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## EVALUATION OF INVESTMENT ATTRACTIVENESS IN RECREATION AREAS OF TRANSCARPATHIAN REGION

*The article analyzes the investment attractiveness of recreational areas of the Transcarpathian region by the 3 groups of indicators using a fuzzy logic methodology. An illustration of priorities in attracting investment in recreational areas of the Transcarpathian region is offered.*

*Keywords:* recreation area; investment attractiveness; fuzzy logic; natural recreational resources; historical and architectural resources; socioeconomic factors.

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## ОЦІНЮВАННЯ ІНВЕСТИЦІЙНОЇ ПРИВАБЛИВОСТІ РЕКРЕАЦІЙНИХ ТЕРИТОРІЙ ЗАКАРПАТСЬКОЇ ОБЛАСТІ

*У статті проаналізовано інвестиційну привабливість рекреаційних територій Закарпатської області за 3 групами показників з використанням методології нечіткої логіки. Створено таблицю пріоритетів при залученні рекреаційних інвестицій у рекреаційні зони Закарпатської області.*

*Ключові слова:* рекреаційна зона; інвестиційна привабливість; нечітка логіка; природно-рекреаційні ресурси; історико-архітектурні ресурси; соціально-економічні чинники.

*Табл. 4. Рис. 1. Літ. 11.*

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## ОЦЕНКА ИНВЕСТИЦИОННОЙ ПРИВЛЕКАТЕЛЬНОСТИ РЕКРЕАЦИОННЫХ ТЕРРИТОРИЙ ЗАКАРПАТСКОЙ ОБЛАСТИ

*В статье проанализирована инвестиционная привлекательность рекреационных территорий Закарпатской области по 3 группам показателей с использованием методологии нечеткой логики. Создана таблица приоритетов при привлечении рекреационных инвестиций в рекреационные зоны Закарпатской области.*

*Ключевые слова:* рекреационная зона; инвестиционная привлекательность; нечеткая логика; природно-рекреационные ресурсы; историко-архитектурные ресурсы; социально-экономические факторы.

**Problem setting.** A precondition for the development of any branch of the national economy is its priority determination by the state and investment support of development. Art. 6 of the Law of Ukraine "On Tourism" declares that the State proclaims tourism as one of the preferred directions of the economy and culture development and creates conditions for tourism activities. One of the priorities of the state policy in the field of tourism is to ensure the development of recreation and tourism as a highly profitable sector of the economy of Ukraine, to encourage domestic and foreign investment in the development of the tourism industry, creating new jobs. In conditions of transitional economics the state is unable to adequately provide the development of the recreational sector with its own resources. Therefore, it is reasonable for the state to operate as a guarantor in attracting private investment and its protection.

**Latest research and publications analysis.** The researches of recreational and tourist complex of Transcarpathian region and the Carpathian region on the whole

are represented by the works of such scholars as M.I. Dolishniy (1984), O.I. Hulych, L.S. Hryniv and N.M. Gerasymchuk (2007), V.I. Matsola (1998) and others. However, the above investigations address mainly the general characteristics of natural and recreational resources of the Transcarpathian region without paying proper attention to its qualitative and quantitative characteristics. Thorough quantitative estimation of administrative districts was made by the scientists O.S. Molnar and O.I. Marchenko (2007). The researchers made numerical score of natural and recreational, cultural and historic resources of recreational areas of Transcarpathia and spent its ranking.

**Unresolved issues.** To study the investment attractiveness of the recreational areas of Transcarpathia the research works of the above mentioned authors are incomplete and objective estimation of investment attractiveness should be complemented by a number of additional investigations. In particular, we attempted to accomplish the following:

- make an evaluation of thermal waters;
- make an evaluation of balneological resources based on debit of resource, but not on the number of wells, because, in our opinion, the number of wells does not objectively reflect the investment potential of the area for this indicator;
- investigate the potential of geomorphological structure of the territory;
- perspectivity of forest areas for recreation and tourism should be explored by the indicator of optimal wooded area (50–60% of the territory), but not the maximum one;
- research limitations in the development of recreation and tourism on a given territory from the standpoint of the presence of sources of environmental pollution;
- research investment attractiveness from the standpoint of infrastructural, employment potential, the number of recreants who visit this area during the year etc.

The aim of the research is to explore the investment attractiveness of recreational areas of Transcarpathian region in terms of strategic planning of its investment development, including the application of methodological toolkit of fuzzy set theory, which has been highlighted in details by the author in R. Slavik (2011), based on fuzzy logic proposed by L.A. Zadeh (1976).

**Key research findings.** Under the recreational areas we mean the administrative districts of Transcarpathia, because within them the management, infrastructure and resource components are concentrated. The set of indicators of estimation of investment attractiveness we will divided into 3 main blocks, which then combine and derive the integral indicator. So we will examine recreational territories for definite indicators, each of which contains a set of factors of estimation (Table 1).

Results of the analysis of weighting coefficients for the 3 categories of indicators are shown in Table 2, where the variables are taken such meanings:

- $\sum_i k_{ij}$  – the sum of weighting coefficients of certain recreational territory;
- $\max_i k_{ij}$  and  $\min_i k_{ij}$  – maximum and, respectively, minimum weight coefficient (show competitive advantages and weaknesses of the  $i$ -recreational territory);
- $k_{i\text{aver}}$  – arithmetic average of weighting coefficients;
- $v$  – coefficient of variation of weights is calculated on the basis of standard deviation  $\sigma$  in percentage and shows the extent of riskiness in attraction of investments in specific recreational territory.

**Table 1. The set of data to be analyzed in determining the investment attractiveness of recreational territories, developed by the author**

Indicators	Factors of estimation
Natural and recreational resources	<ul style="list-style-type: none"> <li>- Number of wells and debit of mineral waters.</li> <li>- Number of wells and debit of thermal waters.</li> <li>- Forest coverage.</li> <li>- Water resources.</li> <li>- Nature reserve fund.</li> <li>- Geomorphological structure of the territory.</li> <li>- Sources of pollution.</li> </ul>
Historic and architectural resources	<ul style="list-style-type: none"> <li>- Attractions of archeology of national importance.</li> <li>- Architectural monuments of national and local importance.</li> <li>- Historical monuments of local importance (building).</li> <li>- Attractions of monumental art (including graves, memorial plaques, burial places of soldiers-liberators of World War II, located in Transcarpathia).</li> <li>- Museums.</li> </ul>
Socioeconomic factors	<ul style="list-style-type: none"> <li>- The number of recreants who visit this territory during the year.</li> <li>- The volume of tourist and recreational services.</li> <li>- The density of public roads with hard surface.</li> <li>- The number of persons not involved in labor activities.</li> <li>- Average salary of regular employees.</li> </ul>

**Table 2. The cumulative analysis of aggregates of investment attractiveness in recreational territories of Transcarpathia**

Recreational territories	$\sum_i k_{ij}$ of natural and recreational resources	$\sum_i k_{ij}$ of historic and architectural resources	$\sum_i k_{ij}$ of socio-economic factors	$\max_i k_{ij}$	$\min_i k_{ij}$	$k_{i \text{ avg}}$	$v$ (%)	$\sum_i k_{ij}$	rank
Uzhhorodska	3.2999	4.5162	3.9189	1.4196	0.0423	0.6903	57.1	11.735	1
Perechynska	1.9743	0.66	1.5852	0.763	0	0.2482	91.4	4.2195	13
Velikobereznianska	3.4387	0.5203	1.6509	1	0	0.323	95.2	5.6099	10
Volovetska	1.9819	0.7448	1.8397	0.8013	0	0.2686	98.5	4.5664	12
Svaljavska	1.6299	0.8112	3.096	1	0	0.3257	92.8	5.5371	11
Mukachivska	2.3693	3.0143	3.7279	1	0.1075	0.536	58.5	9.1115	4
Beregivska	3.4602	3.0087	3.347	1	0.0176	0.5774	67.4	9.8159	3
Vinogradivska	2.26	2.4876	2.4025	1	0.0408	0.4206	81.7	7.1501	6
Irshavska	2.3145	1.3736	2.1114	1	0.0015	0.3411	79.5	5.7995	9
Khustska	2.1843	1.87	2.5308	0.8948	0.0068	0.3874	76	6.5851	8
Tjachivska	2.8901	1.2797	2.5221	0.873	0	0.3936	70.9	6.6919	7
Mizhivska	6.085	2.121	2.1731	2	0	0.6105	82.2	10.3791	2
Rakhivska	4.2538	1.0891	2.1199	1.4308	0	0.439	86.9	7.4628	5

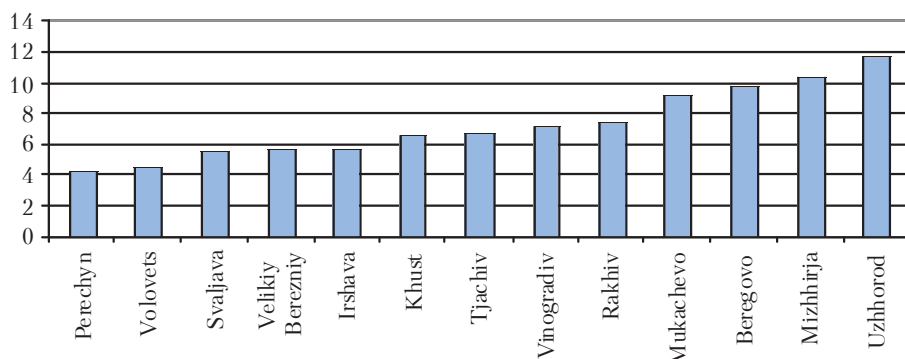
Based on the data from statistical yearbooks and official data of specialized departments in Transcarpathian RSA.

Calculating the sum of coefficients of investment attractiveness of recreational territories in Transcarpathian region by the presence of natural and recreational, historic and architectural and evaluation of socioeconomic indicators we get the following picture (Figure 1).

Consolidated indicator of the degree of belonging of recreational territories to this or that linguistic terms in result of the evaluation of all the 3 groups of indicators are shown in Table 3, where linguistic terms have the following fuzzy formulation:

- *MA* – most attractive territories for investments;
- *AA* – level of attractiveness above average;
- *BA* – below average level of attractiveness;

- LA – least attractive territories for investments;
- $S_i [0;1]$  – set of values of  $\sum_j k_{ij}$  in the range of values from 0 to 1, so that  $S_i$  min = 0, a  $S_i$  max = 1.



Based on the data from statistical yearbooks and official data of specialized departments in Transcarpathian RSA.

Figure 1. The set of values of the  $\sum_j k_{ij}$  as a result of the evaluation of the three types of indicators

Table 3. Belonging of recreational territories to determined linguistic terms as a result of the evaluation of natural and recreational, historic and architectural resources and socioeconomic factors

Recreational territories	$S_i [0;1]$	Linguistic terms			
		LA	BA	AA	MA
Uzhhorodska	1	0	0	0	1
Perechynska	0	1	0	0	0
Veliko-Berezniyanska	0.185	1	0	0	0
Volovetska	0.0462	1	0	0	0
Svaljavaska	0.1753	1	0	0	0
Mukachivska	0.6509	0	0	1	0
Beregivska	0.7446	0	0	0.554	0.446
Vinogradivska	0.3899	0	1	0	0
Irshavska	0.2102	0.898	0.102	0	0
Khustska	0.3148	0	1	0	0
Tjachivska	0.329	0	1	0	0
Mizhhirska	0.8196	0	0	0	1
Rakhivska	0.4315	0	1	0	0

Based on the data from statistical yearbooks and official data of specialized departments in Transcarpathian RSA.

Analyzing the integral factors of investment attractiveness of recreational territories we can draw the following conclusions. The biggest competitive advantages in the market of investments are in Uzhhorodska, Mizhhirska and Beregivska recreational territories. Significant investment attractiveness are also allocated in Mukachevska and Rakhivska regions. However, it should be noted that the factors of investment attractiveness in these territories are different. Uzhhorodska, for example, has the advantage as the place where the largest number of buildings that are historic landmarks and museums are concentrated. Uzhhorodska recreation area is visited by the largest number of tourists throughout the year. Moreover, it has the greatest number of persons not involved in labor activities that are the potential labor force for the

upcoming institutions. Uzhgorodskiy district is relatively strong by indicators of debit of mineral waters. In addition, this territory has the lowest risk when investing. A qualitatively different situation is in the case of Mizhhirska district. The natural and recreational potential of the territory is here at the foreground. In particular, this recreation area is rich in undeveloped and unique mineral water. On this territory optimal forest coverage for management of recreation and tourism activities is observed. In addition, the Mizhhirska recreational territory has almost no large industrial objects – the sources of pollution. Competitive advantages of Beregivska recreational area for investors are the presence of thermal waters, architectural monuments, the highest density of road network and the relative cheapness of labor. Despite the significant potential in development of recreation and tourism, the least competitive advantages for a given set of parameters are allocated in Perechynska, Veliko-Berezniyanska, Volovetska, Svalyavska and Irshavska recreational territories. Low integral indicator of these territories could be explained by the absence of manifestations of thermal waters there. In addition, the weak side of these territories is the low availability of historic and architectural resources and generally underdeveloped market of recreational services.

Based on the data and analysis mentioned above, we can offer basic directions for the future development of recreational economy in Transcarpathian region through attracting of investment resources (Table 4). Thus, the limitations of the latter ones are given, and we can place some priorities in relation to the territories and directions of investment.

**Table 4. Table of recreational priorities in attracting investments in recreational areas of Transcarpathian region, developed by the author**

Directions of investment	Balneorecreation	Recreation on the basis of thermal waters	Recreation based on natural reservoirs	Rafting kayaking, canoeing	Ecological Recreation	Rural green tourism	Mountain ski recreation	Cultural Cognitive recreation	Road infrastructure
Recreational territories									
Uzhhorodska	+							+	
Perechynska							+		+
Veliko-Berezniyanska					+	+			+
Volovetska							+		
Svaljavska	+								
Mukachivska		+	+					+	
Beregivska		+	+			+		+	
Vinogradivska			+						
Irshavska						+			
Khustska				+					
Tjachivska			+	+			+		+
Mizhhirska	+			+	+	+	+		+
Rakhivska	+			+	+	+	+		+

Analyzing the table above, we can classify recreational territories of the region in the following categories:

- areas that have relatively high income from recreation and tourism, but the limited assortment of recreational resources (Uzhgorodska, Mukachivska, Svalyavska);

- areas that have relatively low incomes from tourism and recreation, but have a large variety of recreational resources that are not sufficiently mastered (Rakhivska, Mizhhirska, Tyachivska, Beregivska);

- territories that need to identify or reinforce their competitive advantages in the market of recreational services (Irshavskaa, Vinogradivska, Volovetska, Perechynska).

The most suitable and promising for the development of investment is considered to be the second category, because there are favorable conditions for the establishment of local recreational clusters.

**Conclusions.** Based on the priority directions of recreational economy in Transcarpathian region development, we have outlined the main tasks that relate to investment development of recreational territories in general. This is primarily the following:

1. Settlement of socioeconomic issues of territories.
2. Diversification of recreational services.
3. Additional revenues to the budgets at all levels.
4. Rational use of natural recreational resources.
5. Sustainable development of territories.

**Prospects for further research.** Based on a comprehensive analysis of investment attractiveness of recreational areas for further research the authors should pay attention to the formation of investment strategy of recreational economy development of the region as a whole.

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