Territorial Problems in Modern Rural Settlement of the Volgograd Region

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Abstract — **The article discusses the current problems of the territorial development of the rural settlement of the region. The authors considered the main approaches formed at the federal level to solve the problems of socio-economic development of the country and regions. The formation of strategic planning of economic development is the most important direction of the modern solution of socio-economic problems. The article analyzes the change of the place of the Volgograd region in the state territorial division of labour. The reason for the decreasing role of the region in the economic development of the country was largely due to insufficient consideration of demographic and territorial problems in rural areas. The authors analyzed the upcoming changes in the gender and age composition of the rural population, changes in the number of the rural population at the level of rural regions, rural settlements. They studied rural population density indicators by region. The authors compared the negative trends with territorial differences in the natural fertility of agricultural lands. The article presents the calculations of Spearman's rank correlation coefficients for these indicators. The emerging picture of the settlement of rural areas of the region requires state economic regulation to preserve the demographic potential on fertile agricultural lands.**

Keywords:socioeconomic development of the region, strategic planning, economic and geographical zoning, natural prerequisites of development, demographic potential, population density

I. INTRODUCTION

In recent decades, the socio-economic development of the Volgograd region is subject to significant changes. They resulted from transformations in the management system both in Russia and in the region. At the end of the twentieth century, the implementation of the General Layout of the Productive Forces of the USSR had a dominant influence on the development of the region.

At the regional level, it was specified by the adopted Scheme of the district planning of the Volgograd Region. In the first decade of the twenty-first century, systemic management of socio-economic development was in doubt. However, in the first half of the second decade it marked the beginning of action aimed at streamlining, the formation of hierarchically subordinate provisions which can enhance the positive dynamics of the socio-economic development of the country and regions.

Among the fundamental decisions of recent years, it is necessary to include the Federal Law On Strategic Planning in the Russian Federation adopted in 2014. It indicates that this is a strategic planning document containing a system of scientifically based ideas about internal and external conditions and the expected results of the current development for the medium and long term. Federal law establishes the mandatory development of a Strategy for the socio-economic development of Russia, strategies for socio-economic development on a sectoral and territorial basis. Among these documents, from an economic and geographical point of view, it is necessary to single out the Strategy for the spatial development of the Russian Federation, the Strategy for the sustainable development of rural territories of the Russian Federation, and the strategies for the social and economic development of individual regions.

II. MATERIALS AND METHODS (MODEL)

At the beginning of the first decade of the 21st century, the structure of territorial management of socio-economic development underwent significant changes at the federal level. Decree of the President of Russia No. 849 On the Plenipotentiary Representative of the President of the Russian Federation in the Federal District of May 13, 2000, introduced new macro-territorial entities - federal districts. Currently, all state statistics are based on these territorial units. The territory of the Volgograd region, previously part of the Volga economic region, became part of the Southern Federal District. These changes significantly affected the place of the Volgograd region in the national-territorial division of labour. To identify changes, we used the calculation of the per capita coefficient of specialization according to the formula:

$$K=R/P \qquad (1)$$

where K is the coefficient of specialization, R is the region's share in% of the total industrial production in the country, P is the region's population in% of the country's total population.

Previously, the regional economy had coefficients for per capita specialization greater than one for many types of material production. These included the production of drilling rigs with the specialization coefficient of 15 per

capita, the production of tractors - 15.3, the production of rolling bearings - 4.17, the production of chemical fibers - 3.0, the smelting of steel - 1.7, the production of cement - 1.6, production synthetic resins and plastics - 1.8, meat production - 1.7. The region had industries with high per capita specialization rates in the country's agriculture. In the early 1990s the specialization coefficient for gross grain harvest was 3.5, for the number of cattle - 2.2, including cows - 1.7, pigs - 1.9, vegetable production - 1.7, livestock for slaughter - 1.9, for the production of milk - 1.5 [1, pp.75-423]. The listed branches of specialization indicate a highly developed diversified structure of the regional economy. Over the past decade, the economy of the region has undergone significant changes. She has lost a significant number of specialization industries. The gross grain harvest - 2.4, the production of vegetables - 4.0, and the production of milk - 1.0 have retained their significance. Among industrial sectors, the specialization coefficient remained only in the production of electricity - 1.0. For twenty-five years, the population of the region remained at the level of 2.5 million people [2, pp. 70-400].

III. RESULTS AND DISCUSSION

In our opinion, one of the reasons for the decreasing role of the Volgograd region in the national-territorial division of labour was insufficient attention to the regional characteristics of the demographic and territorial development of the population. The formation of the Southern Federal District shows that they were considered at the federal level since its borders were identified based on identifying favourable natural conditions for the development of agriculture because the characteristics of demographic development did not allow maintaining labour-intensive industry on a former scale.

In modern conditions, high rates of specialization are in the crop production and to a lesser extent in animal husbandry and industry. In the context of macroeconomic zoning, the economy of the Southern Federal District is more focused on agricultural production. Within the boundaries of the Southern Federal District, the Volgograd Region has individual traits of natural potential for the life of the population and the development of crop production. The Natural-agricultural zoning and the use of the land fund of the USSR made zoning of the territory and the possibilities of developing crop production. In it, the territory of the Volgograd region belongs to the temperate natural-agricultural zone of the southern Russian steppe province, Khopersko-Medveditsky district, 2925º; 0.49; 99, where 2925º is the sum of active temperatures; the coefficient of moisture in the territory is 0.49; climatic index of biological productivity is 99. The middle part of the region belongs to the Ilovlinsko-Don district, 3000º; 0.42; 90, and the southern part and the Volga region to the Lower Volga flat-level district 3500º; 0.20; 29.

For comparison, in the Rostov region, the Miussko-Aksai plain-wavy district has indicators 3125º; 0.62; 128. In the Krasnodar Territory, the Kuban plain-flat district has 3450º; 0.78; 164, in the Republic of Crimea it is 3375º; 0.49; 117, in the Stavropol Territory, the Stavropol Upland-undulating District has 3100º; 0.84; 150 [3, pp. 137-139].

As you can see, the territory of the Volgograd region is heterogeneous in resource potential for the development of crop production. The most favourable conditions are in the northwest, the middle part of the territory has relatively favourable conditions, the southeastern part has harsh conditions. Within the boundaries of the Southern Federal District, the region is inferior in natural potential for the development of crop production in the Krasnodar Territory, Stavropol Territory, Rostov Region, Republic of Crimea, but has advantages over the Astrakhan Region and the Republic of Kalmykia, as well as overwhelming majority of regions of the Russian Federation.

According to the economic assessment of natural conditions for the life of the population, the region has favourable features of the climatic potential. Analysis of O.R. Nazarevsky`s map [4] shows that natural conditions have zonal differences that are similar to the assessment of agro-climatic conditions and resources. In the north-west of the region the weighted average point of favourable environmental conditions for the life of the population is 3.55 points, in the south-western part to Surovikinsky district - 3.48 points, and in the south-east of the region, Trans-Volga region - 3.2 points. Elements of natural conditions in the region that reduce the assessment are the human heat perception in the summer and the winter, the duration of the extreme period, natural landscaping, the natural conditions of rest and recreation, the degree of diversity and attractiveness of landscapes. At the same time, the weighted average favourable score in the west of the Krasnodar Territory is 3.81 points, in the west of the Rostov Region - 3.7 points, on the southern coast of Crimea - 3.81 points, in the west of the Stavropol Paradise -3.7 points, in the Astrakhan region and the Republic of Kalmykia -3.18 points. But the natural living conditions of the population in the region are more favourable than in the vast majority of regions of the Russian Federation [5].

The formation of the Southern Federal District contributes to better manageability of territories that have favourable conditions for the development of agriculture and the life of the population. For a long period, a high population density has formed in the region and, in the 20th century, it became the basis of rapid industrial development. In modern conditions, there is a trend of population migration to cities which result in the emergence of demographic problems in rural areas.

Fundamental provisions for managing the socio-economic development of a country and regions pay considerable attention to rural areas. In particular, the Spatial Development Strategy of the Russian Federation emphasizes as one of the tasks need to improve the resettlement system due to the socio-economic development of rural areas outside urban agglomerations which increase the stability of the resettlement system in Russia. It is necessary to consider the interests of the local population and business when planning the socio-economic development of rural areas. It is important to increase the level of transport accessibility by repairing regional and local roads and improve rural settlements considering the views of the local population.

It seems to us that the most significant problem of the near future will be the maintenance of demographic

potential in rural areas. We base our assumptions on an economic and geographical analysis of changes in the population distribution over the past decades, changes in the gender and age structure of the rural population, changes in the density of the rural population, and identification of the leading factors affecting the residence density.

The study shows that in the next 10-15 years in the region, the demographic potential will acquire a limiting value. In particular, in the next ten years, 87 736 rural residents will reach retirement age, and 69 167 rural residents, or 78.8%, will enter working age [6, pp.10-15]. A distinctive feature of the gender and age structure of the population in rural areas is a significantly smaller proportion of people born in the 1980s than in urban areas. For 2018, the proportion of urban residents born in the 1980s was 16.6%, and rural residents were 13.6% of the total population. Consequently, rural migration exacerbates the problem of labour resources in rural areas. We are waiting for jobs not filled by young generations. It will result in a decrease in social control over rural areas favourable for farming.

An analysis of population changes at the level of rural areas, rural settlements, village councils, and administration awaits our assumption. During 1969-2010, the population decreased in 25 districts. In 2010, of them in 3 districts, it amounted to less than 50% compared to 1969, in five districts it was less than 60%, in five districts it was less than 70%, in five districts it was less than 80%, in one district, it was less than 90%, and in six districts it was less than 100%. In eight districts it was an increase in the rural population: Bykovsky district - 142%, Gorodischensky district - 122.5%, Kletsky district - 110.1%, Nikolaevsky district - 105.2%, Svetloyarsky district - 128.5%, Sredneahtubinsky district - 154.2%, Surovikinsky district - 100.7%.

The analyze of dynamics of the population at the level of rural settlements reveals that from 1969 to 2010, the dominant trend was a decrease in the number. We observed it in 76.4% of all settlements in the region. In this settlements group, a decrease of more than 50% was in 24.8% of settlements. In 11.1% the decrease was within 40%, in 11.6% was more than 30%, in 8.1% was more than 20%, in 10.9% was more than 10%, in 10.6% was less than 10%. There was a process of reducing settlements. In 23.6% of settlements, there was an increase in population. In this group, in 4.2% of settlements, population growth was up to 10%, in 4.6% it was up to 20%, in 1.4% it was more than 30%, in 2.8% it was more than 40%, in 8.5 % of settlements it was more than 50%. This group included mainly settlements with significant growth. But in the quantitative relationship, settlements with an increase in population were 3.8 times less than settlements with a decrease in the population [7, pp. 1-125, 54-93].

Changes in the population of the settlements resulted in a change of the density of rural population in the districts of the region.

The area with the highest population density is in the zone of the direct influence of Volgograd: in the Sredneahtubinsky district, it exceeds 11.5 people / km^2, in the Gorodishchensky district - above 9 people / km^2. The average density is observed in most of the north-west of the region and the Kamyshinsky district and is 6.6 - 8.9 people / km$^{2.}$ The low and lowest population density, 2.2–6.5 people / km^2, dominate in most of the region [8]. We can say that the ongoing changes in rural resettlement have a negative trend.

One of the most important life-sustaining resources in rural areas is the natural fertility of soils. The study of Vorobyov A.V. [9] allows us to identify territorial differences according to this indicator. Moreover, territories with high natural fertility are the basis for the sustainable development of rural territories due to their high biological productivity. The strategies for sustainable development of rural territories of the Russian Federation until 2030 consider these features. It notes the need for a separate group of especially valuable agricultural land [10]. We conducted a study of rural areas of the region from mainstreaming the degree of the natural fertility of agricultural land, bonus points, in the formation of a regional settlement system. At the same time, we calculated the indicators of agricultural land bonus points and rural population density as one of the properties of the resettlement system at the level of rural settlements, village councils. Of the two indicators, we took as a basis the fundamental value of agricultural land due to their territorial attachment and relative immutability, in contrast to the dynamic indicator of population density. At the same time, there was a problem of comparability of bonus points indicators and population density in people / km^2. In this regard, we used a technique for identifying rank indicators of a territory by the studied characteristics [11].

Then we identified the rank differences between the indicators - d. The differences in the levels of direct or inverse correlation, we evaluated on a scale: 0.1-0.3 - weak; 0.3-0.5 - moderate; 0.5-0.7 - noticeable; 0.7-0.9 - high; 0.9-1.0 - very high. Calculations for the region with 33 rural districts showed us a value of 0.13, that is, a direct correlation meaning that at the regional level, the formation of district settlement systems considers the indicators of the natural fertility of agricultural land. Calculations at the intra-district level required a large amount of work. Here we counted 432 settlements. Table 1 presents the results of our calculations.

TABLE I.   RANK CORRELATION COEFFICIENTS BETWEEN BONUS POINTS OF AGRICULTURAL LAND AND POPULATION DENSITY BY RURAL SETTLEMENTS

№	*Name of the district*	*Correlation coefficients*	*Correlation level*
1	Alekseevsky	-0.49	Reverse weak
2	Bykovsky	0.25	Direct weak
3	Gorodishchensky	-0.53	Reverse noticeable
4	Danilovsky	-0.6	Reverse noticeable
5	Dubovsky	0.0	absent
6	Elansky	0.09	Direct weak
7	Zhirnovsky	0.52	Direct noticeable
8	Ilovlinsky	0.5	Direct moderate
9	Kalachevsky	0.06	Direct weak
10	Kamyshinsky	0.08	Direct weak

№	Name of the district	Correlation coefficients	Correlation level
11	Kikvidzensky	0.53	Direct noticeable
12	Kletsky	0.39	Direct moderate
13	Kotelnikovsky	0.59	Direct noticeable
14	Kotovsky	-0.25	Reverse weak
15	Kumylzhensky	0.56	Direct noticeable
16	Leninsky	0.29	Direct weak
17	Mikhailovsky	-0.48	Reverse noticeable
18	Nekhaevsky	-0.03	Reverse weak
19	Nikolaevsky	0.4	Direct moderate
20	Novoanninsky	-0.07	Reverse weak
21	Novonikolaevsky	-0.54	Reverse noticeable
22	Oktyabrsky	-0.33	Reverse moderate
23	Olkhovsky	0.11	Direct weak
24	Pallasovsky	0.75	Direct high
25	Rudnyansky	0.27	Direct weak
26	Svetloyarsky	-1.7	Reverse very high
27	Serafimovichsky	0.32	Direct weak
28	Sredneakhtubinsky	0.37	Direct moderate
29	Staropoltavsky	0.24	Direct weak
30	Surovikinsky	-0.14	Reverse weak
31	Uryupinsky	-0.13	Reverse weak
32	Frolovsky	0.04	Direct weak
33	Chernyshkovsky	-0.3	Reverse weak

An analysis of the data in the table shows significant differences in intra-district rank correlation. We found that twenty districts have a coefficient with a positive manifestation and thirteen - with a negative one. Therefore, we observe a direct and inverse correlation, respectively. In the first case, the resettlement system considers, to varying degrees, the natural fertility of agricultural lands, and in the second case, the processes of improving resettlement [16].

The table shows that the most common is a direct weak correlation, 30.3% of all indicators. Further, it follows by the reverse weak correlation of 18.25, the direct moderate correlation is 15.1%, the reverse noticeable correlation is 15.1%, the direct noticeable correlation is 12.1%. Direct high, reverse moderate and high reverse account for 3% of all indicators. Reverse correlation dominates in the northwest of the region. At different poles are the Pallasovsky district with direct high correlation coefficient and Svetloyarsky district with the reverse high correlation coefficient.

IV. CONCLUSION

The study shows that in the next 10-15 years in the region, the demographic potential will acquire a limiting value. In particular, in the next ten years in rural areas, 87 736 people will reach retirement age, and 69 167 people, or 78.8%, will come into working age [12]. A distinctive feature of the gender and age structure of the population in rural areas is a significantly smaller proportion of people born in the 1980s than in urban areas. For 2018, the proportion of urban residents born in the 1980s was 16.6%, and rural residents were 13.6% of the total population. Consequently, rural migration exacerbates the problem of labour resources in rural areas. We are expecting jobs not filled by young generations [13, 15]. It will result in decreasing social control over rural areas favourable for farming [14].

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