Methodology for assessing the territory development in the context of sustainability

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Abstract. Contemporary conditions of socio-economic uncertainty hinder the progressive sustainable development of territories, that requires the improvement of methodological tools for mitigating external factors and continuing the implementation of sustainable development concepts in rural areas. Despite the complexity of the development of socio-economic processes, rural areas are a guarantor of the country's food security. Rural areas are ready to actively implement sustainable development programs by integrating efforts together with state support, therefore they are the object of this study. The article examines in detail the role and place of rural areas in achieving sustainable development outcomes, summarizes the conditions that have a negative impact on socio-economic transformations at the territorial level. Additionally, the ways to improve methodological tools are suggested which allow assessing the territory development, and based on the findings, adjust the program of territory functioning in the context of sustainability. It is known that by implementing and achieving the objectives of sustainable development, the territory can reach a new level of socio-economic transformation and meet the goals in terms of economic stability, high life quality of the population, environmental and social stability. The following methodological techniques are applied in the study: various methods of information analysis (horizontal and vertical analysis), visual presentation of the material, economic and mathematical modeling, forecasting tools.

1 Introduction

The toolkit for assessing the socio-economic development of the territory should necessarily include indicators that are aimed at analyzing the achievement of sustainable development goals. Modern economic reality, characterized by deep crisis tendencies, predetermines the need to identify the innovative mechanisms of territorial development. Economic laws, manifested in processes, characteristics, categories, indicators, should be considered in conjunction with spatial indicators expressed in geographical orientation with the identification of differences of the natural, climatic, demographic and other contexts which affect the sustainable development of the area.

The study of the socio-economic development outcomes of different territories, namely regions, cities, and villages, revealed that it is rural areas that can currently pay special

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attention to achieving the sustainability goals within the framework of integral
development.

The sustainable development of rural areas provides a balance between economic, social
and environmental aspects, which is extremely important in such small areas, characterized
by a wide range of development problems that, until recently, could only be addressed
within one narrow aspect.

It is also important to understand that reaching the sustainable development criteria of
rural areas allows preserving natural resources which perform a vital task of achieving the
country's food security. The destruction or depletion of these resources can lead to a global
environmental and economic crisis.

Facing the challenges in the field of achieving sustainability is especially important, as
it creates proper living environment for population, stabilizes climatic, environmental, and
social factors in the territorial development, provides sustainable economic growth, and, in
the long term, helps achieve strategic goals for the country development.

2 Materials and methods

The exploration of the areas for improving the methodological tools for assessing the
development of rural areas in the context of sustainability involves the following stages:
- examining the current policy regarding the implementation of the concept of sustainable
development of the territory,
- collecting and processing the statistical data for the generalization and analysis of the
information related to achieving sustainable development goals in specific territories,
- critically evaluating the existing methodological tools,
- suggesting an improved algorithm for assessing the development of rural areas with a
particular focus on sustainability indicators.

Horizontal and vertical analysis tools, index method, calculation of averages and other
methods of analysis were applied in the study. The article explores socio-economic
phenomena and processes using the monographic method, and shows forecasts developed
taking into account the revealed changes. Economic and mathematical modeling is also
used in the study. It should be noted that various methodological tools were used in
different stages of the study, but only their integral use leads to achieving the main research
purpose.

3 Results

The present study includes the following stages that allow achieving the set goal, namely,
producing recommendations for the development of methodological tools for assessing the
development of rural areas in the context of sustainability:
- summarizing the experience of implementing the concept of sustainable development of
rural areas,
- analyzing the indicators that may reflect the achievement of the goals of sustainable
development of rural areas,
- exploring and analyzing methodological tools used to assess the results of the
implementation of sustainable development programs of rural areas,
- identifying the areas for improving the methodological toolkit.

Let us show the results of each stage in more detail.

The concept of sustainable development of rural areas is a specific approach that is
included in the area development program in order to achieve a balance of economic, social, and environmental aspects in the long run.
Let us consider the basic principles of sustainable development of rural areas presented in Figure 1, which are summarized based on the experience of a number of villages.

Five groups were used for classification of principles, namely:
- management of natural resources,
- economic conditions of the development of territories,
- social aspects,
- environmental protection with the recognition of the need to cater for future generations,
- commitment of all stakeholders to the concept implementation.

Fig. 1. Principles of sustainable development of rural areas

In general, the exploration of different papers in the field of implementing the sustainable development concept, allows to conclude that they come down to three components, including economic, environmental, and social aspects. We added two more principles to the concept, which imply the need for the conscious inclusion of all categories of stakeholders in the concept of sustainable rural development (municipal authorities, residents, investors, potential counterparties), and environmental protection, since the resources are finite and need to be used as rationally as possible. Additionally, there is a need to develop technologies that could efficiently prolong the term of use of natural resources.

The most important task the society needs to address is the development of communication between all stakeholders that implement programs for the socio-economic transformation of territories. Without such communication and clear allocation of tasks, the defined sustainability goals will not be achieved.

The implementation of the presented principles of sustainable development of rural areas is important, since such areas have a huge economic, social, and environmental
potential that needs to be assessed. It is important to note that in the process of developing programs for the integrated development of territories, one should focus on the rational use of existing capacity.

Let us consider the indicators of sustainable development that characterize the achievement of goals in villages and cities (Table 1). Such comparative characteristics allows defining the aspects on which local authorities should focus in the process of developing and implementing the sustainability principles in a particular area.

Table 1. Comparative characteristics of sustainable development indicators of villages and cities.

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Territory</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>City</td>
</tr>
<tr>
<td>Economic component</td>
<td></td>
</tr>
<tr>
<td>1. Depletion of resources, % of GDP</td>
<td>+</td>
</tr>
<tr>
<td>2. Research and development costs</td>
<td>+</td>
</tr>
<tr>
<td>3. Level of income</td>
<td>+</td>
</tr>
<tr>
<td>4. The number of manufacturing enterprises operating in the area</td>
<td>+</td>
</tr>
<tr>
<td>Environmental component</td>
<td></td>
</tr>
<tr>
<td>1. Percent of renewable energy consumption</td>
<td>+</td>
</tr>
<tr>
<td>2. Per capita share of emissions</td>
<td>+</td>
</tr>
<tr>
<td>3. Forest cover, %</td>
<td>+</td>
</tr>
<tr>
<td>4. Area of agricultural land, %</td>
<td>-</td>
</tr>
<tr>
<td>5. Extraction of freshwater</td>
<td>+</td>
</tr>
<tr>
<td>6. Level of pollution</td>
<td>+</td>
</tr>
<tr>
<td>Social component</td>
<td></td>
</tr>
<tr>
<td>1. Old age dependency ratio</td>
<td>+</td>
</tr>
<tr>
<td>2. Number of institutions ensuring social infrastructure</td>
<td>-</td>
</tr>
</tbody>
</table>

The comparative characteristic of indicators provided above does not include the whole set of data that can be used for assessment. The dataset is presented to reflect the difference in the indicators that should be used in urban or rural areas for the assessment of sustainable development outcomes. It should also be noted that, concerning the indicators of rural areas, there are difficulties in collecting the initial data required for the assessment. If local authorities are obliged to collect such information, this can greatly complicate the municipal management processes and steer the perspective from achieving sustainable development goals to simple collection and display of the data obtained.

After the analysis of the indicators that can be used in the process of assessing the outcomes of achieving sustainable development goals, we can move on to improving the algorithm, which, in our view, should be applied in rural areas. The uniqueness of this step-by-step algorithm is that it is adapted to the peculiarities of rural areas, taking into account
industry specifics (agricultural focus), insufficiently high indicators of the life quality, insufficient population density, etc.

The suggested algorithm should include the following steps:
- a generalized reflection of information about the results of the rural area activities in the passport,
- evaluation of environmental performance, namely the assessment of the influence of agriculture on the territory, the share of land suitable for renewable business processes,
- assessment of economic development factors of rural areas, namely, the income received from business entities operating in rural areas, stability of incomes of the population, the number of newly created jobs, the volume of attracted investments, including public ones,
- evaluation of social aspects of rural development, namely, the number of educational and medical institutions, the number of cultural and mass events held, the share of young people involved in the implementation of events,
- assessment of the degree of involvement of the population of rural areas in the implementation of the sustainable development concept,
- environmental protection evaluation, namely, the volume of energy-efficient technologies used in rural areas,
- synthesis of data, assessment of their dynamics, adjustment of the development program of rural areas.

The suggested assessment toolkit takes into account the specifics of rural areas functioning to the maximum extent.

4 Conclusions

Thus, the study made it possible to identify:
- the need for the implementation of sustainable development concept in rural areas,
- a set of indicators that reflect the achievement of sustainable development goals in rural areas,
- the need to improve the methodological tools used to evaluate the results of the implementation of sustainable development programs of rural areas,
- the areas for improving the methodological toolkit.

The algorithm for assessing the territory development in the context of sustainability, presented in the study, takes into account the specifics of the area and allows to work out measures that can form the basis for complex socio-economic transformations of the rural area.

References

1. E. Muratova, D. Muratov, E. Kravchenko, A. Sukhoveeva, O. Andreeva, Analysis of bench testing results and evaluation of economic effect due to introduction of combine harvester cleaning improvement solutions, E3S Web of Conferences, 273, 07014 (2021) doi.org/10.1051/e3sconf/202127307014


3. K. Barmuta, N. Tuguz, Organizational and managerial mechanism for risk management of agricultural enterprises, E3S Web of Conferences, 273 (2021) doi: 10.1051/e3sconf/202127308005.
4. Z. Gornostaeva, Marketing management of technological and social entrepreneurship in growth poles of the modern global economy. Lecture Notes in Networks and Systems, 73, 287-295 (2020)

5. T. Gaponenko, A. Malkhasyan, N. Filin, R. Bulatova, Diagnostics of the depth of digitalization of HR management, E3S Web of Conferences, 273, 08086 (2021)