Original Research Open Access

Factor Assessment of the Aesthetic and Consumer Parameters of Regions

Lopina Elena M.*
Belgorod State University Russia, 308015, Belgorod region, Belgorod, Russia

Kornilov Andrey G.
Belgorod State University Russia, 308015, Belgorod region, Belgorod, Russia

Bondareva Yana Y.
Belgorod State University Russia, 308015, Belgorod region, Belgorod, Russia

Kalugin Vladimir A.
Belgorod State University Russia, 308015, Belgorod region, Belgorod, Russia

Abstract

Designed aesthetic and consumer parameters of the region (coefficients of representation of objects) depend on types of settlement, individual characteristics of the population, its psychological and physiological characteristics, features of the combination of aesthetic resources and accessibility of areas of public environmental management. Based on assessment results, the existing problems of organizing the land structure are identified in settlements of region and a methodology is developed for mapping the assessment of the consumer parameter of the region.

Keywords: Methods of socio-geographical study; Aesthetic perception; Aesthetic and consumer parameters of the environment; Environment representation coefficients.

1. Introduction

In the field of constant socio-economic changes, there is an uneven distribution of aesthetically significant and attractive objects within the local and regional systems of settlement. It is found that they do not meet the public needs indicating the relevance of study.

A number of leading Russian and foreign universities and research institutes are developing a variety of different approaches to assessing aesthetic resources. This direction is reflected in a number of works by famous scientists Eringis and Boudrunas (1968), Frolova (1994), Nikolaev (2006), Likhacheva and Timofeev (2002), Vedenin and Filippovich (1975), Kane (1981), Villalobos (2003), Tricart (1979), and Linton (1968), etc. Similarly, a significant part of research is devoted to the study on more or less known and popular local territories, while the regional background was poorly represented in the known works. Currently, there is no specialized methodology for studying the aesthetic properties, aesthetic needs and resources of the "landscapes" of a particular "everyday" settlement or their system (Faraji et al., 2018). Accordingly, we can offer a combination of methods of qualitative description and a sociological survey, respectively, two levels of research and assessment of aesthetic and consumer parameters of the regional environment (the aesthetic and consumer parameter means the value characterizing any aesthetic and consumer property of the environment), as well as an algorithm for conducting research (Lopina and Kornilov, 2015).

2. Material and Method

In the present study, we focused on that aesthetic perception could occur at different scales and at any distance, while reflecting both the appearance (visual image) of the settlement in general and some of its parts. The landscape could combine various images, and thus not only a single landscape, but also a certain environment was assessed. Furthermore, those parts of the living space, the environment (areas) including the territory of the settlement and its immediate surroundings (adjacent territories) were explored. The need to study these areas was explained, on the one hand, by the fact of created conditions within them for the implementation of many needs including aesthetic ones. During the period of personal development, the image of the landscape and its aesthetic properties were reflected not only in the formation of a specific list of traditional forms of nature management within it, but also in the appearance of a sense of psychological comfort, satisfaction, reflected in aesthetic assessments (Bunting and Gueelke, 1979), (Cuentas et al., 2017). As a result of the socio-geographical research, there were several differently varying images of the described space (the process of the conscious selection of elements of perceived reality- "representation" ("representation", "image")). The result of building such a scientific model should be the quantitative indices (coefficients) of aesthetic-consumer parameters of the environment (understood as quantities that characterized any aesthetic and consumer properties of the environment).The considered space and its parts- areas - can be studied in three space-time forms: 1) The area where the formation of the initial (children's) aesthetic preferences and the satisfaction of the needs of the subject occur; 2) the area where aesthetic needs are formed in the subject at the

present time; and their aesthetic needs are satisfied including recreational ones; 3) the area where, in the opinion of the subject, it is possible to satisfy aesthetic requirements most effectively. It may coincide with the area located at an arbitrarily large distance from the first two, and not exist at all. The working hypothesis put forward in substantiating the criteria and indicators suggested that the aesthetic needs are closely related with geographical conditions of residence, and therefore will differ in the settlements of different types; with the peculiarities of the respondent's connections with the spatial area (the origin is a citizen, a rural resident, the duration of residence in the given territory is indigenous, the local resident and the actual visitor); individual characteristics of respondents: gender, age, level of education, social status, nationality, etc. The listed and other individual qualities of the respondents, together with the emotional impact of the landscape and its individual components on a person, together form a psychological and aesthetic and aesthetic and consumer assessment (individual characteristics were taken into account to ensure proportional sampling for each studied locality, while the totality of all signs gives an idea of gender and age structure of the population; level of education, social and professional orientation). Therefore, we offered a set of diagnostic indices (coefficients), which, in our opinion, allowed us to find the greatest differences of a settlement with others, conditionally subdivided into three following blocks: Block 1: quantitative characteristics and features of the spatial areas and its population: the area of the territory, the number and density of the population, the proportion of indigenous and visiting residents, the average age of the inhabitants, the duration of residence in the locality and the frequency of change of residence. Block 2: the level of representation (frequency of occurrence) in the answers of the respondents of individual objects (the coefficient of representation of objects) and their combinations in different space-time forms. Block 3: level of satisfaction from the observed landscape (coefficient of positive representation of the observed space), landscape preferences and recreational load on the territory and individual objects. Subjects to the currently existing serious theoretical developments of domestic and foreign scientists, we proposed a version of the methodology for assessing aesthetic and consumer environmental parameters at the regional level. A detailed study design and sequence of operations are presented in detail in a series of publications by the authors (Lopina *et al.*, 2016).

3. Results and Discussion

The obtained results at all stages of study allow us not only to identify main characteristics of representations in a particular locality, but also search for statistical correspondences between size, type of settlements, nature of the surrounding environment and aesthetic-consumer parameters as well as other possible indices. For instance, some differences in aesthetic estimates were noted when establishing the dependence of the coefficient of positive representation of the observed landscape on the percentage of indigenous people in a settlement ($r = 0.4795$; $p = 0.00040$). The analysis allowed us to trace a certain (moderate) relationship between the coefficient of positive representation of the observed landscape and the duration of residence in a settlement ($r = 0.5783$; $p = 0.00002$). Relationship between such indicators as the level of education, social status, on the one hand, and aesthetic assessments of the observed landscape, on the other, are practically absent (r from -0.2689 to 0.1990). Meanwhile, a weak correlation was found between the age and the coefficient of positive representation of the observed landscape ($r = 0.3634$, $p = 0.0111$). Furthermore, certain dependencies were established between individual characteristics of respondents, aesthetic assessments and the preferred place of residence: the dependence of the coefficient of positive representation of the observed landscape on sharing residents preferring the countryside ($r = 0.4100$; $p = 0.0160$); the dependence of the number of inhabitants who prefer the countryside on the average age ($r = 0.5965$, $p = 0.000005$); the dependence of the number of residents who prefer the countryside on the social status: a- pensioners ($r = 0.4136$, $p = 0.0028$); b- schoolchildren and students ($r = 0.3945$, $p = 0.0046$).

For the traditional rural and transitional type of settlements, a fairly moderate dependence of the level of landscape satisfaction on the number of inhabitants of the settlement is revealed. Assuming that the density of the population and the area of settlement affected the aesthetic perception of landscapes, we classified the populated areas of region by population density and found, like in the first case (the dependence of the level of landscape satisfaction on the number of inhabitants of the locality) positive dynamics, but without any close relationship. Certain dependencies are revealed in the analysis of the influence of specific objects observed by respondents and their amount on the level of landscape satisfaction (the coefficient of positive representation).

We also tried to take into account the exotic factor, defined as the degree of contrast of the place of possible stay of respondents with the purpose of recreational or other use of public lands in relation to a permanent place of residence. For example, the dependence of the level of landscape preferences, expectations from the real "experience of observations" of respondents (the earlier opportunity to visit one or another object during life), characterized by positive dynamics, however, lacking any close relationship ($r = 0.3700$).

Table 1 presents results of research on aesthetic-consumer parameters for one of the previously identified spatio-temporal forms.

An important point is the definition of the landscape-forming role of individual elements of the environment. For this purpose, each natural element of the environment (field/ meadow, forest, park, garden, solitary plants, river, pond / lake, relief forms) is assigned as the appropriate place depending on the value of the coefficient of representation.

The analysis results of the landscape-forming role of individual landscape elements do not differ from the generally accepted ones and confirm that vegetation (forest, park, garden, solitary plants) and water objects (river, pond / lake) are the most attractive and at the same time most memorable objects from an aesthetic point of view.

Analysis of results of representing elements of the environment showed that the first places belonged to the forest massif in 27 (child representation) and 23 (preferred landscape) settlements. The second place in 16 and 20 settlements belonged to the river.

Table -1. A Fragment of the Table "Frequency of Mentioning Environmental Elements (In Fractions of a Unit) In Rural Settlements by the Respondents In Terms Of Types of Observed Landscape"

Types of Settlements and Examples	Representation Factor (unit fraction)									
	field / meadow	forest area	park	garden	vegetable garden	single plants	river	pond / lake	forms of relief	Kp_n
Cities	0.05± 0.02	0.05± 0.04	0.04± 0.02	0.06± 0.04	0.03± 0.03	0.08± 0.03	0.04± 0.03	0.01± 0.01	0.02± 0.02	0.37± 0.09
Belgorod	0.04	0.02	0.06	0.06	0.06	0.11	0.05	0	0.03	0.43
Urban settlements	0.04± 0.02	0.05± 0.04	0.02± 0.03	0.09± 0.08	0.06± 0.02	0.08± 0.05	0.01± 0.01	0.02± 0.02	0.01± 0.01	0.36± 0.15
village of Krasnaya Yaruga	0.06	0.02	0	0.20	0.07	0.14	0	0.03	0	0.52
Rural settlements	0.13± 0.09	0.08± 0.09	0.01± 0.02	0.12± 0.10	0.06± 0.04	0.09± 0.06	0.04± 0.04	0.02± 0.03	0.03± 0.04	0.58± 0.15
village of Krutoy Log	0.10	0.06	0.03	0.04	0.08	0.20	0.01	0	0.15	0.67
All settlements	0.10± 0.08	0.07± 0.08	0.01± 0.02	0.11± 0.10	0.06± 0.04	0.09± 0.05	0.03± 0.04	0.02± 0.03	0.02± 0.04	0.51± 0.18

Note: Kp_n is the coefficient of total representation of natural objects

The amplitude of fluctuations in the significance (location) of some elements is insignificant: a forest, a river, a pond / lake, while the role of other objects varies significantly in different settlements, which is especially characteristic of a park landscaped in urban and large rural settlements, as well as fields / meadows.

Therefore, we may note bi-directional differences: intra-component differences (for example, if the vegetation is generally assessed high, there are differences in estimates of forest, park, garden and single vegetation) and intraregional differences due to geographical conditions of residence and, accordingly, the level of representation of objects; quantitative characteristics of the studied settlements; socio-demographic characteristics, etc.

Evaluation of aesthetic-consumer parameters should be carried out as subject to external landscape diversity, which is characterized by a combination of different landscapes and their interrelations. The results of the study showed that the most valuable are the following sets of landscape components: 1) water (river, lake) - forest (park / garden); 2) forest - field / meadow; 3) water - field / meadow. That is, the most attractive are the marginal zones (the junction of different environments).

Cluster analysis of research results of aesthetic-consumer parameters of the environment. Analysis of the results of research on the aesthetic and consumer parameters of the environment has shown that the division of settlements into three categories (urban, transitional, and rural) in the studied aspect is conditional. The corresponding classification is more complex and requires more detailed statistical analysis. In order to identify, based on the survey data, some real relationships of features and classify them further, the use of the cluster analysis procedure is optimal.

In analyzing an array of data consisting of 57 objects (populated areas), each of them was characterized by 8 signs as the aesthetic-consumer parameters of the regional environment:

Block 1 (4 indicators): Coefficient of representation of the forest, park / garden, water bodies, field / meadow;

Block 2: The total coefficient of the representation of natural objects;

Block 3: Coefficient of positive representation of the observed objects;

Block 4: Coefficient of preference for the observed landscape;

Block 5: The total coefficient of recreational use of nature objects.

All settlements were distributed among six clusters, characterized by different values of the indicators making the basis of the clustering.

Calculations and analysis made it possible to establish that the aesthetic-consumer parameters of the environment have significant intraregional differences, due, first of all, to geographical living conditions, and, accordingly, the level of representation (frequency of occurrence) of landscape-forming elements; quantitative characteristics of the studied settlements (area of the territory) and socio-demographic characteristics (number of inhabitants, population density, the share of indigenous and visiting residents, average age of residents, length of residence in the settlement and frequency of change of residence, way of life), etc. First of all, differences are observed in different types of settlements, and the administrative-territorial division and functional features strengthen and consolidate them. For example, these circumstances can explain higher estimates of aesthetic-consumer parameters in large cities. On the one hand, the urban environment is perceived at the level of not the

entire city, but of the micro-district; on the other hand, it is characterized by a considerable degree of livability, respectively, the ability to satisfy a number of needs, including aesthetic, that correspond to the urban lifestyle.

Within the settlement and its immediate vicinity, lots of attractive forms of recreation are carried out, and the behavior of the recreants is regulated based on their own considerations. Important advantages are the possibility of fragmentary implementation of recreational needs when a person has limited free time and most types of recreation become free. Therefore, one of the studied aspects of recreational research should be the identification of preferred objects for recreation and the calculation of the recreational load experienced by them. The most important measure is the study on the nature of connections between groups of holidaymakers and natural complexes, depending on a number of factors, including the selectivity of holidaymakers to elements of natural complexes and their combinations.

The study revealed a number of dependencies including the frequency of visits from the radii of public nature management (Fig. 1). Table 2 presents results of calculating the recreational load on the areas of settlements of the Belgorod region.

Figure -1. Dependence of Visiting Frequency on the Radius of Public Nature Management
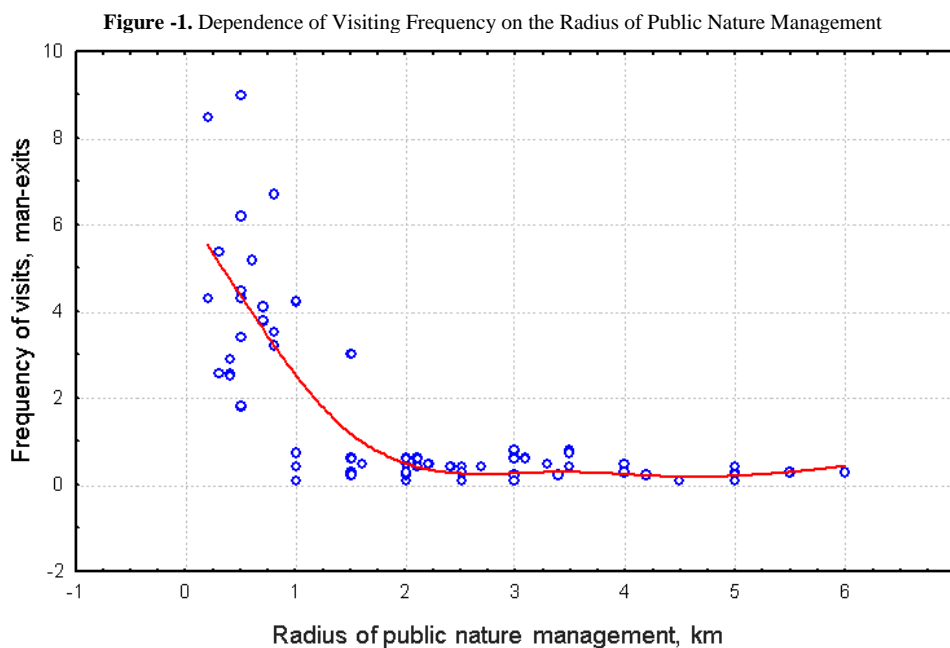
Table-2. A Fragment of the Table "Calculation of the Recreational load on the Areas of Settlements of the Belgorod region"

No.	Examples of different types of settlements	The number of opinions on the possible recreational use by group (number of exits)				Recreational load on the area, man-exits per year/ha
		1-4 times per month ($N_1 \times T_1$)	3-4 times every six months ($N_2 \times T_2$)	1-2 times per year ($N_3 \times T_3$)	Total $\sum_{i=1}^{n} N_i \times T_i$	
1	Belgorod	1900032	820771	171430.5	2892234	46.99
2	Gubkin	619800	220906	34437	875143	14.22
3	Proletarsky village	116232	9611	1302	127145	2.07
4	Krasnaya Yaruga village	83760	10108	3250.5	97118.5	1.58
5	Krutoy Log village	17688	6244	697.5	24629.5	0.40
6	Kurasovka village	4200	5138	420	9758	0.16

4. Conclusion

The present study presented identified structure of the aesthetic preferences and needs of the population, the results of the assessment and the calculated aesthetic-consumer parameters of the environment (representation coefficients of objects), and obtained quantitative characteristics of the recreational load on the territory and individual objects. The identified spatial differences and factors of territorial differentiation of the aesthetic-consumer environmental parameters at the regional level are taken as and form the basis of the corresponding classification of human settlements.

Results of assessing the aesthetic-consumer environmental parameters allow us to propose a number of common key points for planning and organizing rational settlement land structures, the regional settlement system of the Belgorod region and the mapping methodology for assessing the consumer parameter of a region.

As a main conclusion, we should emphasize that despite a number of difficulties arising in assessing the aesthetic and consumer parameters of the environment, one of the central places should be given to the aesthetic approach to the territory planning. Evaluation of aesthetic and consumer parameters allow revealing the recreational potential of the territory, and developing a system of design and economic decisions on the territorial arrangement of region.

References

Bunting , T. E. and Gueelke, L. (1979). Behavioral and perception geography, A critical appraisal. *Annals of the Association of American Geographers,* 69(3): 448-62.

Cuentas, H. R. G., Borrero, T. J. C. and Freyle, R. P. (2017). Colombian institutional educational projects (PEI), Inclusive Education through self-evaluation. 33(84): 10.

Eringis, K. I. and Boudrunas, A. R. (1968). Aesthetic resources of the landscape of Lithuania, The schematic map Vilnius.

Faraji, S. H., Nadi, B. and Narimisa, R. M. (2018). Explaining and zoning the vulnerability of the sixth city of Tehran during and after the earthquake - Hassanali Faraji Sabokbar, Behzad Nadi, Mohammad Rezaei Narimisa. *Astra Salvensis,* (1): 59-74.

Frolova, M. I. U. (1994). *Estimation of aesthetic advantages of natural landscapes Ser. 5 Geography.* 24 vols. Bulletin of Moscow University. 27-33.

Kane, P. S. (1981). Assessing Landscape Attractiveness, a comparative test of tw o new method. *Applied Geography,* 1: 77-96.

Likhacheva, E. A. and Timofeev, D. A. (2002). *Relief of the environment of human life (ecological geomorphology) M.* 640 vols. Media-Press.

Linton, D. L. (1968). The assesment of scenery as a natural resource. *Scotish Geographical Magazine,* 84: 219-38.

Lopina, E. M. and Kornilov, A. G. (2015). *Estimation of aesthetic and consumer parameters of the environment.* 102 vols.: Publishing House Belgorod of the National University of Belsu: Belgorod.

Lopina, E. M., Kornilov, A. G., Petin, A. N. and Kireeva-Genenko, I. A. (2016). Assessment of consumer and aesthetic parameters of environment at the regional level. *International Business Management,* 10(16): 3364-68.

Nikolaev, V. A., 2006. "The landscape as an aesthetic phenomenon." In *Materials of the XI International Landscape Conference Landscape science, theory, methods, regional studies, practice. M, Geographical Faculty of Moscow State University.* pp. 711-13.

Tricart, J. (1979). Paysage et ecologie. Revue de geomorphologie dynamique. 3: 30-34.

Vedenin, I. A. and Filippovich, A. S. (1975). Experience in the identification and mapping of landscape diversity of natural complexes, Geographical problems of the organization of tourism and recreation M. Is. 2.

Villalobos, A. J. V. (2003). Ética, gobernabilidad y estado de derecho en América Latina, en tiempos de globalizaciónEl concepto de espacio político como paradigma ético-jurídico en la nueva Constitución venezolana.Frónesis. 10(2): 1-5.