025, 0.040	0.032, 0.046, 0.060	0.033, 0.048, 0.064	0.028, 0.042, 0.057	0.016, 0.031, 0.045	0.021, 0.037, 0.053
A2	0.026, 0.033, 0.046	0.029, 0.044, 0.059	0.026, 0.040, 0.056	0.023, 0.039, 0.055	0.036, 0.050, 0.064	0.033, 0.048, 0.062	0.022, 0.036, 0.051	0.025, 0.039, 0.054	0.034, 0.049, 0.064	0.015, 0.028, 0.043	0.024, 0.038, 0.052	0.033, 0.048, 0.062	0.034, 0.048, 0.063	0.012, 0.025, 0.039	0.014, 0.027, 0.043
A3	0.025, 0.031, 0.042	0.038, 0.053, 0.067	0.037, 0.053, 0.065	0.036, 0.051, 0.067	0.036, 0.050, 0.060	0.036, 0.051, 0.064	0.031, 0.045, 0.058	0.025, 0.039, 0.054	0.026, 0.040, 0.054	0.025, 0.040, 0.055	0.027, 0.040, 0.054	0.036, 0.051, 0.064	0.036, 0.051, 0.061	0.025, 0.039, 0.052	0.029, 0.043, 0.057
A4	0.027, 0.035, 0.050	0.041, 0.056, 0.067	0.037, 0.053, 0.067	0.033, 0.048, 0.061	0.041, 0.056, 0.066	0.030, 0.045, 0.059	0.039, 0.054, 0.067	0.034, 0.048, 0.061	0.034, 0.049, 0.064	0.040, 0.055, 0.067	0.035, 0.049, 0.061	0.036, 0.051, 0.067	0.034, 0.048, 0.061	0.036, 0.051, 0.063	0.027, 0.043, 0.059
A5	0.026, 0.033, 0.046	0.040, 0.053, 0.064	0.030, 0.046, 0.062	0.022, 0.036, 0.051	0.044, 0.057, 0.067	0.039, 0.055, 0.067	0.039, 0.054, 0.066	0.042, 0.057, 0.067	0.037, 0.053, 0.067	0.037, 0.052, 0.066	0.043, 0.057, 0.067	0.039, 0.055, 0.067	0.039, 0.054, 0.067	0.039, 0.054, 0.067	0.037, 0.053, 0.067

Source: Authors

The positive and negative ideal solutions are presented in the following Table 6. From it, we can observe that within the group of economic criteria, the price of tourism services/products has an advantage over other criteria in that group. Similarly, the criteria of diversity of agricultural resources and importance of local community development have advantages within the group of ecological criteria and sociological criteria, respectively.

Table 6. The positive and negative ideal solutions

	Positive ideal	Negative ideal
Price of tourism services/products	(0.025, 0.031, 0.042)	(0.031, 0.042, 0.067)
Quality of offered services and organization	(0.041, 0.056, 0.067)	(0.026, 0.041, 0.056)
Accommodation facilities	(0.037, 0.053 ,0.067)	(0.026, 0.040, 0.056)
Transportation connectivity	(0.036, 0.051, 0.067)	(0.022, 0.036, 0.051)
Attractiveness of services for tourists	(0.044, 0.057, 0.067)	(0.033, 0.047, 0.060)
Availability of natural resources	(0.039, 0.055, 0.067)	(0.030, 0.045, 0.059)
Quality of natural resources	(0.039, 0.054, 0.067)	(0.022, 0.036, 0.051)
Landscape/environment	(0.042, 0.057, 0.067)	(0.025, 0.039, 0.054)
Diversity of agricultural resources	(0.037, 0.053, 0.067)	(0.026, 0.040, 0.054)
GeoFigureic characteristics	(0.040, 0.055, 0.067)	(0.013, 0.025, 0.040)
Offer of local products	(0.043, 0.057, 0.067)	(0.024, 0.038, 0.052)
Possibility of organizing new tourism activities and events	(0.039, 0.055, 0.067)	(0.033, 0.048, 0.062)
Accessibility of tourist facilities	(0.039, 0.054, 0.067)	(0.028, 0.042, 0.057)
Transfer of knowledge from tradition to consumers	(0.039, 0.054, 0.067)	(0.012, 0.025, 0.039)
Importance of local community development	(0.037, 0.053,0.067)	(0.014, 0.027, 0.043)

Source: Authors

In comparison to the results of previous similar studies in neighboring regions and countries, we can observe both similarities and differences. For example, in the research conducted by Nedeljković et al., (2022a) on the development of rural tourism in Brčko

District, they identified rural facilities and services as the highest-rated criterion among the analyzed households. However, Nedeljković et al., (2022) in a study focusing on the territory of Republic of Srpska identified criteria from the ecological group as the highest-rated among the selected households, with price being the dominant economic criterion. Another recent study (Puška et al., 2022) in this field, covering the territory of Bosnia and Herzegovina, also emphasized the dominance of economic criteria in the selection of rural households, particularly price and quality, which aligns somewhat with the findings of this research. Any differences among these studies are likely influenced by the fact that different regions were examined, each with its own specificities and variations.

Table 7 shows the distance from the positive and negative ideal solutions.

Table 7. Distance from positive and negative ideal solutions

	Distance from positive ideal	Distance from negative ideal
Alternative 1	0.207	0.031
Alternative 2	0.193	0.044
Alternative 3	0.112	0.126
Alternative 4	0.06	0.177
Alternative 5	0.029	0.207

Source: Authors

The best obtained alternative is the closest to the Positive Ideal Solution (FPIS) and the furthest from the Negative Ideal Solution (FNIS). The coefficients of closeness for each alternative and their ranking are shown in the following Table 8.

Table 8. Ranking of alternatives

	Ci	Rank
Alternative 1	0.131	5
Alternative 2	0.184	4
Alternative 3	0.53	3
Alternative 4	0.748	2
Alternative 5	0.876	1

Source: Authors

The visual representation of the closeness coefficients for each of the provided alternatives is shown in Figure 1, which follows in the paper. From the Figure, we observe that alternative 5, or the household "*Radoja*" is rated the highest. This particular household is located in an extremely rural area in the village of Pljeva, at an altitude of 450 meters and seven kilometers away from the city of Šipovo. The household is situated near the Pliva River, and the surrounding area is mountainous, characterized by untouched and attractive nature that fully enables the organization of all essential tourist activities.

Figure 1. Closeness coefficient
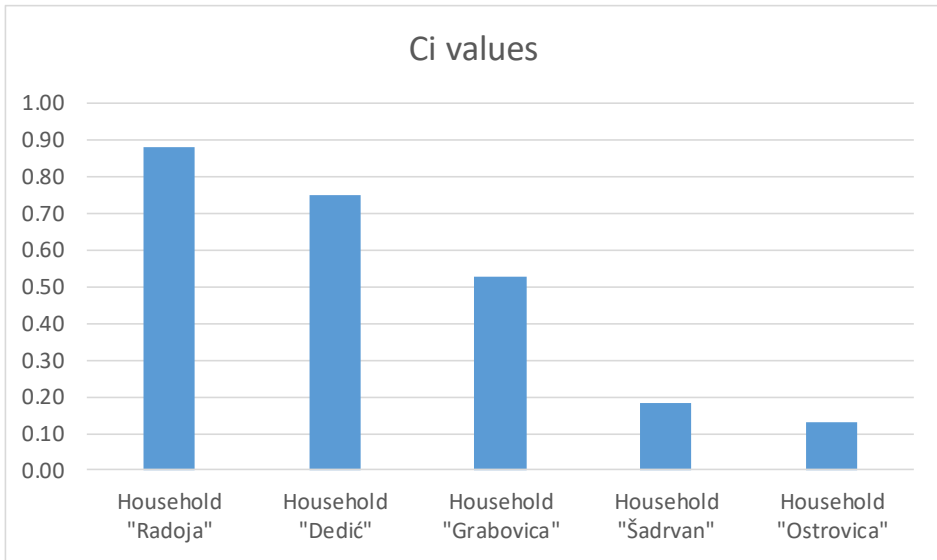
Source: Authors

Conclusions

The study considered and applied a multi-criteria decision-making model in selecting a household engaged in rural tourism. Based on the evaluation of five rural tourist destinations chosen by five experts in the field, the household "Radoja" from the municipality of Šipovo was selected as the best-rated alternative. The criteria considered were of economic, ecological, and sociological nature. Due to the significance of rural tourism for the entire territory of Bosnia and Herzegovina, rural households from five different regions were included in the study. The mentioned household effectively utilized all the unique features offered by the natural surroundings in this part of Bosnia and Herzegovina, making it a valuable example for the overall development of this form of tourism in the country. This, of course, has significant implications for the local development of this area.

The chosen decision-making method used in the study has proven to be highly flexible for research purposes, but it does not exclude the use of other multi-criteria analysis methods in this field. The focus of future research in rural tourism should be on the application of these methods in other rural regions of the country, with the aim of establishing rational guidelines for further development of rural tourism in those areas.

Conflict of interests

The authors declare no conflict of interest.

References

1. Adamov, T., Ciolac, R., Iancu, T., Brad, I., Pet, E., Popescu, & G., et al. (2020). Sustainability of agritourism activity: Initiatives and challenges in Romanian mountain rural regions. *Sustainability 12* (6), 2502. doi:10.3390/su12062502

2. Anabestani, A. (2016). An Analysis of Factors Affecting Tourism Brands in Rural Settlements ff Iran (Case Study: Binaloud County). *The Turkish Online Journal of Design*, Art and Communication, Special Edition, 2061-2075. doi: 10.7456/1060AGSE/084

3. Blešić, I., Petrović, M., Gajić, T., Tretiakova, T., Vujičić, M., & Syromiatnikova, J. (2021). Application of the analytic hierarchy process in the selection of traditional food criteria in Vojvodina (Serbia). *Journal of Ethnic Foods*, 8, 20,5

4. Cvijanović, D., Gajić, T., & Cvijanović, D. (2021). Achieving the Complete Quality of the Rural Gastronomy in Vojvodina. *International Yearbook Faculty of Security Skoplje*, 1, 43-53.

5. Dileep Kumar, M., Govindarajo, N. S., & Khen, M. H. S. (2020). Effect of Service Quality on Visitor Satisfaction, Destination Image and Destination Loyalty – Practical, Theoretical and Policy Implications to Avitourism. *International Journal of Culture*, *Tourism and Hospitality Research*, 14 (1), pp. 83-101.

6. Ezung, T. Z. (2011). Rural Tourism in Nagaland, India: Exploring the Potential. *International Journal of Rural Management*, 7(1-2), pp. 133-147.

7. Giaccio, V., Giannelli, A., & Mastronardi, L. (2018). Explaining determinants of agri-tourism income: Evidence from Italy. *Tour. Rev*. 73 (2), 216–229. doi:10.1108/tr-05-2017-0089

8. He, Y., He, P., Xu, F. & Shi, C. (2019). Sustainable tourism modeling: Pricing decisions and evolutionarily stable strategies for competitive tour operators. Tour. Econ. *25*(5), 779–799. doi:10.1177/1354816618806729

9. Hopkins, D. (2020). Sustainable mobility at the interface of transport and tourism. J. Sustain. Tour. *28*(2), 129–143. doi:10.1080/09669582.2019.1691800

10. Jeong, J.S., García-Moruno, L., Hernandez-Blanco, J., & Sanchez-Ríos, A. (2016). Planning of rural housings in reservoir areas under (mass) tourism based on a fuzzy DEMATEL-GIS/MCDA hybrid and participatory method for Alange, Spain. Habitat International, 57, pp. 143-153. doi: 10.1016/j.habitatint.2016.07.008

11. Kostić, M., & Stanišić, T. (2022). Potentials and effects of future rural tourism development in the Republic of Serbia. *Tourism International Scientific Conference Vrnjačka Banja* - TISC, *7*(1), Faculty of Hotel Management and Tourism, Vrnjačka Banja pp. 347-362. Retrieved from http://www.tisc.rs/proceedings/index.php/hitmc/issue/view/12/12

12. Mahboban, S., & Talebi, T. (2015). Potential Assessment of Heris Tourism Attractions with the Emphasis on New Markets Introduction Using TOPSIS Model. *Indian Journal of Fundamental and Applied Life Sciences*, 5(S2), pp. 957-967.

13. Maksimović, M., Janovac, T., Karabašević, D., & Brzaković, M. (2018). Solution of general and prevention of ecological problems of Stara Planina Mountain as potential obstacles to the development of rural tourism. *Economics of Agriculture*, *65*(2), pp. 531-544.

14. Mijajlović, M., Puška, A., Stević, Ž., Marinković, D., Doljanica, D., Virijević Jovanović, S., Stojanović, I., & Beširović, J. (2020). Determining the Competitiveness of Spa-Centres in Order to Achieve Sustainability Using a Fazzy MultiCriteria Decision-Making Model, *Sustainability*, 12. 8584, doi:10.3390/su12208584

15. Muhacir, E.S.A., & Tazebay, I. (2017). A tool in determination of rural tourism alternatives: the ecosystem services approach. *Turkish Journal of Forestry*, *18*(1), 74-81. doi: 10.18182/tjf.308633

16. Muresan, I. C., Harun, R., Arion, F. H., Oroian, C. F., Dumitras, D. E., Mihai, & V. C., et al. (2019). Residents' perception of destination quality: Key factors for sustainable rural development. *Sustainability* 11, 2594. doi:10.3390/su11092594

17. Nedeljković, M., Puška, A., & Krstić, S. (2022). Multicriteria Approach to Rural Tourism development in Republic of Srpska. *Economics of Agriculture*, *69*(1), 13–26. doi:10.5937/ekoPolj2201013N

18. Nedeljković, M., Puška, A., Đurić, A., & Polcyn, J. (2022a). Evoluation of Rural Tourism in the Area of Brcko District using Multi-criterial Decision-making Methods. *International Review*, No. 2-4, pp. 136-145.   doi: 10.5937/intrev2204143N

19. Nikolić, D., Spasić, J., Živković, Ž., Djordjević, P., Mihajlović, I., & Kangas, J. (2015). SWOT - AHP model for prioritzation of strategies of the resort Stara Planina. *Serbian Journal of Management*, *10*(2), pp. 141-150. doi: 10.5937/sjm10-8928

20. Palmi, P., & Lezzi, G. E. (2020). How authenticity and tradition shift into sustainability and innovation: Evidence from Italian agritourism. *Int. J. Environ. Res. Public Health 17*(15), 5389. doi:10.3390/ijerph17155389

21. Pantić, N., Mikulič, K., & Lekovič, M. (2022). The influence of claims payments on the investment portfolio of insurance companies. *Oditor*, *8*(3), 42-71. https://doi.org/10.5937/Oditor2203042P

22. Pantović, D., Seočanac, M., Đorđević, N. (2023). Cultural values, tourism valorization and authenticity: the case of Vrnjačka Banja*, The European Journal of Applied Economics*, 20(1), 93-106. https://doi.org/10.5937/ejae20-42657

23. Park, D-B., Kim, K-H., & Choo, H. (2017). The Development of Quality Standards for Rural Farm Accommodations: A Case Study in South Korea. *Journal of Hospitality & Tourism Research*, *41*(6), 673-695. doi: 10.1177/1096348014550871

24. Podovac, M., Đorđević, N., & Milićević, S. (2019). Rural tourism in the function of life quality improvement of rural population on Goč mountain. *Economics of Agriculture*, *66*(1), pp. 205-220.

25. Prevolšek, B., Maksimović, A., Puška, A., Pažek, K., Žibert, M., & Rozman, Č. (2020). Sustainable Development of Ethno-Villages in Bosnia and Herzegovina-A Multi Criteria Assessment. *Sustainability*, *12*(4), 1399.

26. Puška, A., Maksimović, A., Grgić, Z., & Šakić Bobić, B. (2020). Improving competitiveness of agritourism in Bosnia and Herzegovina by using the decision support model. Econ. Thought Pract. *49*(1), 227–246.

27. Puška, A., Nedeljković, M., Jeločnik, M., Subić, J., Nancu, D., & Andrei, JV. (2022). An assessment of improving the sustainable agro-touristic offer in an emerging country using the integrative approach based on fuzzy logic. *Frontiers in Environmental Science*, doi 10.3389/fenvs.2022.894811

28. Puška, A., Pamucar, D., Stojanović, I., Cavallaro, F., Kaklauskas, A., & Mardani, A. (2021). Examination of the Sustainable Rural Tourism Potential of the Brčko District of Bosnia and Herzegovina Using a Fuzzy Approach Based on Group Decision Making. *Sustainability*. 13(2), 583. doi: 10.3390/su13020583

29. Puška, A., Stojanović, I., & Maksimović, A. (2019). Evaluation of sustainable rural tourism potential in Brcko district of Bosnia and Herzegovina using multi-criteria analysis. *Operational Research in Engineering Sciences*: Theory and Applications, *2*(2), 40-54, doi: 10.31181/oresta1902039p

30. Puška, A., Šadić, S., Maksimoviić, A., & Stojanoviić, I. (2020a). Decision support model in the determination of rural touristic destination attractiveness in the Brčko District of Bosnia and Herzegovina. Tour. Hosp. Res. 20, 387–405.

31. Ristic, L. (2013). Strategic Management of Sustainable Rural Development in the Republic of Serbia. *Ekonomski horizonti*, *15*(3), pp. 229-243.

32. Roman, M., Roman, M., & Prus, P. (2020). Innovations in agritourism: Evidence from a region in Poland. *Sustainability 12*(12), 4858. doi:10.3390/ su12124858

33. Romao, J., Kourtit, K., Neuts, B., & Nijkamp, P. (2018). The smart city as a common place for tourists and residents: A structural analysis of the determinants of urban attractiveness. Cities 78, 67–75. doi:10.1016/j.cities.2017.11.007

34. Sagić, Z., Lakićević, M., & Durkalić, D. (2019). Analysis of tourist turnover in a rural tourism destination – case study of Ivanjica. *Economics of Agriculture*, 66(3), 835–850. https://doi.org/10.5937/ekoPolj1903835S

35. Spenceley, A. (2019). Sustainable tourism certification in the African hotel sector. Tour. Rev. *74*(2), 179–193. doi:10.1108/TR-09-2017-0145

36. Stankov, B., & Roganović, M. (2022). Pružanje podrške i podsticanje razvoja malih i srednjih preduzeća u Evropskoj uniji. *Akcionarstvo – časopis za menadžment, 28*(1) 21-43.

37. Stevanović, A., Mitrović, S., & Rajković, A. (2022). Application of information technologies and the internet in modern business. *Oditor*, *8*(2), 54-74. https://doi.org/10.5937/Oditor2202054S

38. Šarković, A. (2018). TV as a factor in development of rural tourism. Tourism *International Scientific Conference Vrnjačka Banja* - TISC, Faculty of Hotel Management and Tourism, Vrnjačka Banja 3(2), pp. 506-520. Retrieved from http://www.tisc.rs/proceedings/index.php/hitmc/article/view/72/70

39. Tseng, M. L., Chang, C. H., Wu, K. J., Lin, C. W. R., Kalnaovkul, B., & Tan, R. R. (2019). Sustainable agritourism in Thailand: Modeling business performance and environmental sustainability under uncertainty. *Sustainability* 11, 4087. doi:10.3390/su11154087

40. Wang, G. (2021). Innovation and Development of Rural Leisure Tourism Industry Using Mobile Cloud IoT Computing. Wireless Communications and Mobile Computing 2021., Article ID 6211063.

41. Yavuz, M. (2016). Equipmnet Selection by using Fazzy TOPSIS Method, World Multidisciplinary Earth Sciences Symposium (WMESS 2016), pp. 1-5, doi:10.1088/1755-1315/44/4/042040

42. Zhang, T., Chen, J., & Hu, B. (2019). Authenticity, quality, and loyalty: Local food and sustainable tourism experience. *Sustainability* 11, 3437. doi:10.3390/su11123437

43. Zhang, Y., Li, W., Li, Z., Yang, M., Zhai, F., Li, Z., Yao, H., & Li, H. (2022). Spatial Distribution Characteristics and Influencing Factors of Key Rural Tourism Villages in China. *Sustainability*, 14, 14064.

44. Zolfani, S H., Sedaghat, M., Maknoon, R., & Zavadskas, E K. (2015). Sustainable tourism: a comprehensive literature review on frameworks and applications. *Economic Research*, 28(1), pp.1-30, http://dx.doi.org/10.1080/1331677X.2014.995895