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INNOVATIVE DEVELOPMENT OF RURAL TERRITORIES AND AGRICULTURE IN UKRAINE

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Abstract

The socio-economic aspects of rural development in the context of decentralization of management, features of the organization of rural areas and the formation of potential for development is considered in the article. The necessity of intensifying activities in the direction of decentralization of power and introduction of modern principles of economic reform of rural areas is substantiated. The process of greening of agricultural production has been confirmed. The structure of production of the main types of agricultural products by agricultural enterprises and their profitability are considered. A quadratic trend model of the dynamics of the volume of profits of business entities in rural areas has been developed. Sufficient attention is paid to the formation and justification of scientific solutions aimed at building a new, more effective model of rural development management in Ukraine. Risks and threats to the development of entrepreneurship in rural areas have been identified and the probability of influencing the level of socio-economic development of rural areas has been substantiated. It is important to note that in order to increase the effectiveness of business policy, it is necessary to determine the main criteria that will shape the development of rural areas on the basis of the formed forecast indicators and determined factors influencing them. A number of important positions that influence directly or indirectly on the implementation of innovative projects of development of rural areas have been proved, in particular, the greatest weight have their own resources, which can be used in communities. On the basis of the conducted researches the whole model of innovation development is proposed, which includes all spheres that influence the development of entrepreneurship in rural areas.

Key words: *rural areas, innovative development, risks, opportunities, stimulating determinants, profitability, agricultural enterprises*

INTRODUCTION

In modern conditions, the development of agriculture is based on a significant update of agricultural technologies according to market needs [15], that is why the need for human labor is decreasing and the number of employed rural population is also decreasing. This creates the relevance of the study of the prospects of rural areas in Ukraine.

The traditional benefits of economic activity in rural areas will be continue to depreciate. It affects negatively to the quality and standard of living of the rural population and the general prospects for rural development.

From a scientific point of view, an important problem is the ability to form and approve scientific solutions aimed at creating more effective model of rural development management in Ukraine. Given the need to ensure the competitiveness of rural areas for business in modern conditions, this development should be aimed at creating a favorable environment for the introduction and dissemination of innovation, encouraging enterprises to innovate in rural areas. This

requires optimization in the management system of rural development, through the development of an innovative model that will be scientifically sound, which will serve as a challenge in the study. Scientific aspects and practical problems of solving this problem are investigated in scientific works by A. Popescu, T. Yu. Dubnevych, Dinu, E. Stoian V.Serban, T.Shmatkovska, M. Dziamulych, N.Vavdiiuk, N. Kutsai, V. Polishchuk, V. Dushka, V. Yakubiv and other researchers [5, 6, 7, 8, 9,10, 11, 12, 13, 14, 15].

It should be noted the contribution of domestic researchers in the development of theory and methodology of innovation management, in particular Kulagina N., Ch. Pencea [3, 4]. Successful attempts were also made to theoretically comprehend and form practical solutions to the issues raised in the article of optimizing the management of territorial development in the works of such scientists as F. Vazhynsky, V. Zalizko, V. Martynenkov, R. Sodoma,, O.Agres,, O.Havryliuk, K. Melnyk [19, 20, 16]. Regarding the specifics of innovation development management in rural areas, the works of R. Khaled, W. Gotry, M.I. Ignatko [2, 1].

According to N.A. Kulagina [3], innovative component of development in agriculture contributes to ensuring the competitiveness of rural products through the development and implementation of innovations [3, p.104]. Of course, it is worth agreeing with the position of N.A. Kulagina, but in our opinion it is appropriate to focus on the development of agricultural business in the countryside, this will help attract new business ideas, new startups and increase opportunities for doing business in the countryside. Therefore, the introduction of digital literacy for the population, the provision of more information on new opportunities and an innovative toolkit in social communications of modern business is aimed at improving the infrastructure in the countryside.

The availability and content of a large number of studies on the problem of innovation management, stimulating innovation development, ensuring the effective creation, implementation and dissemination of innovations indicate not only the scientific interest in the problems of development management on the basis of innovation, but also on the tangible need of market participants in the use of their results in management practice, in particular the management of rural development.

The authors show that the peculiarities of rural development in the context of agrarian business environment are factors that affect the configuration and structure of the mechanism for managing rural development in modern conditions. It is possible to optimize the system of proper management of rural development in Ukraine at the current level.

MATERIALS AND METHODS

The theoretical and methodological basis of the study is a systematic approach to the study of the fundamental provisions of economics in relation to the development of entrepreneurship in rural areas in terms of innovative changes.

Methods of analysis and synthesis, scientific hypotheses, grouping, analysis, system approach, time series, logical method and etc. were also used in the research process. The process of scientific research is based on general scientific and special economic methods. The abstract-logical method is used to formulate basic principles, theoretical generalization of conclusions and analysis of research results of other researchers, clarification of the conceptual and categorical apparatus. The use of sociological methods allowed to monitor the business environment in rural areas. Characteristic of entrepreneurial formations and assessment of entrepreneurial activity in rural areas was carried out using the economic-statistical method. In order to substantiate the business environment and determine the strategic orientations of business, the method of SWOT analysis was used. Within the economic-mathematical method, the methods of correlation-regression analysis and modeling are used. Graphic and tabular techniques are used to visualize the results.

The reliability of the obtained results, conclusions, and proposals is based on a comprehensive analysis of statistical data and scientific generalizations.

RESULTS AND DISCUSSIONS

Management is carried out with the help of certain tools, namely regulatory, administrative and socio-economic.

By using the tools to prevent or minimize the impact of macro-environmental changes on rural development, formulating an action plan and monitoring its implementation within the rural development management system, the problem of hopelessness of rural development can be solved. Ukraine in which agriculture is an important component of the domestic economy, where the field of agricultural innovation management is important, but not the only sector that needs improvement that will significantly affect the development of rural areas of Ukraine [1, p. 20.]. Significant changes have taken place in the context of decentralization and reform of the management system.

Innovation can be considered from two conceptual positions:

1) the process which is carried out in a certain order and has features that allow you to explain it in terms of process method;

2) new products are some improvements that are the result of the implementation of the innovation process.

Agricultural innovations play an important role in promoting the modernization of agricultural products and significantly improving the quality of agricultural products. They are based on ideas and concepts, the process of development and implementation, as well as the implementation of new technologies. Modern production methods that take into account the interests of potential consumers. Such innovations cover everything related to the creation, demonstration of innovative ideas, usually ending with the implementation of innovation in practice, such as:- conquest of new markets for environmental products; - making profits from the implementation of environmental innovations; - formation of corporate ecological image; - increase employment through job creation; - rational use of natural resources. Therefore, the essence of eco-oriented entrepreneurship in rural areas is usually the same as traditional entrepreneurship (taking into account the subjectivity of the economy), but the emphasis is on the ecological form. Considering that the environmental utility of this type of business is a significant share of the overall utility, it is logical to say that the body of environmental business should be considered as the main body. The relationship of the greening of agricultural production with economic, social, and environmental systems is shown in Figure 1.

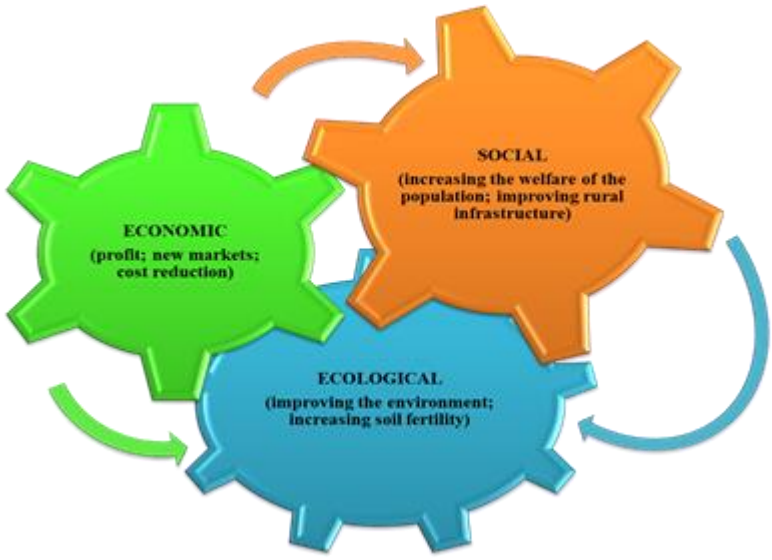

Fig. 1. The relationship of the greening of agricultural production with economic, social, and environmental systems
Source: adapted from [4].

In rural development management, we focus on changes in the organizational structure, management methods, and ways of serving and meeting the needs of the population and businesses. The interrelation between greening is close to social (welfare), economic (maximum profit at minimum cost), and environmental (improving the environment and increasing soil fertility).

Innovative rural governance must take an integrated approach, which means that the reorganization of the management system requires the integration and coordination of many success factors, namely leadership, organizational structure, processes, infrastructure, and human resources.

Supporting the development of innovation in certain areas makes it possible to obtain a specific effect that is important for ensuring the development of rural areas.

Therefore, building an effective digitalized infrastructure is important in managing rural innovations, for this we highlight the following areas:

- improving the conditions of economic activity in rural areas and living conditions of the rural population by reducing legislative and administrative restrictions on the use of IT infrastructure for doing business, gaining knowledge, implementing innovative ideas;
- presentation of the activities of public administration bodies through ensuring easy access to public information.

Innovations that will affect the development of rural areas include modification, improvement of administrative services provided to businesses and the population in this area. Prominent are e-services, which significantly simplify work in rural areas and require a reduction in human participation and time. However, the introduction of modern technologies in rural areas requires a modern hardware platform, the purchase of the necessary software, and the organization of trainings to increase the competence of officials. Modern technologies should increase the efficiency of public administration and self-government.

Modern technologies should help increase the efficiency of public administration and autonomy. The implementation of innovations is shown in Figure 2.

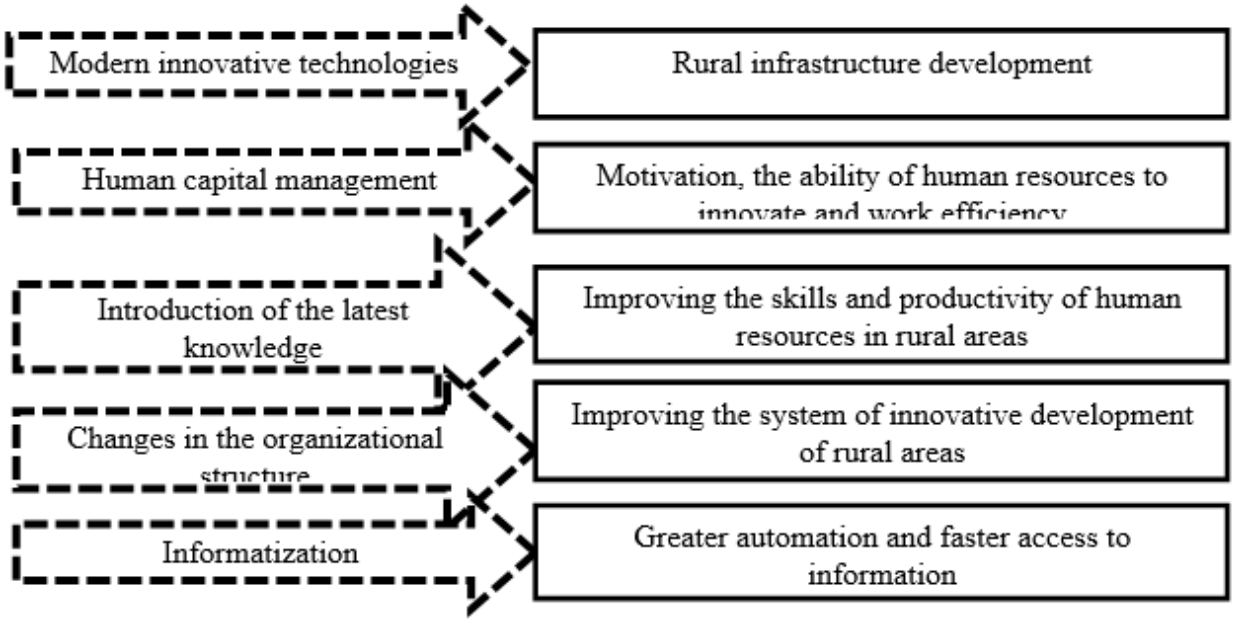

Fig. 2. Implementation of innovations for rural development
Source: own development.

In the case of rural areas, product innovations that can have a significant impact on the development of these areas include the modification and improvement of administrative services provided to businesses and the population in the area. The task of innovation and development management is to provide customers with new opportunities,

so e-services have become important, which greatly simplifies work in rural areas and requires less manual involvement and time.

However, the introduction of modern technologies in rural areas requires a modern hardware platform, the purchase of necessary software, training to improve the skills of officials.

In modern conditions, measures for innovative development of rural areas should be complemented by projects of integrated and sustainable development. The innovative model of rural development provides for the creation of regional model centers for rural development, which include not only agriculture but also local industry, construction, trade, tourism, social services. Without this, it is impossible to increase the efficiency of the economy and improve living conditions in rural areas.

As for households, they produce most agricultural products, such as honey and potatoes (over 95%), vegetables (about 86%), fruits and berries (about 80%), milk (over 75%). Like farms, families that also cultivate small areas of agricultural land may switch to producing such products in the future. This indicates the feasibility of analyzing their functional status and characteristics in rural areas. The structure of production by agricultural enterprises of the main types of agricultural products in Ukraine in 2021 is shown in Figure 3.

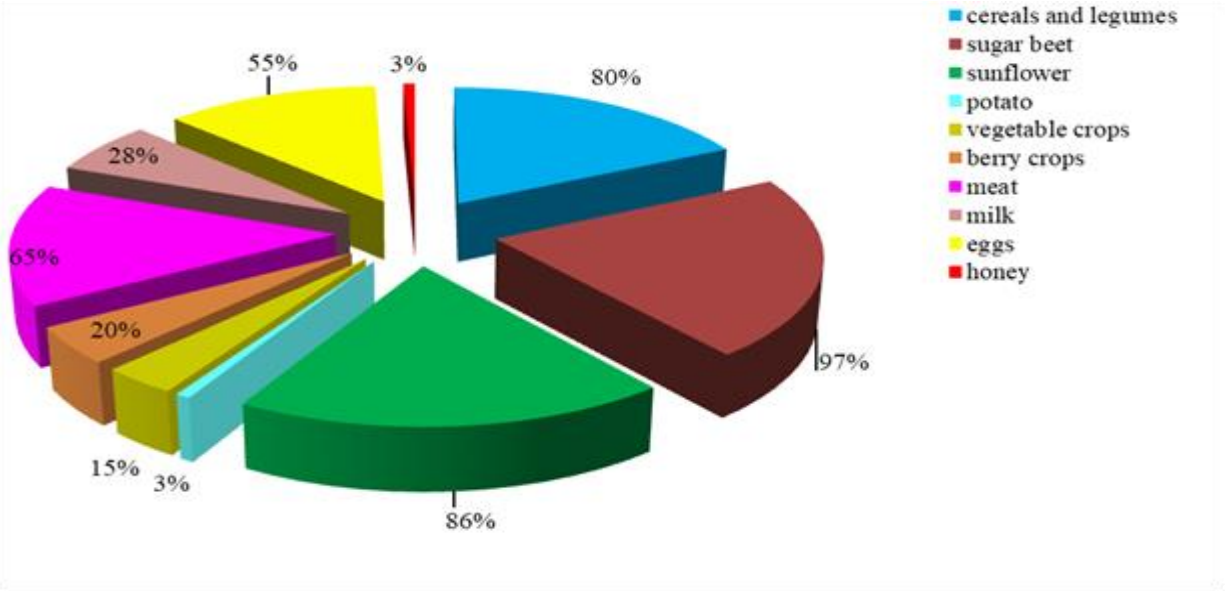

Fig. 3 Structure of agricultural production of the main types of agricultural products in Ukraine, 2021
Source: own development.

Table 1. Profitability of agricultural enterprises by their size

Years	Profitability of operational activity of enterprises,%				Profitability of all activity of enterprises			
	large enterprises	medium enterprises	small enterprises	of which microenterprises	large enterprises	medium enterprises	small enterprises	of which microenterprises
2016	54.3	37.8	41.4	36.2	45.4	23.4	32.4	30.9
2017	29.3	30.4	37.2	33	24.7	21.6	30	26.5
2018	24.6	20.8	24.1	24.2	20.5	15.4	15.6	7.7
2019	22.9	17.1	18.6	16.4	21.2	14.3	10.9	7.9
2020	8.3	25.2	13.4	15.5	6.1	23.6	9.6	8.9

Source: systematized and built on the basis [17; 18].

Most agricultural producers grow sugar beet, sunflower and cereals and legumes, and the least - potatoes and bee families. The profitability of agricultural enterprises during 2016-2020 is shown in Table 1.

Analyzing Table 1, the highest profitability of

operating activities is observed in 2016 - large enterprises (54.3%), however, within five years is declining and is 8.3%. Profitability of all activities of large enterprises in 2016 - 45.4%, and in 2020 - 6,!%. The level of profitability of agricultural enterprises operating in rural areas in Ukraine is shown in Figure 4.

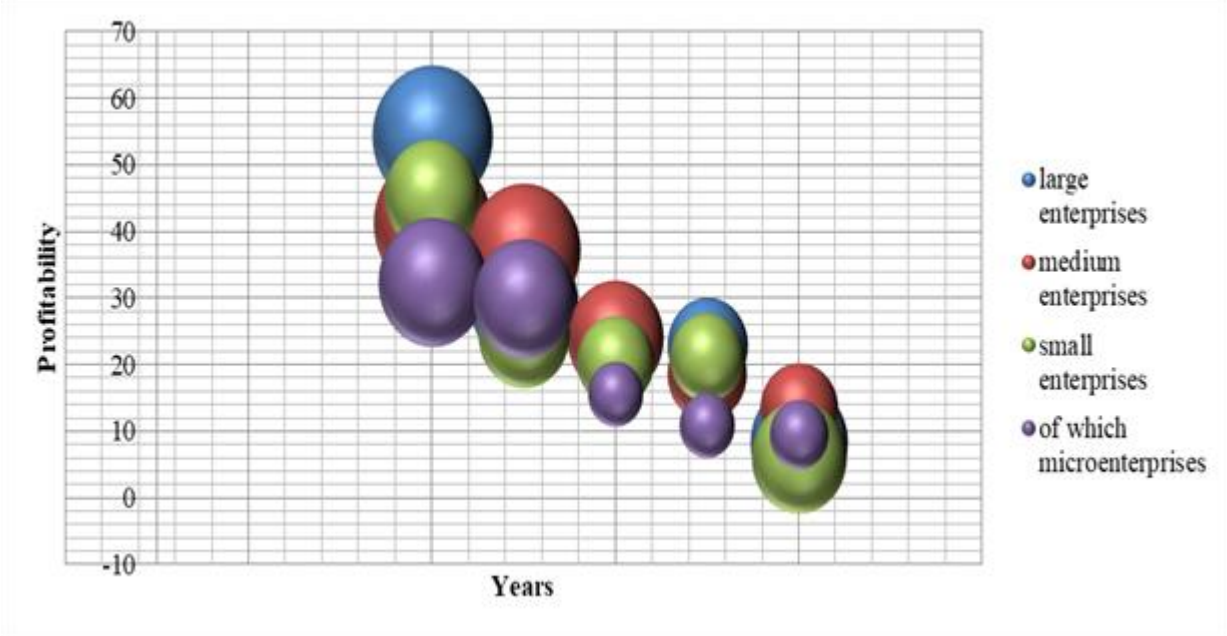

Fig. 4. The level of profitability of agricultural enterprises operating in rural areas in Ukraine
Source: own development.

A detailed analysis of the company's financial results, including profits, is very important for studying the features of corporate development in rural areas. We are building a multifactor model of profit (Y) dependence on the following factors: volume of sold products (X1), export of agricultural products (X2), Indices of agricultural production (in 2016 prices; in % to the previous year) (X3) (Table 2).

Table 2. Statistical data for building an economic-mathematical model

Period	Net profit (billion UAH) (Y)	Volume of sold products (billion UAH) (X1)	Export of agricultural products (billion UAH) (X2)	Indices of agricultural production (in 2016 prices; in % to the previous year) (X3)
2010	17.2	94.8	58.88	98.6
2011	25.2	119.1	78.88	120.2
2012	26.7	155.6	114.4	96.1
2013	14.9	153.9	174.2	113.6
2014	21.3	205.2	183.3	102.2
2015	101.8	349.7	193.7	95.2
2016	89.7	388.6	306.0	106.3
2017	68.2	437.4	338.0	97.8
2018	70.4	504.5	372.0	108.2
2019	92.8	537.6	439.3	101.4
2020	81.1	523.4	432.4	89.9

Source: systematized and built on the basis [17; 18].

The construction of the correlation-regression model according to the data in Table 2 was carried out with the help of Microsoft Excel spreadsheet tools, namely, the "Data Analysis" add-on.
Let's build a model:

Table 3. Results regarding the correlation regression model and analysis of variance

The result	
Regression statistics	
Plural R	0.931
R-square	0.867
Normalized R-square	0.810
Standard error	14.945
Observation	11

Analysis of variance					
	df	*SS*	*MS*	*F*	*Significance F*
Regression	3	10,212.142	3,404.047	15.241	0.002
Remainder	7	1,563.427	223.347		
Together	10	11,775.569			

Coefficients	*Standard error*	*t-statistics*	*P-Value*	*Lower 95%*	*Upper 95%*	*Lower 95%*	*Upper 95%*
4.310	64.964	0.066	0.949	-149.306	157.926	-149.306	157.926
0.441	0.116	3.808	0.007	0.167	0.715	0.167	0.715
-0.349	0.142	-2.466	0.043	-0.684	-0.014	-0.684	-0.014
-0.025	0.591	-0.042	0.967	-1.423	1.373	-1.423	1.373

Source: own development.

The coefficient of determination R^2 = 0.86 indicates that the change in the y indicator by 92% depends on the change in the available Xi factors.

We check the constructed model according to the Fisher test. The estimated value of the criterion F_r = 15.24, while according to the tables of critical points F_k =FRASPOBR(0.05;k_1;k_2)=4.63, where k_1= m; k_2=nm (k_1=3; k_2=10-3=7). Since Fr >Fk (15.24>4.63), then it can be assumed that the built model is adequate for the selected data. $y=0,44 \cdot x_1-0,34 \cdot x_2-0,02 \cdot x_3$.

Let's build a correlation matrix. Let's use the "correlation" tool for calculation in Table 4.

Table 4. Results regarding the coefficient of correlation between net profit, volume of sold products, export of agricultural products and index of agricultural production

	Net profit (billion UAH)	Volume of sold products (billion UAH)	Export of agricultural products (billion UAH)	Indices of agricultural production (in 2016 prices; in % to the previous year)
Net profit (billion UAH)	1			
Volume of sold products (billion UAH)	0.86	1.00		
Export of agricultural products (billion UAH)	0.75	0.97	1.00	
Indices of agricultural production (in 2016 prices; in % to the previous year)	-0.39	-0.37	-0.31	1

Source: own development.

According to the results of the calculations, it was determined that there is a strong correlation between the effective and factor characteristics. SWOT analysis of business development in rural areas is shown in Fig.5. The results of the SWOT analysis allow determining the directions of strategic actions of business development in rural areas based

on taking into account the ratio of strengths (S) and weaknesses (W) of the internal environment of the Zhytomyr region and opportunities (O) and threats to the environment (T). The sustainable development strategy involves attracting investment resources to support the business sector. The strategy of informatization improves information services and provides for the creation of public organizations to protect the interests of entrepreneurs. The diversification strategy serves to cover different types of business activities to create new jobs. The sanitation strategy is based on closing unprofitable productions and increasing corporate social responsibility.

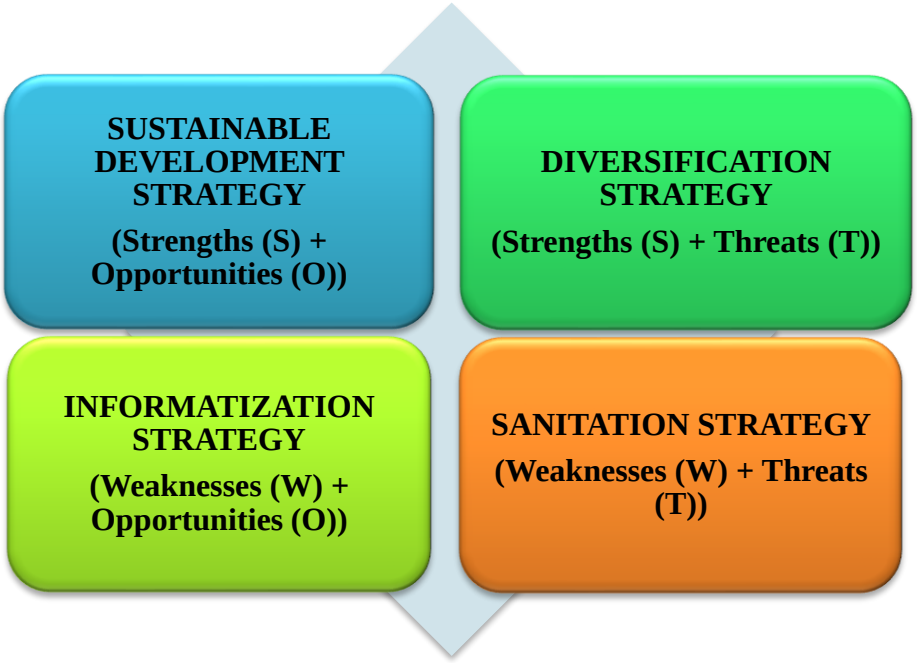

Fig. 5. SWOT-analysis of business development in rural areas
Source: own development.

Significant threats are the high cost of credit, imperfect taxation, and low purchasing power of the population. However, the possibilities of SWOT analysis allow attracting funds from the state budget and opportunities to enter foreign markets. It is believed that the community budget is stable when there are regular tax revenues from companies that conduct its business in a particular village, therefore, the countryside should always be investment-attractive. Stimulating factors are shown in Figure 6.

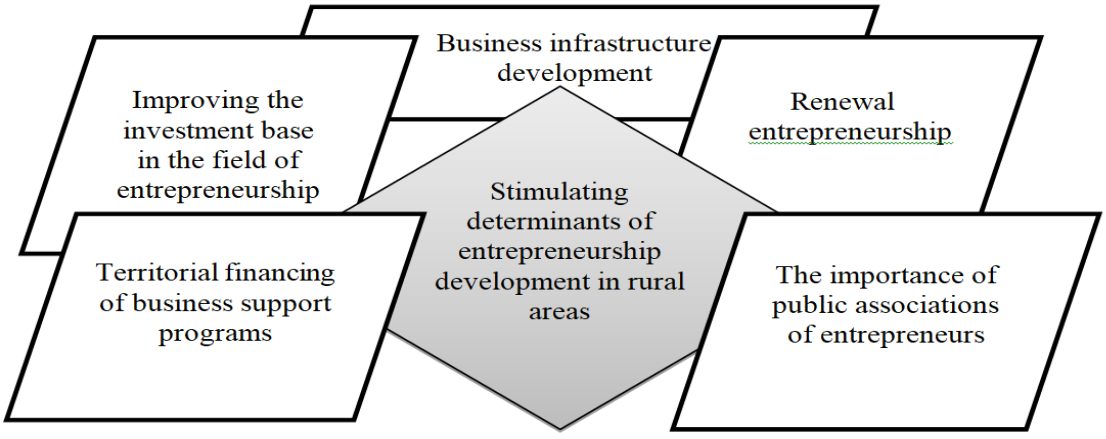

Fig. 6. Stimulating aspects of entrepreneurship in rural areas
Source: own development.

Today, innovation is a solid foundation for the development of the modern economy [2; 4], in particular, it concerns the problem of rural development and sustainable growth of agriculture [20]. At the same time, the introduction of innovations in the field of organization and management of agriculture is extremely important [19], public administration in rural areas, as well as in creating a favorable infrastructure for business and life in rural areas. The modern development of rural areas in Ukraine is based on innovation, creation, and use in a particular locality. The focus is on certain development priorities, allocation of state resources, opportunities, and infrastructure projects based on the country's development strategy. In this sense, rural areas do not differ from urban areas, as they must also offer businesses attractive conditions for starting and locating production, and for workers - an acceptable standard and quality of life [1]. To some extent, rural areas lost to urban areas in this competition, but it is important to identify and harness the potential competitive advantages of rural areas to place innovative businesses, for which there is a need for effective management of rural development [4], its optimization, adaptation to modern needs and conditions. The uniqueness of agricultural products is an important aspect, therefore it is necessary to take into account the specifics of rural areas when creating and implementing a new innovative product. Thus, the innovative development of rural areas in Ukraine is influenced by a set of factors, the main of which can be grouped into such groups [2; 16]:

- economic conditions;
- marketing conditions (demand for products produced in rural areas and for business activities in rural areas);
- search for alternative sources of income.

Innovations and new modern technologies are becoming key elements in the decision-making process for rural development:

1) technological changes take time;
2) adaptation and adoption of new innovative decisions often have a negative impact on production and the local economy at some stage;
3) management must understand that innovation is a source of regional development and technological change, so management decisions, models and tools used to stimulate rural development must also be innovative.

Improving the management of innovation and rural development involves changes in planning, employment, product promotion, communication between government and business, government and the public, and knowledge management. In this context, focus on working with active people to find common ideas for solving complex socio-economic problems, forming new perspectives, new paradigms and new ways of solving problems, ways to remove obstacles to creative thinking, finding examples. The analogy can help identify potential opportunities for rural development.

CONCLUSIONS

Progressive management of rural development today must be innovative, focusing on taking full account of the relationship between macro-environmental changes in these areas and governance models, taking into account environmental, economic and social commitments. Optimizing the management of innovative development in rural areas of Ukraine may provide specific areas for development. The specific advantage does not contribute to the dynamic development of the village in economic, demographic and technological areas, only the integrity of the system will serve the effective development of territories

The article is proposed an optimized model of rural innovation and development management in Ukraine and the objects of management highlight key areas that affect rural innovation and development. The influence of certain directions of development and the introduction of innovations on rural development is characteristic. Emphasizes the promotion of infrastructure as an element of rural development, as well as the characteristics, models, methods and methodological techniques that form the general methodological basis for stimulating

rural development based on infrastructural innovations.

At the same time, the success and scale of the implementation of innovative solutions in rural areas largely depend on the human factor, which involves a lot of work to identify, stimulate change, stimulate training and responsiveness.

Rural innovation organization for the active stratum of the rural population. With this in mind, successful management of innovations aimed at rural development are effective. Economic growth in the countryside is associated with new programs and projects, the implementation of which allows the community to increase competitiveness and and improve the economy of its environment. All this is possible thanks to the joint activities of the community and the active participation of rural residents in the formation of an innovative business model for the future.

Generally according to the research in modern conditions we can see that rural areas have an increased investment attractiveness, which is associated with the innovative development of e-commerce, digital economy and digitalization.

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