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**ASSESSMENT OF
BALNEOLOGICAL
RESOURCES FOR THE
NEEDS OF RESORT
ESTABLISHMENTS OF
IVANO-FRANKIVSK REGION**

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The topicality. The main natural recreational resources of Ivano-Frankivsk region are balneological, which include medicinal mineral waters, therapeutic mud and ozokerite. Mineral waters and, especially, medical occupy a significant place. **Purpose and methods.** The purpose of the study is a theoretical and methodological justification of the prospects for the development of balneological tourist and recreational resources in Ivano-Frankivsk region. To carry out this study a number of general scientific methods, approaches and techniques have been used which are applied in social geography. The authors have developed a new methodology for assessing natural recreational resources. In this study, balneological resources are on an example of Ivano-Frankivsk region. **Results.** The research examines the evaluation features of the distribution and development of balneological tourist and recreational resources of Ivano-Frankivsk region. The potential of spa treatment, which is not fully used, is thoroughly analyzed. In the article the authors propose to intensify the development of balneological resource potential of Ivano-Frankivsk region. In addition, it is proposed to divide the resorts of the region according to the specialization, which will correspond to a certain type of effective treatment of the disease. **Conclusions and discussions.** The study confirmed that Ivano-Frankivsk region has unique recreational and tourist resources. *The scientific novelty* of the study is to substantiate the prospects for the development of balneological tourist and

recreational resources for the needs of resorts in the Carpathians. The practical significance of the obtained results is manifested in the possibility of applying a comprehensive model of development of balneological tourist and recreational resources in Ivano-Frankivsk region.

Keywords: recreation, resort, balneology, mineral waters, therapeutic mud, ozokerite.

The topicality of the problem

The problem formulation. Ivano-Frankivsk region in terms of its physical-geographical, climatic, natural-resource and socio-economic conditions belongs to the territories favorable for the recreation development. Almost all types of recreational activities are developed in the region: from sanatorium treatment to recreation and various types of tourism carried out throughout the year.

Among the natural recreational resources of the greatest importance for the tourism industry and recreational activities are climatotherapeutic, water, balneological and landscape components.

Information on the use of healing mineral and thermal waters has a long history. A lot of archaeological finds indicate that the use of mineral waters was carried out from V millennium BC. People used thermal water for bathing and healing. At the spa resorts of the Carpathian tourist region with the help of mineral waters, patients treat diseases of the gastrointestinal tract, cardiovascular and nervous systems, respiratory tract, musculoskeletal system. The study of the main balneological resorts of Ivano-Frankivsk region is relevant, because Prykarpattia is one of the leaders in Ukraine in terms of the availability of this type of resorts.

State study of the problem. Ukrainian scientists V. H. Herasymenko, H. K. Bedradina, S. S. Halasiuk, K. A. Halasiuk, I. V. Davidenko deal with the issues of assessment of recreational resources of the Eastern Carpathians (2016); V. M. Klapchuk (2012), OO Klapchuk, V. M. Klapchuk (2013); VS Kravtsiv, LS Green, MV Kopach, S. P. Kuzyk (1999); I. H. Smyrnov (2009); L. Cherchyk, I. Yerko, N. Kolenda, O. Mishchenko (2014). Foreign scientists, unfortunately, pay little attention to the actual assessment of balneological resources and ranking of this indicator of administrative-territorial entities. However, important for the last 50 years is the study of the composition and characteristics of mineral waters of the Polish scientific school under the direction of L. Rejchel (Rajchel, 2017).

The authors of the article introduce into scientific circulation a new, own method of certain type's assessment of natural recreational resources.

Unresolved issues. Today still unresolved is the question of accounting for research and monitoring of natural resources, including mineral water, curative mud and mineral wax. There is a cadastre of only industrial reserves of minerals, but important for the resort are some small reserves of balneological resources, which are of exceptional health value. It is the identification and balneological study of such deposits will allow expanding the network of resorts.

Purpose and research methods

The purpose of the research is a theoretical and methodological justification of the prospects for the development of balneological tourist and recreational resources of Ivano-Frankivsk region.

The methodological basis of this study is the conceptual foundations of social geography, which are integrated into the practical solution of the urgent needs of balneology and services.

Research methods. To carry out this study, a number of general scientific methods, approaches and techniques used in social geography were used.

The object of the study is the process of assessing balneological resources for the needs of resorts in Ivano-Frankivsk region.

The subject of research is theoretical and applied aspects of research and evaluation of deposits and balneological resources, mineral waters, therapeutic mud and ozokerite.

Methodological and informational basis of the study are monographs and scientific works of domestic scientists, electronic resources, to perform the tasks, a comprehensive assessment of the regional report of the Ivano-Frankivsk Regional State Administration was carried out and research methods were used: historiographical, field research, statistical, cartographic.

Research methodology. A number of general scientific *methods*, approaches and techniques used in social geography were used to carry out the research.

There are three main stages of the study:

1. in-house is collection of published and unpublished sources on balneological resources of Ivano-Frankivsk region;
2. evaluation is the definition of criteria and evaluation of resources;
3. innovation-proposal is implementation of balneological resource typification of administrative districts and proposals development for optimizing the use of mineral waters and therapeutic muds in the recreational sphere.

At the first stage of the study, information on balneological recreational resources of Ivano-Frankivsk region was collected. To achieve this, historiographical, field research and statistical methods have been used. The historiographical method consisted in the fullest possible study of literary sources; it helped to acquire basic knowledge about the area and the research history. In social geography, the traditional general scientific method of observation has been specified as field. The field research method is used for direct study of an object in nature by observing it, instrumentally measuring parameters, studying the functioning, structure or development. The statistical method consists in selection and processing of quantitative indicators of recreational resources. Using the statistical method, quantitative indicators of balneological recreational resources were obtained and characterized; these data also served as a basis for scoring.

If the first stage concerned the collection and processing of literary and archival sources, the second required clarification and optimization of methods for assessing recreational resources proposed earlier V.S. Kravtsev and others, and V.M. Klapchuk and others (Klapchuk, 2012; Klapchuk et al., 2013; Kravtsiv et al., 1999). These methods have been used as a basis for establishing criteria for evaluating recreational resources and calculating cognitive value coefficients using the method of sign formalization (Shabliy, 2001, pp. 55-56).

Balneological recreational resources of the region are divided into 5 groups taking into account their quantity and quality indicators in a certain administrative-territorial formation and evaluated, respectively, from 1 to 5 points (Table 1).

Table 1. Assessment of balneological tourist and recreational resources

Balneological tourist and recreational resources	Points				
	1	2	3	4	5
Source of mineral water of insignificant flow	+				
Low-power deposit of therapeutic mud or ozokerite		+			
A deposit of mineral water, or therapeutic mud, or ozokerite			+		
Mineral water and therapeutic mud (or ozokerite) deposit				+	
Complex of balneological resources (mineral waters, therapeutic muds and ozokerite deposits)					+

Source: own development

For each administrative district, the sum of points was calculated, which was determined by the sum of points of cognitive value of the territory for each group:

$$\sum A = Xx1 + Xx2 + Xx3 + Xx4 + Xx5, \tag{1}$$

where $\sum A$ – the sum of points of cognitive value of the territory;

X – the number of deposits of balneological resources;

1, 2, 3, 4, 5 – the number of points for each group of resources.

The next step was to establish the coefficient of cognitive value (K_p) of administrative districts of Ivano-Frankivsk region, which was determined by the formula:

$$K_p = \frac{\sum A}{\sum A_{region}}, \tag{2}$$

where K_p – coefficient of cognitive value;

$\sum A$ – the sum of points of the territory cognitive value;

$\sum A_{region}$ – the sum of the region's points.

The following scale was proposed and used to rank the levels of cognitive value of administrative districts (based on the value of K_p):

- < 5 – unattractive;
- 5,01–10 – little attractive;
- 10,01–15 – moderately attractive;
- 15,01–20 – highly attractive;

The last stage of the research was the creation of a map of the cognitive value of the administrative districts in Ivano-Frankivsk region, for which an interdisciplinary cartographic method was used (Liubitseva, 2002, p. 136).

Research results

On the territory of Ukraine there are 2233 deposits of combustible, 147 metallic and 4676 non-metallic minerals, as well as 1705 deposits of groundwater, therapeutic mud and brine (Table 2) (“Mineral resources of Ukraine”, b.r.).

Table 2. The state of reserves of mineral deposits in Ukraine by balneological purpose

Mineral	Units of measurement (stocks)	Number of plots		Stocks as of 01.01.2020				Stocks were repaid in 2019		
		Total	Under development	Balance sheet, total		Balance, in development		Production	Use	Reset and natural unloading
				A+B+C ₁	C ₂	A+B+C ₁	C ₂			
Mineral groundwater	m ³ / day	340	168	94 334,2	1010	30 628,8	192	8856,9	5622,3	3234,6
Therapeutic mud (peloids)	thousand m ³	15	7	1707,0		446,5		3,3	3,3	
Brine is medicinal	m ³ / day	3	2	798,9		265,9		73,4	73,4	

Source: own development

Mineral waters. In the Ivano-Frankivsk region, 321 deposits of 26 types of minerals (oil, gas, potassium salts, building materials, etc.) have been explored. Exploration and evaluation works were carried out for 23 mineral water deposits and reserves in category C1 were approved. Among them are analogues of “Naftus”, “Morshynska”, “Yesentukiv” (“Ecological Passport”, 2019, p. 142). The State Commission of Ukraine for Mineral Reserves approved 14 reserves of mineral waters of the region with the total flow rate of 951.4 m³ / day. From them: natural-dining – 742,4 m³ / days: medical – 209,0 m³ / days.

Mineral water deposits in the Ivano-Frankivsk region are located haphazardly, taking into account the diversity of geological worlds and paleogeographic conditions of the geological environment. In the table 3 there are lists of the balneological resources deposits of Ivano-Frankivsk region.

Table 3. Deposits of mineral waters, therapeutic muds and ozokerite on the territory of Ivano-Frankivsk region Source: own development

Districts	Mineral and mineralized waters		Deposits of therapeutic mud		Ozokerite deposits	
	Number, pcs.	Deposits (sources)	Number, pcs.	Deposits	Number, pcs.	Deposits
Bohorodchanskyi	3	Huta, Rozsilna, Stara Huta	1	Starunia	2	Dzvyniach, Starunia
Verkhovynskyi	5	Burkut, Verkhovyna, Kryvopillia, Mokryn, Shybeny	1	Maricheika	0	

Continuation of the table 3

Districts	Mineral and mineralized waters		Deposits of therapeutic mud		Ozokerite deposits	
	Number, pcs.	Deposits (sources)	Number, pcs.	Deposits	Number, pcs.	Deposits
Halytskyi	6	Halychanka, Zacharovana Khrystyna, Kniazha krynysia, Mirelli, Nasha voda, Chyste dzherelo	0		0	
Horodenkivskyi	4	Hvizdets, Horodenka, Torhovytsia, Chernelytsia	0		0	
Dolynskyi	5	Bolekhiv, Horianka, Dolyna, Novyi Mizun, Tysiv	2	Lysak, Obolon, Tysiv, Shyrkovets	0	
Kaluskyi	2	Yavorivka, Novytsia	0		0	
Kolomyiskyi	8	Kolomyika, Korolivka, Korshiv, Markivka, Merydian, Pidhaichyky, Pokutska, Sloboda	0		0	
Kosivskyi	13	Arshytsia, Bereziv, Ivanka, Kamenetska, Kosiv, Kosivchanka, Krynychsta, Synevyr, Sokolivka, Tekucha, Utoropy, Sheshory, Yabluniv	0		0	
Nadvirnianskyi	13	Bili Oslavy, Bukovel, Bukhtivets, Vorokhta, Deliatyn, Lanchyn, Mykulychyn, Novomarkivka, Tatariv, Rafailovets, Chorni Oslavy, Yamna, Yaremche	2	Vorokhta, Tsybulnyk	0	
Rohatynskyi	5	Bukachivtsi, Cherche Pidmykhailivske, Rohatynska, Roksolana,	3	Boloto, Pid Verkhovynoiu, Cherche	0	

Continuation of the table 3

Districts	Mineral and mineralized waters		Deposits of therapeutic mud		Ozokerite deposits	
	Number, pcs.	Deposits (sources)	Number, pcs.	Deposits	Number, pcs.	Deposits
Rozhniativskiyi	3	Perehinska, Petranka, Pidliute	4	Verkhove Boloto, Liutoshara, Mshana, Turova Dacha	0	
Sniatynskiyi	2	Sniatynska, Ustia	0		0	
Tysmenytskyi	1	Dzherelo Yakova	0		0	
Tlumatskni	6	Hrushka, Dolyna, Zhydachiv, Ozeriany, Obertyn, Prydnistrovska	0		0	
Total	76		13		2	

Source: own development

In the Verkhovyna district, in addition to the sources of mineral waters such as Burkut (Klapchuk, 2012, p. 20), there are wells of mineral water “Verkhovynska” (Verkhovyna) and hydrogen sulfide water in the village Kryvopillia.

In the village of Bolshivtsi, Halyts'kyi district, table mineral waters were found: “Zacharovana Khrystyna”, “Kniazha krynytsia”, “Mirelli”, “Nasha Voda”, «Chiste dzherelo». The Ukrainian Research Institute of Medical Rehabilitation and Balneology recommends these waters for drinking. Mineralization is 0.4-0.8 g / dm³.

In Dolynskii district (v. Novyi Mizun) for drinking treatment is used mineral water “Goryanka”, which is an analogue of “Naftus” and mineral water sources № 1 and № 6 resort Morshyn. Tysiv Bolekhiv City Council developed three wells of mineral water.

Sodium chloride brines with a total mineralization of 135 g / dm³ (content of Br – 319.6 mg / dm³; Cl – 35.5 mg / dm³) were explored in Yavorivka, Kalush district. Flow rate – 690 m³ / day.

Mineral water deposits are exploited in Kosiv district: “Arshytsia”, “Ivanka”, “Kamnetska”, “Kosivska”, “Kosivchanka”, “Krynchysta” and “Sheshorska”.

On the territory of Kolomyia district there are mineral springs and wells in the villages of Sloboda, Pidhaichyky, Korolivka, Markivka (source “Bili krynytsi”).

In Nadvirnianskii district there are industrial deposits of salt brine in the villages of Delyatyn and Lanchyn, hydrogen sulfide mineral waters in f.d. “Rafailovets” (the village of Bystritsa) and f.d. “Bukhtivets” (v. Pasichna). On the territory of Yaremche City Council more than 10 sources of mineral waters of different ionic composition, flow rate and medicinal properties were found in Yaremche, Vorokhta village, Mikulichin, village Polyanysia.

In Rohatyn district there is a Pidmykhailivske deposit of hydrocarbonate-sulfate-sodium mineral waters with mineralization of 200–800 mg / dm³. In the village Cherche and the village of Bukachivtsi operate sulfide (hydrogen sulfide) mineral wa-

ters used by the resort “Cherche”. Sources of table mineral water “Rohatynska” have been revealed in the village Pukiv.

In the tract Pidlyute Osmoloda of Rozhnyativ district operates a source of hydrogen sulfide water with a high content of silver.

Sources of calcium-magnesium, sulphate-carbonate waters in the villages of Ozeryany, Dolyna, Zhydachiv and Hrushka were studied in Tlumach district. A source of “Levada” with high content of boron and iodine (4.5 mg / dm³) was found in Obertyn village.

In Tysmenytsia district there is a source of table mineral water “Dzherelo Yakova” near v. Posich.

The geography of balneological groups of mineral waters of Ukraine within the Ivano-Frankivsk region is as follows:

Waters without specific components and properties are common in Halych, Horodenka, Kalush, Kolomyia, Rohatyn, Tysmenytsia and Tlumach districts (“Arshitsa”, “Verkhovyna”, “Pereginska”, “Pridnestrovska”, “Rohatynska”, “Sokolivchanka” and others).

Mineral waters with specific components and properties of the “Naftusya” type are distributed in a strip in the south-western part of the region within the boundaries of Verkhovyna, Kosiv, Nadvirna, Bohorodchany, Dolyna districts. Pre-estimated reserves are 175 m³ / day for category C2. In total, more than 60 sources of mineral waters of the “Naftusya” type have been identified. Of these, only “Goryanka” water (Novy Mizun village, Dolyna district) and “Guta” water (Guta village, Bohorodchany district) are actively used. Similar deposits have been discovered near the village of Sheshory, Kosiv district, in the town of Yaremche, the villages of Yamna and Mykulychyn, near the town of Vorokhta. “Naftusya” mineral water resources are 3540 m³ / day.

Carbon dioxide is common in the southern part of the region, especially in the basin of the Chornyi Cheremosh. The composition and properties are close to the Caucasian mineral waters such as “Narzan” and “Kazbegi”. Mineralization near the village Burkut 1276–1400 mg / dm³, near the village of Shibeni –924 mg / dm³ [8]. The reserves of mineral carbon dioxide in the five water outlets are 25.0 m³ / day for category C2.

Sulfide waters are widespread in Rohatyn, Tlumach, Kalush, Tysmenytsia, Kolomyia, Horodenka, Sniatyn districts. At the Cherche resort the reserves are estimated at 54.0 m³ / day, at the Korshiv block is 74.0 m³ / day at the C2 category. The projected resources of sulfide waters are 5130 m³ / day. On the basis of the sulfide water deposit (hydrogen sulfide concentration is 22.6 mg / dm³) the Cherche sanatorium (Rohatyn district) operates (Klapchuk, 2012, p. 100).

Iron waters are common in the southern and southeastern parts of the region within Verkhovynskoho, Kosivskoho, Bohorodchanskoho, Nadvirnianskoho and Rozhnyativskoho districts. Stocks from 15 sources are estimated at 120.0 m³ / day for category C2 (iron content up to 20 mg / dm³).

Mineral soda waters were found in Verkhovyna, Nadvirna and Dolyna districts. Estimated reserves are 30.0 m³ / day for category C2.

Bromine, iodine, iodine-bromine waters are associated with deposits of salt and oil in the mountainous part of the region, as well as with the deep horizons of the Pre-Carpathian regional depression: in Kosiv (Bereziv, Yabluniv, Utoropy, and Tekucha) and Nadvirna (Delyatyn) districts. The content of bromine is 170–1055 mg / dm³, iodine is 15–1000.7 mg / dm³.

Sodium chloride and sulfate-containing brines are distributed in a strip from northwest to southeast in the territory of Dolyna, Kalush, Rozhnyativ, Nadvirna and Bohorodchany districts. Estimated reserves are 70 m³ / day for category C2.

The field of *boric* medical and table water is known in the village of Obertyn, Tlumach district. "Levada" hydrocarbonate-chloride-sodium water has a salinity of 2.0-6.0 g / dm³. The content of orthoboric acid is 35–150 mg / dm³, iodine is 4.5 mg / dm³.

Twelve sources of mineral waters belong to medical table waters with mineralization of 1,0–8,0 g / dm³: Bohorodchanskyi district is "Guta"; Verkhovyna district is "Burkut" and "Verkhovyna"; Dolyna district is "Goryanka"; Kosiv district is "Arshitsa" and "Sokolivchanka"; Rohatyn district is "Rohatyn"; Rozhnyativ district is "Perehinskaya"; Tlumach district is "Levada" and "Transnistrian". According to incomplete data, more than 100 deposits of the region in terms of their chemical composition, content of specific components and microelements belong to medical and table waters (Havryliuk, 2008).

Twenty-one sources of mineral water are natural table waters with a salinity of less than 1 mg / dm³. Hydrocarbonate calcium-magnesium-sodium waters include: "Halychanka", "Kosivska", "Pokutska", "Rohatynska dzherelna", "Sloboda", "Sheshorska". Sulfate-hydrocarbonate-calcium-sodium-magnesium are natural table waters: "Horodenkivska", "Knyazhenska", "Roksolana", "Snyatynska", "Chereshenka", "Chernelytska". Similar are also "Delyatynska", "Kolomyiska", "Krynychenka" and "Korolivska", but they also contain chlorine ions.

Mineral waters are used in the resorts of the region:

Balneo-mud foothill resort "Cherche". For internal and external application hydrogen sulfide, sulfate-hydrocarbonate-calcium and sulfate-calcium therapeutic waters are used (Klapchuk, 2012, p. 100-101), consumed in the treatment of diseases of the musculoskeletal system, various types of polyarthritis, radiculitis, neuritis, hypertension diseases and other ailments.

Sanatorium-dispensary "Source of Prykarpattia" (v. Novyi Mizun in Dolynskii district). Uses mineral water "Goryanka" with the increased maintenance of organic substances like "Naftusya" which is used at treatment of gastrointestinal diseases.

Sinogora Health Complex (Guta village, Bohorodchany district). Uses mineral water sources such as "Naftusya" – "Guta-1" and "Guta-2", which help treat diseases of the gastrointestinal tract.

Ski and SPA-resort "Bukovel". Operates hydrocarbonate-sodium mineral waters "Bukovel-1" and "Bukovel-2", which promote the treatment of chronic gastritis, pancreatitis, colitis and pyelonephritis, biliary dyskinesia.

Therapeutic mud. According to the State Information Geological Fund of Ukraine ("Mineral Resources of Ukraine", b.r.), reserves of therapeutic mud in the village Cherche is recorded in the volume of 36,644 thousand m³; annual production is 422 m³. The Obolon deposit of peat therapeutic muds of the hydrogen sulfide type, which is operated by the "Morshyn" resort, has been discovered in the Dolyna district. Operating reserves are 200 thousand m³. There is the ionic composition of the peat mixture chloride-sulfate sodium-magnesium-calcium. A similar field with medicinal properties was discovered in the village Tysiv near the town of Bolekhiv. Peat-therapeutic muds and the climate of the forest-steppe zone contribute to the treatment of patients with diseases of the respiratory, digestive, nervous system, metabolic disorders, etc.

Ozokerite deposits are explored only in the villages of Dzvyniach and Starunya of Bohorodchany district. It was actively exploited before the First World War. Today ozokerite is not mined in the region. Ozokerite is indicated for the treatment of arthritis, peri-arthritis, radiculitis, peripheral nervous system diseases and inflammatory gynecological diseases.

Assessment of balneological resources. According to officially confirmed data, mineral water deposits have been established in 76 settlements in the region, therapeutic mud deposits in 13 settlements, and ozokerite deposits in 2 settlements. However, only 14 mineral water deposits and 1 therapeutic mud deposit are of industrial importance.

According to these data, the assessment of balneological resources was carried out (Table 4).

Table 4. Assessment of balneological resources on the territory administrative districts of Ivano-Frankivsk region

District	Balneological resources						The sum of points	Coefficient of cognitive value
	1 (3 points)		2 (4 points)		3 (5 points)			
	Number	Points	Number	Points	Number	Points		
Bohorodchanskyi	3	9	0	0	1	5	14	5,14
Verkhovynskyi	6	18	0	0	0	0	18	6,62
Halytskyi	6	18	0	0	0	0	18	6,62
Horodenkivskyi	4	12	0	0	0	0	12	4,41
Dolynskyi	9	27	0	0	0	0	27	9,93
Kaluskyi	2	6	0	0	0	0	6	2,20
Kolomyiskyi	8	24	0	0	0	0	24	8,82
Kosivskyi	13	39	0	0	0	0	39	14,34
Nadvirnianskyi	13	39	1	4	0	0	43	15,81
Rohatynskyi	6	18	1	4	0	0	22	8,09
Rozhniativskyi	6	18	1	4	0	0	22	8,09
Sniatynskyi	2	6	0	0	0	0	6	2,21
Tysmenytskyi	1	3	0	0	0	0	3	1,10
Tlumatskyi	6	18	0	0	0	0	18	6,62
Region	85	255	3	12	1	5	272	100,0

1 – a deposit of mineral waters, or therapeutic muds, or ozokerite;

2 – deposit of mineral waters and therapeutic muds (ozokerite);

3 – complex of balneological resources (mineral waters, therapeutic muds and ozokerite deposits).

Source: own development

Determining the coefficient of cognitive value of the administrative districts of Ivano-Frankivsk region by balneological resources allowed us to conclude that none of the

administrative districts of Ivano-Frankivsk region can be attributed to the unique (Table 5).

Given the insufficient technical characteristics of individual water manifestations, the following criteria are taken into account for this purpose: if a mineral water deposit is discovered in the district, or therapeutic mud, or ozokerite, then it was assigned 3 points; mineral water deposit and therapeutic mud (or ozokerite) are 4 points; complex of balneological resources (mineral waters + therapeutic muds + ozokerite deposits) are 5 points.

Table 5. Distribution of administrative districts of Ivano-Frankivsk region by attractiveness

Administrative area	Coefficient of cognitive value (K_p)	Attractiveness of districts
Horodenkivskyi, Kaluskyi, Sniatynskyi, Tysmenytskyi	< 5	Unattractive
Bohorodchanskyi, Verkhovynskyi, Halytskyi, Dolynskyi, Kolomyiskyi, Rohatynskyi, Rozhniativskyi, Tlumatskyi	5,01–10	Little attractive
Kosivskyi	10,01–15	Medium attractive
Nadvirnianskyi	15,01–20	Highly attractive
Not found	>	Unique

As a result of an estimation it is established that in area 85 settlements where one type of deposits of balneological resources meets, three settlements on two various kinds of deposits, and one village – three various kinds of deposits have been found.

On the basis of quantitative and qualitative indicators, according to the above method, the share of each administrative district is calculated according to the availability of balneological resources and their affiliation to groups of districts according to attractiveness has been established.

Conclusions and discussion of results

Research has confirmed that Ivano-Frankivsk region has unique recreational and tourist resources: mountain landscapes, unique forest complexes, rural green tourism is intensively developing in the region, a network of private estates is growing, the owners of which offer interesting recreation programs for their guests. However, the full functioning of balneological resorts is very important for the tourist industry development of the region.

Balneological resorts of the Carpathian region have a long history. Streams of tourists visit the region to relax and have fun. But there are a significant number of tourists who visit Prykarpattia for medical purposes. That is why such trips will be quite significant, and balneology will occupy a significant place in the resorts development in Ivano-Frankivsk region.

Evidence of this is the fact that due to the presence of its own sources of mineral water, the resort of Bukovel has recently begun to develop as a spa center. Given the in-

dustrial reserves of mineral waters and therapeutic mud, the presence of ozokerite deposits, we recommend local governments, enterprises, institutions and organizations of the resort economy in Ivano-Frankivsk region the following:

1. To continue the study of balneological resources.
2. Expand the network of accommodation establishments that would use mineral waters for the prevention and treatment of diseases.
3. Diversify the specialization of resorts.
4. Take steps to invest in existing and rehabilitate abandoned sanatoriums.
5. To divide the resorts of the region according to the specialization that will correspond to a certain type of effective treatment of the disease.

Thus, the assessment of the balneological recreational potential of Ivano-Frankivsk region shows that its qualitative and quantitative parameters in combination with geographical and economic factors are important objective prerequisites for the recreational complex development in Prykarpattia. Balneological potential of the region is high and is characterized by promising for further development, improvement of operating conditions. By their nature, these resources provide treatment, recreation, knowledge of nature and cultural and historical phenomena in Ivano-Frankivsk region.

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ОЦІНКА БАЛЬНЕОЛОГІЧНИХ РЕСУРСІВ ДЛЯ ПОТРЕБ КУРОРТНИХ ЗАКЛАДІВ РОЗМІЩЕННЯ ІВАНО-ФРАНКІВСЬКОЇ ОБЛАСТІ

Актуальність. Основними природними рекреаційними ресурсами Івано-Франківської області є бальнеологічні, до яких відносяться лікувальні мінеральні води, лікувальні грязі та озокерит. Вагоме місце посідають мінеральні води і, особливо, лікувальні. **Мета і методи.** Метою дослідження є теоретико-методологічне обґрунтування перспектив розвитку бальнеологічних туристично-рекреаційних ресурсів Івано-Франківської області. Для здійснення цього дослідження використано низку загальнонаукових методів, підходів і прийомів, що застосовуються у суспільній географії. Авторами розроблено нову методику оцінки природних рекреаційних ресурсів. У цьому дослідженні – на прикладі бальнеологічних ресурсів Івано-Франківської області. **Результати.** У науковому дослідженні розглядаються оціночні особливості поширення і розвитку бальнеологічних туристично-рекреаційних ресурсів Івано-Франківської області. Ґрунтовно аналізується потенціал курортного лікування, який використовується не у повному обсязі. У статті автори пропонують активізувати розвиток бальнеологічного ресурсного потенціалу Івано-Франківської області. Окрім того, пропонується здійснити поділ курортів регіону відповідно до спеціалізації, яка

відповідатиме певному виду ефективного лікування захворювання. **Висновки та обговорення.** Дослідженням підтверджено, що Івано-Франківська область володіє унікальними рекреаційно-туристичними ресурсами. *Наукова новизна* дослідження полягає в обґрунтуванні перспективності розвитку бальнеологічних туристично-рекреаційних ресурсів для потреб курортних закладів розміщення на Прикарпатті. Практичне значення одержаних результатів виявляється у можливості застосування комплексної моделі розвитку бальнеологічних туристично-рекреаційних ресурсів в Івано-Франківській області.

Ключові слова: рекреація, курорт, бальнеологія, мінеральні води, лікувальні грязі, озокерит.

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ОЦЕНКА БАЛЬНЕОЛОГИЧЕСКИХ РЕСУРСОВ ДЛЯ НУЖД КУРОРТНЫХ ЗАВЕДЕНИЙ РАЗМЕЩЕНИЯ ИВАНО-ФРАНКОВСКОЙ ОБЛАСТИ

Актуальность. Основными природными рекреационными ресурсами Ивано-Франковской области являются бальнеологические, к которым относятся лечебные минеральные воды, лечебные грязи и озокерит. Важное место занимают минеральные воды и, особенно, лечебные. **Цель и методы.** Целью исследования является теоретико-методологическое обоснование перспектив развития бальнеологических рекреационных ресурсов Ивано-Франковской области. Для осуществления этого исследования использован ряд

общенаучных методов, подходов и приемов, которые применяются в общественной географии. Авторами разработана новая методика оценки природных рекреационных ресурсов. В этом исследовании – на примере бальнеологических ресурсов Ивано-Франковской области. **Результаты.** В научном исследовании рассматриваются оценочные особенности распространения и развития бальнеологических рекреационных ресурсов Ивано-Франковской области. Основательно анализируется потенциал курортного лечения, который используется не в полном объеме. В статье авторы предлагают активизировать развитие бальнеологического ресурсного потенциала Ивано-Франковской области. Кроме того, предлагается осуществить раздел курортов региона согласно специализации, которая будет соответствовать определенному виду эффективного лечения заболевания. **Выводы и обсуждение.** Исследованием подтверждено, что Ивано-Франковская область владеет уникальными рекреационными ресурсами. *Научная новизна* исследования заключается в обосновании перспективности развития бальнеологических рекреационных ресурсов для нужд курортных заведений Прикарпатья. Практическое значение полученных результатов заключается в возможности применения комплексной модели развития бальнеологических рекреационных ресурсов в Ивано-Франковской области.

Ключевые слова: рекреация, курорт, бальнеология, минеральные воды, лечебные грязи, озокерит.