



Problems of using innovative potential in order to increase the efficiency of innovative activities in agricultural organizations

Problemas de uso del potencial para aumentar la eficiencia de las actividades innovadoras en organizaciones agrícolas

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ABSTRACT:

The purpose of the article is to study the problematic aspects of the use of innovative potential in the agricultural sector of the economy. The methodology used the following methods of scientific knowledge: systemic and integrated approaches to research, logical, comparative and contextual analysis, synthesis, methods of generalization and concretization, methods of induction and deduction, analogies and formalization, classification, systematization, tabular and schematic methods of data interpretation. The mentioned methods allowed determining patterns and contradictions, including problem areas of the studied topic, and summarizing the results of the study.

Keywords: Innovative activity, innovative potential, investment, human capital.

RESUMEN:

El propósito del artículo es estudiar los aspectos problemáticos del uso del potencial innovador en el sector agrícola de la economía. La metodología utilizó los siguientes métodos de conocimiento científico: enfoques sistémicos e integrados de investigación, análisis lógico, comparativo y contextual, síntesis, métodos de generalización y concretización, métodos de inducción y deducción, analogías y formalización, clasificación, sistematización, métodos tabulares y esquemáticos de interpretación de datos. Los métodos mencionados permitieron determinar patrones y contradicciones, incluidas las áreas problemáticas del tema estudiado y resumir los resultados del estudio.

Palabras clave: Actividad innovadora, potencial innovador, inversión, capital humano.

1. Introduction

The words "modernization" and "innovation" became one of the most common during and after the global crisis of 2008–2010. They reflect the understanding by societies of the need for significant changes in the very technological foundations of production in many countries

of the world, including in the most developed countries, which are lagging not only in society's expectations, but also to a certain extent from the existing scientific and technological potential they have achieved. This also applies to Russia, whose leadership has for several years attempted to carry out a radical modernization of the country's economy mainly through the mass introduction of innovative technologies"[12].

The last decade of the 20th century, and the beginning of the 21st century, for the agro-industrial complex of Russia, was characterized by a deep decline in production and the development of a number of negative socio-economic processes. To stop this negative trend and make the transition from the crisis state of agro-industrial production to the stage of its consistent development is possible only on the basis of the wide use of the results of scientific and technical activities.

Thus, the important strategic directions of development of agriculture and all agro-industrial complex are the research progress and innovative processes allowing to conduct continuous updating of production on the basis of development in it of achievements of science and technology. Therefore, one of the main tasks is to preserve and develop the scientific and technical potential of the industry and create conditions for the use of the results of its activities directly in the workplace.

1.1. Review of literature

The formation of the theoretical foundations of innovation was laid by the Russian economist ND Kondratiev, who in 1920 comprehensively substantiated the logical connection of the upward and downward stages of large cycles with waves of technical inventions and their practical use [10]. He put forward the theory of the wave-like development of world scientific and technological progress. According to his concept, the fundamental production technology changes every 45-60 years, which leads to a sharp increase in economic indicators and accelerated social development. Mostly, this happens only in those countries where the level of science, technology, human potential allows using this technology. N.D. Kondratieff has defined five such periods, or, as he called them, waves of technological development [Ibid.].

Later, the Austrian economist Joseph Schumpeter introduced the concept of "innovation" and defined it as a new scientific and organizational combination of production factors motivated by an entrepreneurial spirit. Innovation is a source of profit and creates a new kind of competition, more effective than price competition [8].

Among contemporary researchers using the evolutionary approach methodology A. Alchian, R. Nelson and N. Winter, K. Freeman, J. Dosi, K. Perez; and among domestic scientists - V.I. Mayevsky and S.Yu. Glazyev. Thus, A. Alchian introduced the idea of evolutionary selection into economic theory, R. Nelson and N. Winter also found facts that are incompatible with the traditional ideas of orthodox economic theory. Simultaneously with the criticism of this theory, they obtained new knowledge about the content of the processes of economic development. They expanded the foundations of economic theory to more fully reflect reality, introduced the term "evolutionary" and brought the basic idea of the evolutionary approach to the level of a new direction (paradigm) in economics [8].

Along with the study of K. Perez, the stages of technological progress and the complicated processes of impact of technological and economic changes towards the functioning of economic system associated on the bases of N.D. Shumperei's approach, and Kondratieff's ideas is currently developing, according to Russian scientists V.I. Mayevsky and S.Yu. Eyes.

V.I, Mayevsky [9] connects his theoretical views with the substantiation of evolutionary theory and its role in disclosing the content of modern innovative development in the context of transformation into a post-industrial economy, while criticizing the official neoclassical theory of inconsistency for evolution. In doing so, he focuses on the fact that in evolutionary theory monopolism, disequilibrium and innovation are interrelated concepts.

The importance in this approach is to make development as a process of qualitative change, and in this regard, a distinction is made between those actors who have these changes and those who oppose them, that is, they are divided into innovators and conservatives. The

former deliberately go to imbalance to achieve maximum profit, while the latter are trying to maintain the level achieved. However, there are uncertainties due to competition between these actors. In turn, uncertainty creates innovative risks that are fully consistent with the nonequilibrium nature of innovative super-profits. As a rule, innovators succeed in competition. They force out the least efficient conservatives, capturing a larger share in the economic space, which in turn leads to economic and technological progress in the economy. However, as the scientist rightly points out, "neoclassicists do not pay attention to this nuance"[6], although it is fully confirmed by the practice of economic life.

The post-industrial stage of development of the economic system at the turn of the XX-XXI centuries led to the accelerated development of STP (Scientific- Technological Progress), which influenced the change in the technological structure of production.

Technological structures in historic housing are divided into 6 stages, which are presented in Table 1 [3] (Khamidova, Prokhorova, 2018).

Table 1
Stages of technological structure

Stage	Period of development	The essence of the technological structure
the first	1770-1830	New technologies in textile production.
second	1830-1880	The development of railway construction and transport engineering, the mechanization of production.
third	1880-1930	The widespread use of electric motors and the rapid development of electrical engineering, discoveries in the field of chemistry.
fourth	1930-1970	The rapid development of electronics, computing, information technology, mass production
fifth	1970-2010	Development of communication network technologies, biotechnologies and nanotechnologies.
sixth	2010-2050	The use of the sphere of the mind (noosphere) or a biocomputer compatible with the human mind (intellect).

Thus, the imperative of the modern national economy in modern conditions is the transition to a new strategy of economic development. General problems of such a developmental path were first voiced by D.A. Medvedev, being the president of the Russian Federation. In his message to the Federal Assembly, he noted the basic elements of the modernization of the Russian economy: investment, innovation, institutions, infrastructure, and also "intelligence" as a spare.

This issue from the economic sphere is rapidly moving into the political space in order to radically improve the investment climate, due to the severity of the problem in international competition for investment. Therefore, the rejection of the pre-crisis model of the national economy is becoming more and more obvious.

2. Methodology

Based on the provisions of the Long-term Socio-Economic Development Concept, an Innovative Development Strategy of the Russian Federation for the period up to 2020 has been developed, the goal of which is to ensure a high level of welfare of the population. The implementation of the tasks requires the acceleration and development of the innovative type.

The priority task of forming a new type of economy in Russia is the formation and use of

innovative potential.

The origin of a new era, which becomes a knowledge society, leads, as a rule, to the development of a new type of economy - the «knowledge economy», it is also called innovative or informational. The basis of the innovation economy is the innovation potential.

Innovation potential is the most important component of economic potential across the country, region, industry, as well as a separate organization or company.

Innovation potential can be defined as an organization's ability to improve and (or) update, it describes the maximum amount of innovative products or innovative products.

Innovative potential reflects the ability of the company to improve or upgrade, it characterizes the maximum amount of innovation that is possible with the full use of existing innovation resources. Under the innovative resources of any organization understand the totality of financial, intellectual and material resources available to the company to implement innovations. Thus, internal innovation resources of an enterprise include:

- natural resources;
- labor resources;
- tangible;
- intellectual property;
- financial resources;
- Information resources.

As many authors rightly point out, "... a central role in the innovation economy belongs to a person who determines the value of human capital inherent in individuals, and social capital that characterizes relations between people. Under the economic and social conditions of Russia, the transformation of the economy cannot be instantaneous and omnipresent, and therefore begins with an increase in regional growth zones" [13].

Consequently, intellectual resources, knowledge-intensive and information technologies are becoming the main key to ensuring high, sustainable and high-quality economic growth. In leading industrialized countries, the emergence of an innovation economy is largely due to the changing economic role of innovation, the pace, trends, and mechanisms for implementing innovation processes [1] (*Guseinova, 2012*).

To achieve effective flow of innovation processes is possible first of all, due to their state regulation. The presence of a strong government policy, on the one hand, makes it possible to form a concept and a long-term strategy for the development of an innovation system, on the other hand, to implement specific measures to support and stimulate those stages of innovation processes where market incentives are not enough.

In these conditions, the formation of the labor market is the driving force that promotes innovative transformations of the country's economy.

In an innovative economy, innovative labor resources are becoming key. High professional and educational level of employees is a necessary condition for its innovativeness.

Thus, various spheres of the information economy generated demand for highly skilled workers, which are currently lacking in many countries around the world, including Russia. In the future, labor will become even more complicated. In particular, almost all the jobs that will be created in the next 10 years will require specialists with higher education. This places a new demand on society, which will be forced to move to universal higher education as a prerequisite for the continued employment of its citizens and the competitiveness of their economies in a globalizing world [5].

The purpose of the state policy in the field of labor market development in the long term is to create conditions for the effective use of skilled labor, the development of an effective, result-oriented labor market infrastructure.

Achievement of goals will be carried out by solving the following tasks.

1. Increasing the flexibility of the labor market and the balance between demand and supply of labor;

2. Development of the labor market infrastructure, ensuring the growth of employment and the efficiency of labor use, incl. by increasing the territorial and professional mobility of labor resources;
3. The creation of working conditions to ensure the preservation of the ability to work working throughout the professional career;
4. Formation of transparent rules for the functioning of the labor market, regulation of labor relations and the effectiveness of monitoring their implementation;
5. Creating conditions for attracting foreign labor, taking into account the future needs of the economy in the labor force and on the basis of the principle of priority use of national personnel.

Indicators of labor resources objectively exist at three levels of the national economy:

- at the level of macroeconomics (national economy as a whole);
- at the level of inter-branch economic relations (mesoeconomics), including those organized in large diversified corporations;
- at the level of microeconomics (enterprises).

The modern Russian labor market has specific features shaped by the effects of the transition economy, the demographic hole and the crises of 2008 and 2014.

The total population of the Russian Federation from 2010 to 2017, increased by 4 million people or 2.8%. This increase is due to the annexation in 2014 of the Crimean peninsula and the ongoing demographic policy of the Russian government since 2000. High results of natural population growth for our country were achieved in 2013-2015. However, 2017 shows a natural decline associated with a decline in the birth rate by 203.4 thousand people.

The migration growth in these years has increased by 34%, while since 2013 there has been a decrease in the number of migrants. This trend has led to an increase in total employment by 3.2%. Per capita cash incomes and average monthly nominal wages for this period tend to increase [5] (Khamidova, 2018). However, real disposable cash income fell by 8 percentage points (Table 2) [2] (Khamidova, Prohorova, 2018)

Table № 2

The main socio-economic indicators in the labor market

Indicators	Years						
	2010	2013	2014	2015	2016	2017	2017г. в % к 2010г.
Population (on the end of the year), one million persons.	142,9	143,7	146,3	146,5	146,8	146,9	102,8
Number of labor – all (one thousand people)	75478	75529	75428	76324	76636	76109	100,8
from them: are busy	69934	71391	71539	72324	72393	72142	103,2
unemployed	5544	4137	3889	4264	4243	3967	71,6
Natural increase, decrease (-) of the population, thousand people.	-239,6	24	30,4	32,1	-2,3	-135,8	56,7
Migration increase in population, one thousand persons.	158,1	295,8	280,3	245,4	261,9	211,9	134
Per capita income of the population, rubles per month	18529	25735	27723	30588	30544	31022	167,4
The average monthly nominal charged wage of employees of the organizations, rub.	20952	29792	32495	34030	36709	39144	186,8
Real disposable cash income, % of previous year	106	104	99	97	94	98	

There is a positive trend in the levels of employment and unemployment. The unemployment rate, starting from 2013, corresponds to the level of natural unemployment, which from a theoretical point of view, according to the law of Owen there are no GDP losses.

3. Results

In this way, for the formation of an innovative economy, such dynamics of these indicators of the labor market is favorable. However, there are other factors, such as a steady trend of population aging, low labor productivity, high depreciation of fixed capital, low labor motivation, decline in real incomes of the population, etc., which are an obstacle to innovation activity.

Thus, investments in human resources (human capital) are considered to be the most effective in the real aspect. «In the long term, their real effectiveness is expressed not only and not so much in the direct usefulness of services for education, culture, health, but also in the growth of labor productivity in all sectors of the economy. This will eventually find its expression in the growth of financial efficiency of industries in which investment costs are made (education, culture, health), as well as other sectors of the economy»[7].

For example, «in the US, agricultural science is financed from the budget. Agricultural science does not pay for itself directly, but indirectly, through the increase in the efficiency of agricultural production, such budget (non-market) financing pays for itself many times»[ibid].

Thus, the development of innovation processes is determined by a number of factors: the political situation; the economic situation and the innovative climate in the country; the development of market infrastructure; national scientific, innovation and structural and technological policy.

It should be noted that currently the country has significant fundamental and technological reserves, a unique scientific and production base and highly qualified personnel, but there is a very weak orientation of innovative potential for the implementation of scientific achievements in production and other fields. The innovation crisis is manifested in a sharp decrease in the level of controllability of the process of creation and implementation of innovations, the absence in some cases of sources of its financing, the curtailment of research teams.

Further development of innovation processes in agriculture is impossible without a deep and comprehensive analysis of the current state of innovation in the industry, allowing assessing and developing a real innovation policy, the active implementation of which will provide scientific and technological progress in agricultural production[15].

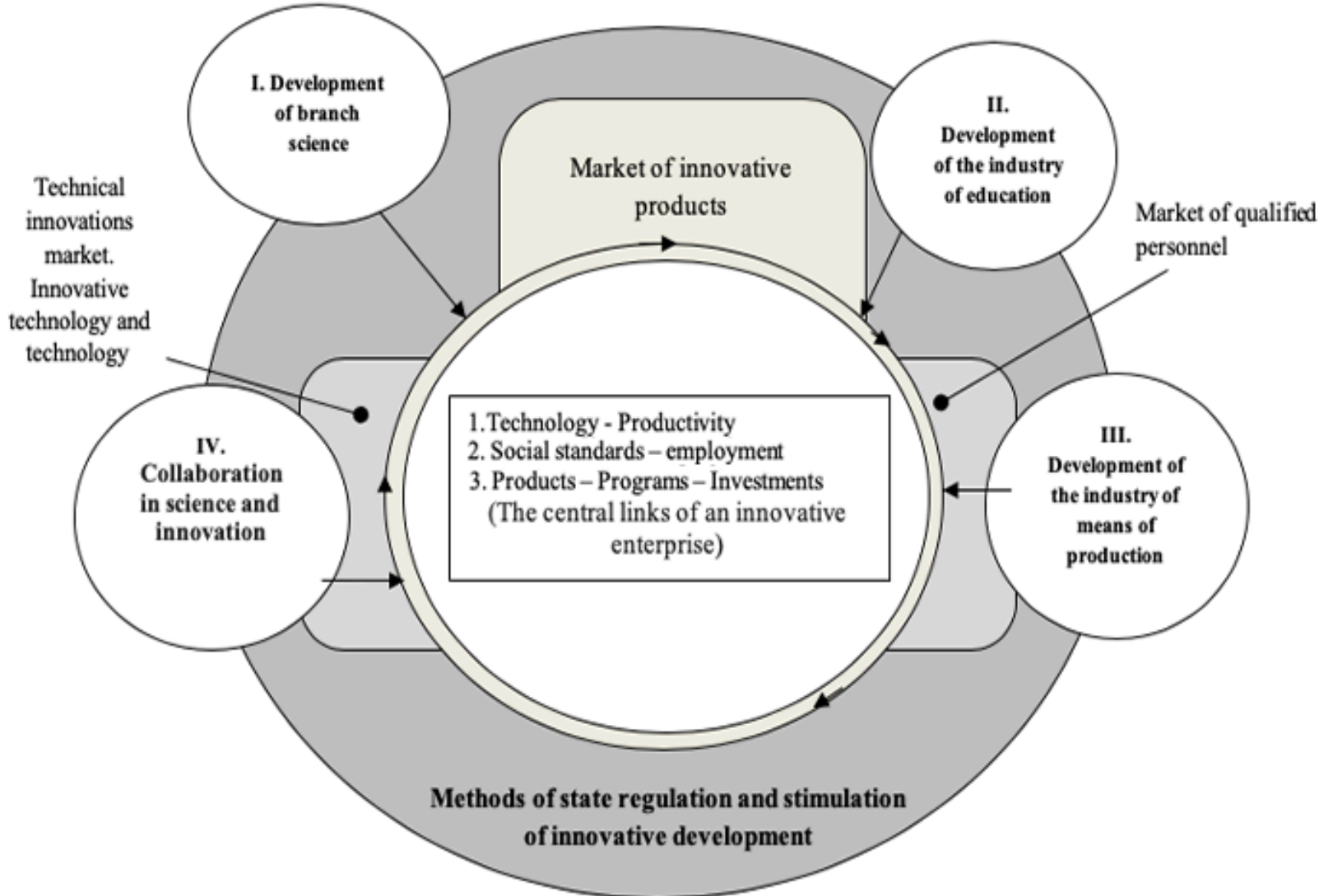
Table 3
Internal current costs of research and development by types of works in the field of agricultural science (million rubles)

Types of works	2012	2013	2014	2015	2016	2017	2017 κ 2012%
Fundamental study	4587,4	4845,9	7536,0	8047,6	8112,0	8234,0	179,49
Applied research	4503,9	4651,5	370,3,3	3699,0	4025,2	4407,8	97,87
scientific developments	10855,5	2007,3	1916,9	1917,4	1812,3	1525,0	14,05
Total	10855,5	11504,7	13156,2	13664,1	13949,5	14166,8	130,50

Apparently from the table, a share of costs in agriculture of basic researches in 2017 increased by 79.49% and made 8234.0 million rubles to 4587.4 million rubles 2012. Costs of application studies and developments in 2017 to 2012 made 97% (4407.8 million rubles to 4503.9 in 2012) and 14, 05% according to (1525.0 million rubles to 10855 million rubles 2012).

Thus, there is a need of improvement of the economic mechanism of forming and development of the innovation potential allowing to create necessary conditions for gain of the innovation activity in scales of the country, region, the industry and for the end at the local level – the organizations of the industry and as a result, building or release of the innovation products. It is obviously important in this regard that development of the industries and types of activity in agriculture is an evolutionary uneven process of improvement and radical change which submits to laws of the cyclic dynamics arising owing to development, mastering and diffusion of basic innovations (fig. 1).

Figure 1
The methodological paradigm of the economic mechanism of innovation development at the micro level within the framework of coordinated economic development



4. Conclusions

Thus, the Effective development of agriculture and the creation of new biological assets are impossible without innovative development, which, in turn, requires a search for sources of investment, the use of investment resources to revitalize innovative activity.

The solution of these problems is possible provided that the investment is in line with the innovations, and that the investment and innovation processes closely interact. This approach entails the obligation to consider investments and innovations as a single system, from the successful development and operation of which depends on the level of economic growth and stabilization of the development of agriculture and agribusiness in general.

The model developed by us reflects the priority way of functioning of economic entities at the micro level, based on interaction with other subjects of various industries (science, producers of means of production, financial institutions, directly for agricultural production), manifested in competitive innovative products, high-performance equipment and technology, management and marketing methods, intellectual resources and modern information knowledge.

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