Improving the Methodology for Assessing the Sustainable Development of Municipalities*

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Abstract

The aim of this article is to enhance the methodology for evaluating the level of sustainable development in municipal structures. The study aims to define sustainable development in municipal structures as a process that manages ecological and socio-economic systems, ensuring the integral stability of the structures, their connections, and elements. The article explores primary methodological approaches for assessing sustainable development at various levels, such as national and regional economies, territories, and municipal structures. A methodology has been developed based on calculating an integral indicator for evaluating the stability level of the municipal economy. This is determined by measuring changing indices for partial criteria of a set of economic, social, environmental, demographic, budgetary, innovative, and management indicators. The current state of urban districts in the region over a five-year period has been analyzed, and the stability level of municipal districts has been estimated using indicators. It has been proven that systematic evaluation of the sustainable development level of municipal structures can identify problems that impede the development of a region, which, in turn, can enhance the living standards and quality of life of the population.

Keywords: municipal formation, methodology, sustainable development, evaluation algorithm, economic subsystem, environmental subsystem, demographic subsystem, innovative subsystem, management subsystem.

1. Introduction

The term “Sustainable Development” was initially brought about in the “Our Common Future” report of the Development and Environment Committee in 1987 and is clarified as “development that meets the needs of present generations without compromising the ability of future generations to satisfy their own requirements” (World Commission on Environment and Development).

In 2019, within the framework of the Summit, the UN member states unanimously approved
seventeen Sustainable Development Goals until 2030. Thus, the multifaceted nature and importance of the topic also places particular demands on tools for measuring sustainable development. Since the sustainable development of the country consists of the stable development of municipalities (Gandini et al., 2021). The issues of assessing the sustainability of municipalities are one of the current arenas of scientific research that are of utmost importance for achieving sustainable socio-economic development of Russia.

2. Literature Review

Sustainable development is dynamic, representing not stability of harmony, but a process of change in which the amount of resources exploited, investment orientation, technical equipment and institutional changes are coordinated not only with current but also with future needs.

For a municipality, sustainable development is possible only with a competent and effective strategy for the formation of the territory. As a result, social and economic sustainable development should concern not only certain spheres of life, but also the municipality as a whole, including municipal spheres of population activity, interaction with state authorities and local authorities of other municipalities (Ellis, 2021).

To date, there is no single definition for sustainable development in world practice. Petrova (2007) means “the ability of local self-government to maintain its development and functioning, which should be based on self-support, self-regulation in the long term, on ensuring dynamic balance, motivation of economic agents to expand innovative reproduction, increase competitiveness and, as a result, to consistently enhance the life quality of the people taking into account the interests of future generations” (Zavadskas et al., 2021).

Churkina (2016) believes that “The sustainable development of the municipality is the process of managing its socio-economic system, ensuring the holistic stability of the structure, elements and their connections, which are aimed at increasing the quality of life of the population in balance with the environment”.

When considering the sustainable development of the municipality, special attention should be paid to the following strategically important points:

− the sustainable development of the municipality should, first of all, guarantee comfortable living and satisfying the needs of citizens living in its territory, which is impossible without creating conditions for the development of human potential, respect and respect for human rights and freedoms (Hussain and Jergeas, 2022);
− the municipality should be considered as a single organism with its own structure and internal laws of development;
− sustainable development of the municipality is necessary for inter-municipal cooperation, which allows harmonizing interests and coordinating the actions of municipalities to solve issues of local importance;
− the introduction and widespread use of information technologies and digitalization of all spheres of social activity at different levels are the most important factor and condition for sustainable development, and therefore digitalization of the management of the municipal facility is very useful;
− the use of modern information technologies and innovations aimed at achieving sustainable development should, first of all, promote the integration of all municipal areas of activity;
− finally, all the factors mentioned above must be translated into a coherent and carefully designed strategy for the sustainable socio-economic development of the municipality, which should be presented in the form of a sequence of concrete measures and a time frame for their implementation.

In the modern world, there are no common, unified approaches and methods designed to develop an index of socio-economic sustainability of countries, regions and municipalities.
3. Results

Since the idea of sustainable development of municipalities implies the achievement of a balance between social, environmental and economic development, the most promising is the development model, in which a balance of economic, social and environmental criteria is achieved.

Thus, during the consideration of the sustainable development of the municipality, the following seven main analysis subsystems were identified, forming a system that guarantees the sustainable development of the territory:

1. social subsystem that reflects the appropriate living standards of the people, education and health care, social protection, and demographic situation;
2. economic subsystem containing key indicators of economic and productive activities that provide infrastructure;
3. environmental subsystem that includes data on air and water pollution in the territory of the relevant municipality;
4. budget subsystem consisting of indicators that determine the balance of the local budget;
5. demographic subsystem containing the main indicators of analysis of demographic processes of the municipality;
6. innovative subsystem, which includes data on organizations that carried out scientific research and development located in the municipality;
7. management subsystem, which includes an assessment of the effectiveness of implementing municipal programs implemented in the territory of the municipality.

In the process of assessing the sustainable development of a municipality, you can follow a certain algorithm consisting of several next interdependent steps:

1. The first step is to collect system indicator data for a certain period of a municipality.
2. The second step is to calculate the key figures for the corresponding subsystem.
3. The third step is to bring the indicators into a comparable form.
4. The fourth step is the calculation of complex indicators for each subsystem.
5. The fifth step is to evaluate the sustainable development level of the municipality.
6. The sixth step is to analyze the results and find ways to improve the management of sustainable development of the municipal economy (Golovanov, 2015).

Thus, at the initial stage, primary data are collected to calculate a system of indicators for the sustainable development of the economy of the municipality. Next, you define the upper and lower limits of the measure limit values and create complex measures for each component of the subsystem, based on bringing the measures into a comparable form.

Having obtained the values of complex indicators for economic, environmental and social subsystems, an integral assessment of the level of sustainable development of the economy of a municipality in the corresponding municipality is carried out, and at the final stage it is necessary to interpret the results in order to find directions for improving the sustainable development of the corresponding municipality.

As an effective way to assess the level of sustainable development, an integrated aggregated system of indicators for the sustainable development of the municipality should be adopted.

The set of basic indicators for assessing the sustainable development of the municipality includes 52 indicators below:

1. Economic subsystem (gross municipal product, gross municipal product per capita, average per capita monetary income of the people, average salary of employees, renewal factor of investments in fixed assets, fixed assets, share of investments in fixed assets in gross municipal product, the subsistence minimum, the number of enterprises and organizations, the settled financial

(Kazyaikina, 2012; Storonenko, 2016; Tatarkin et al., 2010; Ferova et al., 2019; Filonova and Bozhenko, 2021; Turboer and Silvius, 2022).
result of the activities of organizations per capita, per capita retail trade turnover, index of industrial production, shipped goods volume of own production, goods and services per capita).

2. Ecological subsystem (share of expenses for environmental protection in the budget of the municipality; Emissions of pollutants into the air; discharging contaminated wastewater into water bodies; capture of air pollutants; generation of production and consumption wastes; index of the volume of environmental expenditures).

3. Social subsystem (number of unemployed; unemployment rate; consumer expenditure per capita on average; The population with monetary incomes is below the subsistence level; the share of household expenditure on housing and communal services; the share of education expenditure in the total budget expenditure; the share of health expenditure in total budget expenditure; expenditure of budgets on the implementation of social support measures for certain categories of citizens; The number of recorded crimes per 100,000 population; incidence per 1,000 population).

4. Budget subsystem (level of budget balance; deficit/budget surplus; general capacity to pay; the ratio of accounts payable to local budget expenditures; the ratio of municipal debt to income; tax revenues from investment projects.

5. Demographic subsystem (annual population growth rate; population density; the overall demographic burden factor; total fertility rate; total mortality rate; mortality rate of the working-age population, migration growth rate).

6. Innovation subsystem (organizations that carried out scientific study and development; the quantity of personnel involved in scientific development and research, people; number of researchers with degrees, people; internal expenses of development and research, million rubles; advanced production technologies developed; organizational, creative activity of organizations (the share of organizations implementing technological, marketing innovations in the total volume of examined organizations,\%); expenses of technological innovations, million rubles; volume of innovative goods, works and services, million rubles) (Rokotyanskaya, 2017).

7. Management subsystem (average indicator of the efficiency or inefficiency of implementing municipal programs implemented in the territory of the municipality) The program-target method has a number of advantages, one of which is the simplicity and convenience of monitoring the implementation of the program not only for various levels of government, but also for the population of the country. The advantages of this method include high efficiency in achieving the goals set. That is why it has become widespread around the world.

The calculation of complex indicators is calculated according to Eq. (1).

\[
I_i = \frac{x_i - x_{i\text{min}}}{x_{i\text{max}} - x_{i\text{min}}},
\]

where \(i = 1,2,3,4,5,6,7\).

Next, an integral indicator is calculated for assessing the level of stability of the municipal economy, determined by the production of indices for changing private criteria of a set of economic \(I_{\text{econ}}\), social \(I_{\text{soc}}\), environmental \(I_{\text{ecol}}\), budget \(I_{\text{bud}}\), demographic \(I_{\text{dem}}\), innovative \(I_{\text{in}}\) and management indicators \(I_{\text{mag}}\):

\[
I_{\text{int}} = \sqrt{I_{\text{econ}} + I_{\text{soc}} + I_{\text{ecol}} + I_{\text{bud}} + I_{\text{dem}} + I_{\text{in}} + I_{\text{mag}}},
\]

Interpretation of the obtained results of the integral assessment of the sustainable development of the municipality (the final stage of the algorithm) is carried out on the basis of the established limits of permissible values (Golovanov, 2015).

In the Russian Federation, a large number of municipalities are 21,501 units, their large share is occupied by rural settlements and municipal areas (80.83 and 8.04, respectively). The smallest share among all municipalities of the Russian Federation is occupied by urban districts with intracity
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...division - 0.01. In the subjects of the Volga Federal District there are 5785 municipalities - 26.9% of the total number of municipalities in the Russian Federation. As well as in Russia as a whole in the subjects of the Volga Federal District, a large share in the structure of municipalities is rural settlements - 85.01. In the Republic of Bashkortostan, 895 municipalities, of which 54 municipal districts, 9 urban districts, 14 urban settlements, 818 rural settlements (Ferova et al., 2019). To test the proposed methodology for assessing the sustainable development of municipalities, the three largest urban districts of the Republic of Bashkortostan were selected – Ufa, Salavat, Sterlitamak.

The city district of Ufa, the capital of the Republic of Bashkortostan, is one of the largest administrative, industrial, cultural, educational and scientific centers of the Russian Federation, a valuable transport hub, on the territory of which 1124226 people live.

City district of Salavat - a city of republican significance, a cultural, sports center located in the southern part of the Republic of Bashkortostan, one of the largest industrial centers with a population of more than 153 thousand people, with a total area of 106 km².

The population of Sterlitamak is 278.1 thousand people or 6.88% of the population of the Republic of Bashkortostan. This city is the second city of the republic after Ufa in terms of population, industrial and cultural potential.

Consider the socio-economic indicators of these urban districts for 2015 and 2019 and conduct their comparative characteristics (Table 1).

Table 1. Socio-economic indicators of urban districts of Ufa, Salavat, Sterlitamak for 2015 and 2019

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Ufa</th>
<th>Salavat</th>
<th>Sterlitamak</th>
</tr>
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<tbody>
<tr>
<td>Population, people</td>
<td>1105667</td>
<td>1124226</td>
<td>155655</td>
</tr>
<tr>
<td>Number of births, people</td>
<td>18108</td>
<td>12176</td>
<td>1898</td>
</tr>
<tr>
<td>Number of deaths per 1,000</td>
<td>12901</td>
<td>11957</td>
<td>1928</td>
</tr>
<tr>
<td>Natural population growth, people</td>
<td>5207</td>
<td>219</td>
<td>-30</td>
</tr>
<tr>
<td>Gross municipal product per capita, million rubles</td>
<td>414431.9</td>
<td>586451.9</td>
<td>213246.2</td>
</tr>
<tr>
<td>Average monthly salary of employees, rubles</td>
<td>35674.1</td>
<td>50656</td>
<td>25368</td>
</tr>
<tr>
<td>Investments in fixed assets, million rubles</td>
<td>101231.9</td>
<td>105171.0</td>
<td>15983.1</td>
</tr>
</tbody>
</table>

The demographics of the three urban districts are different, but the dynamics are very similar. The number of people born in Ufa in 2019, compared to 2015, decreased by 32.8%. In Salavat, there is a decrease in the birth rate (from 12.3 ‰ in 2015 to 8.1 ‰ in 2019) and a decrease in mortality (from 12.5 ‰ in 2015 to 11.9 ‰ in 2019), leading to an acceleration of natural population decline for 2015-2019. from - 30 people. by up to - 529 people. The current trend led to a decrease in the permanent population of the city from 155.7 thousand people. up to 151.5 people. As in two other cities, Sterlitamak has a decrease in fertility and mortality.

In Ufa, Salavat and Sterlitamak, the demographic burden on the able-bodied population increases. The labor market shows stability, while the share of citizens without permanent earnings is only 1% of the total working-age population of these cities. It should be noted that the number of unemployed tends to decrease and is generally lower than the national average. In the period from 2015 to 2019, the official unemployment rate decreased from 0.99% to 0.78%.
After considering the general characteristics of the three municipalities, it is necessary to move to an assessment of the level of sustainable development of selected urban districts.

The calculation of indices of economic, environmental, social, budgetary, demographic, innovative and managerial sustainability was carried out in dynamics for the five-year period from 2015 to 2019, respectively. Figure 1 shows the results of the calculation of complex indicators of municipalities. In accordance with Figure 1, it can be concluded that the economic and environmental development of Ufa and Salavat are on the same level, which cannot be said about Sterlitamak. In turn, the social development index is higher in the urban district of Sterlitamak. The management development index in all three municipalities is almost the same, a high level of efficiency in the implementation of municipal programs. The demographic development index is the highest in Ufa.

![Fig. 1. Comprehensive indicators of urban districts of Ufa, Salavat, Sterlitamak](image)

According to the interpretation of the threshold values of the integral index of stability of the municipal socio-economic system, the urban districts of Ufa, Salavat, Sterlitamak belong to the field of sustainable development, which corresponds to development close to a stable state.

![Fig. 2. Integral indicators of urban districts of Ufa, Salavat, Sterlitamak](image)
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4. Discussion

The complex of problems faced by municipalities at the local level characterizes the current stage of development of the country's economy. The solution of these problems is devoted to a number of scientific studies, as well as attempts to reform the management apparatus at various levels. Multiple programs are being generated and implemented at the national, regional and local levels. Various means of managing the development of socio-economic systems and maintaining their stability are suggested.

The municipal authority creates a road map for the socio-economic development of the territory, which contains a number of competitive opportunities for municipalities, their weaknesses and strengths, as well as the course and opportunities for progressive movement, appropriate actions to improve the socio-economic situation of the municipality and means of fulfilling the tasks formulated.

5. Conclusion

Thus, speaking of the sustainable development of municipalities, it should be:

Firstly, to consider the municipality as a system with its internal laws of economic, environmental, social, demographic, managerial development.

Secondly, all the results of sustainable development should be aimed at preserving and developing human potential, respecting human rights and freedoms and meeting human needs.

Thirdly, at present, the digital economy of the municipality should be the basis of sustainable development.

Fourthly, sustainable development requires a balanced, competent and effective strategy for the development of the municipality.

Systematic assessment of the level of sustainable development of the municipality will permit timely recognition of problems stagnating the development of the territory, which will subsequently lead to an improvement in the quality and level of life of the residents.

References


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