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Assessment of the level of socio-economic development of the Rostov Region based on the balance of regional subsystems

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Subject. The conditions determining the balanced development of regional subsystems depend on multiple factors that influence the degree of regional development of a certain region. In today's world, the balanced development of regional subsystems directly affects the level of socio-economic development of the regional economy.

Objectives. Justification of a methodological approach to assessing the region's level of socio-economic development through the prism of the balance of its subsystems (social, environmental, and economic).

Methodology. The research methodology is based on a systematic approach, and in this work we used the following: general scientific and special analytical methods: logical analysis, used in the study of methods for assessing the balance of regional development; structural and logical analysis, allowing to organise and clarify the terminology in the conceptual framework of the "balanced development of the region"; generalisation and grouping (while selecting statistical indicators). Economic-mathematical and economic-statistical methods were also used to analyse and assess the relation between indicators, including the method of index correlations. It allows determining the degree of one indicator influencing another and evaluating their correlation. The method of visualisation was used to clearly demonstrate the results of the study and analytical data. It helped to present the obtained results in graphical or diagrammatic form so as to better understand their meaning and make conclusions. Comparative and economic analysis was used to analyse the balance of the region's component subsystems (social, environmental, and economic). Comparative analysis allows determining the differences and similarities between these components and assess their impact on the overall development of the region. Economic analysis identifies economic factors influencing the state of the region and assesses the efficiency of its subsystems' operation. The method of expert assessment is used to justify a set of indicators and assess the efficiency of regional subsystems' operation (social, environmental, and economic), which allows obtaining more objective and substantiated data for the analysis and assessment of the region's activities.

Results. The obtained results indicated that the development system of the Rostov region is imperfect, and social, environmental, and economic subsystems were not balanced. The assessment of the balance of regional development showed a low level of economic activity in the region, which

was 1.9 points, being below the average value (from 2 to 3 points). This indicator means that the state of the socio-economic system is unstable, therefore, a mechanism must be created to regulate the balance of the target characteristics of the system. This will serve as a fundamental line for future research.

Discussion. The obtained results were compared with the conclusions of researchers who assessed the level of socio-economic development of the region in the specified time periods based on an assessment of the balance of regional subsystems and made forecasts regarding the prospects for regional development.

Conclusions. The conducted analysis allowed making conclusions on the informative characteristic in the balance of regional development as a result of the influence of economic, social, and environmental factors on the region's subsystems; the elemental composition of integral indicators for assessing the balance of regional subsystems in particular and regional development in general, including the informative side of assessing the socio-economic development of the region; and features of the methodological approach based on the scoring of regional development indicators.

Key words: region, regional development, balanced development, balance, proportions, assessment, three-factor model.

Introduction

The study and solution of the issues of balance of regional development has remained relevant for several decades. Regional development, being a dynamic process with a vector aimed towards social progress, is subject to being shifted in the plane of unstable state of its element base affected by a number of objective and subjective factors. An imbalanced regional development leads to disproportions which have a negative effect on the economic efficiency as well as strategy and tactics of institutional transformations.

The balanced development of regions is highly important for the country's general development as it allows using the potential of each region to the maximum degree in accordance with its specific features and possibilities. Regional possibilities, in their turn, are defined by individual features, such as systematic development, current trends of the region's development, and economic specialisation.

The main factors influencing the development of the region and improvement of the lives of its population include general factors (geographical location, climate, demography), spatial development (infrastructure, housing construction), resources (natural resources, environmental conditions), economic development (production, capital), and social assets (stability, partnership, qualifications, and social infrastructure). (Ibragimkhalilova & Lukyanchenko, 2017. P. 94).

O. A. Ushakova (2012. P. 163) rightly believes that the most significant natural factor in the development of regions is natural resources potential, which, in turn, forms the basis for the development of territorial production complexes, territorial division of labour, and market specialisation.

Regional development is also being influenced by the structure of regional economics and their material and component basis that determine the role and place of administrative-territorial entities in the system of social division of labour at the national and global levels.

Balance, according to the modern economic dictionary, is "…equilibrium, i.e. a state of an economic system characterised by the balancing of two or more multidirectional factors"[1]. T. G. Brodskaya (1991, C. 7), characterising the balance of the economy, mentions the importance

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[1] *Raizberg B. A., Lozovsky L. Sh., Starodubtseva E. B. Modern economic dictionary. 6th ed., revised and enlarged. Moscow, 2022. 512 p.*

of establishing not only certain proportions, but also correspondence between social needs, supply volumes, distribution structure, as well as economic forms in which production, distribution, exchange, and consumption take place. According to D. A. Barabash (2014. C. 42), balanced development of any system entails changes in all subsystems, synchronous and harmonious in order to keep relative proportionality between them. M. Yu. Kalinnikov (2005. C. 15) defines balanced regional development from the point of balance and a reduction in imbalances in its economic, political, social, and environmental subsystems, ensuring "the progressive development of the region on the whole." S. V. Dokholyan (2022. C. 62) conducted a comprehensive study of the theoretical essence of the concept of "balanced development of the regional economy" and defined balanced regional development as a process agreed upon between subjects of the regional economy, based on target figures and indicative planning, and implemented in order to improve the level of economic management of all participant categories of people (or groups), such as local residents, participants of entrepreneurial activities, government bodies, educational institutions of various levels, etc. In addition, S. V. Dokholyan noted that, on the one hand, it was necessary to maintain a balance between the volume and composition of resources and, on the other hand, the need for these resources through the introduction of dynamic changes in their qualitative and structural characteristics.

L. A. Gamidullaeva, E. S. Grosheva, O. A. Belogradova, D. S. Shevchenko (2022. P. 30) mentioned the differences between balanced and sustainable development and noted that the latter presupposed the achievement of the given parameters of the region reflecting the interests of all stakeholders in social, economic, and environmental areas. The correspondence of the scale, structure, and qualitative features of resources to demand for them is also important (Gamidullaeva et al., 2022. P. 27).

R. I. Shniper (1979), R. V. Boltov et al. (2016), Yu. V. Pavlov (2020), D. Kh. Krasnoselskaya and V. M. Timiryanova (2022) Yu. I. Treshchevsky et al.

(2022) and D. A. Endovitsky et al. paid special attention to the balance and proportionality between the economic potential of the region and reproduction processes, including the spatial migration of the population.

V. I. Ksenofontov (2010) extends the idea of balancing to the elements of economic policy, rights, responsibilities,[2] and interests of the spatial-functional systems of various levels.

A. I. Sadykov (2022) focused on the achievement of optimality in the use of the potential of the region and the country on the whole.

It should be noted that in order to ensure balanced regional development, it is necessary to ensure consistency in the development pace of the region's industries, depending on the priorities of its socio-economic development and also taking into account the degree of satisfaction of regional demand. Imbalanced regional development leads to disproportions (incommensurability and inconsistency between parts of the whole), which have a negative impact on the efficiency of the economy, tactics, and strategy of institutional transformations. In this regard, it should be noted that the issue of imbalance and disproportionality in the development of large territorial subsystems of the country was articulated back in 1996[3], although it is still cannot be considered as being solved.

Moving towards sustainable and balanced regional development using the principles of stimulating rational and socially-oriented natural resource management and maximising the preservation of human potential through the formation of high standards of the population's well-being (Korchak, 2020) predetermined the development of the Federal target programme "Narrowing the difference gap in socio-economic development of the regions of the Russian Federation" which was based on a comprehensive

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[2] *Ksenofontov V. I.* Theoretical and methodological basis of economic management of the balanced regional development: abstract diss. ... Doctor of Economic Sciences. St. Petersburg, 2011. 42 p.

[3] On the principal provisions of regional policy in the Russian Federation : Decree of the President of the Russian Federation as of 3 June 1996 No. 803 // Collected legislation of the Russian Federation. 03.06.1996. No. 23. Art. 2756.

assessment of the level of socio-economic development of the regions of the Russian Federation (Table 1). This programme allowed identifying the possibilities of current and long-term social and economic development tasks based on the use of internal reserves, economic growth sources, and the effectiveness of socio-economic policy measures. It also helped reduce the gap in the main indicators of socio-economic development between the most developed and lagging regions[4].

The suggested assessment and set of tasks did not completely smooth away the disproportions in regional development, since regions were studied in isolation, regardless of the interactions between physical capital, natural capital, human capital, business environment, and institutional structure, which all operate together in a broader ecosystem.

V. I. Ksenofontov (2010), who studied the assessment of the socio-economic development of the region, believes that several indicators must be analysed (Table 1) in order to help identify the balance of the socio-economic system of the region. This analysis will allow determining the correlation between the region's needs for resources and its ability to obtain the required resources. Although the method developed by V. I. Ksenofontov has not been widely applied, it helped us to identify certain indicators of regional development programmes.

Quite noteworthy is the three-factor model proposed by A. Yu. Davankov and N. L. Yatsukova (2015) for the assessment of the balance in the economic activities of the region. It is based on determining the equilibrium (balance) between the economic, social, and environmental subsystems, which ensure the balance and sustainability of the regional socio-economic system.

At present, a consensus has been reached regarding the concept of sustainability with

"environmental", "social", and "economic" measurements that are called "The three pillars of sustainability" (Atkinson et al., 1997; Efimova, 2023). Environmental sustainability involves making decisions to protect the natural environment; social sustainability means actively supporting the ability of current and future generations to create healthy and habitable communities; economic sustainability requires efficient and responsible use of resources to achieve long-term benefits.

The three-factor model presented below (Table 1) based on research by A. I. Tatarkin et al. (2016. P. 147–155) ensures a rather accurate assessment while forming the integral indicators for each subsystem. At the same time, its application will contribute to the development of systematic solutions and actions through providing simplified and refined aggregated information to stakeholders. The model's indicators, being useful tools for conveying ideas and values, will ensure the introduction of knowledge from physical and social sciences into decision-making, as well as help set the goals and measure the progress towards such goals (Kuik & Verbruggen, 1991).

Methods and results

The balance of regional development of the Rostov Region was assessed using the indicators based on Rosstat data on the level of development of the social sphere (education, house management, healthcare, culture and sports, population, crime rate, and social tension), on the level of environmental development (air, water, forests, waste), and the level of development of economic activity in the region in 2018–2022.

Based on the three-factor model by A. Yu. Davankov and N. L. Yatsukova (2015), using the calculations of the selected indicators, the criteria for assessing the static (absolute) and dynamic (growth index) values of each indicator were substantiated so as to be ranked on a three-point scale, where 3 points is the best dynamics, 1 point is the worst dynamics, and 2 points are given for insignificant dynamics (within the range of 0.99–1.01).

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[4] On the federal target program "Narrowing the difference gap in the socio-economic development of the regions of the Russian Federation (2002–2010 and until 2015)" : Decree of the Government of the Russian Federation as of 11 October 2001 No. 717. Access from the reference and legal system "ConsultantPlus".

T a b l e   1

Transformation of assessment models for the level of socio-economic development of regions

Federal target programme "Narrowing the difference gap in the socio-economic development of regions of the Russian Federation	Assessment of the level of socio-economic development of the region (according to V. I. Ksenofontov)	Three-factor model for assessing the balance of development of regional subsystems
		The system for the assessment of a region's social sphere
Gross regional product (taking into account purchasing power parity) per capita (thousand roubles)	Covering the region's funding needs	*Education* (average number per 1 preschool educational institution, people/unit; average number per school, person/unit; average number per educational organisation training qualified workers, employees, people/unit; average number per educational institution organisation training mid-level specialists, people/unit; average number per higher professional education institution, people/unit.
Volume of investments in fixed capital per capita (thousand roubles)	Covering the region's need for equity financing	*House management* (total area of residential premises per inhabitant on average, sq.m. 2; share of household expenses for the payment of housing and utilities services, %; providing social support (benefits) to citizens to pay for residential premises and utilities).
Volume of foreign trade turnover per capita (US dollars) (VTO)	Covering the region's labour needs	*Healthcare* (number of hospital beds per 10,000 people; capacity of outpatient clinics per 10,000 people; number of doctors of all specialities per 10,000 people; number of medium-grade medical personnel per 10,000 people; morbidity rate per 1,000 people).
Financial security of the region taking into account purchasing power parity per capita (thousand roubles)	Covering the region's labour needs using own resources	*Culture, sports* (number of sports facilities; public libraries (library collection, volumes/1,000 people); average number of children per children's health resort, people/unit).
Share of the average number of employees in small enterprises (with the exception of external part-time and civil contract employees) in the total average number of employees in enterprises and organisations (percentage)		*Population* (average annual population, thousand people; life expectancy at birth, years; ratio of marriages and divorces, number of divorces per 1,000 marriages).
Registered unemployment rate (percentage of economically active population)	Average utilisation rate of fixed production assets by industry	*Crime rate* (number of crimes committed by minors or as accomplices; number of registered crimes per 100,000 population). *Social tension* (strikes (number of participating workers); migration growth rates per 10,000 population; number of unemployed, thousand people; expenses of consolidated budgets of the regions of the Russian Federation aimed at the implementation of measures of social support for certain categories of citizens, thousand roubles).
The ratio of average per capita income and subsistence level	Covering the region's food needs using own resources	*The system for the assessment of a region's environment*
Share of the population with incomes below the subsistence level (percentage) in the total population		*Air* (number of air pollution sources, units; emitted unpurified pollutants, thousand tons; pollutants emitted into the air in the reporting year from fuel combustion (electricity and heat generation), thousand tons; pollutants emitted into the air in the reporting year from technological and other processes, thousand tons; pollutants captured and neutralised as a percentage of the total amount from stationary sources, %).
Total turnover of retail trade, catering, and paid services (taking into account purchasing power parity) per capita (thousand roubles)	Covering the region's food needs using own resources	
Fixed assets of economic sectors (according to net book value in average annual terms of the full book value, taking into account increased capital costs) per capita (thousand roubles)	Covering the region's needs for consumer goods	*Water* (water intake from water sources, million cubic metres; fresh water consumption, total, million cubic metres; volume of recycled and consistently used water (including the use of waste and collector and drainage water), million cubic metres; volume of wastewater discharge, total, million cubic metres; volume of polluted water from discharged wastewater, million cubic metres).

The end of table 1

Road density coefficient (Engel coefficient)		*Forests* (forest lands as a % of the total area; reforestation, million hectares; artificial reforestation (planted forests), million hectares; loss of forest vegetation due to various (biological) reasons, million hectares; forest lands affected by fires, million hectares).
Total indicator of the development level of social infrastructure sectors: – availability of preschool educational institutions (places per 1 thousand preschool children); – specialists trained in higher and state secondary educational institutions (people per 10 thousand population); – availability of doctors and medium-grade medical personnel (people per 10 thousand population)	Covering the region's energy needs by own sources	*Waste* (pollutants received at treatment facilities, thousand tons; most common pollutants captured and neutralised, thousand tons; most common pollutants disposed, thousand tons; payment for permissible and excess emissions (discharges) of pollutants (disposal of production and consumption waste), million roubles; funds (claims) and fines paid to compensate for damage caused by violation of environmental legislation, thousand roubles).
	Covering the region's needs for mineral deposits using own resources	*The system for the assessment of a region's economic activity*
		Region (share of fixed assets of the industry of specialisation in the total assets, %; ratio of fixed assets introduced in the industry of specialisation to introduced fixed assets in the region, %; ratio of the depreciation degree of fixed assets of enterprises in the industry of specialisation to the depreciation degree of fixed assets in the region on the whole, as a decimal fraction; share of completely worn-out fixed assets by industry of specialisation, %; gross regional product, billion roubles; gross added value by industry (% of added value of manufacturing industries in the region's GRP), %; gross fixed capital formation, billion roubles).
		Enterprises (fixed-asset turnover of all enterprises in the region, rub./rub.; turnover ratio of operating assets of all enterprises in the region, turnover per year; revenue from the sale of products, works, and services for all enterprises in the region, billion roubles; profitability of sales of all enterprises in the region, %; profit rate (commercial margin) of all enterprises in the region, %).
		Labour resources (economically active population, thousand people; average annual number of people employed in the economy, thousand people; average annual number of people employed in manufacturing industries, thousand people; average consumer expenses per capita, thousand roubles/month; structure of household consumer expenses; ratio of average income per capita to consumer expenses; ratio of average income per capita to nominal wages; percentage of wages in the structure of the population's income, %)

Results and discussion

The results of the calculations conducted in the Rostov Region in 2018–2022 according to the above-mentioned method are presented in Tables 2–4. The limiting factor for the study being fully completed was the availability of relevant statistical data[5].

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[5] Information and analytical website of legal statistics of the Prosecutor General's Office of the Russian Federation. URL: http://crimestat.ru ; Regions of Russia. Social and economic indicators. 2020: P32 Coll. stat. / Rosstat. M., 2020 ; Regions of Russia. Social and economic indicators. 2022: P32 Coll. stat. / Rosstat. M., 2022.

The monitoring of social activity indicators presented in Table 2 shows a decrease in the efficiency of the region's activities in this area. According to calculations, the average final score was 1.85 points, which is lower than the average value of 2 points. The lowest results were observed in the "Social tension" section (1.75 points) and "Population" (1.67 points).

It should be noted that negative dynamics was identified as a result of the analysis of environmental activity indicators (Table 3).

T a b l e 2

Monitoring of social activity indicators in the Rostov Region in 2018–2022

Name of the indicator	2018	2019	2020	2021	2022	Growth index (2021/2020)	Points
1	2	3	4	5	6	7	8
Education							2.80
1. Availability of places in educational organisations for children aged one and a half to three years, per 1,000 children 1) (places)	357.00	370.00	367.00	394.00	431.00	1.07	3.00
2. Availability of places in educational organisations for pre-school children, per 1,000 children (units)	581.00	602.00	619.00	672.90	702.91	1.09	3.00
3. Pre-school education coverage (children aged 1 to 6), %	69.04	70.32	71.22	74.22	75.60	1.04	3.00
4. Number of students in training programmes for mid-level specialists per 10,000 population	175.00	181.00	191.00	204.00	211.00	1.07	3.00
5. Number of students in training programmes for bachelor's, master's, and specialist's degree per 10,000 population	319.00	325.00	317.00	316.00	313.00	1.00	2.00
House management							2.00
6. Total area of residential premises per inhabitant on average, sq. m	28.00	28.80	25.80	26.50	27.20	1.03	3.00
7. Share of household expenses for payment of housing and utilities services (as a % of the total amount of consumer expenses)	11.40	11.40	11.40	11.70	11.80	1.03	1.00
8. Average monthly amount of benefits, roubles/person	637.00	765.00	748.00	797.00	–	1.07	2.00
Healthcare							2.00
9. Number of hospital beds per 10,000 population	80.30	79.30	78.30	78.60	–	1.00	2.00

1	2	3	4	5	6	7	8
10. Clinics capacity	242.50	242.20	246.10	256.80	–	1.04	2.00
11. Number of doctors of all specialities per 10,000 population	37.50	37.10	38.70	39.10	–	1.01	2.00
12. Number of medium-grade medical personnel per 10,000 population	88.20	88.20	87.60	85.40	–	0.97	1.00
13. Morbidity rate per 1,000 people	801.20	821.20	746.90	894.60	–	1.20	3.00
Culture, Sport							2.00
14. Number of sports facilities	8,059.00	8,121.00	8,253.00	8,336.00	–	1,01	2.00
15. Public libraries (library collection, volumes/1,000 people)	5,456.00	5,181.00	5,139.00	5,127.00	–	1.00	2.00
16. Number of children on vacation in the region of the Russian Federation, thousand people	60.40	62.00	52.00	56.30	–	1.08	2.00
Population							1.67
17. Average annual population, thousand people	4,211.40	4,200.10	4,189.60	4,167.60	4,192.32	0.99	1.00
18. Assumed life expectancy at birth, years	73.21	73.69	72.04	69.79	72.00	0.97	1.00
19. Ratio of marriages and divorces, number of divorces per 1,000 marriages	700.00	680.00	800.00	710.00	686.00	0.89	3.00
Crime rate							2.58
20. Number of registered crimes*	55,460.00	60,914.00	61,753.00	58,538.00	57,250.00	0.95	3.00
21. Number of crimes committed by minors or as accomplices*	930.00	967.00	733.00	725.00	665.00	0.99	3.00
Social tension							1.75
22. Strikes (number of participating workers)	–	–	–	–	–	–	0.00
23. Migration growth rates per 10,000 population	–6.00	32.00	28.50	36.00	–0.50	1.26	1.00
24. Number of unemployed, thousand people	16.70	17.30	107.00	17.30	–	0.16	3.00
25. Expenses of consolidated budgets of the regions of the Russian Federation aimed at the implementation of social support measures for certain categories of citizens, thousand roubles	17,562,654.00	17,324,984.00	18,886,248.00	20,262,216.00	–	1.07	3.00
Total average score in points							1.85

T a b l e 3

Analysis of environmental activity indicators in the Rostov Region in 2019–2021

Name of the indicator	2019	2020	2021	Growth index (2021/2020)	Points
Air					1.33
1. Pollutants emitted into the air from stationary sources, thousand tons	158	175	177	1.01	2.00
2. Pollutants in the air from stationary sources captured, thousand tons	849	730	861	1.18	1.00
3. Pollutants captured and neutralised as a percentage of the total amount of pollutants from stationary sources, %	84	81	79	0.97	1.00
Water					1.75
4. Fresh water consumption, million cubic metres	2,216	2,141	2,230	1.04	2.00
5. Volume of recycled and consistently used water (including the use of waste and collector and drainage water)	6,606	6,586	6,372	0.97	1.00
6. Volume of wastewater discharge, total, million cubic metres	202	188	198	1.05	2.00
7. Environmental protection expenses, million roubles	5,924	7,216	7,645	1.06	2.00
Forests					2.33
8. Forest lands as a % of the total area	3	3	3	1.00	2.00
9. Reforestation, million hectares	2	2	2	1.07	2.00
10. Production of raw wood, thousand cubic metres	4	6	11	1.85	3.00
Total average score in points					1.81

S o u r c e: Rostov Region in figures: Brief collected statistics Rostovstat. Rostov-n D, 2022.

T a b l e 4

Assessment of economic activity in the Rostov Region in 2019–2021

Name of the indicator	2019	2020	2021	Growth index (2021/2020)	Points
Region				1.04	2.00
1. Depreciation degree of fixed assets (by the end of the year; as a percentage)	44.7	46.2	47.1	1.02	1.00
2. Cost of fixed assets (by the end of the year; gross book value; million roubles)	6,831,010	7,018,721	7,460,101	1.06	3.00
3. Gross regional product	1,548,223	1,636,018	1,692,407	1.03	2.00
4. Gross regional product per capita	367,628	389,521	403,949	1.04	2.00
Enterprises				1.06	2.00
5. Number of enterprises and organisations (by the end of the year; according to state registration data)	82,455	75,575	70,966	0.94	1.00
6. Industrial production indices (as a percentage compared to the previous year)	103	102	111	1.09	2.00
7. Consolidated financial results (gain minus loss) of the organisation's activities, million roubles	−55,157	119,895	137,013	1.14	3.00
Labour resources				1.01	2.17
8. Number of employed people per retired employee (average annual; people)	1.5	1.5	1.6	1.07	2.00
9. Average consumer expenses per capita, rub./month	26,881	26,216	30,989	1.18	3.00
10. Ratio of average per capita income to consumer expenses	15 %	20 %	13 %	0.65	1.00
11. Average monthly nominal wages of organisations' employees	33,757	35,622	39,291	1.10	3.00
12. Average per capita income of the population, thousand roubles/person a month	30,866	31,519	35,041	1.11	3.00
13. Ratio of average per capita income to nominal wages	−9 %	−12 %	−11 %	0.94	1.00
Total average score in points					2.06

As for the "Air" section, negative dynamics was found, and the average score was 1.33 points, while the normal value should be ⩽ 1 point.

As for the "Water" section, the indicator of fresh water consumption increased in 2021 as compared to 2020 by 89 million cubic metres.

Although the value slightly increased, the standard of the indicator is almost twice less; the volume of recycled and consistently used water (including the use of waste and collector and drainage water) decreased in 2021 as compared to 2020 by 303 million cubic metres, which is less than the standard value.

The volume of wastewater discharge increased in 2021 as compared to 2020 by 10 million cubic metres, which is also almost twice less than the standard value.

Thus, the "Air" section showed an increase:

Pollutants emitted into the air from stationary sources increased by 2 thousand tons in 2011 as compared to 2022.

Registered pollutants emitted into the air from stationary sources increased by 131 thousand tons in 2021 as compared to 2022.

It should be noted that the rate of capturing (registering) and neutralising pollutants as a percentage of the total amount emitted by stationary sources decreased by 2 % in 2021 as compared to 2022, which is also a negative factor of environmental activities, and environmental protection expenses increased in 2021 as compared to 2020 by 429 million roubles. This increase in the environmental activity indicator is very small for the Rostov Region. An increase in the 2021 amount to more than 700 million roubles would be considered a normal value.

As for the "Water" section, the average score was 1.75 points, which on the whole is a low value.

As for the "Forest" section, in 2021 the indicators did not change as compared to 2020, with the exception of the production of raw wood (the indicator increased by 5 thousand cubic metres). In general, it can be stated that this section is almost twice less than the normal value.

Thus, according to the results of the analysis of environmental activity indicators in the Rostov Region in 2019–2021, the average score for this area of activity was 1.81 points in 2021, which is below the average.

As for the studied industries in the field of economic activity, the intermediate results were above 2, and the best result in the "Labour resources" section was 2.17. The final value of the "average consumer expenses per capita" indicator was 3 points, which showed an increase in this indicator by 18 % as compared to the previous period; the value of the "average per capita income of the population" indicator in 2021 increased by only 11 % as compared to the previous period.

In the "Enterprises" section, good results were achieved in the "consolidated financial results" indicator (profit) of organisations' activities and amounted to 137,013 million roubles, which was 14 % more than in the previous year.

The total average value of regional development was 2,06 points. Both "Region" and "Enterprise" sections showed the same result of 2.0, which indicated insignificant dynamics in these sections.

The regional picture of average monthly wage growth reflects deep changes in labour supply and demand, which, in their turn, are influenced by structural changes in the economy.

Figures 1 and 2 show the structure of the population's incomes in the Rostov Region and the structure of the use of population's incomes in the Rostov Region.

The figures show insignificant changes in the dynamics of the structure of income and the use of income of the population over the analysed period. The data presented in Figure 1 show insignificant dynamics in the structure of the population's income, however, such indicators as property income and social benefits show a decrease in 2021 as compared to 2020.

The data presented in Figure 2 show that the largest share in the structure of the use of the population's income is purchasing goods and paying for services, which increased by 5 % in 2021 as compared to 2020.
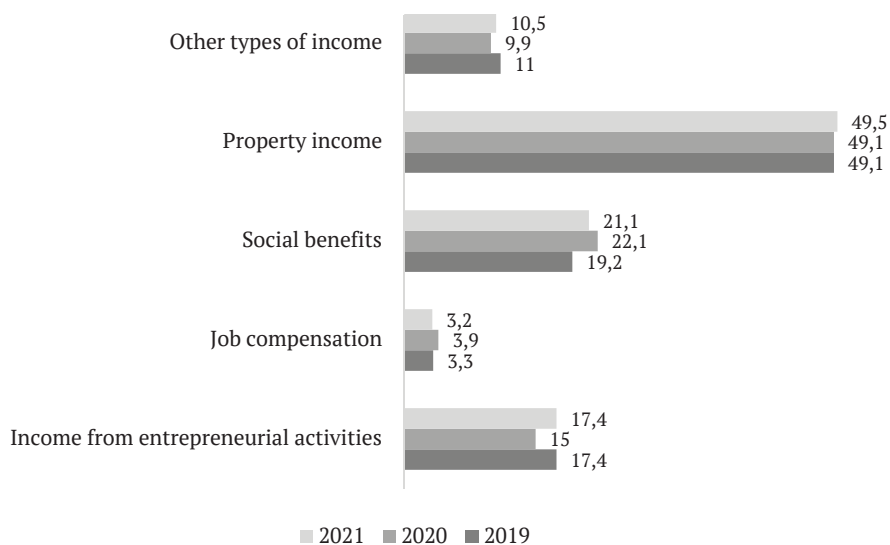
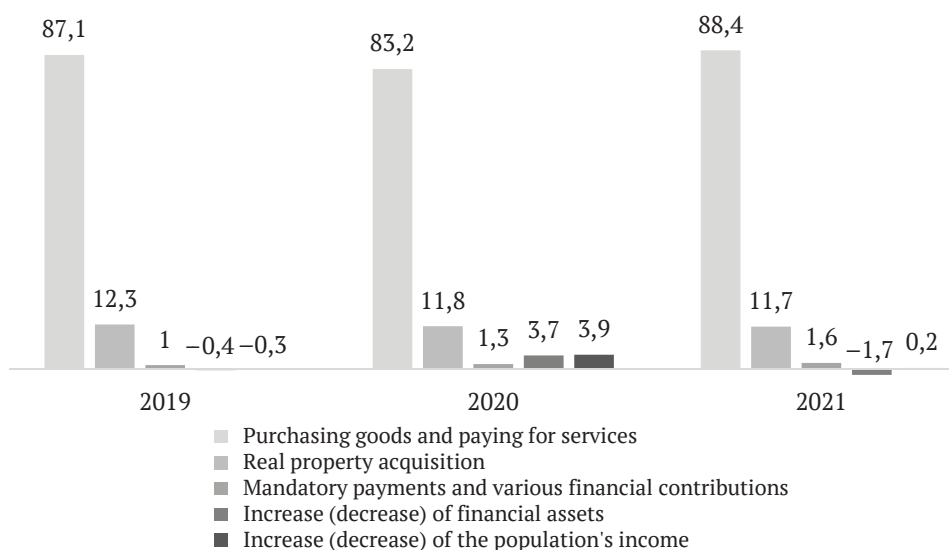*Fig. 1.* Structure of the population's incomes in the Rostov region (%)

Fig. 2. Structure of the use of the population's incomes in the Rostov Region (%)

Table 5 presents an assessment of the level of balance of economic activity in the Rostov Region in 2021. The scores were calculated using the arithmetic mean assessment of such areas of activities as social, economic, and environmental and were based on the results of calculating each assessment indicator.

Thus, as a result of assessing the indicators of the Rostov Region in 2021, the highest level of operational efficiency was observed in the economic sphere, where the final score was 2.06. Negative dynamics were found in the social and environmental sphere: 1.85 and

T a b l e 5

Cumulative report on the level of balance of economic activity in the Rostov region in 2021

Subsystems	Points
Social	1.85
Environmental	1.81
Economic	2.06
Arithmetic mean of the level of economic activities	1.90

1.81 points respectively. Therefore, the average final assessment of the regional development level of the Rostov Region, taking into account the influence of social and environmental factors, was 1.90, which is relatively low. It can be concluded that the regional development of the Rostov Region is imbalanced.

Conclusions

An assessment of the balance of regional development in the Rostov Region showed that the final assessment of the economic activity level in the region was below the average value (1.9 points).

Therefore, the three-factor methodology for assessing the balance of a territory development based on scoring of economic, social, and environmental factors allowed identifying "sensitive" regional subsystems that hinder sustainable regional development. This methodological approach allowed assessing the level of the balance of regional development over a long period of time and determining the general line of the region's development as well as each individual indicator. Various regions can be compared using this method only if the same set of assessment indicators is used.

Balanced and sustainable development remains the most important goal for most regions and states. Different approaches to regional development have been designed by many countries as they were driven by the above-mentioned attempts to solve one or several issues regarding regional development in different countries. In the future, this approach will allow further consideration of this issue, which could help decision makers find the necessary answers to the question of what the efficient balanced and sustainable development of the region should be like.

Conflict of Interest

The authors declare the absence of obvious and potential conflicts of interest related to the publication of this article.

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Вестник Воронежского государственного университета
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Региональная экономика

Оценка уровня социально-экономического развития Ростовской области на основе сбалансированности региональных подсистем

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Предмет. Условия, определяющие сбалансированность развития региональных подсистем, зависят от многих факторов, влияющих на степень регионального развития конкретного региона. В современных условиях сбалансированность развития региональных подсистем напрямую влияет на уровень социально-экономического развития региональной экономики.

Цель. Обоснование методического подхода к оценке уровня социально-экономического развития региона через призму сбалансированности его подсистем (социальной, экологической, экономической).

Методология. Методология исследования основана на системном подходе; в работе использовались общенаучные и специальные аналитические методы логического анализа, которые применялись при исследовании методик оценки сбалансированности регионального развития; структурно-логического анализа, позволяющего упорядочить и уточнить терминологию в понятийном аппарате «сбалансированного развития региона»; обобщения; группировки (при проведении отбора статистических показателей). Также в работе использованы экономико-математические и экономико-статистические методы при анализе и оценке связей между показателями, в том числе метод индексных взаимосвязей, позволяющий определить степень влияния одного показателя на другой и оценить их взаимосвязь. Для наглядной демонстрации результатов исследования и аналитических данных использовался метод визуализации, с помощью которого можно представить полученные результаты в графическом или диаграмматическом виде, что помогает лучше понять их суть и сделать выводы. Для оценки баланса составляющих подсистем региона (социальной, экологической, экономической) были задействованы сравнительный анализ и экономический анализ: сравнительный анализ позволяет определить различия и сходства между этими составляющими и оценить их влияние на общую картину развития региона; экономический анализ позволяет выявить экономические факторы, влияющие на состояние региона, и оценить эффективность функционирования его подсистем. При обосновании набора показателей и оценке эффективности функционирования региональных подсистем (социальной, экологической и экономической) был применен метод экспертной оценки, позволяющий получить более объективные и обоснованные данные для анализа и оценки деятельности региона.

Результаты. Полученные результаты указывают на несовершенную систему развития Ростовской области, где социальные, экологические и экономические подсистемы не сбалансированы. Оценка сбалансированности регионального развития показала низкий уровень хозяйственной активности региона, который составляет 1,9 баллов, что ниже среднего значения (от 2 до 3 баллов). Данный показатель сигнализирует о нестабильном состоянии социально-экономической системы, поэтому требуется создание механизма для регулирования баланса целевых характеристик системы. Это будет являться основополагающим направлением для будущих исследований.

Обсуждение результатов. Полученные результаты сопоставлены с выводами исследователей, осуществлявших оценку уровня социально-экономического развития региона в указанные временные периоды на основе изучения сбалансированности региональных подсистем и делающих прогнозы относительно перспектив регионального развития.

Выводы. Проведенный анализ позволил сделать выводы о содержательной характеристике сбалансированности регионального развития как результате влияния экономических, социальных и экологических факторов на подсистемы региона; элементном составе интегральных показателей оценки сбалансированности региональных подсистем в частности и регионального развития в целом, включающем содержательную сторону оценки социально-экономического развития региона; особенностях методического подхода, основанного на балльной оценке показателей регионального развития.

Ключевые слова: регион, региональное развитие, сбалансированное развитие, баланс, пропорции, оценка, трехфакторная модель.

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