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SUSTAINABLE DEVELOPMENT ECONOMY OF RURAL AREAS AS A FACTOR OF BUSINESS DEVELOPMENT

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Abstract

The article touches upon the issue associated with the need to develop approaches that provide the optimal combination of development directions, both the agricultural sector and rural areas interrelated with it. On the one hand the importance of this problem is determined by resource constraints, in modern conditions, primarily financial. On the other, it is determined by the need for such sustainable development of rural areas that could make them an independent factor of investment attractiveness and innovative development for economic entities of agrarian sector. Based on the analysis of appropriate methods that allow balancing social, economic, environmental and other aspects of development using methods of dialectical and empirical knowledge, system and situational analysis, as well as general methods of analysis and synthesis, the authors obtained the following results. The obtained results allow concluding that the proposed developments are aimed at the solution of strategic problems, overcoming obstacles and barriers that can have the most significant and long-term impact on the course of reproduction processes in rural areas and agricultural sector. In the future, it is advisable to adapt this approach to the structure of a specific agricultural sector of regional economy, taking into account the territorial and industry specifics, as well as the development of infrastructure. It is also necessary to note that the tools of the proposed mechanism are focused on the development of agro clusters focused not only on the economic development of economic entities, but also their social, environmental and even institutional development.

Keywords: Sustainable development, rural areas, process management.

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1. Introduction

Sustainable development of rural and other territories is legally fixed in the Russian Federation, namely, in Urban Planning Code of the Russian Federation. Sustainable development is defined as an equilibrium of social, economic, environmental and other components of development.

For agricultural activities and production, this requirement is most relevant. The term "sustainable development" in relation to the agricultural sector was specifically defined long ago in the decisions adopted by the FAO session in 1996 (Rome).

A generalization of studies on social, environmental, economic, institutional and technological areas of agricultural activity in the Russian Federation and abroad shows that according to the results of these studies, primarily abroad, new approaches were put forward:

- "Alternative agriculture", which seems to be a more generalized term that characterizes a radical transition from a technogenic industrial farming system to an environmentally sustainable system with minimal use of non-renewable energy resources of non-farm origin (low-input agriculture, reduced input agro ecosystem),
- -"Ecological agriculture" – a biological-dynamic method of managing, based on the idea of conducting agricultural activities in accordance with the laws of nature;
- "Natural farming" – the use in agricultural activities of components created by nature to ensure the required productivity and quality in crop production, animal husbandry, etc.;
- "Biological farming" (biological agriculture, organic farming) – the cultivation of crops (mainly vegetables and fruits) without the use of mineral fertilizers, pesticides, growth regulators, as well as genetically modified seed;
- "Dynamically adaptive and ecologically balanced agriculture" with minimal use of material and energy resources of non-farm origin (low-input sustainable agriculture),
- High-tech agriculture and livestock breeding – "precision agriculture" (precision agriculture, precision farming, precision livestock farming) – is an integrated agricultural production system with full-scale application of the achievements of information technologies, using automated and robotic control and production systems that contribute to the optimization of agricultural technologies, stabilization productivity of agrocenoses providing minimal negative impact on the environment.

There are a many variations of the above mentioned definitions. However, all of them have common denominator, which means replacing intensive technogenic systems with a socially, economically, environmentally and institutionally balanced agricultural system based on the outstripping needs of the population and the demands of the market for technological development, in which the condition for the balanced development of elements of the agricultural system dominates.

2. Problem Statement

Nowadays at the national and regional levels, the main tasks are to develop and adjust strategies for the sustainable development of rural territories and agribusiness, to find the place of agribusiness at

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global and national agricultural markets and to create effective state regulation mechanisms that ensure the sustainable development of the agro-industrial sector of economy.

3. Research Questions

The practical implementation of an effective mechanism for the regulation of the sustainable development of rural territories and the basic agricultural sector can be based on the experience of economic and mathematical modeling of agricultural development, which is used to one degree or another depending on the setting of specific tasks.

In order to get a description of the system as a whole, economic theories apply one or another organizational principle, most often it is the principle of market equilibrium. At the same time, this principle does not allow uniquely determining the motion of the system; the problem of the multiplicity of equilibrium arises, which leads to the immense multiplicity of solutions. Another difficulty is the variety of existing theoretical approaches that can be taken as a basis for modeling economic processes. Transition economies are the source of numerous examples of this kind.

The improvement of the mathematical apparatus allowed improving the economic theory itself. Thus, the theory of equilibrium took into account the presence of a “very large” number of agents in competitive markets, the possible non-transitivity of preferences, the probabilistic nature of technological capabilities and the incompleteness of information in the formation of expectations, etc. The apparatus of the theory of equilibrium and game theory served as the basis for the creation of modern theories of international trade, taxation and public goods, the monetary economy, and the theory of production organizations.

The possibilities for the use of the theory of general equilibrium in the practice of economic analysis expanded significantly with the advent of a class of models using Computable General Equilibrium Model toolkit, which allows generating models and solving systems of nonlinear equations. The models of this class are based on the so-called of social accounting matrix (SAM), in the form of which data are organized according to the principle of constructing an input-output table. At the same time, revenues are always equal to expenses, a double account is excluded and the data are presented in a highly aggregated form. The matrix provides an information basis for the model, and the main indicators of the matrix are obtained from statistical sources.

The next step in the improvement of the software for building and using models of general and partial equilibrium was the development of GAMS software (General Algebraitic Modeling System – a general algebraic modeling system), which is a system that implements the task language in a user-friendly form of mathematical programming. The model implemented using this system with the participation of scientists from Russia was the EPACIS model.

The EPACIS (Agricultural Policy Analysis Model for CIS countries) is a partial equilibrium model designed to analyze agricultural trade and trade policy. In this model, foreign trade relations are divided into two components: trade between the CIS countries and trade with non-CIS countries. The model analyzes in detail bilateral trade flows. This allows observing not only the change in the balance of agricultural trade, but also to analyze in detail the situation for each product or production group used in the model.

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The most large-scale development of partial equilibrium models is the global food model BLS (Basic linked system), created in collaboration with experts from many countries as a part of a project of International Institute for Applied Systems Analysis (IIASA) (1986). In order to become a part of BLS, any national model must meet certain conditions related to the creation of a formalized idea of the control levers and mechanisms of economic regulation. Thus, each national model that is a part of BLS has at least three blocks: decision-making, production and foreign trade. Within each national agribusiness model, the volumes of land resources, labor and capital are determined, and labor and capital are distributed between agriculture and the non-agricultural sector, as well as between agribusiness sectors. In order to achieve this, the problem in the general case of nonlinear programming is solved to maximize profits by changing the distribution of resources, feed, pricing processes, technological progress and the level of management.

According to above mentioned aspects, it follows that BLS is a model shell open to connect national modules made in accordance with system agreements. In accordance with BLS requirements for national models, the American model has the following blocks: decision making, demand, production (Card, 1987). In the decision-making block, commodity programs, a dairy program, import restrictions, stocks, etc. are considered as the main control levers. Import restrictions are presented by a list that includes dairy products, beef, lamb and are set by the corresponding shares of national production. The parameters are estimated by expert or empirical methods in functions that determine the value of control variables endogenously.

As an example of even more detailed analysis of the agricultural sector of economy, the US Agricultural Resource Interregional Model (ARIMS), developed by the CARD Agricultural Research Center of the University of Iowa, presents interest (Froberg, 1989). The purpose of its creation is a comparative analysis of alternative strategies for the distribution of agricultural resources. Prospective calculations can be made for the period up to 2030 with exogenously given technological resources and demand for agricultural products. The model consists of seven blocks: crop production, animal husbandry, grazing, land development, land resources, transportation of final and intermediate products, demand. The first three blocks cover the distribution of resources and the production process; the fourth and fifth blocks cover production resources, the last two is aimed at bringing products to consumers.

The econometric model of the agro-industrial complex of the Russian Federation was developed in All-Russian Institute of Agrarian Problems and Informatics named after A. A. Nikonov of RAAS, one of the versions of which was implemented on the principles of partial equilibrium (Ognivtsev, Siptits, & Romanenko, 2020).

The following units are included in the number of economic agents of the agribusiness model of the Russian Federation:

- Crop production industry;
- Livestock production industry;
- Processing industry;
- The population that is a consumer of food;
- A state defined by a set of external (in relation to the agro-industrial complex) control actions;

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- Other sectors of the Russian economy that form the external economic environment for agricultural sector.

In this version of the model, sales prices of agricultural products to the population are determined from the condition of equal supply and demand, taking into account the import and export of products of various groups. For each group of products introduced into consideration in this model, the equation of the commodity balance is written, including production, import, export and consumption; the change in carryover stock is neglected. Each component of the commodity balance is recorded in the form of an econometric relationship obtained from the analysis of statistical information. The consumption functions are built on the basis of the classical concepts of equilibrium theory. Taking into account the patterns of consumption of products, a vector of prices is determined at which commodity balances are fulfilled (in practice, this is not an exact solution, but an approximate one, obtained from the condition of minimizing the total discrepancy of all commodity balances). At the same time, the incomes of the population are considered external information and are set scenarios.

4. Purpose of the Study

The functioning model of the national agro-industrial complex can be used to justify many elements of development strategies for this sector of economy in transition from the point of view of the neoclassical approach. The transitional nature of economy suggests that someday a state of quasi-equilibrium will be achieved, characterized by stable proportions between the agro-industrial complex and other sectors. Based on this model, for example, a forecast for the strategic development of the agro-industrial complex of the Russian Federation was developed.

In addition the study took into account national experience in the management of sustainable and innovative development: the agricultural sector of a region (Sandu, Butorin, & Ryzhenkova, 2019) and territorial zones; agriculture through improved economic monitoring (Bogoviz, Sandu, Demishkevich, & Ryzhenkova, 2019) and municipal government, the territory of a municipal district. European priorities in the field of territorial management (Franks, 1994), as well as foreign experience in sustainable rural development (Perella, Galli, & Marcheggiani, 2010), were also taken into account.

These approaches allowed modeling the conditions and mechanisms for managing the sustainable development of rural areas and their basic agro-industrial complex.

5. Research Methods

The study used the dialectical and empirical methods of cognition, systemic and situational analysis, general methods of analysis, synthesis, and a statistical method of extrapolation. The territorial objects of research are the Russian Federation as a whole and Perm Territory in particular.

6. Findings

Taking into account the interdependence of sustainable rural development and their basic agribusiness, a structural interconnection of the conditions of sustainable rural development and basic agribusiness is proposed (Table 01).

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Table 01. Structural interconnection of the conditions of sustainable rural development and the basic agricultural sector

1.Social development	**2.Economic development**	**3.Environmental development**	**4.Institutional development**
1.1. Creation of jobs in the countryside	2.1. State regulation	3.1. Replenishment of land fertility	4.1. Market development
1.2. Labor motivation	2.1.1. Antitrust Regulation	3.2. Introduction of energy-saving technologies	4.1.1. Wholesale markets
1.3. Occupational Safety and Health	2.1.2. Indicative pricing	3.3. Environmental Protection Financing	4.1.2. Infrastructure market
1.4. Social Infrastructure Development	2.1.3 Macroeconomic Forecasting and Planning	3.4. Climate Risk Reduction	4.1.3. Improving Economic Relationships
1.5. High-quality reproduction of labor	2.1.4. State support, targeted programs		4.1.3.1. Price parity
1.5.1. Child benefits	2.2. Economic instruments for agricultural development		4.1.3.2. Stocks and bods market
1.5.2. Career guidance	2.2.1. Prices		4.1.3.3. Application of guarantee payment forms
1.5.3. The development of agricultural education	2.2.2. Subsidies		4.2. Information Support
1.5.3.1. Agricultural universities	2.2.3. Tariffs		4.2.1. Logistics and software
1.5.3.2. Additional training	2.2.4. Credit policy		4.2.2. Management Accounting
	2.2.5. Insurance		4.2.3. Internet communication
	2.3. Complex diagnostics of agricultural enterprises		4.2.4. Automation of accounting and planning
	2.3.1. Forecasting		4.2.5. Internet Control Server
	2.3.2. Controlling		
	2.3.3. Situational analysis		
	2.3.4. Financial analysis		

Source: performed by the author

The main mechanism for the implementation of the conditions of sustainable rural development and the basic agro-industrial complex is the mechanism for transforming the goals of sustainable rural development in the direction of innovative development of economic entities in agricultural sector (Figure 1). It takes into account the solution to the problem of balancing the interests of 6 groups of stakeholders in strategic management of sustainable development (population, trade unions, state, production – managers, production – performers and processes of management of objects).

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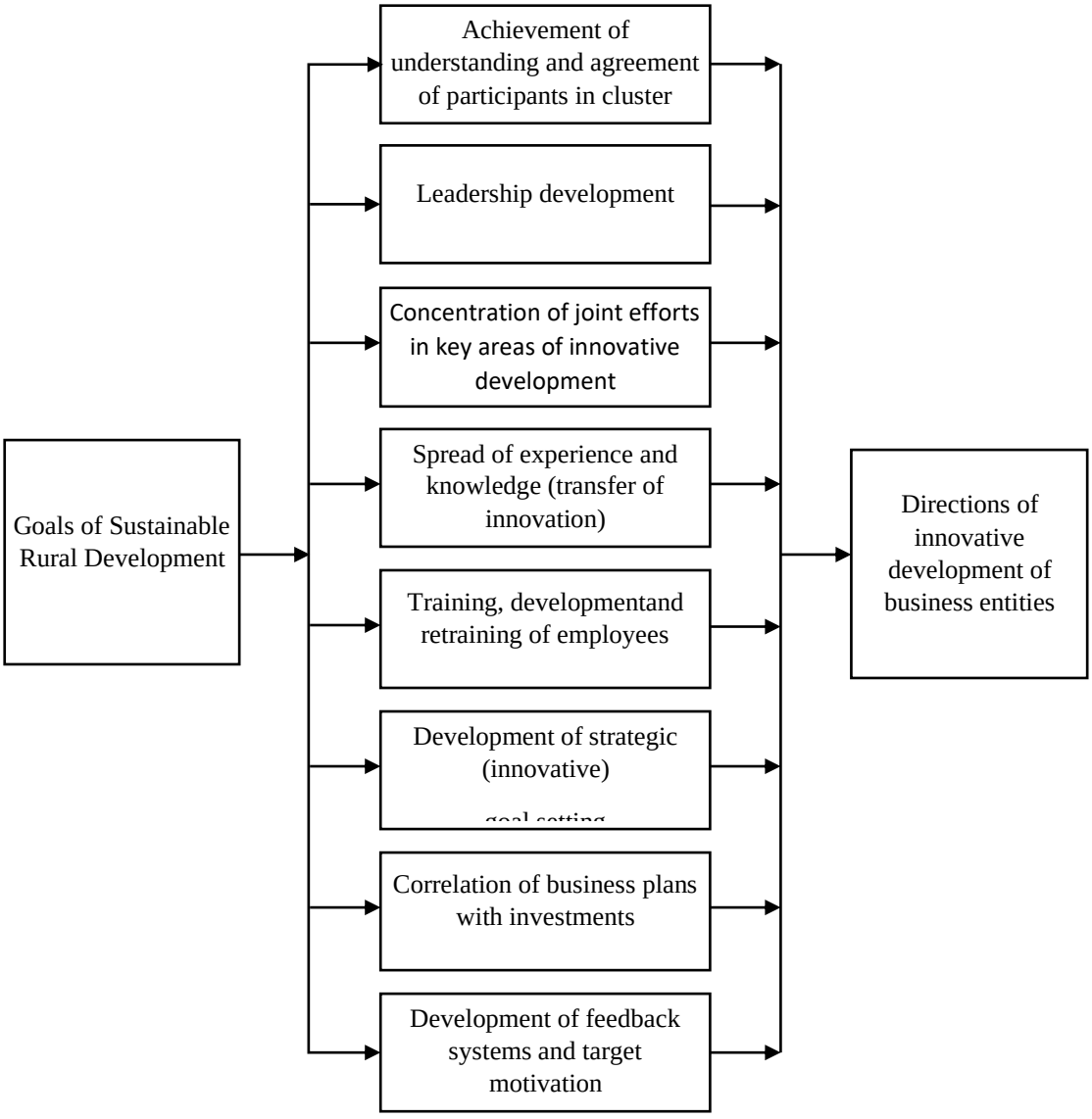

Source: performed by the author

Figure 01. Mechanism of transformation of sustainable rural development goals in the direction of innovative development of economic entities of agricultural sector

7. Conclusion

The functioning of the management system of sustainable rural development and basic agricultural sector should be aimed at the solution of strategic problems, overcoming those obstacles and barriers that can have the most significant and long-term impact on the course of reproduction processes in rural areas and agricultural sector.

The solution of these problems will require coordinated efforts on the part of all participants in the organizational and economic relations that arise during the implementation of sustainable development processes that are balanced in terms of social, economic, environmental, institutional and technological aspects. They will be most effective in the joint actions of government bodies and commercial structures and will accelerate the achievement of sustainable rural development.

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