

Integral Componentwise Estimation of Tourist and Recreation Potential as a Universal Tool for the Research of Destination Possibility

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Abstract — The article analyzes the integral componentwise estimation using a system of balanced indexes as one of the effective estimation methods for the tourist and recreational territory potential. This method implicates the following of a certain algorithm of the study, which includes a number of evaluation stages sequencing. The result of each past the point directly affects the final indicator of the integrated assessment. As an example of the application of this technique in economic and geographical studies, we choose such a component of the tourist and recreational environment as water resources. This type of resources is prospective for the development in the studied region, as the Volgograd region is a territory with a developed hydrographic network. As the main studied indicators we took the lake landscapes, watered landscapes and the degree of moisture dominant in the landscape landform. The research found out that lake indexes and the degree of moisture tracts are optimum while the water logging landscapes index is negative. The integral assessment showed the average attractiveness of this component of the natural environment for recreants. This method of assessing the tourist and recreational potential has shown its validity and is recommended by the authors for such studies.

Keywords: *lakes density of landscape, water content of landscapes, hydrographic network, touristic and recreational potential, methodology of regional component-by-component research, score assessment of water complex indicators*

I. INTRODUCTION

Currently, there are many methods for assessing the tourist and recreational potential of the territory. Each of them has its own characteristics, is aimed at different goals and solves its problems. The lack of a single accepted method among the geographical community is due to the diversity of resources and the variability of tourism as an activity. However, it is impossible to compare the studies of different authors using different methods because each of them used different techniques that is why the result was different, too.

In our opinion, the integral method of tourist-recreational potential estimation is the most productive and reliable. The integral estimation is made by means of a system of balanced indicators. We adjusted all indexes to a

unified mathematical evaluation system where the role of each index is clearly defined.

II. MATERIALS AND METHODS (MODEL)

This technique has the following requirements:

- 1) independence from the units of measurement of the indicator;
- 2) bringing all results to a single scale of assessment;
- 3) adaptability to changes in the number of studied indicators;

For subsequent perception and ease of implementation of the technique, it is necessary to describe the algorithm [1].

Stage 1. Ranking of indicators from the balanced system in descending order of their importance;

Stage 2. Definition of borders of indicators on the basis of available theoretical materials and developments with allocation of four ranges of values;

Stage 3. Determination of points. Using the weights used in the first stage, the sum of points for each indicator is determined. The Fishburne rule is used for the calculation, which reflects the fact that nothing is known about the level of significance of the indicators, except that they are arranged in descending order;

Stage 4. The distribution of scores across levels;

Stage 5. Score calculation;

Stage 6. Convert numeric data to pins;

Stage 7. Collation of data. According to the results of the score assessment, the conclusion about the importance of a particular indicator in the touristic and recreational potential is formulated.

III. RESULTS AND DISCUSSION

As an example of the use of this technique in economic and geographical research, we evaluated the tourist and recreational potential of water resources of the Volgograd region.

Water resources determine opportunities for various kinds of recreational activities: swimming, kayaking, fishing, etc. Volgograd region is a region with a developed hydrographic network [2].

The territory of the Volgograd region is located at the junction of five hydrogeological structures: Volga-khopersk, Donetsk-don, Syrtov, Ergeninsky and North Caspian [3].

On the territory of the region flows about 200 rivers of different sizes. They belong to the basins of the Azov and Caspian seas, the Caspian and Sarpin drainage basins. Most of the territory of the region is drained by the Don with its tributaries: Khopr, Medveditsa, Ilovlya, Chir, don Tsarina, Myshkova, Aksai, Kurmoyarsky Aksai-only 165 rivers (65% of the region) [3].

The Volga basin occupies a narrow strip along the Volga valley and includes 30 watercourses (13.5% of the region). The largest rivers are yeruslan and Torgun, the left arm is the Akhtuba river to the border with the Astrakhan region. The same basin includes the internal water bodies of the Volga-Akhtuba floodplain (more than 179 watercourses and more than 3000 lakes), as well as the watershed reservoirs of the Volga-don shipping channel-Karpov, Varvarovskoye and Bereslavskoye [3; 4].

In the vast territory of the Caspian drainage region (22172 km², 19.7% of the area) there are few rivers, they flow into the lake. Elton (Smaragda, 'hare Lanzov, Thistle, Chernavka and Quarantine). Also on this site are bitter-salty Bodul and Bulukhta lakes.

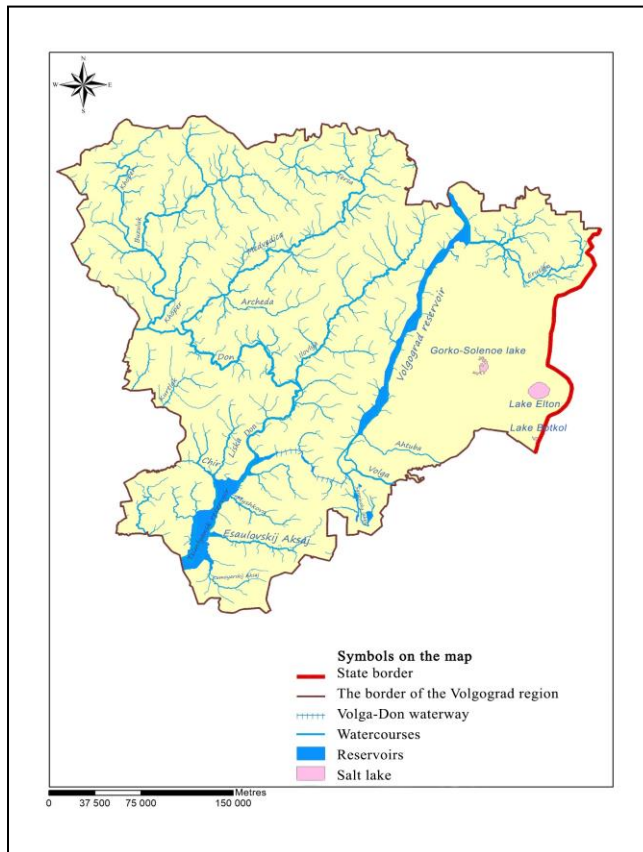


Fig. 1. Hydrographic network of the Volgograd region (compiled by the authors).

Rivers, which belong to the Sarpinsk drainage basin (less than 1.5% of the region), drain from the Eastern slope of the Ergeninsky upland and flow into the chain of fresh and brackish lakes Sarpa and Tsatsa [3]. In addition, the water Fund of the region is represented by a large number of small artificial reservoirs-reservoirs and ponds for various purposes (more than 2000 objects) and irrigation canals (figure 1)

Volga, Don with large tributaries are used as water transport highways.

The rivers of the Volgograd region are flat, with a winding bed and a calm flow, in most cases the bottom is composed of sand and clay deposits. This contributes to the development of river tourism in the region. Rivers are suitable for rafting on kayaks, boats, you can often find rafting on a raft. [5]. The main artery of the region, the Volga river, is characterized by a cruise orientation of recreational use. As a rule, at the end of May, a high temperature is set, the heating of water bodies begins, which is an attractive factor for tourists in the region. [6].

Lakes of the Volgograd region are difficult to count because of their impermanence. There are 8 large lakes: Barmantsak, Botkul, Bulukhta, Galgoy, Sarpa, Sarpa lakes group, Tsatsa. Elton. Lakes of the Caspian lowland-Elton, Botkul and Bulukhta and a number of small lakes have great recreational value. [7]. The layers of rocks composing the surface of the territory contain a large amount of salts. The coast of some of them is saturated with mud containing various chemical elements that have healing properties. The region has low attractiveness in terms of fishing, compared with the neighboring Astrakhan region. However, in the summer season fishing recreation in plentiful supply on the banks of the Don, Khoper, Akhtuba, the Volgograd and Tsimlyansk reservoirs

It should be noted that the Volgo-Donskoy navigation canal is located on the territory of the region. It functions only during the navigation period. This object, theoretically, has a high recreational value, as traffic through the locks of the channel can become a quality cognitive content of any excursion. But, at the moment, recreational activities on the channel are almost impossible, because the object has a technical operational value with a strict category of protection [8].

To characterize the recreational potential of water bodies within landscapes, three main indicators were used, which are traditionally used by other researchers. Such indicators were: lake landscapes, watered landscapes and the degree of moisture dominant in the landscape tracts (table No. 1).

Lakes density of landscape is the ratio of the area of the water mirror of lakes, ponds, reservoirs located within the landscape to the area of the landscape, expressed as a percentage. The indicator of lake capacity of the Volgograd region consists of the sum of the water surface of lakes, ponds and reservoirs to the ratio of the total area of the region. Based on the data of the encyclopedia "Water of Russia", the lake area of the Volgograd region is 3,716% [1].

Water content of landscapes is the ratio of the length of water bodies in kilometers to the area of the landscape. In addition, this indicator is often called the density of water-erosion dismemberment, the density of the river network

and other similar terms. The total length of water bodies in the Volgograd region is 7981 km. [9].

The General moistening of landscapes is estimated by the author by means of traditional landscape characteristics of the degree of moistening of tracts dominating in a landscape which is subdivided into dry, fresh, damp, damp and wet. These characteristics, widely used by landscape scientists, are used by us in the recreational assessment of the water component (table I).

TABLE I. RANKING OF LEVELS OF INDICATORS IN THE ASSESSMENT OF THE WATER COMPLEX

| Indicators | The level's limits | | | |
|---|--------------------|----------------------|------------------------|----------------------|
| | Unfavorable | Relatively favorable | Favorable | Most favorable |
| Lakes density of landscape, % | 1 | 1-3 | 3-5^a | 5 |
| Water content of landscapes, km/km ² | 0,1 | 0,1-0,2 | 0,2-0,3 | 0,3 |
| The General moistening of landscapes | raw | Damp and raw | Fresh and damp | Dry and fresh |

^a bold text indicates intervals typical for the Volgograd region

Next, using the Fishburne rule, we determined the sum of points for each indicator (table No.2, 3).

TABLE II. DEFINITION OF POINTS OF INDICATORS AT AN ASSESSMENT OF A WATER COMPLEX

| Indicators | Weight, n | Significance of the criterion Frishbena | Point (gr.3*100) |
|--------------------------------------|-----------|---|------------------|
| Lakes density of landscape | 1 | 0,33 | 33 |
| Water content of landscapes | 1 | 0,33 | 33 |
| The General moistening of landscapes | 1 | 0,33 | 33 |
| Total | | 1 | 100 |

TABLE III. RANKING OF LEVELS OF INDICATORS IN THE ASSESSMENT OF THE WATER COMPLEX

| Indicators | Scores by levels | | | |
|--------------------------------------|------------------|----------------------|-----------------------|----------------|
| | Unfavorable | Relatively favorable | Favorable | Most favorable |
| Lakes density of landscape | 8,2 | 16,5 | 25^b | 33 |
| Water content of landscapes | 8,2 | 16,5 | 25 | 33 |
| The General moistening of landscapes | 8,2 | 16,5 | 25 | 33 |

^b bold text indicates intervals typical for the Volgograd region

To obtain a score of hydrographic indicators, we distribute the results by levels, in accordance with the methodology (table No. 4).

TABLE IV. INDICATORS OF WATER COMPLEX ASSESSMENT AND THEIR CORRESPONDING SCORES

| Indicators | Indicator's level | Score corresponding to the level |
|--------------------------------------|-------------------|----------------------------------|
| Lakes density of landscape | Favorable | 25 |
| Water content of landscapes | Unfavorable | 8,2 |
| The General moistening of landscapes | Most favorable | 33 |
| Total | | 66,2 |

IV. CONCLUSION

The evaluation of water complex of Volgograd region as a component of tourist-recreational potential, we get the value at 66.2 points, which corresponds to the average attractiveness of this component of the natural environment for holidaymakers.

This study is part of a large work on the study of tourist and recreational opportunities of the region, the purpose of which is to comprehensively assess the tourist and recreational potential of the Volgograd region.

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