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SOCIO-ECOLOGICAL AND ECONOMIC DEVELOPMENT OF MUNICIPAL DISTRICTS OF THE REPUBLIC OF BASHKORTOSTAN

Natalia V. Trofimova (a), Marina Yu. Sazykina (b)*, Elvira R. Mamleeva (c),
Gulnara F. Shiryaeva (d)
*Corresponding author

(a) Institute for Strategic Studies of the Republic of Bashkortostan, 15 Kirova St., Ufa, Russia, trofimovanv@isi-rb.ru
(b) Institute for Strategic Studies of the Republic of Bashkortostan, 15 Kirova St., Ufa, Russia,
sazykinamyu@isi-rb.ru
(c) Institute for Strategic Studies of the Republic of Bashkortostan, 15 Kirova St., Ufa, Russia,
elvira.mamleeva@yandex.ru,
(d) Private educational institution of higher education "Eastern Economic and Legal Academy of Humanities", 215/4
Mendeleeva St., Ufa, Russia, shiryaevag@mail.ru

Abstract

At the present stage, territorial systems are characterized by uneven development, both at the level of the constituent entities of the Russian Federation and within the regions. A complex assessment of socio-ecological and economic development of municipal districts of the Trans-Ural region of the Republic of Bashkortostan (RB) with the help of an index method and clustering has been made in the article. The results obtained made it possible to assess asymmetry and propose typologisation of the municipal districts of Bashkortostan by the level of socio-ecological and economic development. It was found that the values of the main social, economic and environmental indicators in the municipal districts of the Trans-Ural region of Bashkortostan significantly lag behind the national average, despite the significant potential of the territories. The results obtained made it possible to identify the strengths and weaknesses of the development of territories, to assess the socio-ecological and economic potential of the municipalities, to highlight the key development opportunities for the Trans-Urals RB based on the existing competitive advantages. Conclusions are made about the need to adjust the development programs of municipal districts of the Trans-Ural region of the Republic of Bashkortostan, taking into account the identified social, economic and environmental features of the development of territories.

Keywords: Economic development, municipality, socio-ecological development

1. Introduction

The role of municipalities in ensuring stable and sustainable socio-economic development of regions and the country as a whole is increasingly important. The reform of local government has resulted in municipalities having to find their own sources for development. In times of crisis, when survival is a priority, the state of the natural environment is not given due attention. This trend continues today, when strategic documents for municipal development reflect environmental aspects in a very formal way.

2. Problem Statement

The relevance of the study topic lies in the need for an effective system of strategic planning for municipal development, which includes environmental priorities, along with economic and social ones. Zhukov (2017) assessed the social, economic and environmental processes taking place in the region, he used an integral approach, namely, the calculation of the human development index. A significant number of scientific studies use a socio-ecological and economic approach to assess the level of development of individual territorial-administrative entities:

1) evaluating the socio-ecological and economic development of municipalities of are based on the system of indicators of the development of the socio-ecological-economic system (Belozerova, 2011; Dondokova & Makarova, 2015);

2) a group of authors - analysis of socio-ecological and economic balance is based on a combination of static and dynamic approaches (Pechenitsina, 2017; Tretyakova & Osipova, 2016);

3) in the works of the emphasis is on the ecological aspect and the potential growth of the ecological discomfort of the local population of the study area (Milanova & Bondarchuk, 2012; Malykh & Polyanskaya, 2019; Zabelina & Kolotovkina, 2019);

4) Assess the stability of the regional system from the standpoint of the balance of social, environmental and economic components of development (Davankov et al., 2016).

3. Research Questions

In previously published articles, to analyze the problem of sustainable development of territories, integral assessment methods are mainly used. Our study combines the index method and the multidimensional grouping (clustering) method. The objects of the research are the municipal districts of the Trans-Ural region of the Republic of Bashkortostan.

4. Purpose of the Study

The aim of the study is to identify the degree of irregularity in the development of municipalities in the region, based on the approach proposed by the authors, as well as the development of mechanisms and tools for managing the balanced development of territories, taking into account specific features of socio-ecological and economic development of the Republic of Bashkortostan.

5.   Research Methods

Empirical methods of action, economic and statistical methods (statistical grouping methods, index method) were used in preparing the article. Each of the methods was used in a manner adequate to its functional capabilities, which made it possible to ensure the representativeness of the results obtained, the argumentativeness of estimates and the reliability of the conclusions of the scientific research.

6.   Findings

These facts justify the relevance of using a socio-economic approach to assessing the level of development in the territory. In order to obtain a generalised characteristic of the process under study, it is advisable to use the index method. We will construct three indexes: economic, social and environmental development. The construction of the indexes includes several stages:

1. Formation of a set of baseline indicators that characterise various aspects of the territory's functioning: social (demography, standard of living, comfort of living, etc.), economic (financial, investment, etc.), environmental (pollution levels, environmental measures, etc.).

Based on the study's goals and objectives, 14 indicators were selected to reflect the state of the economy, social and environmental spheres. The indicators are divided into blocks and presented in Table 1.

Table 1.   Private indicators of socio-economic development of municipal districts

Group of indicator	Name of the block	Name of indicator	Private Index
Economic indicators	Economic Development Level Summary indicators	Gross municipal product per capita (RUR)	I_{GMP}
		Retail trade turnover per capita (RUR)	I_{RT}
		Goods produced in-house shipped and work and services performed in-house per capita (RUR).	I_{GP}
	Financial resources	Investments in capital stock per capita (RUR)	I_I
		Own tax and non-tax revenues of municipal budgets per capita (RUR)	I_{RMB}
Social indicators	Demography	Fertility rate (ppm)	I_{FR}
		Mortality rate (ppm)	I_{MR}
		Arrival rate (ppm)	I_{AR}
		Discharge rate (ppm)	I_{DR}
	Living conditions	Total floor space per inhabitant on average (end of year; square metres)	I_{TFS}
		Number of doctors per 10,000 population (people)	I_{NoD}

	Recorded crimes (per 10,000 people; units)	I_{Cr}
Ecological indicators	Pollutants detected and neutralised as a percentage of the total amount of pollutants discharged from stationary sources (percentage).	I_{PDN}
	Emissions of pollutants from all sources per capita (kg)	I_{EoF}

The inclusion of environmental indicators will make it possible to take into account the degree of environmental friendliness of production processes and the state of the natural environment.

Income indicators have not been included in the system of indicators characterising well-being, as the average monthly gross municipal product (GMP) is used to calculate monthly gross wages. The gross municipal product (GMP) also takes into account the labour force of the municipal district using the indicator - number of employed people in the municipal district.

Bringing the indicators to a comparable form due to the different dimensionality of the initial indicators.

The indicators are unified according to their nature: for direct indicators - according to formula (1), as an increase in their values characterises positive changes in the development of the territory, and the reverse - according to formula (2), as an increase in their values, on the contrary, has a negative impact. Indicator values in the municipal district are compared to regional averages, which allows us to judge whether development trends in the municipal district deviate from the regional averages:

$$i = \frac{x_i}{\overline{x}}, \tag{1}$$

where i is the private index;

x_i – private index value in the municipal district for the current period;

$\overline{x}_i$ – average value of the private index in the Republic of Bashkortostan for the current period:

$$i = \frac{1}{\frac{x_i}{\overline{x}}}. \tag{2}$$

3. The resulting private indexes were combined into sub-indexes depending on their affiliation (I_{Econom}, I_{Soc}, I_{Ecolog}) using formula 3-5:

$$I_{Econom} = \sqrt[5]{i_{GMP} \cdot i_{RT} \cdot i_{GP} \cdot i_I \cdot i_{RMB}}. \tag{3}$$

$$I_{Soc} = \sqrt[7]{i_{FR} \cdot i_{MR} \cdot i_{AR} \cdot i_{DR} \cdot i_{TFS} \cdot i_{NoD} \cdot i_{Cr}}. \tag{4}$$

$$I_{Ecolog} = \sqrt[2]{i_{PDN} \cdot i_{EoF}}. \tag{5}$$

Socio-ecological and economic development of the territories will be assessed using the example of municipalities in the Bashkir Trans-Urals in 2018. The Trans-Urals sub-region is one of the largest in terms of area (4,0062 sq km - 27.9% of RB area) and includes 8 municipalities (Table 2) - Sibai, Uchalinsky, Abzelilovsky, Burzyansky, Baymaksky, Zilairsky, Khaibullinsky and Zianchurinsky municipal districts (Ganiev & Vasilyeva, 2018).

Table 2. Ranking of Trans-Urals municipal districts among municipal districts of the Republic of Bashkortostan in 2018

	Municipal districts	I_{Econom}	Place in RB	I_{Soc}	Place in RB	I_{Ecolog}	Place in RB
Group I	Uchalinsky	1.323	3	1.007	6	0.444	39
Group II	Khaibulinsky	1.022	10	0.875	43	0.446	37
	Sibai	0.887	12	0.935	17	0.446	38
Group III	Abzelilovsky	0.258	50	0.976	9	2.226	9
	Burzyansky	0.299	43	0.932	19	1.710	12
	Zianchurinsky	0.274	48	0.955	12	4.217	3
Group IV	Zilairsky	0.187	62	0.863	53	3.020	5
	Baymaksky	0.382	38	0.864	52	0.800	30
	Xmax/Xmin	5.13	-	1.17	-	9.46	-

Source: authors based on (Ganiev & Gataullin, 2019; Ganiev & Zaripova, 2019; Ganiev & Vasilyeva, 2018)

A multivariate grouping of municipal districts was carried out using the k-average method based on the obtained index values by I_{Econom}, I_{Soc}, I_{Ecolog}. Using this method, a certain number of groups are formed that are as different from each other as possible, with elements within the group being as 'similar' as possible.

The main distinguishing feature of the k-average method is the need to determine the optimal number of groups at the initial stage of the survey. The solution to this problem depends on the purpose of the research and the specifics of the phenomenon under study, but there are several universal principles. The formation of too few groups will not be able to reflect distribution patterns, and the formation of too many groups will make it difficult to interpret the results due to the blurring of existing trends.

On an experimental basis, it was decided that the optimal number would be four groups of municipal districts, taking into account the number of observations and variables used:

Group 1: with a high level of economic and social development and a difficult environmental situation (Uchalinsky district).

The indexes presented in Table 1 show that among the municipal districts of the Trans-Urals region in 2018 only the Uchalinsky district showed a higher level of social and economic development than the republican average.

Uchalinsky district ranks first due to the presence of large real sector enterprises, developed infrastructure, a high level of social development, high investment attractiveness, and a stable migration situation.

However, the environmental situation in this municipality is very complex. The volume of hauling from all sources in 2018 increased 5.1 times (112.2 kg per capita) relative to 2014. 22.44 kg per capita as average for RB is 1.33 times. At the same time, the Uchalinsky district is characterized by a low proportion of detected and neutralized pollutants as a percentage of the total number of pollutants leaving stationary sources - 27.4% against 58% in the RB. And the dynamics of this indicator is negative (43.8% in 2014), which indicates the absence of a long-term well-considered policy for environmental protection in the municipal district.

Group 2: with high potential for social and economic development and a difficult environmental situation (Sibai city and Khaibullinsky district). These areas are characterized by a fairly high level of economic development with a predominance of large industrial enterprises. At the same time, the city of Sibai takes higher positions in social development as compared to the Khaibullinsky District, both in the Trans-Urals and in the Republic, primarily due to the high level of availability of doctors (5th place in the Republic of Bashkortostan). That should be considered as one of the factors of low mortality in the municipal district, even if the ecology is unfavourable.

The economy of Sibay is a monoindustry; the largest contribution to the formation of the territory's financial potential is made by major mining companies: Sibai Branch of JSC Uchalinskiy Mining and Processing Integrated Works, JSC Sibai Mining and Processing Integrated Works, JSC Bashkir Mining and Processing Department, Bashkir Copper Ltd (Tazhitdinov & Akhmetov, 2018).

In recent years, the Khaibullinsky district has been actively developing, primarily due to the inflow of investments, which made it possible to build a processing plant and an underground mine at the Yubileinoye deposit. These projects have created several thousand jobs, which has reduced tension in the labour market and improved the quality of life of the local population. Municipalities of this group, as well as the Uchalinsky district, have been among the 15 leading municipalities in the Republic in terms of nominal wages since 2012.

The city of Sibai and the Khaibullinsky district may become centres of economic growth due to the high agglomeration and industrial potential of these municipalities. But the presence of large industrial enterprises complicates the environmental situation in the municipalities, which demonstrates the need to develop comprehensive programmes to reduce the level of anthropogenic pressure on the environment.

The 3rd group of municipalities with a low level of socio-economic development and a favourable environmental environment (Abselilovsky, Burzyansky, Zianchurinsky and Zilairsky municipal districts) is distinguished by its agricultural specialisation. These municipal districts are characterised by depressed economic development (ranking in the municipal districts Economies in RB from 43 to 62), lack of growth points and weak development of the social sphere. At the same time, the absence of large industrial enterprises ensures a favourable environmental situation.

The areas have significant potential for the establishment of large processing plants in the agro-industrial and forestry sectors, as well as for tourism development.

It is necessary to adjust the development programmes of the municipal district in order to increase the use of the existing resource potential of the territories by increasing their investment attractiveness and developing industrial production to ensure budgetary self-sufficiency of the municipal district. Increasing the financial self-sufficiency of the municipal district will make it possible to improve the quality of life of the population, including through the development of social infrastructure.

Group 4: with low socio-economic development and adverse environmental conditions (Baimaksky district). The municipality has a rich natural resource potential, but over the past few years natural resources have been depleted and the environment has been severely damaged.

The social situation is also unfavourable: a low level of housing, lack of doctors, high mortality with low birth rates - these factors lead to a high migration outflow of population.

At the same time, the Baimaksky district is experiencing high growth rates in the agricultural sector, and advanced innovative agricultural processing technologies are being introduced. In particular, for the production of sublimated products, including koumiss.

The key opportunities for the development of the region, the use of which in the long term can increase the potential of the territory, may be: an increase in investment in the municipal district due to the development of the business climate; development of cooperation with neighbouring regions in the field of tourism development and marketing of agricultural products. This also includes development of transport infrastructure, improvement of the quality of highways; development of tourism clusters due to high potential; development of small and medium-sized businesses (horse breeding, koumiss production, light industry, production of environmentally friendly products, etc.). There is a possibility of legalising the shadow sector; active introduction of energy-saving technologies, modernisation of utility networks in order to increase their reliability.

The ratios of maximum and minimum values for private indexes (IEconom, ISoc, IEcolog) and their visualisation in Figure 1 show a significant unevenness in the development of the territories of the Trans-Urals region, primarily in environmental and economic areas. In social development, the municipalities are fairly homogeneous.
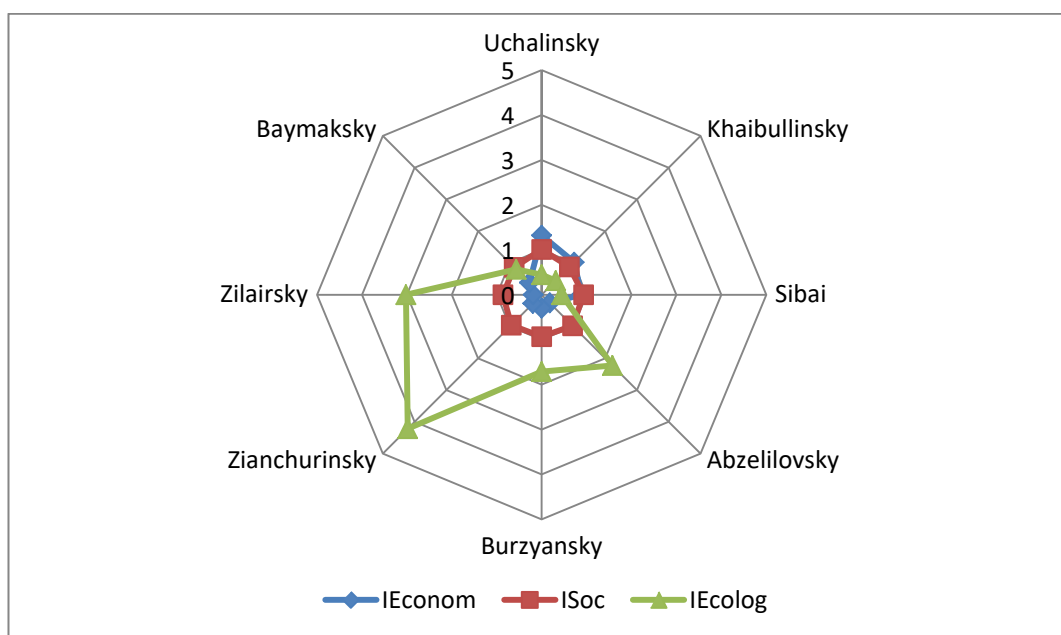

Figure 1. Ieconom, Isoc, Iecolog values in 2018 in Trans-Urals municipal districts

Factors that make up the strategic assets and competitive advantages of the Trans-Urals are as follows:

1) rich natural resource potential: the area is rich in minerals and substantial reserves of forest resources;

2) developed industry: large production facilities in mining and mining engineering industry;

3)   recreational resources: unique natural landscape, centuries-old cultural traditions, monuments of nature, culture, history, archaeology, and art.

4) Trans-Urals municipal districts, in particular the Baimaksky district, are a major producer of agricultural products. The area of agricultural land is 332.8 thousand ha (first place in the Republic of Bashkortostan), including 117.1 thousand ha of arable land (Ganiev & Zagidullin, 2019). The main directions of activity of agricultural producers of the district are cultivation of grain, technical and fodder crops, breeding of cattle and horses. Farming and Forestry are also engaged in growing vegetable crops and breeding sheep, goats, pigs and poultry.

Main limitations and problems in the development of Trans-Urals municipalities that pose a threat to the stability of the socio-economic situation:

- low level of investment, road and tourism infrastructure. The territories of the Trans-Urals are characterised by complex road logistics, in particular due to dead-end railways in Sibai and Uchaly, which results in increased transportation costs for companies (Tazhitdinov & Akhmetov, 2018);
- imbalances, sectoral and territorial asymmetries in the development of the agro-industrial complex, weak development of the processing industry (bankruptcy of large processing enterprises in the 2000s: Sibaysky Dairy and Canned Food Processing Plant, Sibaysky Meat Processing Plant);
- Lack of an effective system for selling agricultural products, including due to insufficient development of logistics centres and the system of agricultural consumer cooperation;
- low labour productivity, technical and technological backwardness of the agro-industrial complex, high physical and moral wear and tear of equipment (physical wear and tear of agricultural equipment in some regions reaches 80-90%) (Akhmetov & Fatkhullina, 2018);
- energy deficit in the Trans-Urals, which hinders the implementation of investment projects;
- reducing the financial self-sufficiency of municipalities. Limited own revenue sources and budget deficit are with increasing social burden on the district budget;
- blurring the spatial and dispersion framework of the district. Decrease is in the number of remote rural settlements, growth in the average age of the population.

7. Conclusion

The analysis shows a high degree of differentiation of municipal districts in the Trans-Urals region of the Republic of Bashkortostan in terms of socioecological and economic development: only 3 out of 8 municipalities have a high level and significant development potential.

The results show that only Uchalinsky district in 2018 demonstrated a higher level of socio-economic development than the republican average.

Special attention must be paid to the development of the social and transport infrastructure of the municipal districts, whose deplorable condition leads to restrictions on economic development and a decline in the quality of life of the population.

The key opportunities for the development of the Trans-Urals region of Bashkortostan, the use of which in the future could increase the potential of the territory, could be as follows:

- availability of unused areas and land resources;
- formation of a favourable investment climate in the district, including the formation and promotion of a positive image of the city as a platform for the implementation of ambitious investment projects;
- expansion of housing construction in order to attract and retain specialists in the district; participation in federal and republican programmes to attract young specialists ("Zemsky Doctor", etc.);
- development of the human resources potential of local authorities and the competencies of municipal employees. Optimisation of administrative procedures, reduction of the time required to provide municipal services; digitalisation of the service delivery process;
- small business potential development.

In the conclusion, it should be noted that the economic development and improvement of the quality of life of the population of the Trans-Ural region of Bashkortostan is linked to the solution of their environmental problems, which requires a comprehensive approach by local and republican authorities.

Acknowledgments

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