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OPPORTUNITIES FOR STUDYING CULTURAL LANDSCAPES IN THE KALININGRAD REGION

This article focuses on opportunities for studying cultural landscapes in the Kaliningrad region and offers methodology for it. The author outlines types of the information required: genetic types of natural landscapes, spatial settlement and land use features, and the network components of the landscapes environment.

Key words: landscape, Quaternary sediments, settlement, land use.

Conventionally, Russian geography divides landscapes into natural and anthropogenic (cultural) ones. In the Kaliningrad region, almost all landscapes are cultural (except for some parts of the Baltic Sea and lagoon coasts). As early as the beginning of the 20th century, this territory was populated and developed. It had a diverse network of railways and roadways. Large parts of the territory had been meliorated and tilled, which resulted in the changes in the structure of soil and vegetation cover. Not all cultural landscapes retained their appearance until the 21st century. The area of tilled lands has increased. A large number of railways were dismantled in the postwar period. Some of the pumping stations supporting the water balance of polders are not in use. The total number of villages has decreased. Many cultural landscapes returned to their "natural" appearance. Ruined settlements can be recognised by the thickets of lilac and fruit trees, which have run wild. Old tracks are covered with elder bushes. It seems as if many rural roads dissolved in the landscape. The only reminders left are cobblestones discernible under the layer of sand, lonely bridges over the brooks, rows of old trees... The dramatic historical fate of the territory was shared by its cultural landscapes, which are now at different stages of development (or degradation). All these complicate the research on landscapes. However, it is necessary because the landscape environment of any territory is not only the natural environment for a regional community but also a potential resource for its further development.

Existing approaches to the study of cultural landscapes

At the beginning of the 20th century, it was evident that the anthropogenic impact on natural environment was comparable to other (natural) factors. For the first time in Russia the study of cultural landscapes was addressed by L. S. Berg in his presentation for the Russian Geographical Society in 1913 [1]. However, almost a hundred years later, there is neither unanimous opinion on the study of cultural landscapes, nor a standard definition.

Contemporary Russian geographers offer several approaches to the concept of cultural landscape [1]. The first one is called the landscape-

geographical approach (works by V. A. Nizpvtseva, A. N. Ivanova, V. A. Nikolayeva (Moscow State University), and G. A. Isachenko (St. Petersburg State University)). According to these scholars, cultural landscape is a particular type of anthropogenic landscape.

The second approach is the ethnological-geographical one (works by V. N. Kalutskov (Moscow State University)). Within ethnocultural landscape studies, cultural landscape incorporates the material layer (nature, economy, local community) and the semantic layer (language and folklore).

The third approach — informational-axiological — is being developed at the Institute of cultural and natural heritage (works by Yu. A. Vedenin, R. F. Turovsky, M. Ye. Kuleshova) [3]. This approach balances the natural-geographical and cultural studies paradigms.

It is worth mentioning that there is one more approach to cultural landscape as a constructed object on the basis of theory of territorial ranges and networks (B. B. Rodoman, V. L. Kagansky) [12]. Except for geography, the concept of "cultural landscape" is used in the humanities.

The variety of approaches to the study of cultural landscapes is explained by the complexity of the phenomenon and the development of Russian geography, which has been dominated for years by the division into physical geography and economic geography. The study of cultural landscapes is undertaken by the two disciplines. Thus, universal research methodology has not been developed yet. The specific features of the Kaliningrad region — the replacement of population after the WW II along with changes in the economic system and the administrative and territorial division — make it impossible to employ any of the mentioned approaches in full. There are a few regions in Russia, the recent history of which was determined by the change of state belongingness and even the replacement of ethnos. These are the Karelian Isthmus, the southern part of Sakhalin Island, the Kuril Islands, and the Kaliningrad region. A comprehensive study into the cultural landscapes of these transborder regions has been conducted only for the Karelian Isthmus [8]. The Kaliningrad region differs from the Karelian Isthmus in natural and socioeconomic features, as well as the degree of territory development. Thus, one cannot apply the methodology used in Karelia to the Kaliningrad region. The central object of study of cultural landscapes in the Kaliningrad region can only be its material layer. The most appropriate definition of cultural landscape to be applied to the Kaliningrad region situation was given by Yu. G. Saushkin [17]. The approach given makes it possible to consider the development of landscapes, which is of major importance for the analysis of landscape dynamics.

The methodology of study of cultural landscapes in the Kaliningrad region

Cultural landscapes in the Kaliningrad region were formed on the basis of natural complexes created by the last Quaternary glaciation and as a result of the processes which shaped the natural environment after the glaciation. Thus, the basic element of the study is genetic types of landscapes, the cen-

tral objects of which are the parent rock and terrain. Moreover, it is important to assess the degree of natural landscape transformation by human society and to choose the components of the material layer that would make it possible to accurately assess the landscape load. One of the components is a settlement system. An important factor of natural landscape transformation is agriculture. Hence, there is a need for a land use analysis. Other components of the cultural landscape material layer are transport infrastructure, and industrial, military, recreation and settlement-related facilities. Cultural landscape is affected by both spatial and temporal changes to a larger extent compared to the natural one. A study into modern landscapes is impossible without research on their transformation. It is reasonable to compare the conditions of 1939 (the pre-war condition and the peak of territory development) and 2009 (the modern condition). To assess the degree of landscape transformation means to compare different conditions of landscapes. There is no representative data on the landscapes of the region's territory in the pre-war period so the comparison is hardly possible. However, there is a solution to this problem which can be found in the definition of cultural landscape given by Yu. G. Saushkin. Human beings create cultural landscapes on the basis of the natural one through changing its components, but the new landscape is still affected by the laws of nature. When the human impact on landscape comes to an end, the landscape will keep the set model of development, but without any human impact. It is worth recalling the work by V. P. Semyonov-Tyan-Shansky, who divided landscapes into primordial, half-wild, cultural, "falling out of cultivation", and "fallen out of cultivation" ones [19]. Thus, the algorithm chosen for research on the cultural landscapes of the Kaliningrad region is as follows: analysis of structure of natural landscapes of the region, study into the settlement systems in the selected periods (1939 and 2009), study of other material layer components and the land use system in the selected periods, and cross-sectional analysis of all material layer components of the regional cultural landscapes in the framework of theory of territorial ranges and networks.

The structure of natural landscapes of the Kaliningrad region as a basis for the cultural landscape

Despite a comprehensive study of natural components, a detailed integrated research on landscapes has not been carried out in the Kaliningrad region so far. Only maps showing landscape types have been drawn. In 1998—2001, individual studies were carried out on the Curonian Spit and the Vistula Spit [5, 6]. The atlas of the Kaliningrad region published in 2002 contains a landscape map of the region at a scale of 1:500000 based on the hypsometrical approach to landscape identification and drawn without any prior field works on the basis of the previously published data [7]. Thus, in 2003—2010, we performed landscape mapping of the territory at a scale of 1:200 000 and even larger for certain territories [4; 14—16]. There are the following genetic types of natural landscapes in the Kaliningrad region (fig. 1).

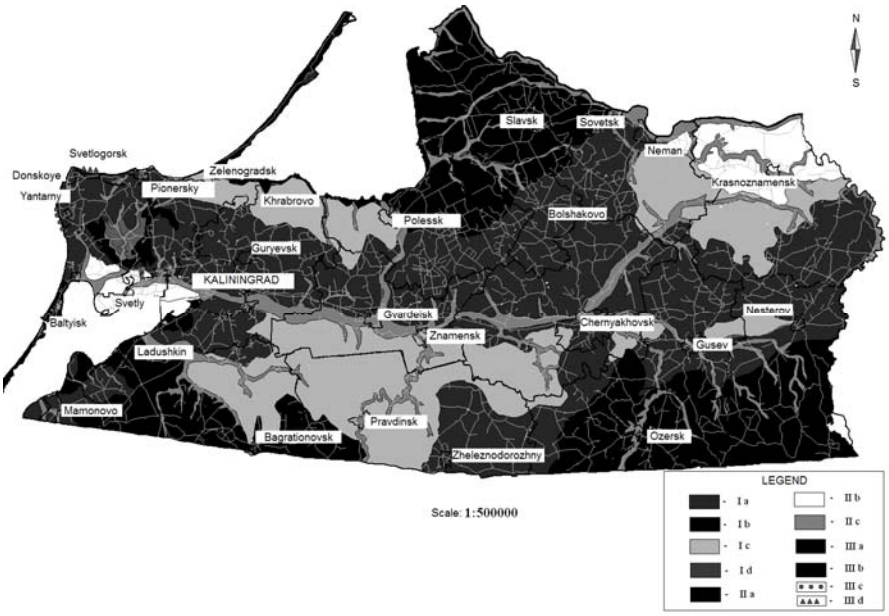

Fig. 1. The landscape structure of the Kaliningrad region

Genetic types of landscapes: Ia — rolling plains of basal moraine; Ib — terminal moraine elevations and ridges; Ic — flat glaciolacustrine plains; Id — rolling glaciofluvial plains; IIa — ancient delta lowlands; IIb — ancient alluvial plains; IIc — modern valley complexes; IIIa — coastal lagoon lowlands; IIIb — coastal eolian formations; IIIc — accumulative sea coasts; IIId — abrasion sea coasts

Moraine — predominantly rolling — plains occupy the central part of the region, stretching from the Sambian peninsula in the west to the eastern border of the region. The Sambian peninsula is dominated by a system of horseshoe-shaped terminal moraine ridges; there are also a lot of glaciofluvial forms — kames. Another landscape phenomenon of glacial origin is found in the southern part of the region. A vast glaciolacustrine plain is situated between the two spurs of the Warmian-Vištytis elevation and characterised by flat terrain. Another large area of glacial sediment distribution is situated in the north-eastern part of the region. Coastal landscapes are represented by abrasion and accumulative coasts of the Vistula Spit and the Curonian Spit. The coasts of the Vistula and Curonian lagoons are covered with coastal meadows and lowland swamps on the inland side. The ancient dealt of the river Neman lies in the north-western part of the region. It is a vast lowland covered with lowland and upland swamps and polders; there are inland dunes and sand masses. The valley complexes of the rivers Neman, Pregolya, and Šešupė and their tributaries exhibit well-developed, partially swampy floodplains with oxbow lakes and numerous branches downstream. In the north-east of the region, in the interfluve of the Neman and the Šešupė and to the south of it there is a large area of ancient alluvial deposits, which underwent eolian deflation and are covered with mixed forests now. Thus, the territory of the Kaliningad region is a coastal plain in a humid region

with insignifcant elevation differences, which has a branching river network and large swamp areas. A specific feature of the territory is large aeolian formations.

The characteristics of regional settlement system as an indicator of landscape development

The evolution of population distribution in the Kaliningrad region and its current state have been studied extensively [9; 10; 21—24]. The modern network of settlements on the territory of the Kaliningrad region started to develop in the 13th century while the region was being explored by the Teutonic order. The historical type of population distribution on the territory, inhabited by the Prussian tribes at the time, can be described as pre-agrarian [18]. The population distribution of Eastern Prussians in 1939 can be assigned to the early industrial type since the province occupied a periphery position in pre-war Germany, which explained the agricultural specialisation of the most administrative districts. After the northern part of Eastern Prussia was annexed to the USSR, the existing settlement network remained unchanged over several years, although the population size decreased substantially (1,107,197 people in 1939 and 937,360 people in 2009). Rural residents accounted for 43.3 % of the general population size in 1939; 60 % of the economically active rural population was engaged in agriculture [26; 27]. In 2009, the rural population accounted for 23.5 % of the total population size, and less than 10 % of the economically active rural residents were engaged in agriculture. Other indicators — the number of rural settlements and the density of population — reveal similar tendencies.

The analysis of urban population distribution shows that it is a legacy of the pre-war period. The centre (Kaliningrad/Königsberg) is still dominating; however, in comparison to 1939, its role has become even more important. For instance, the ratio between the population of Kaliningrad and five most-populated regional towns increased from 1.9 to 2.5. The town hierarchy also altered (Zipf's law). We produced graphs using the $P_n = P_1/n^{\alpha}$ [20] formula, where P_n is the population size of a town of rank n, P_1 — the population size of the city, α — the hierarchy coefficient (1.3 in this case) [15]. It also confirms an increase in the role of the regional centre and the insufficient development rates of the towns. Thus, the territory is less populated than in 1939 and most of the population is concentrated in the regional centre. However, this data is insufficient for a study of cultural landscapes. It is also important to have data on the spatial distribution of population. The regional population distribution will reflect not only the dynamics of settlement landscapes, but also the level of landscape load. The existing maps of population density show average values for rural districts and cannot be applied to a study of urban cultural landscapes. The study required maps of the actual population density, showing population distribution across the region's territory.

We drew maps of the actual population density for 1939 and 2009. The calculation was performed both within the limits of a settlement and within adjacent territories located within a walking distance in view of their landscape and land use features (fig. 2, 3).

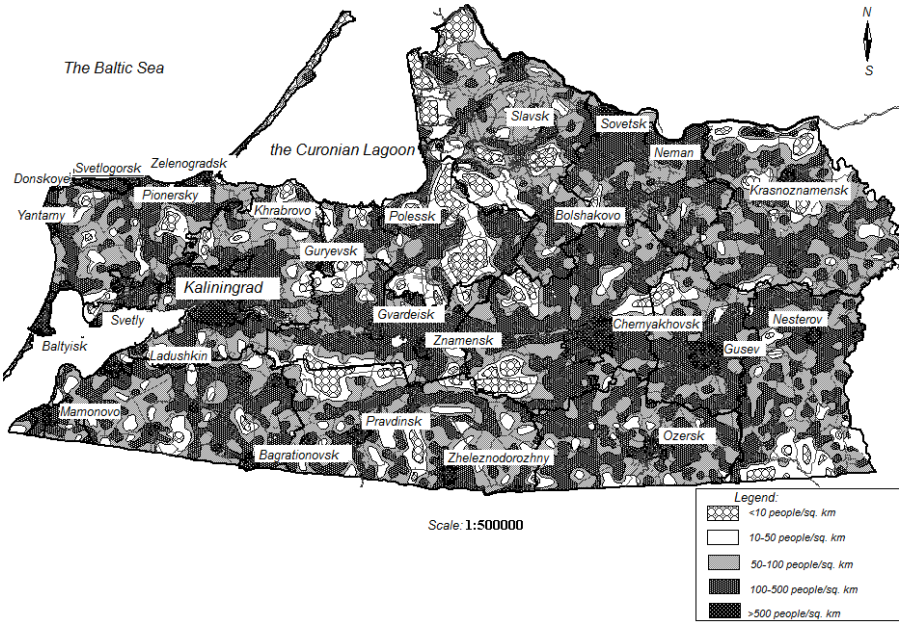

Fig. 2. The actual density of population of the Kaliningrad region in 1939

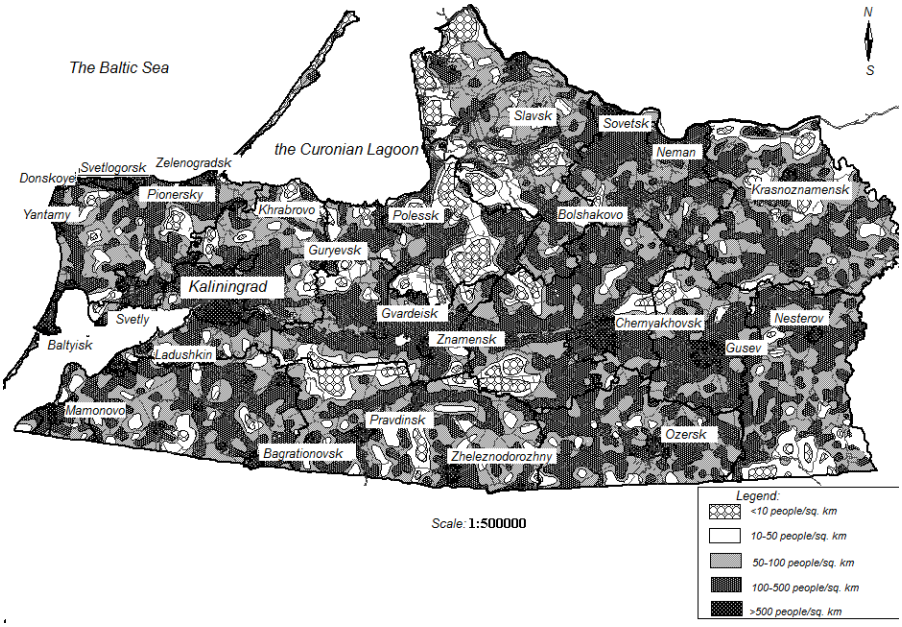

Fig. 3. The actual density of population of the Kaliningrad region in 2009

In 1939, the high density areas (more than 100 people per square meter) occupied almost the whole territory of the region and formed a high density zone which stretched along the sea coast and the Pregel (Pregolya) and concentrated

around the towns. The high density areas in the east and in the west of the region were balanced. In 2009, the zones with a density of more than 100 people per square kilometres were scattered, and their area had decreased. Most of the Kaliningrad region's territory has a population density of less than 10 people per square kilometre. The cross-sectional analysis of the cultural landscape and the spatial population distribution structure shows that the modern system of population distribution is more landscape-dependent than the pre-war one.

Other important components of the material layer of cultural landscapes in the Kaliningrad region

The land use system changed drastically over the last 70 years. On the one hand, it relates to the global trends of technological development. On the other hand, the modern land use system is a result of the planned economy of the Soviet period and the crisis of the 1990s. Today, fallow lands account, on average, for 40.5—68 % of the area of municipal agricultural lands.

The post-war changes also affected the transport system of the territories. So, until the 1990s, the Kaliningrad region was a restricted territory. The roads connecting it with the southern neighbour were blocked. The northern and eastern borders of the region were internal. The traffic across these borders had been constant until the Baltic States gained independence. Eastern Prussia had a dense railway network connecting the settlements. Only the major railroads are functioning today. Unlike the railway, the roadway network has survived almost completely intact. Its specific feature is roadside trees forming an arch across the roads. Today, these trees are being cut down for the purpose of expanding the roadway and increasing traffic safety, which will lead to the elimination of this unique type of cultural landscape in the future.

Important components of the material layer of landscape are industrial facilities — which are concentrated, as a rule, in the settlement areas and "growth poles" — and quarry and dumping sites. A specific feature of the region is the amber quarries in the village of Yantarny.

An interesting component of the contemporary regional landscape is fortifications — both modern and historical ones.

The region's recreation zone is a product of its coastal position. At the moment a well-developed recreation zone exists only on the Curonian Spit, which enjoys the status of a national park. Another one is being formed on the southern coast of the Vistula lagoon. The northern coast of the Sambian peninsula exhibits a settlement framework of the "waterfront" type. Unlike the neighbouring European countries, the vast coastal territories (the western coast) have a population density of less than 10 people per square kilometre.

The basic principles for the study of cultural landscapes of the Kaliningrad region

Consequently, the initial material for the study of cultural landscapes in the Kaliningrad region is divided into several layers, or blocks. A cross-sectional analysis of these blocks makes it possible not only to classify landscapes, but also to forecast their further transformation.

The first (basic) layer of information describes the structure of natural landscapes, and their genetic type shaping the terrain and the Quaternary sediment of the territory. Each genetic type of landscape forms a territorial range. The second layer of information is the contemporary population distribution system and the actual population density, which also results in the formation of territorial ranges. The third layer is similar to the second one — it is the spatial representation of the previous settlement system (the selected period is 1939). The cross-sectional analysis of these three layers makes it possible to describe the dependence of population distribution on the environment and the succession stage of cultural landscape. The forth layer — the modern land use system — is also represented by a system of territorial ranges. The fifth layer of information relates to networks rather than ranges as it contains information on point and linear objects (e. g., settlements, roads, dikes, etc.). Most of the existing classifications of cultural (and anthropogenic) landscapes consider only these objects.

The combination of range and network approaches in the study of cultural landscapes expands the opportunities for research and serves the basis for forecasting their further transformation. Territorial ranges and networks are studied within theoretical geography [12; 13], which has already disclosed the laws of territorial polarisation and analysed a number of territorial structure transformation mechanisms. A study into the cultural landscapes of the Kaliningrad region will make it possible to test the theory and, what is more important, to use the achievements of theoretical geography for the improvement of the existing landscape environment in the interests of the regional community.

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