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Socio-Economic Sustainability Of Municipal Areas In The Region.

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ABSTRACT

A sustainable process of production and social development of the municipal territory means a quality state and continuous improvement of production and financial activities in all sectors of the region. In the context of the sustainable development of the regional economy, the social sphere and the environmental complex there is a dynamic socio-economic, environmental and biotechnological systems. It is the balance of these components at the level of the municipal territory that contributes to the effective development of all elements of the market mechanism of management and improves the system of entrepreneurship in the region. The article defines the quantitative and qualitative characteristics of the reserves of sustainable development of municipal territories based on the integration of expert and correlation methods. This allowed to develop the main directions of formation of conditions conducive to the sustainable development of the region, determined by the increase in employment.

Keywords: sustainability, sustainable development, region, municipal territory, correlation and regression method, expert research method

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INTRODUCTION

Increasing the level of social and economic sustainability of municipal territories contributes to the formation of a favorable business environment in the region, positively influences the dynamics of the economic and social well-being of the population, and suggests an increase in labor activity. In rural areas, sustainable development of the territory is a factor in improving the industrial and natural structure of the region, contributes to the optimal balance of socio-economic and biotechnological subsystems, the transformation of family farms into enterprises of agrarian-industrial-commercial type, reduction of tension in the agrarian labor market, and efficiency in the use of labor.

Theoretical and methodological aspects of the sustainable economic and social development of the region are reflected in the scientific works of such foreign scientists as: F. Kotler, D. Medouz, M. Porter, R. Solow, R. Harrod J. Schumpeter, and others. This problem has been investigated in scientific articles and monographs of Russian scientists: Bautina V.M., Efimova O.V., Zolotukhina O.V., Kutsenko E.I., Merenkova I.N., Uskova T.V. and etc.

At the same time, methodological and applied issues of sustainability and sustainable development of socio-economic systems, problems of sustainable growth of municipal territories, including those at the level of individual regions, are not fully disclosed in the scientific literature. There is no method of substantiating the expert method and the method of simulation modeling in relation to this issue, as well as the definition of reserves for the sustainable development of territories.

MATERIAL AND METHODS

Stavropol Territory as a subject of the South of Russia and as an important region of the North Caucasus Federal District is characterized by certain socio-economic parameters of its development. Thus, the share of the region in the gross regional product of the North Caucasus Federal District on average for 2015-2017. amounted to 37.4%, in the total volume of investments - 39.6%, in foreign trade turnover - 53.0%, in the production of products of the agro-industrial complex - 42.1%.

If, on average, in the federal district, the industrial production index in 2017 compared to 2015 was 104.6%, in the region as a whole - 105.2%, in mining, respectively - 98.1 and 103.4% , by the volume of production of agricultural products - 101.1 and 103.7%, by the number of rural able-bodied population - 100.3 and 99.8%.

At the same time, the region is characterized by a relatively low level of natural population growth, there is an intensity of migration processes, a low birth rate of the rural population is registered, instability of the demographic processes prevails and a low level of employment of the population (especially in rural areas) (table 1).

Table 1: The procedure of the expert method

Experts	Factors				Total
	First	Second	…	M-th	
The first			…		
Second			…		
…	…	…	…	…	…
Nth			…		
Total sum of ranks			…		
Linear deviation from the mean			…		
Deviation squared			…		
Significance factor			…		

These features determine the practical feasibility of measures to increase the sustainable development of individual municipal rural areas in the region, including the implementation of measures to ensure effective employment of the population [5, 8].

At the initial stage of the study, it is recommended to use the capabilities of the expert method, since it will allow to select the necessary factors correctly and calculate the most significant indicators determining the sustainability and sustainable development of municipal territories (tab. 1). At the same time, this will lead to a logically justified elimination of unimportant criteria at the very first stages of the study.

After determining the significance of the factors, the so-called concordance coefficient is calculated. R_{con}, which gives a quantitative assessment of the unity of opinions on the group of experts by the formula (1).

$$R_{con} = (12 * B)/(a^2 (b^3 - b))$$
(1)

B – standard deviation of the total value for each factor from its average value, rank;
a – number of experts in the group, people.;
b – the number of analyzed factors, units.

In that case, if complete consistency is reached between the members of the expert group, the value of this coefficient is 1. Otherwise, the coefficient takes a value from 0 to 1. It is considered that almost complete consistency between the respondents is achieved with Rcon > 0,8.

Some authors, after completing the calculation of the coefficient of concordance, immediately formulate certain conclusions regarding the significance of individual factors [4, 6]. In our opinion, after this, the significance of the experts' answers should be re-checked using the method of correlation and regression analysis. In this case, the average value of the calculated correlation coefficients in the corresponding matrix is determined.

In this case, the real level of opinions and consistency of experts is more reliably confirmed, which is confirmed by the average value of the correlation coefficient of the agreed estimates (correlation relationship between the ranks). A number of scientists call this indicator the integral index of the agreement of expert opinions [3].

If the coefficient of concordance and the integral index of agreement of opinions are higher than 0.7, then it is necessary to consider the consistency of expert opinions on the selection of the proposed factors as the most acceptable and adequate. Otherwise, the degree of probability of each selected factor is not significant.

We proceed from the fact that the statistically justified coefficient of variation between the studied characteristics in the time series should be less than 0.3. Accordingly, an adequate sustainability factor should be greater than 0.7.

The number of experts and factors to be evaluated should not be too large so as not to negatively affect the accuracy of the assessment or not to average the significance of individual sustainability criteria. From our point of view, there should be no more than 5–7 experts and approximately as many factors assessed. This can also be explained by the fact that, psychologically, one person can simultaneously keep in sight no more than 7 objects (in this case, various factors).

After selecting the most significant factors (criteria, indicators) and determining their weight, we should proceed to the second stage of assessing the sustainability of rural areas, that is, calculating individual indicators and, if necessary, comparing them, to the procedure of their normalization. The significance of the described methodological tools can be increased by using the correlation-regression method of processing statistical information.

RESULTS AND DISCUSSION

Studies have established that the sustainable development of municipal territories in the region is determined by many different factors and conditions. At the preliminary stage, according to the development of the regional complex for 2013-2017, 48 indicators characterizing the various components of the sustainability of the subregions in the province were selected and calculated. These are groups of indicators:

employment, economic development of the regional complex, social stability in the region, efficiency of production and financial activities, development of the agro-industrial complex, and ecological balance.

In the process of correlation and regression analysis, the statistical interrelation of these factors (X_1 ... X_{48}) and independent Y value was determined. (thousand roubles.). This indicator Y as a whole characterizes labor productivity in the region and determines the development of the economic and social sustainability of the territory.

As a result of multi-step correlation and regression analysis and the elimination of multicollinear factors, six main indicators remained:

X_1 - unemployment rate,% (from the block of employment factors) - the pair correlation coefficient between it and the Y index is fixed as a negative value: - 0.688;

X_2 - the volume of investment per capita, thousand rubles (from the block of economic factors) - the correlation coefficient was: 0.554;

X_3 - the income level of rural residents, thousand rubles. (from the block of social factors) - correlation coefficient: 0.481;

X_4 - balanced financial result per 1 employed, thousand rubles. (from the block of factors of efficiency of production and financial activities) - correlation coefficient: 0.529;

X_5 - the volume of agricultural production per 100 hectares of crops, thousand rubles. (from the block of factors of development of the agro-industrial complex) - correlation coefficient: 0.467.

X_6 - the amount of pollutant emissions on average per 1 inhabitant, kg (from a block of environmental factors) - the correlation coefficient is negative, but not significant: - 0.262.

The coefficient of multiple correlation between these factors and the independent value of Y was 0.896 for this group of factors. Thus, they on average by 80.3% cause the variation of the socio-economic sustainability of municipal territories in the region.

In order to maximize objectivity, in order to further determine the significance of each of these selected factors, 7 experts were interviewed on the problems of municipal development and employment. They are: 4 leading specialists from district agricultural departments from four municipal districts of the Stavropol Territory (representatives from various subregions) and 3 leading specialists from regional employment services of the population of the same municipal territories.

Specialists were asked to rank these 6 selected factors according to their significance, which, in their opinion, could most jeopardize the sustainability of the development of municipal territories if the value of these indicators decreases in the near future (and increases for unemployment and environmental safety) or the degree of their development will remain at the same level (Table 2).

Table 2: Significance factors calculation influencing the sustainable development of municipal territories in the region

Experts	Factors under investigation						Total
	I	II	III	IV	V	VI	
	ranks indicated by respondents [*]						
The first	6	5	4	1	2	3	
Second	4	6	5	3	1	2	
Third	5	6	6	2	1	3	
Fourth	6	4	5	3	1	2	
Fifth	6	4	5	3	2	1	
Sixth	6	5	4	2	1	3	
Seventh	6	5	4	1	2	3	
Total sum of ranks	39	35	33	15	11	16	149
Linear deviation from the mean	14,5	10,5	8,5	- 9,5	- 13,5	- 8,5	0
Deviation squared	210,25	110,25	72,25	90,25	182,25	72,25	737,5

| Significance factor | 0,2851 | 0,1495 | 0,0980 | 0,1224 | 0,2471 | 0,0980 | 1,0 |

* the maximum rank was assigned to the most significant factor; factor I - the level of rural unemployment,% (X_1); II - the volume of investment per capita, thousand rubles. (X_2); III - income level of rural residents, thousand rubles. (X_3); IV - balanced financial result per 1 employed, thousand rubles. (X_4); V - the volume of agricultural production per 100 hectares of crops, thousand rubles. (X_5); VI - the amount of emissions of pollutants per 1 inhabitant, kg (X_6).

In tab. 2 reflects the results of the calculation to determine the weighting factors of factors affecting the sustainable development of rural areas.

As a result of econometric analysis, the coefficient of concordance was determined R_{con}, which quantitatively characterizes the unity of opinions of the group of experts:

$$R_{con} = (12 * B)/(a^2(b^3 - b)) \qquad (1)$$

B – standard deviation of the total value for each factor from its average value, rank;
a – number of experts in the group;
b – number of factors analyzed.

In our case, the concordance rate is 0.604. Thus, the degree of consistency of expert opinions is above average:

$$R_{con} = \frac{12 * 737,5}{7^2(6^3 - 6)} = \frac{8850}{49(216 - 6)} = \frac{6216}{10290} = 0,604$$

In addition, the degree of interrelation of each expert's answers with each other was established when pairwise comparing them (Table 3). In this case $R_{korr.} = 0,874$. Therefore, you can be confident in the objectivity of the general opinion of the members of the expert group.

Table 3: Correlation matrix of expert group members opinion

Expert Group Members	Members of the expert group (specialists from the district departments of agriculture and employment centers)						
	Apanasenkovsky district	Blagodarnenskiy district	Sovetsky district	Mineralovodsky district	Ipatov district	Alexandrovsky district	Krasnogvardeysky district
First							
Second	0,741						
Third	0,942	0,811					
Fourth	0,867	0,834	0,673				
Fifth	0,649	0,769	0,821	0,774			
Sixth	0,855	0,658	0,733	0,831	0,858		
Seventh	0,707	0,752	0,902	0,773	0,916	0,783	1,000

Further, correlation models were calculated, which determine the relationship between sustainable development of rural areas and the main socio-economic factors. This made it possible to substantiate the reserves of social and economic sustainability of municipal territories (tab. 4).

Table 4: Reserves for increasing the sustainability of municipal territories by increasing (decreasing) level of the main factors (2013-2017)

Conditions for increasing sustainability	Preliminary calculation, mln rub.	Weight coefficient (expert assessment)	Final settlement, mln rub.	Structure of financial losses,%
Reducing unemployment to mid-region	14249	0,285	4060,97	50,4
The increase in investment per 1 resident to its average value over the territory	17276	0,149	2574,12	32,0
Increased income	1356	0,098	132,888	1,6
Increasing the net financial result per 1 employed	892	0,122	108,824	1,4
Increasing the volume of agricultural production per 100 hectares of crops	3086	0,247	762,242	9,5
Reduction of pollutant emissions per inhabitant	4255	0,098	416,99	5,2
Total		1,000	8056,03	100,0

In this case, the calculations were adjusted taking into account regression coefficients and coefficients of significance of the selected factors based on expert judgment. For example, when calculating sustainable development reserves in relation to the "unemployment rate reduction" factor separately for each municipal territory, the number of employees, labor productivity of employees, the difference between the level of unemployment in a given area and its average value were taken into account, and the coefficient regression of a regression equation confirming the relationship between labor productivity and unemployment.

The use of this statistical toolkit allowed us to calculate the potential losses of goods and services due to the low level of sustainable development of municipal territories in the region (the comparison was made with the average regional level of the relevant factor indicators).

Studies have shown that the main reserves for increasing employment and sustainable development of municipal territories are hidden in the level of economic activity of the population, investment activities and the efficiency of the agricultural sector (by 92.9%). At the same time, the share of rural areas with a lower level of employment (such as 27%) accounts for the maximum loss of production (3095 million rubles, or 38.4%) and, accordingly, the lack of income of rural residents - 19% less compared to other municipalities.

The analysis shows that the main problems of the low level of sustainable development of municipal territories are inherent in those rural areas of the region, where the level of employment and labor productivity are lower compared to other territories that are most developed economically and socially.

In this regard, it is advisable to develop a special program "Basic measures to increase the employment of the population of municipal territories in the region", which can be implemented at the level of individual municipal districts.

The implementation of such a program document is particularly relevant for municipal territories with a low level of employment (they are also areas with a high level of sustainable development risk - (Arzgirsky, Kursky, Stepnovsky, Trunovsky, Andropovsky, Novoselitsky). Calculations show that as a result of sustainable development of municipal areas and the introduction of new jobs in 2019-2020, an additional increase in production is possible only in the first four listed municipal areas (areas with the lowest level of development and employment) in the amount of at least 217.4 million rubles.

Priority measures for these municipalities should be: development and implementation of program activities that provide increased employment, taking into account the rationale for the sustainable development of municipal territories; priority development of the agro-industrial sector, construction and

trade; the formation of a sustainable system of small and individual entrepreneurship; the expansion of self-employment in the non-agricultural sector of the rural economy; Primary investment of funds in the social sphere; creation of non-capital-intensive workplaces in the countryside.

At the same time, in rural areas, new jobs can be created in various fields of activity related to the reconstruction and construction of the road network, sidewalks and recreational areas for recreation, the construction of gas pipeline networks, the improvement of quality housing, the repair of social infrastructure, the construction of children's sports and recreation sites, reconstruction of monuments and places of cultural and historical heritage, the expansion of the network of consumer services, the creation of industrial and mini-per processing enterprises and complexes, the introduction of storage facilities for agricultural products and their primary processing, greening residential areas, arranging park areas, organizing the collection and removal of solid household waste, carrying out multidisciplinary public works through the employment service.

Regarding the rural areas with an average level of employment and development (Aleksandrovsky, Apanasenkovsky, Gratitude, Grachevsky, Kirovsky, Krasnogvardeysky, Petrovsky districts), recommend the following measures: introduction of municipal programs for employment and sustainable development of rural areas; monitoring the sustainable development of territories and the level of forced unemployment; encouraging the use of atypical types of employment; expanding opportunities to create new jobs in the recreational sphere.

For rural areas with a relatively high level of employment (Budennovsky, Izobilnensky, Kochubeevsky, Mineralovodsky, Neftekumsky, Novoaleksandrovsky, Shpakovsky), the main strategic directions for the development of sustainability in terms of increasing employment in rural areas should be implemented:

- timely monitoring of the rural labor market and sustainable income growth in the sectors and sectors of the municipal economy;
- development and implementation of socio-economic maps of sustainable development, investments in social infrastructure facilities;
- creation of new jobs in the field of rural tourism, small business and agricultural entrepreneurship.

CONCLUSION

The socio-economic sustainability of municipal territories is their most important property to maintain the parameters of their functioning over a sufficiently long time interval, despite the impact of internal and external factors affecting the change in environmental and socio-economic processes in the region. It is stability that allows maintaining the ability of a municipal territory to develop stably in the conditions of transformation of the internal and external environment.

Sustainable development of municipal territories is a continuous, constantly renewable and really reasonable use of natural, industrial, social and labor resources of the territory - mainly on an extended basis. Sustainable development of municipal territories is a strategic direction of stable and effective reproduction of the economic and social sphere of the region.

The analysis of the differentiation of municipal territorial units on a number of essential features showed that their further development should be determined primarily based on specific socio-economic conditions and prospects for the further functioning of municipal districts, including measures to increase employment.

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