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Recreational use and spatial organization of rural regions in terms of new sociological and economic factors

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Abstract. Important issues regarding the exploration of aesthetically attractive and recreationally important objects within the boundaries of traditional rural regions are discussed. The usage of the proposed methodological approach to the evaluation of aesthetical and consumer parameters regarding the regional settlement system is demonstrated in the example of rural regions located in Valuysky Municipal District, Belgorod Oblast. Specific features of recreational activities, their unique forms, and coherence between different types of environmental management are determined. Environmental representation coefficients, recreational radiuses, the local residents' group with the appropriate frequency of recreational activity, and the recreational load are calculated. The necessity and promise of using such studies result in making social, economic, and geoscientific decisions related to the development of the land use planning documents, including recreational complex organization are shown.

1. Introduction

In such a dynamic social and economic environment within regional and local (Municipal) settlement systems, we can clearly see two facts. On the one hand, it's obvious that aesthetically attractive and recreationally important objects have a disjunct distribution, but on the other hand, we can see that some of those objects don't correspond to the needs of the people, which mean that the territory's potential doesn't meet the appropriate use level.

In recent decades, there is an active development of methodology related to the learning and estimating of aesthetical, consumer, and recreational environment parameters. Research concerning this aspect is generally characterized by its interdisciplinarity. The aesthetic part of such studies is intended to bring together the social part and the Natural Sciences and Geography part [1-7].

Studies concerning aesthetic and consumer features of the environment within the settlement systems of different hierarchical levels let us identify the recreational potential and its restrictive factors. We also should take into account such studies result while making social, economic, and geoscientific decisions related to the development of the land use planning documents, including recreational complex organization.

In the current social, economic, and geoscientific circumstances for such regions as Belgorod Oblast it is a matter of urgency to transform the settlement system with the introduction of new development trends. The long history of the regional settlement system forming is connected with the successional change of the ways of adaptation and the means of interaction between people and ecosystems. It is also connected with the further anthropogenic transformation. The high level of transformation is typical for the regional ecosystem. To a great extent, that is due to the long exploration history and forming of Industrial agriculture. Dynamic development of agricultural and industrial production has affected



consumer parameters and the ability to fully meet the needs of the people in the natural environment. Meanwhile, Belgorod Oblast has all the necessary prerequisites for the formation of a more comfortable living and recreational environment.

Behavioral geography has such construct as “place aesthetic”, which is also known as attractiveness. That's the place characteristic that determines its ability to affect the nervous system of humans and the mental sphere. All those factors form functional characteristics of the inspected area [9, 10]. In general, this concept is considered as a recreational phenomenon but in the long term, it can become one of the key concepts affecting the transformation of regional settlement systems.

2. Materials and Methods

Throughout the last 16 years, innovative research is being conducted by scientists of the Institute of Earth Sciences, Belgorod National Research University. These studies are devoted to exploring social geography, environmental management aspect, and consumer parameters. Big amount of theoretical materials and factual information have been accumulated. All this can be found in different scientific works, study aid. Many degree dissertations were defended on the basis of these materials.

Taking into account all valuable experience gained by both domestic and foreign scientists, we want to offer the methodology related to aesthetic and consumer environment estimation. This methodology combines a qualitative description and sociological survey, which lets us see a certain set of representative images related to the investigated areas.

The purpose of the study is to form the geo-ecological basis for the territorial spatial organization in terms of modern customer parameters.

According to the authors of the methodology, evaluation covers not only specific natural complexes and selected natural-anthropogenic landscapes but individuals' living environment in general including the locality and adjacent areas, which are located in a range of most people's environmental management.

3. Results and Discussion

As stated above, the approbation of the methodology has a multi-year nature. Over 60 regional communities located in 18 different metropolitan regions and urban districts have been studied. Over the extended period of the study, the population of the localities has increased. Updated studies were conducted to show the dynamics of change. Moreover, the survey methodology has been clarified and elaborated with the help of new technologies including research facilities and survey tools. Besides that, part of the research is aimed at exploring aesthetic and consumer features of the environment within the special groups [10-12].

The part of the research results regarding the Valuysky Municipal District is presented in the article. The total number of the studied communities is 10, 8 of which are considered rural regions. The main benefit is that some of those regions were studied twice with a 15 years difference. That allowed us to discern the dynamics of the studied environmental parameters.

Customer characteristics in the rural localities are different from such characteristics in the urban localities. This is reflected in the relevant representations, the examination of the environmental convenience level, and the meeting the recreational and other people's needs. The formation of the environmental management types and their particularities is also the result of that difference. For example, meeting the rural residents' recreational needs is defined by its fragmentary character, which means that even in the no time conditionals there is a way to find a minute to rest without any expenditure. Fig. 1 shows the change of the positive assessment of the ecosystems depending on the population numbers. As for the traditional rural localities, the level of the ecosystem assessment depends on the number of residents.

This research let us identify natural and social conditionals for the establishment and development of environmental management as a basis for a safe and comfortable socioecological environment. The differentiation of the localities was also conducted during this research. Matrix and

cartographic interpretations of the results of the study were designed. Then, the research allowed estimating the landscape components and particularities of their combinations.

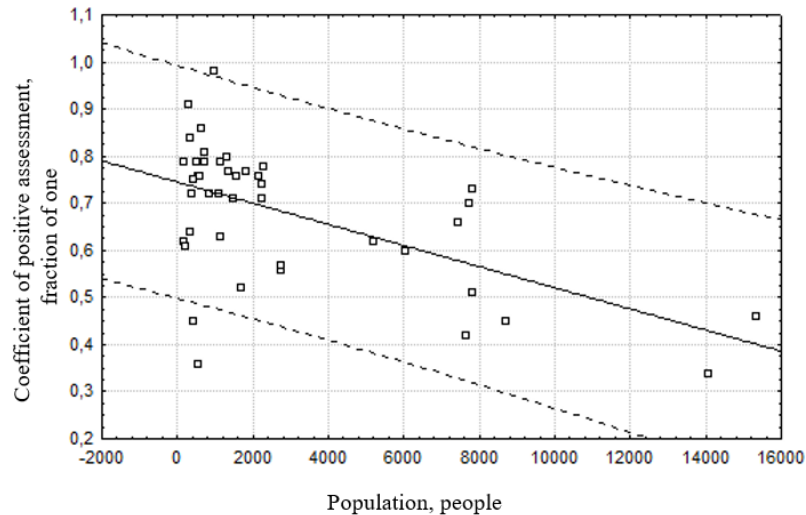


Figure 1. The dependence of the positive assessment (coefficient) of the ecosystems depending on the population numbers ($r = -0,5695$, $p = 0,00005$).

In recent decades, population decline is taking place in most regions of our country and the Belgorod Oblast is not an exception. Fig. 2 shows the population dynamics during the first phase of the study (2005th year) and during the second phase (2020th year). Depopulation is visible in most rural localities, especially in the small communities where the number of residents is lower than 400 people.

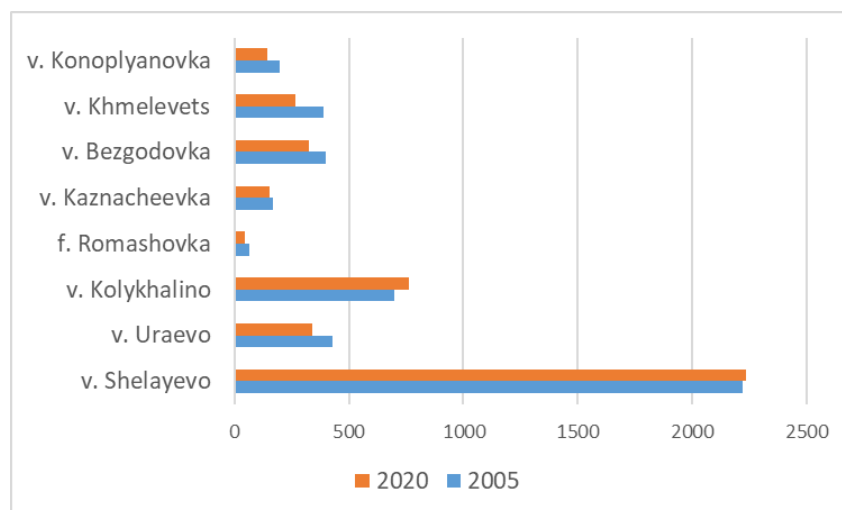


Figure 2. The population dynamics.

The reason for the increasing rural-urban migration is the income gap between urban and rural residents. This, in turn, resulted in the change of the studied parameters.

Preferred recreational facilities were identified throughout the research. The residents' differentiation into separate groups according to the recreational intensity was held. Moreover, the recreational load was calculated (table 1 and 2).

Table 1. Rural residents' groups with different recreational intensity.

Studied localities	The number of residents (N) with appropriate recreational intensity						The number of the potential participants	
	1-4 exits per month (N ₁)		3-4 exits per month (N ₂)		1-2 exits per year (N ₃)			
	people	%	people	%	people	%	people	%
Localities of the Shelaevskoe rural settlement, Valuysky Municipal District								
v. Shelayevo	973	43.6	618	27.7	397	17.82	245	10.2
v. Uraevo	166	49.2	64	18.9	63	18.67	45	13.2
v. Kolykhalino	274	36.1	134	17.6	225	29.64	127	16.7
f. Romashovka	14	30.8	15	32.3	6	13.94	11	23.1
Other localities of the Valuysky Municipal District								
v. Kaznacheevka	75	48.6	31	20.2	33	21.2	16	10.1
v. Bezgodovka	124	38.5	69	21.5	30	9.2	99	30.8
v. Khmelevets	100	37.6	82	30.8	48	18.0	37	13.8
v. Konoplyanovka	54	37.5	36	25.0	24	16.7	30	20.8
Average values								
Shelaevskoe rural settlement		39.9		24.1		20.1		15.8
Other rural localities		40.6		24.4		16.3		18.9
All localities of the urban district, 2009		41.5		25.0		16.6		17.2
All localities of the urban district, 2020		40.4		24.2		18.2		17.3
All localities of the region		38.2		28.1		19.9		13.7

The methodology for calculating the number of each group participants and the recreational load is detailed in the mentioned author's methodology, which can be found in the series of publications [13, 14]. The formula on which recreational load calculations are made is presented below (1):

$$R = \frac{\sum_{i=1}^n N_i \times T_i}{S_i} \quad (1)$$

N_i – the number of the specific group participants; T_i – the number of exits per month (recreational purpose), S – covered area, km².

Environmental management areas (S , km²) where recreational and other activities take place were calculated based on the results of the studies regarding territorial and time characteristics of different localities [10].

It is established that some recreational activities are contingent on the rural locality residents. It is so because their recreational activities are connected with such work activities as picking of berries, mushrooms, and herbs. Thus, we can obviously see another recreational difference between rural and urban regions. Rural recreational activity is interpreted in a broad sense, encompassing different types of activities based on the valeologic component.

Table 2. The calculation of the rural residents' possible exits for each group with appropriate recreational load.

Studied localities	The number of each group exits per year				R, Exits per year/km ²
	$(N_1 \times T_1)$	$(N_2 \times T_2)$	$(N_3 \times T_3)$	$\sum_{i=1}^n N_i \times T_i$	
v. Shelayevo	29190.0	4326.0	595,5	34111.5	1724.0
v. Uraevo	4980.0	448.0	94,5	5522.5	279.2
v. Kolykhalino	8220.0	938.0	337,5	9495.5	480.1
f. Romashovka	420.0	105.0	9.0	584.0	29.5
v. Kaznacheevka	2250.0	217.0	493,5	2516.5	127.2
v. Bezgodovka	3720.0	483.0	45.0	4248.0	214.8
v. Khmelevets	3000.0	574.0	72.0	3574.0	180.7
v. Konoplyanovka	1620.0	252.0	36.0	1908.0	96.5

Further research on the linkage between specific residents' groups and different natural complexes within active environmental management areas is a perspective direction for studies.

As noted above, there were 3 urban districts, which were surveyed twice with the 15 years difference. The purpose of those studies was to identify possible changes of aesthetic customer parameters. Earlier it has been hypothesized that the aesthetic customer environment parameters have changed over the past 10-15 years, which have been confirmed by this study. As for the Valuysky Municipal District, the hypothesis has been falsified.

4. Conclusion

Historical, social, economic, and geo-ecological factors and preconditions for the formation of the aesthetic customer preferences regarding studied territories have been analyzed. These factors determine the formation of the traditional environmental management types, affect people's mentality, which is in turn expressed in the evolution of the aesthetic customer preferences.

The results of the study formed the basis for the assessment changes identification depending on the geographical living conditionals, quantity characteristics of the localities, and the rate of change of a social, economic, and geo-ecological conditions. Besides that, it is obvious that the "quality" and the "quantity" of communities predetermine the differences in aesthetic customer assessments and the importance of analysis of the linkages.

This research has not only a theoretical component but also applicable nature. It can be used as one of the most important instruments of sustainable development.

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