

The modern paradigm for the development of the regional transport complex

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Abstract. The purpose of the article is to consider the diagnosis of the socio-economic characteristics of the region, to justify the specifics and perspectives for the development of its transport complex. Socio-economic diagnostics is a set of scientific techniques and methods aimed at identifying and examining the level and characteristics of the development of the region's economy. At the same time, diagnostics becomes a methodology for determining the development opportunities of the transport complex. Transport serves trade and economic ties between enterprises and industries, ensures inter-territorial contiguity of the country's regions, and transports the population between settlements. The development of transport is directly determined by the mobility of the population, as well as the level of economic development, the needs of manufacturers for the transportation of materials and goods. The modern paradigm of spatial development of the transport complex describes the region as an independent subject in the country's economic management system, and transport communications provide socio-economic relationships between individual regions.

1 Introduction

The socio-economic development (SED) of the region is a complicated set of processes affecting economic, social, demographic parameters, the socio-political and environmental situation within its borders. Of the many definitions of spatial SED in our study, we will operate with the following: these are progressive changes, expressed in progressive transformations leading to economic growth of the territory [1]. At the same time, regional development involves quantitative and qualitative changes, expressed in the growth of the main parameters of the development of society and structural changes [2]. In addition to economic characteristics, the development of a territory necessarily includes social transformations.

Regional development always has a certain direction of its course, determined by the goal and the put forward tasks for the future [3]. At the same time, the objectives of regional policy, formed and implemented by public authorities, are the need to smooth out

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disproportions in the development of the country's regions and equalize the overall level of spatial differentiation in the national economic space [4].

Effective regional policy, as a system of measures aimed at equalizing the levels of economic development of the country's regions and improving the quality and standard of living of the population, requires taking into account a complex of socio-economic parameters of the territory [5]. This problem is solved by regional diagnostics as a special scientific direction of the regional economy, monitoring the socio-economic situation in the region and identifying its features in comparison with other territories of the country.

The theoretical foundations of regional diagnostics were laid by scientists as part of the formation of concepts of regional economics. Moreover, each of the concepts is based on its own terminological apparatus, which are often intertwined, not maintaining consistency and purposefulness. On their basis, in recent years, taking into account changes in global SED, attempts have been made to form a new modern paradigm of spatial SED, which would consider the region as an independent unit in the country's economic complex, with priority attention to the qualitative aspects of its development on the basis of changing the role of regions in managing economic and social processes across the entire national economic complex. The founders of this modern paradigm are W. Isard [6], M. Porter [7], P. Krugman and M. Fujita [8], and among Russian scientists – A.G. Granberg [9], V.N. Leksin and A.N. Shvetsov [10], V.M. Polterovich [11].

The modern paradigm of regional development requires complete objective information about the SED of the region. A tool for forming such an information base about the region, necessary for developing regional policy measures adequate to the socio-economic situation, in our opinion, is regional diagnostics. Based on this, as a hypothesis for our research, we put forward the assumption that the modern paradigm of regional development calls for the need to adjust the existing system of socio-economic diagnostics of the region, taking into account changes in the concepts of interpretation of the region that have occurred recently.

The basis for diagnosing the SED of a region can be a system of indicators that consider population distribution, natural resource potential, the degree of economic diversification and the activities of individual industries. The use of relative comparative indicators allows to identify, compare and analyze the degree of manifestation and intensity of socio-economic processes in the region. On this basis, it is possible to determine the need for vehicles for the transportation of goods and the population, the need to expand existing or build new transport communications and develop transport infrastructure [12]. As a result, the diagnosis of SED acquires important analytical significance, since it becomes the basis for justifying the perspectives for the development of the transport complex of the region, the development and implementation of programs, forecasts, concepts and strategies for the SED of the region, which solve the problems of equalizing and improving the quality of living standards of society, including transportation, provision of transport services.

2 Research materials and methods

This research is based on the approaches of various authors who interpret the region from different points of view:

- region as part of the country's territory, as an independent unit of its administrative-territorial structure – B. Chinitz [13], J. Friedmann [14];
- region as a corporation – H.I. Ansoff, D. Kipley, A.O. Lewis, R. Helm-Stevens, R. Ansoff [15], E. J. Blakely and T. K. Bradshaw [16];
- region as a special social community – N. Olenev and N. Mollaverdi [17], M. S. Ben Ali and S. M. S. Krammer [18];

• region as a market economic structure – M. E. Porter and M. R. Kramer [19], H. J. De Blij, P. O. Muller, J. Nijman [20].

Concepts for considering a region are based on regional diagnostics, using it as a set of techniques and methods that reveal the characteristics of the population and economy of the region based on a set of indicators. At the same time, based on the modern paradigm of regional development, priority in regional diagnostics is given to the analysis of qualitative parameters that reflect the level of development of socio-economic phenomena and processes in the region [21].

The study used a set of methods aimed at analyzing the concepts of regional research, comparing traditional concepts with the modern paradigm of regional development, selecting and justifying indicators of the SED of the region for inclusion in the system of regional diagnostics [22]. At the same time, we assume that the system of indicators we presented allows us not only to fully reflect all components of regional development, but also to provide more valid information about the parameters of regional development in the form of level indicators, which will allow for more objective interregional comparisons.

3 Results

Regional diagnostics of a region is one of the most traditional tasks of regional economics, since it reflects a set of parameters for the development of a region and allows us to identify its features. The results of regional diagnostics, as a methodology for regional research, form the information base of the state and regional management system. At the same time, regional diagnostics is interdisciplinary in nature, since it combines methods of geography, sociology, statistics, demography, and economics. Interdisciplinarity gives the SED of the region significant significance, since, being at the intersection of scientific and methodological fields of a number of disciplines, it enriches the regional economy with the interpenetration of methods and ideas, forming its extensive epistemological potential [23].

The task of SED is to determine the level of development of the region. However, taking into account the modern paradigm of regional development, in which more attention is paid to the independent capabilities of the region in managing the socio-economic situation, in regional diagnostics it is important not to simply identify the features of the spatial organization of the population and economy, but also to establish disproportions in comparison with other regions and the national economy generally. Taking into account these imbalances reveals the problems of regional development associated with underutilization of production capabilities, ineffective use of resources and limited prospects for further growth. Therefore, in our opinion, a mandatory element of regional diagnostics is a comparison of the achieved values of the parameters of the SED of the region with the general and average values for the larger territories of its localization - the macroregion and the national economy as a whole. Such a comparison makes it possible to determine the region's place in the socio-economic system of the entire country or macroregion and its level of development [24].

Regional diagnostics, as a relatively new scientific direction, is aimed at obtaining a holistic picture of the characteristics of the SED of the region. Therefore, in its structure it must take into account the entire complex of features reflecting the territorial organization of the population and economy. When diagnosing the territorial organization of the economy, it is mandatory to take into account not only the achieved level of economic development of the region as a whole, but also the parameters of the activities of individual spheres and sectors of the economy - industry, agriculture, construction, transport, and services. This makes it possible not only to determine the degree of diversification of the economy, but to assess the rationality of its structure, identify the vanguard industries on

which the overall development of the region's economy depends, and outline possible prospects for further development and production transformations.

During regional diagnostics, it is important to consider not only the achieved level of development of the region, but also the resources that form its development potential. Therefore, in the diagnostic program, in our opinion, it is necessary to include in a separate section an analysis of the resource potential of the region's development.

The availability of resources and the degree of their diversity expands the possibilities for economic development of the region, and many of them are important export goods in the foreign economic relations of the region.

The functioning and development of the region does not occur in isolation, but in relationships and interactions with other regions of the country and foreign countries. Therefore, diagnostics should take into account the region's foreign economic relations. In this case, the scale of foreign economic contacts, their levels per capita or per unit of value of gross regional product (GRP), the balance of export-import operations in the region, the degree of their influence on the development of the regional economy (in the form of export and import quotas), food, sectoral and territorial structures of foreign trade as the most active and widespread form of foreign economic relations.

An important part of regional diagnostics is the selection of indicators that are used as indicators of SED of the region. Taking into account changes in approaches and concepts that consider the essence and directions of regional development, in recent years, in regional economics as a scientific direction and the practice of studying regions, a transition has formed from large-scale indicators of socio-economic analysis to level ones [25]. The last ones allow us to evaluate the qualitative component of the development of socio-economic processes and phenomena and assess the degree of their manifestation in the region, and establish their intensity. Level indicators can be coefficients, indices or indicators synthetic in structure (Table 1).

Table 1. Indicators of diagnostics of SED of the region from traditional concepts and modern paradigm.

Indicators for diagnostics of SED of the region	Traditional paradigms of regional economics	Modern paradigm of regional development
General level of regional development	GRP	Per capita GRP Sectoral GRP structure Annual growth rate of GRP
Natural-resource potential	Amount of reserves and annual volume of production (harvesting) of natural resources	Resource endowment of certain types of natural resources; the amount of extraction and export of natural resources (minerals, forests); the state of the environment and the causes of its pollution
Region's demographic potential	The size and composition of the region's population Population density	Population base Annual growth rate of population Demographic ratios Population structure and density Urban saturation The settlement network
Labor resources and employment level	Number of labor forces Number and proportion of employed people	Number of labor resources. Number and structure of employees Population's cost-to-performance ratio Unemployment rate

		Balance of labor resources
Level and quality of life	Value of population's income Value of population's consumption of goods and services Population's living conditions Development in the areas of health and education	Value and sources of population's income Value and structure of population's consumption of goods and services Inflation rate Value of living quarters per one man Level of improvement of housing stock Human Development Index (HDI)
Development of individual sectors of the regional economy	Volume of the production of goods and services	Volume of the production of goods and services – in total and per capita
Region's foreign economic relations.	Value of exports, imports, foreign trade turnover, foreign trade balance	Value of exports, imports, foreign trade turnover, foreign trade balance – in total and per capita Export quota Import quota Industry, product and territorial composition

Based on a comparison of heterogeneous indicators that form an integral system of indicators of the SED of the region, it is advisable to apply rating or scoring methods. The first allows us to establish the place of the region being studied in the socio-economic system of a larger spatial order, for example, on the scale of the entire country or macroregion. Point estimates are expressed in assigning points to the parameters of the SED of the region, based on the developed scale. In this case, indicators with higher values will have significantly more weight than indicators with low or negative values, for example, like natural population decline or migration outflow. The assigned points make it possible to compare in a generalized form the general level of development of the region under consideration with other territories of the country and thereby give a comparative integral assessment of the socio-economic situation and identify spatial differentiation of the macroeconomic system of the national economy.

4 Discussion

The system of indicators for SED of the region that we developed was tested using materials from the Rostov region. This region ranks second in the South of Russia in terms of population (after the Krasnodar Territory) and in terms of territory (after the Volgograd Region). At the same time, the region is distinguished by a relatively high level of development in comparison with other regions of the South of Russia and has a diversified economic structure with a predominance of the service sector. But at the same time, industry, agriculture and transport retain their important positions in its economy.

During the research, a statistical data base was formed that reflects indicators of SED of the Rostov region, the South Russian macroregion and the Russian Federation as a whole. On their basis, regional diagnostics were carried out, which included establishing the position of the Rostov region among other constituent entities of Russia, as well as the share of indicator values in the all-Russian indicators of socio-economic diagnostics. Summarized research data are presented in Table 2.

The set of indicators we have formed does not pretend to be a complete regional diagnostic, but, in our opinion, it is sufficient to determine the main features of the SED of the region under consideration.

In relation to the Rostov region, which is the territory of our study, based on the values of the indicators, their comparison with the all-Russian value and establishing the rating of the region, among other subjects of the Russian Federation, it can be stated that the level of SED of the region is insufficient. The Rostov region, having sufficient demographic potential, has a high population density, but at the same time a negative demographic situation - the population here is declining due to natural decline, which is not covered even by high migration growth. We also assess the level of economic development of the Rostov region as insufficient. This is evidenced by the low indicators of GRP per capita and the growth rate of GRP, which is half the national value. The problems of economic development in the region are also evidenced by the increased unemployment rate compared to the national level. As a result of insufficient development of production, the Rostov region has lower average incomes per capita.

Table 2. Relative indicators of regional socio-economic diagnostics of the Rostov region, 2019.

Indicators	Data from Rostov region	Data from Russian Federation	The ratio of values of indicator of Rostov region with indicators of Russian Federation
GRP per capita, thousand rubles	343.4	578.7	0.59
Annual growth rate of GRP, %	7.4	13.4	0.55
Annual population growth rate, %	-0.12	-0.02	6.0
Fertility rate, ‰	10	10.1	0.89
Mortality rate, ‰	12.3	12.3	1.08
Natural population decline rate, ‰	-4.3	-2.2	1.95
Migration growth rate, ‰	22.0	19.0	1.68
Population density, people per square kilometer	41.41	8.54	4.84
Unemployment rate, %	4.8	4.6	1.04
Cash income per capita (monthly average), thousand rubles	30.752	35.247	0.87
Human Development Index	0.874	0.951	0.92

We used the HDI as a general indicator of the quality and standard of living of the population. According to this indicator, the Rostov region is in 35th place among Russian regions, which confirms our conclusion that the level of SED of the region is insufficient.

Thus, the system of socio-economic indicators we presented, in our opinion, can be applicable for regional diagnostics in order to assess the level of SED of the region. It allows you to reflect individual aspects of regional development – demographic, social, production, macroeconomic – and compare their indicators with the overall level of regional development in the country.

5 Conclusion

Thus, diagnostics of the SED of a region is one of the components of modern regional studies and a unique tool for characterizing the region. It is aimed at identifying the state and level of development of spatial features of the population and economy of the region. Construction of a system of indicators that adequately and most fully reflects the

parameters of regional development is an important methodological task on which the effectiveness of all regional diagnostics as a whole will depend. During regional diagnostics, taking into account the many features and properties of a region necessitates the use of various research methods and approaches, which gives it an interdisciplinary character.

The set of indicators used in regional diagnostics is based on different concepts of considering the region. The complex structure and variety of connections between the elements of the spatial organization of the region forms the modern paradigm for its study, which interprets the development of the region as the positive dynamics of its parameters in general and in individual sectoral, reproductive and territorial areas. At the same time, the modern paradigm of spatial SED emphasizes the role and place of the region in the system of public administration as an independent subject and pays more attention to the consideration of the qualitative characteristics of the region.

One more transformation in regional diagnostics associated with the transition to the modern paradigm of spatial SED is the transition from absolute indicators that take into account the large-scale characteristics of objects and phenomena to relative indicators that reflect the level and intensity of their manifestation. This approach is expressed in a more active involvement in regional diagnostics of average values, level indicators, indices and other synthetic indicators, which make it possible to compare the degree of manifestation of economic, social, demographic phenomena in the region and compare them with other regions of the country. This significantly expands the cognitive value of regional diagnostics as a methodology for regional economics.

Regional diagnostics has important applied significance. Based on its results, a rating and typology of regions is carried out, which in turn, serves as a scientific justification for measures and directions of regional policy. At the same time, regional diagnostics in this case acts as the basis for systematic monitoring of the development of the socio-economic situation in the regions of the country, on the basis of which a set of measures of differentiated assistance and support is developed and implemented by individual parts of the state territory. In this regard, materials from a comprehensive component-by-component regional diagnostic of the SED of the region are used by state and regional authorities to develop strategic planning and forecasting documents, present the potential and advantages of the region's economy at presentation events of various levels and directions, and search for innovative ways to further develop the region in based on existing advantages, factors, conditions and prerequisites for development. With the improvement of the regional diagnostics system for the purposes of regional policy, this constitutes the direction of further research in this scientific area.

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