



SUSTAINABLE DEVELOPMENT OF RURAL AREAS: STRATEGY AND CONCEPTUAL FRAMEWORK (UKRAINIAN CASE)

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ABSTRACT

The algorithm for determining the priority of solving problems of rural development on the example of the whole of Ukraine, taking into account the economic, social and environmental components are investigated in this article. Calculations based on econometric modelling of the current state of functioning of rural areas were the methodological basis for the study of this work. A specific system of evaluation of selected indicators was used as a tool for analysis. The results helped to establish a certain typology of rural areas according to the level of their development and to group the solution of their development problems into three components: economic, social and environmental. Elements of the organizational and economic mechanism for regulating the development of rural areas have been developed based on these results, which provides for measures in the areas of software, regulatory and legal support.



Keywords: Strategy; Sustainable development; Development priority; Organizational and economic mechanism; Social and economic development; Regulation, Rural areas

1. INTRODUCTION

The development and implementation of an effective rural development policy is seen as one of the strategic goals. The existing disproportions in their functioning and the slow process of formation of society did not allow to form complex systems of regulation of development of rural territories. As a result, a number of problems remain unresolved today, such as the decline of production systems, the decline in the quality of life of the rural population, the destruction of social and transport infrastructure, and so on.

It is obvious that each of the regulatory entities at different levels needs to modify the existing organizational and economic mechanism, which will not only solve the above problems, but also more effectively use the potential of rural areas, and ultimately increase the competitiveness of individual regions and countries in general.

Substantiation of the priority of solving the problems of rural development is not just a stage of research, but a decision-making environment for achieving strategic goals in the economic, social and environmental spheres of rural functioning.

2. LITERATURE REVIEW

The scientific works of many scientists are devoted to the issues of theoretical and organizational support, definition of conceptual directions of development of rural territories, substantiation of tools for regulation of social and economic parameters of functioning of territorial communities.

In particular, a number of scholars describe substantiating the theoretical foundations of rural development, focusing on the conceptual apparatus and principles of their functioning (BULAVKA, 2016; PAVLOV, 2008; SLAVKOVA, 2010), or pointing to the importance of studying the methodological framework for assessing the state and prospects of rural development (GONCHARENKO, 2009; ONYSCHENKO; YURCHYSHYN, 2006).

Other scientists have established the sufficient importance of social factors (PROVASNIK, 2007) or environmental factors (ARONSSON; JOHANSSON; LOFGREN, 1997) in the development of rural areas.

The study of regional features is one of the options for achieving the strategic goals of rural development (BOUDEVILLE, 1966).



Some authors propose to apply various organizational and economic mechanisms for regulating territorial development (PROKOPA, 2007); apply adaptive models of strategic development (KUBITSKY, 2011). As a rule, their works highlight the conceptual principles of application of rural management tools.

RADCHENKO with her co-authors (2020) conducts the study of financial balance in order to determine the supply and demand of financial resources for the agricultural sector. They take into account the factors shaping the economic relations of the personified forms of capital movement. The authors conclude that sustainable agrarian development requires strategic planning of financial resources for a variety of their sources and state regulation of this process.

SAVITSKA's and her co-authors (2020) proposed a model for the formation of investment support for sustainable rural development has been developed, which, in their opinion, that in order to activate the sustainable development of rural territories, will help to streamline and allocate financial and investment resources and improve rural investment activities.

Nevertheless, the works do not take into account the priority of solving problems and the importance of the impact of organizational and economic levers on the strategic directions of rural development in economic, social and environmental components.

The purpose of the article is to determine the priority of solving the problems of rural areas, substantiation of strategic directions of their development in Ukraine and proposing an organizational and economic mechanism for solving economic, social and environmental problems of their functioning.

3. METHODOLOGY

The following methods are used in the process of research, in addition to a number of scientific methods of economic research, as the main system approach (in revealing the essence of rural areas and the peculiarities of their functioning); economic and statistical analysis (in assessing the current state of rural development); econometric modelling (detection of the influence of factors on the level of development of rural areas); grouping and classification (to determine the typology of rural development); institutional approach (to substantiate the organizational and economic mechanism for regulating the development of rural areas at different levels); abstraction and formalization (to substantiate the strategic directions of rural development, theoretical generalization and formulation of conclusions).



The research methodology included consideration of the forecasting factor as an integral element of social and economic development of rural areas, where the key role is given to the process of determining the organizational and economic support.

The formation of strategic directions of rural development is based on the methodology developed in previous studies (SAVA, 2020) for modelling forecast indicators of their economic, social and environmental condition.

According to this method, 60 indicators were selected by three blocks. Mathematical expression of the model formed to predict the development of rural areas; we reflected using formula (1):

$$G = f(X, Y, Z), \quad (1)$$

In this model, G is an independent variable (the effective indicator of the regression equation – Y) and X, Y and Z are dependent variables (factors – X), which affect the level and variation.

Each criterion for assessing the level of development of rural areas reveals signs of the existence of problems, which are reflected in certain values of indicators and indexes below one. In this mathematical way, we calculated individual and group indices for each block of the study. The basis for comparison is the highest level (equal to one) within the national level.

According to the results of the calculations, five groups were identified according to the level of development of rural areas, which were assigned the appropriate type. Their formation is based on the ranking of index values from the lowest to the highest.

Thus, the approach to the formation of priorities for solving problematic issues of functioning and further development of rural areas is determined. Within the national level, the priority of rural development problems has been established, which must be solved in stages. We formed three groups that correspond to a certain type of development to do this (Table 1).

Table 1: Algorithm for determining the priority of problems




Code of the group	Name of the group		Type of development	Index value scale
Group I	priority problems		1 (critical)	0.000 – 0.200
			2 (threatening)	0.201 – 0.400
Group II	Medium-term problems		3 (satisfactory)	0.401 – 0.600
			4 (optimal)	0.601 – 0.800
Group III	Remote problems		5 (best)	0.801 – 1.000

Figure 1: Algorithm for determining the priority of problems of development of rural areas

Source: Calculations of the authors



According to the studied indicators, blocks of problematic issues have been formed, on which measures will be directed at different levels of regulation of rural development. Each of them is assigned a code number and the content of the question is determined.

According to the economic block of the study of rural development, the list and codes are shown in Table 2.

Table 2: List and codes of problems of rural development by economic block

Code of the problem	Code of the indicator	Code of the index	The list of problems of development of rural territories concerning which administrative actions will be directed
1e	X ₁	X ₁₁	Introduction of an effective mechanism for economic land use
2e		X ₁₂	Provision of the population with fresh water
3e		X ₁₃	Provision of territories with natural lands
4e	X ₂	X ₂₁ , X ₂₂	Balanced growth and efficient development of industries
5e		X ₂₃ , X ₂₄ , X ₂₅	Effective and optimal structural development of the agricultural sector of the economy
6e		X ₂₆	Provision of labour and material and technical resources, innovation and technological development
7e		X ₂₇	Effective development of trade and services
8e		X ₂₈	Increasing the potential of foreign economic activity
9e		X ₂₉	Regulation of inflation
10e	X ₃	X ₃₁ , X ₃₃	Formation of a favourable investment climate
11e		X ₃₂ , X ₃₃	Implementation of investment projects in the industry
12e	X ₄	X ₄₁ , X ₄₅	Effective regulation for implementation of business activities
13e		X ₄₂ , X ₄₅	Liberalization of economic policy towards small and medium business
14e		X ₄₃ , X ₄₄	Legal regulation and introduction of the mechanism of entrepreneurial activity of citizens (private individuals, peasant farms, etc.)

Source: Calculations of the authors

4. RESULTS AND DISCUSSIONS

We tried to form the stages of complex revival and development of rural areas of Ukraine at the national level of regulation by economic block based on the obtained materials of the analysis. As a basis for conclusions it is possible to use a map of individual and group values of indices of economic parameters of development of rural areas (Figure 1).

As indicated by the data shown in the Figure 1, the integrated index of the economic block of rural development corresponds to the 3rd type with a value of 0.468, but the behaviour of indicators and their indicators is characterized by significant variability.

It is necessary to solve program tasks based on these strategic goals and stages. They can be determined on the basis of the behaviour of individual indexes of the studied indicators. According to the calculations, they are also characterized by significant variability and form their own matrix of scattering of results – the values of individual indices.

We have developed the appropriate stages based on the assessment of the level of development of rural areas by 20 indicators of the economic block and the priority of solving problems (Table 4).

Table 4: Stages of solving problems of rural development by economic block

Group I	Urgent and priority problems
	11e, 8e, 10e, 4e, 1e
Group II	Medium-term problems
	3e, 5e, 14e, 2e, 12e, 6e, 7e
Group III	Remote problems
	13e, 9e

Source: Calculations of the authors

According to a similar algorithm, we determined the list and codes of problems of rural development by social block (Table 5).

Table 5: List and codes of problems of rural development by social block

Code of the problem	Code of the indicator	Code of the index	The list of problems of development of rural territories concerning which administrative actions will be directed
1s	Y ₁	y ₁₁	Preservation of the population of rural areas
2s		y ₁₂ , y ₁₃ , y ₁₅ , y ₁₇	Improving the birth rate and addressing the issue of “aging”
3s		y ₁₄ , y ₁₆	Reducing negative trends in mortality and increasing life expectancy
4s		y ₁₈	Promoting family development
5s	Y ₂	y ₂₁	Providing children with quality preschool education
6s		y ₂₂ , y ₂₃ , y ₂₄	Providing children with quality school education
7s		y ₂₅ , y ₂₆	Development of vocational and higher education
8s	Y ₃	y ₃₁ , y ₃₂	Formation of a favourable business environment for employment
9s		y ₃₃	Addressing economic and social issues of unemployment
10s		y ₃₄	Expansion of employment
11s	Y ₄	y ₄₁ , y ₄₂	Development of proper transport infrastructure
12s		y ₄₃ , y ₄₉	Development of public utilities
13s		y ₄₄ , y ₄₅	Development of educational institutions
14s		y ₄₇	Development of health care facilities
15s		y ₄₆ , y ₄₈	Development of services
16s	Y ₅	y ₅₁ , y ₅₂	Increasing the level of profitability of the population
17s		y ₅₃ , y ₅₄	Overcoming poverty and social protection
18c	Y ₆	y ₆₁	Provision of housing for the population
19c		y ₆₂ , y ₆₃	Provision of buildings with communal infrastructure

Source: Calculations of the authors



On the basis of the materials of the conducted analysis the stages of complex revival and development of rural territories of Ukraine at the national level of management on the social block are formed. As a basis for conclusions it is possible to use a map of individual and group values of indicators of social parameters of development of rural territories (Figure 2).

According to the data shown in Figure 4, the integrated index of the social block of rural development corresponds to the 3rd type with a value of 0.541, but the behaviour of indicators and their indicators is characterized by significant variability.

Thus, only 4 out of 6 indicators have values above the partial social index, and none of the indicators reaches the highest level. Therefore, if we consider the development of rural areas globally through the prism of the studied indicators, the priority of solving social problems belongs to the index with the lowest value with a consistent movement to the index with the highest value.

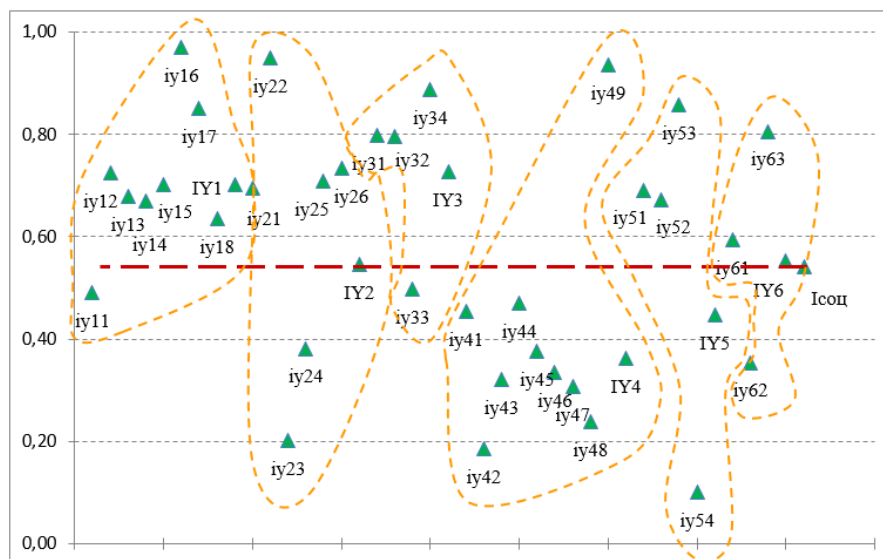


Figure 2: Map of values of rural development indicators to determine the priority of problems by the social block

Source: Calculations of the authors

In our example, the priority of development problems and the sequence of solving social issues in rural areas are reflected as follows (Table 6).

Table 6: The general sequence of solving problems of rural development by social block

Y ₄	Y ₅	Y ₂	Y ₆	Y ₁	Y ₃
0.363	0.447	0.545	0.553	0.703	727
The level of infrastructure development	The level of profitability of the population	The level of education	Quality of life	The level of the demographic situation	The level of employment

Source: Calculations of the authors



It can be established based on this scheme that in order to achieve the strategic goals of rural development by the social block, it is necessary to form the appropriate infrastructure; develop an effective mechanism to ensure a high level of profitability; qualitatively change the approaches to the formation of state policy on social protection of citizens, improving the quality of education and solving demographic problems.

Based on the assessment of the level of development of rural areas on 34 indicators of the social block and the priority of solving problems, we have developed the appropriate stages (Table 7).

Table 7: Stages of solving problems of rural development by social blocks

Group I	Urgent and priority problems
	17s, 11s, 6s, 15s, 14s, 13s
Group II	Medium-term problems
	1s, 9s, 18s, 4s, 3s, 16s, 2s, 5s, 7s, 8s
Group III	Remote problems
	12s, 19s, 10s

Source: Calculations of the authors

According to a similar algorithm, we determined the list and codes of problems of rural development by ecological block (Table 8).

Table 8: List and codes of problems of rural development by ecological block

Code of the problem	Code of the indicator	Code of the indexes	The list of problems of development of rural territories concerning which administrative actions will be directed
1p	Z ₁	Z ₁₁	Rational use of land resources and optimization of their economic use
2 p		Z ₁₂	Reducing the level of land pollution
3p	Z ₂	Z ₂₁ , Z ₂₂	Reducing the level of water pollution
4p		Z ₂₃	Providing the population with fresh water
5p	Z ₃	Z ₃₁	Reducing the level of air pollution

Source: Calculations of the authors

On the basis of the materials of the conducted analysis the stages of complex revival and development of rural territories of Ukraine at the national level of management on the ecological block are formed. It is possible to use a map of individual and group values of indicators of ecological parameters of development of rural areas as a basis for conclusions (Figure 3).

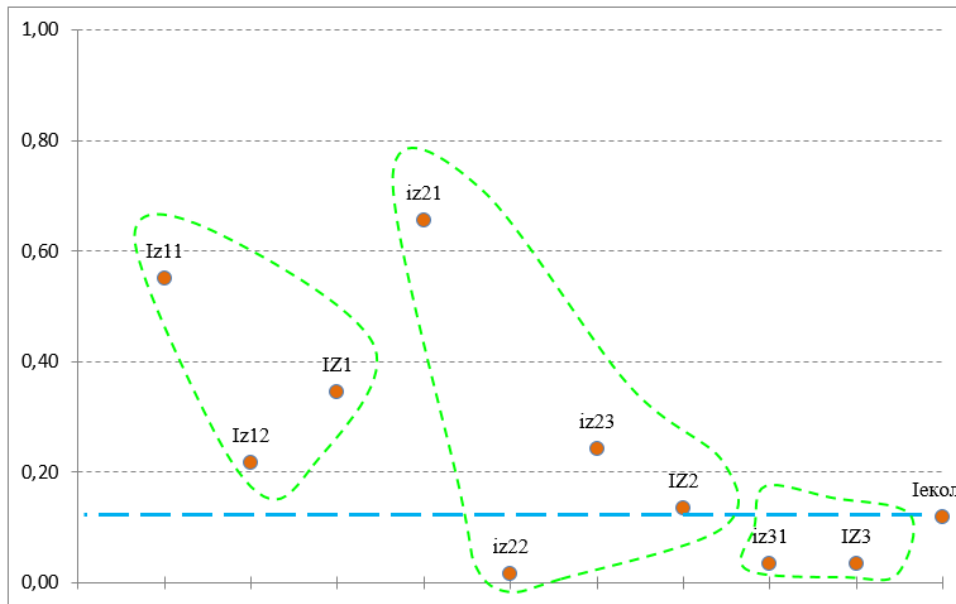


Figure 3: Map of values of rural development indicators to determine the priority of problems by ecological block

Source: Calculations of the authors

According to the data shown in Figure 4, the integrated index of the ecological block of rural development corresponds to the 5th type with a value of 0.118, but the behaviour of indicators and their indicators is characterized by significant variability. Thus, only 1 of the 2 indicators has a value above the partial environmental index, and the highest level reaches only the second type of development (*Iz1*). Therefore, if we consider the development of rural areas globally through the prism of the studied indicators, the priority of solving environmental problems belongs to the index with the lowest value with a consistent movement to the index with the highest value.

In our example, the priority of development problems and the sequence of solving environmental issues in rural areas are reflected as follows (Table 9).

Table 9: The general sequence of solving development problems of rural areas by ecological block

Z_3	➤	Z_2	➤	Z_1
0.035		0.135		0.345
The level of state of atmospheric air		The level of state of water resources		The level of state of land resources

Source: Calculations of the authors

Based on this scheme, it can be established that in order to achieve the strategic goals of rural development in the ecological block, it is necessary to address issues with high levels of air pollution, water and land resources, as well as the conditions of their use.

Based on these strategic goals and stages, it is necessary to solve current tasks. They can be determined on the basis of the behaviour of individual indicators of the studied indicators. According to the calculations, they are also characterized by significant variability and form their own matrix of scattering of results - the values of individual indices.

We have developed the appropriate stages based on the assessment of the level of development of rural areas on 6 indicators of the ecological block and the priority of solving problems (Table 10).

Table 10: Stages of solving problems of rural development by ecological block

Group I	Urgent and priority problems
	3i, 5i, 2i, 4i
Group II	Medium-term problems
	1i
Group III	Remote problems
	–

Source: Calculations of the authors

4.1. Practical aspects of solving the priority problems of rural development

The implementation of social, economic and environmental directions in the development of rural areas is based on appropriate organizational and economic support. The formation of a system of organizational and economic support for the regulation of rural development involves the development of a mechanism for implementing the strategy of their development.

It is necessary to provide for the development of mechanisms to stimulate and finance these processes in order to ensure the development of rural areas. The components of this mechanism should be designed to harmonize the impact of management actions on the economic, social and natural environment of rural areas and to cover national, regional and basic levels of government.

An important aspect of organizational and economic support for the development of rural areas is the methodological process of forming a system of their regulation, which involves the selection of the following stages:

- a) Formation of an effective regulatory structure at the national, regional, district and basic levels.



- b) Determination the level of balance of rural development by economic, social and environmental blocks of the study.
- c) Redistribution of available resources to maintain a balanced trajectory of rural development based on identified disparities in the economic, social and environmental spheres.
- d) Development of the concept and strategy of regulation depending on the defined optimum values of economic, social and ecological components of development of rural areas.
- e) Formation of a model of balanced (harmonious combination of economic, social and environmental results) development of rural areas.
- f) Development of a mechanism to stimulate and finance the development of rural areas.

In its content, the mechanism of stimulating and financing the development of rural areas involves the simultaneous linking of economic, social and environmental contradictions and their coordination in the overall expected outcome of the level of development.

Levers of organizational and economic support for the regulation of rural development should be grouped by component subsystems (Table 11).

Table 11: The system of levers of organizational and economic support for the regulation of rural development

Level of regulation	Subsystem of economic development	Subsystem of social development	Subsystem of environmental development
National	Formation of state economic policy, creating conditions for effective entrepreneurship	Institutional and resource provision of the social sphere	Ecological zoning of the territory of the state on the basis of systematic assessment of the ecosystem
Regional	Development and implementation of regional programs to support entrepreneurship, support of investment projects	Promoting the creation of infrastructure for the provision of social services to the population	Development and implementation of regional programs for environmental protection
Basic	Formation of projects for the development of entrepreneurship in rural areas	Rationalization of social infrastructure of rural areas and ensuring the availability of social services for the population	Formation of ecologically oriented concept of urban planning and land use

Source: It is developed by the authors

The purpose of organizational and economic regulation of rural development is to create institutional, legal, economic and social conditions for human activity as a carrier of the



properties of the three habitats in which it becomes interested in implementing strategic priorities for rural development. Therefore, to increase the development of rural areas, it is necessary to create an effective and efficient mechanism for achieving and maintaining balanced economic growth, raising social living standards and minimizing the negative impact on the environment. It provides for measures in the areas of software, regulatory, administrative and information support.

Normative and regulatory measures provide legal conditions for the implementation of targeted actions in a particular area. Their main task is to implement program goals within the current regulations or through the creation of new provisions. Administrative measures include a specific list of conditions and mechanisms that can ensure the implementation of program goals to improve the condition of rural areas. Information measures serve as a kind of link between programmatic, regulatory and legal, administrative goals, as well as all stakeholders within rural areas.

For the full implementation of the proposed measures it is necessary to carry out a number of actions outside the research, in particular: public discussion of proposals, determining the degree of financial and administrative support for their implementation, coordination of proposals for rural areas with other spheres of public life.

One way to investigate the most significant cause-and-effect relationships between factors and consequences in the situation or problem being studied is to identify a clear relationship between performance and factor characteristics. In our case, the set of factor features includes a large number of parameters that in practice are complementary, or, conversely, mutually exclusive.

This necessitates complex mathematical calculations to determine the relationships of influence, which will be quite conditional in the calculations and will not be subject to the logic of economic knowledge and processes. Complicating the situation is the fact that the development of rural areas depends on three main components: economic, social and environmental, the directions of development of which may be multi-vector.

To solve this problem, you can use a graphical method (Ishikawa diagrams) to assess and display the relationship of a large number of factors on one performance trait, which will determine the preconditions for the impact of the institutional environment on rural development.

The diagram is named after one of the most prominent Japanese management theorists,



Professor Kaoru Ishikawa (1952), who proposed as a supplement to existing methods of logical analysis.

This diagram allows you to identify the key relationships between the various factors and to better understand the process under study. The diagram helps to identify the main factors that have the most significant impact on the development of the problem, as well as to prevent or eliminate the action of these factors.

On the example of the studied object, we tried to build a diagram of cause-and-effect relationships of factors on the development of rural areas of Ukraine (Figure 4).

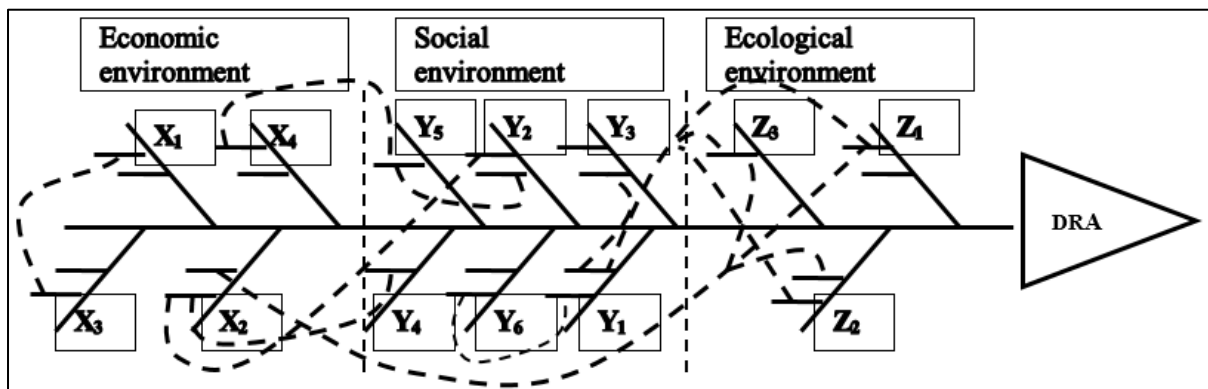


Figure 4: Diagram of cause-and-effect relations of factors of social and economic development of rural areas*

*DRA – the development of rural areas (according to the value of the integrated index); X₃ – designation of indicators of each environment according to the determined priority of problem solving; - - - – indication of typical (possible) relationships between individual indicators.

Source: developed by the authors by Ishikawa method

In it, we envisaged that the overall (i.e. the only) result of solving the problem is the development of rural areas, balanced in economic, social and environmental components. As a result, it will be affected by three blocks of factors.

As the diagram shows, the overall result is formed due to the influence of all factors through the system of connections in one's own environment, as well as on other indicators of adjacent environments, and vice versa. This, in turn, requires the development of an adequate mechanism for organizational and economic support for regulating the development of rural areas.

The formation of such a system involves the use of interconnected and mutually agreed economic, social and environmental indicators and indexes used in the development of a mechanism to stimulate and finance the development of rural areas. It is proved that these indicators are necessary for solving the tasks of coordination of state and regional target programs with forecast indicators of rural functioning.

Due to the use of mutually agreed indicators, the tasks of management entities are integrated into the general system of rural development goals in terms of economic, social and environmental components. Interrelated indicators stimulate the reduction of the negative impact of factor characteristics on the performance indicators and form the forecast state of the level of development of rural areas.

5. CONCLUSIONS AND RECOMMENDATIONS

Based on the results of the indicative assessment, ranking of index values from the lowest to the highest and the proposed typology of rural areas according to their level of development, an approach to prioritizing the functioning and further development of rural areas, which allows to develop their strategy in accordance of different levels of regulation: from national to basic.

The basis for making appropriate decisions is the mathematical forecasting, which allowed establishing the restraining factors of rural development and developing an improved organizational and economic mechanism of rural development, which offers a set of program, regulatory, administrative and informational measures.

The author's position provides for the deepening of conceptual approaches to the development of rural areas at the national, regional and basic levels of regulation, the content of which is to implement the organizational and economic mechanism on the principle of "bottom-up" and depending on the needs of rural residents. In practice, this means legally separating rural areas as an independent object of regulation. In view of such statements, a strategy for the development of economic, social and environmental development of rural areas with the establishment of the most important cause-and-effect relationships of the three blocks of factors is defined.

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