

# Improving the organizational and economic mechanism for the development of innovative processes in agriculture

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**Abstract:** *The article reveals the issues of improving the organizational and economic mechanism of innovative processes in agriculture, and also discusses ways to increase the efficiency of the application of innovative technologies in agriculture of the Republic of Uzbekistan.*

**Key Words:** *innovation, innovation process, agriculture, organizational and economic mechanism, efficiency.*

## 1. INTRODUCTION:

Agriculture is one of the most socially significant sectors of the national economy. Important priority areas for the development of agriculture are: saturation of the domestic market with food products, achieving self-sufficiency in their production and ensuring food security. The effective implementation of these tasks made it possible to solve such acute social issues as employment of the population, increasing its well-being, and improvement of cities and villages. The assimilation and further widespread dissemination of innovations are becoming key factors in the growth of production and employment in agriculture. It is here that the most significant reserves for improving product quality, saving labor and material costs, increasing labor productivity, improving the organization of production and increasing its efficiency are hidden. All this, ultimately, predetermines the competitiveness of enterprises and their products in the domestic and world markets, improvement of the socio-economic situation in the country's agricultural sector. It is known that the successful development of the innovation process requires not only the accelerated production of high-quality scientific products, but also its active practical development. The effective implementation of the innovation process is possible with its optimal organization and established economic relationships between various structures. That is why, for the successful management of innovative activities, a necessary condition is the formation and use of an integral organizational and economic mechanism for the development of innovative processes in agricultural production, which would provide for a clear orderliness of its elements and the effectiveness of their interactions.

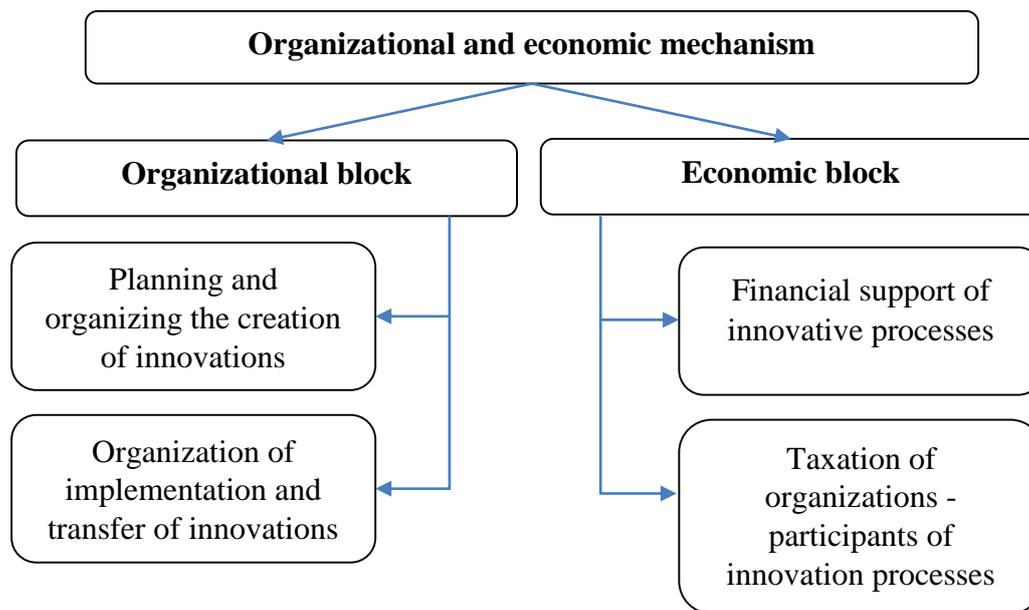
In the modern economic dictionary, the organizational and economic mechanism is understood as "a set of organizational structures, specific forms and methods of management, as well as legal norms with the help of which economic laws operating in specific conditions, the reproduction process" are implemented. In general terms, the organizational and economic mechanism can be represented as a kind of hierarchical system of subjects and objects of management, which determines the order, methods, principles, methods and tools of their balanced and harmonious interaction. The basis for the formation of the organizational and economic mechanism of innovative development are systemic and institutional approaches. The systematic approach provides for the consideration of the mechanism as an integral set of elements in the totality of relations and connections between them. The institutional approach determines the conditions for the formation of the mechanism by the effectiveness of institutions that stimulate the innovative activity of economic entities. The formation of an organizational and economic mechanism requires, first of all, the definition of the purpose and main tasks of its functioning, as well as parameters and properties.

The main tasks of the functioning of the organizational and economic mechanism for the development of innovative processes in agriculture include:

- prioritization of the tasks of innovative development of the industry;
- optimization of resource allocation in the most important areas of agricultural development;
- ensuring the accelerated development and effective use of the innovative potential of agricultural producers through continuous organizational, economic, technical and technological renewal of productive forces;
- ensuring the adequacy and proportionality of the development of the infrastructure of innovation processes in agriculture;
- coordination of interests of all participants in the innovation process in the industry.

The ultimate goal of the functioning of such a mechanism is to increase the indicators of the competitiveness of industry production.

The organizational and economic mechanism is characterized by a complex structure and consists of two blocks - organizational and economic (Fig. 1).



**Figure 1.** Scheme of the organizational and economic mechanism for the development of innovative processes in agriculture

The economic block of the mechanism is designed to create conditions for expanded reproduction of agricultural production.

## 2. LITERATURE REVIEW:

The problems of the theory of innovations are becoming more and more urgent, arouse increased interest among many scientists, as evidenced by the constantly increasing volume of publications, both in foreign and domestic science. The development of theoretical and methodological foundations of innovation and agricultural development is presented in the works of foreign scientists: L. Vodachek, P. Drucker, M. Peters, B. Santo, B. Twiss, R. Hizrich, M. Huchek, I. Schumpeter, V.V. Alekseev, S.V. Valdaitsev G.Ya. Goldstein, L.M. Gokhberg, P.N. Zavlin, S.D. Ilyenkova, G.D. Kovalev, G.I. Morozova, I.S. Sandu , R.A. Fatkhutdinov and scientists of our country: A. Abduganiev, B. Salimov, A. Gafforov, A.M. Kadirov, M.Kh. Kamilova, S.S. Gulyamova, G.A. Samatova, E.D. Yusupov, K.A. Khodzhaeva, D. Shodieva and others.

Many works of theoretical scientists are devoted to the theoretical aspects of the problems of innovations, their classification, organization of innovation management, state regulation of innovation. At the same time, the issues of practical use (development and implementation) of innovations in the production of the agricultural sector have not been sufficiently studied. The question of studying the patterns and factors influencing the development of innovative processes in agriculture, where the technological and economic-organizational features of production interact with the natural-biological laws of nature, remains very relevant.

## 3. MATERIALS AND METHODS:

It is expedient to consider innovative activity in agriculture in modern conditions as a process of managing complex natural and economic systems and the development of new technical, chemical and biological means, technological processes (A.M. Gataulin, G. S. Prokopyev, I. S. Sandu). Moreover, each innovation must be assessed in a unified agricultural system, in specific agro-climatic and organizational-economic conditions. The most important task of agriculture is the production of competitive products, which is possible only with the use of the achievements of scientific and technological progress, which is based on innovative processes that allow continuous renewal of agricultural production. Thus, using and implementing innovative developments, an agricultural enterprise reduces costs, increases production volumes, profits, conquers sales markets, contributes to increasing economic efficiency and the development of the national economy.

However, the unsolved problems of organizing and developing innovative processes in agriculture actualizes the need to study all the problems, contradictions, potential and prospects for the development of innovations in the agricultural sector of the country's economy in order to create conditions for the development of strategic directions of state policy in the field of innovation. Solving the food problem and, as a consequence, ensuring the country's economic and national security presupposes, first of all, sustainable effective development of the agricultural sector.

As a result of the implementation of comprehensive measures aimed at the structural transformation and diversification of this industry, the agro-industrial complex of the republic has changed radically. The modern agricultural sector is represented by enterprises of various organizational and legal forms provided for by national legislation; allied and accompanying types of entrepreneurial activities have become widespread, including processing, trade, and service. The need for broad cooperation of farms, the formation of vertically integrated structures designed to increase the stability of enterprises in the competitive struggle is gaining recognition. The approval of market principles for the transformation of agrarian relations predetermined the formation of new structural formations in the management of enterprises and firms, including the creation of marketing departments, commercial services, service departments, etc.

Recognizing the effectiveness and high importance of innovations for the national economy, it is necessary to state that the transition to the controlled development of innovative activities will require the creation of a new organizational and economic mechanism aimed at the development of innovative activities in the region. The development of this mechanism will allow, by combining agricultural science and production, to solve one of the main problems of agriculture - increasing the scientific and technical potential of the industry.

The functioning of this mechanism will provide:

- accelerating the introduction of new knowledge by forming a system for bringing innovations to real production;
- growth of investment activity and increasing investment attractiveness of the agricultural sector of the economy;
- rational and efficient use of unclaimed resources of large enterprises;
- creation of conditions for the integration of subjects of innovation activity with the authorities that regulate relations and have a set of administrative resources.

The modern functioning of the agrarian complex should be carried out under the influence of an economic mechanism aimed at creating scientific, technological, managerial and organizational conditions for the innovative development of the industry. The study of the mechanism under consideration allows us to form the following content. The economic mechanism of innovative development of the agro-industrial complex is a system of interrelated forms and methods of organizing and stimulating R&D, business development in the scientific and technical sphere of the agro-industrial complex and state support at all stages of the process (creation, distribution, implementation and development of agro-innovations) on the basis of mutual partnership of its participants with the aim of increasing the socio-economic and innovative development of agricultural production.

In accordance with the strategy of innovative development of the agro-industrial complex, the formation of an economic mechanism should be carried out in the following areas:

- creation of systems of legal regulation of innovation activity;
- program-targeted management of the development of innovative activities in the agro-industrial complex at the republican and regional levels;
- development of public-private partnerships.

The study of the content of the economic mechanism of innovative development of the agro-industrial complex makes it possible to single out in it a set of institutional, instrumental, methodological and regulatory components. Each of them determines its own forms and methods of organizing and stimulating innovative activity in agricultural production, as well as the directions of the main tasks to be solved, including: stimulating the innovative activity of business entities along the entire chain of formation of agro-innovations; development of the potential of economic entities (innovation, technological, personnel, scientific, economic, etc.); increasing the investment attractiveness of the industry; development of infrastructure and sales markets for agricultural products.

An effective option in organizing and stimulating innovation in agriculture should be the active participation of state capital on the principles of public-private partnership, which determines the use by the state of mechanisms that stimulate the participation of private business in the development of innovative processes, allows to pool resources, distribute profits and risks, contributes to the formation of competitive environment and at the same time - more efficient use of budgetary funds.

Uzbekistan has favorable natural and climatic conditions for the production of various agricultural, including industrial crops. As a result of purposeful work on reforming agriculture, in particular, the implementation of measures to optimize the structure of sown areas, introduce new advanced technologies in production, ensure an increase in crop yields and animal productivity in the country, production volumes in agricultural sectors have significantly increased.

Structural changes in agriculture imply, first of all, a change in the structure of sown areas by optimizing crops for cotton and increasing areas for grain crops, vegetable growing, horticulture and viticulture. Thus, the cotton sowing area was partially reduced in Andijan, Kasansay, Chartak, Urtachirchik, Uzbekistan and Buvaida districts, and in Asaka, Yangiyul and Dzhabay districts it was decided not to sow cotton at all. As a result, more than 30 thousand

hectares of irrigated land was freed up, on which crops, vegetables, potatoes, orchards and vineyards are located. The most important direction of sustainable and effective development of agriculture is its transfer to intensive methods of farming through the introduction of modern agricultural technologies and equipping with high-performance agricultural machinery. At the same time, the most important factor in a significant increase in the production of vegetable crops, plantings of fruits, berries and vineyards has become complex measures aimed at increasing crop yields, the widespread introduction of modern methods of selection and seed production, effective resource-saving technologies and agrotechnical measures.

In 2019, the total sowing area of agricultural crops in farms of all categories was 3309.4 thousand hectares. The area occupied by grain crops was 1578.3 thousand hectares. Sowing of industrial crops was carried out on an area of 1099.5 thousand hectares. Due to the reduction of the sown areas for cotton, the share of sown areas for potatoes increased by 224%, vegetables - by 32% compared to 1991. The area of melons decreased by 64%. (Table 1).

**Table 1 : Sown area of agricultural crops in the Republic of Uzbekistan (in all categories of farms), thousand hectares<sup>1</sup>**

	Years					2019 / 1991, %
	2015	2016	2017	2018	2019	
The whole sown area	3694,2	3706,5	3474,5	3.396,0	3309,4	90
including cereals	1671,1	1689,9	1655,6	1643,2	1578,3	94
industrial crops	1368,7	1332,4	1253,3	1150,5	1099,5	80
potato	80,6	84,6	78,8	86,8	89,6	111
vegetables	194,0	206,0	189,7	219,0	220,0	113
melons food	52,0	58,8	52,3	52,6	53,4	103

The total volume of crop production in 2019 amounted to more than 29042.4 billion soums, which is 75% more than in the same period in 2015.

As a result of the above measures, 2 million 691 thousand tons of raw cotton were produced in 2019 (20% less compared to 2015), 7,437.8 thousand tons of grain crops (9% less compared to 2015) , 10215.1 thousand tons of vegetables (1% more than in 2015), 3089.7 potatoes (15% more than in 2015), 2068.7 thousand tons of melons (12% more, than in 2015). (Table 2). The head of state and the government of the country pay great attention to the widespread introduction of water-saving technology in the agricultural sector. So, the basis for the introduction of the drip irrigation system was the Decree of the President of the Republic of Uzbekistan dated January 26 "On the State Program" Year of Development and Improvement of the Village "and the Decree of the Cabinet of Ministers of the Republic of Uzbekistan dated June 16, 2011" On additional measures to introduce water-saving technologies and water saving for irrigation. "According to the data, in the last 3 years alone, water-saving technologies have been introduced on an area of more than 8.5 thousand hectares, including: on 5.5 thousand hectares - drip irrigation; on 1.26 thousand hectares - irrigation using polyethylene film laid on furrows, more than 1.6 thousand hectares - with the use of elastic polyethylene pipes In particular, to date, the drip irrigation system has been introduced on 3730 hectares of gardens.

**Table 2 : Crop production in the Republic of Uzbekistan (for all categories of farms), thousand tons<sup>2</sup>**

	2015 год	2016 год	2017 год	2018 год	2019 Год	2019 г. / 1991 г., %
Зерновые	8173,5	8263,8	7288,5	6535,5	7437,8	91
Хлопок-сырец	3361,3	3300	2853,9	2285,6	2691,7	80
Картофель	2696,9	2958,3	2793,7	2911,9	3089,7	115
Овощи	10129,3	11272,5	10219,9	9760,3	10215,1	101
Бахчи продовольственные	1853,6	2045,2	2031,0	1837,0	2068,7	112

In each region of the republic, appropriate recommendations have been developed in terms of reducing water losses through the introduction of water-saving technologies, effective use of water resources by farms. Training

<sup>1</sup> Agriculture of Uzbekistan. Statistical collection. - T.: State Committee of the Republic of Uzbekistan on Statistics, 2016; <http://www.stat.uz>

<sup>2</sup> Agriculture of Uzbekistan. Statistical collection. - T.: State Committee of the Republic of Uzbekistan on Statistics, 2016; <http://www.stat.uz>

seminars are constantly held for water users. At the same time, there are shortcomings and shortcomings in this direction. In particular, although opportunities have been created for the repair of drip irrigation equipment, the service for equipment imported from abroad is not fully established. In some farms in which the drip irrigation system has been introduced, modern information and communication systems for accounting for water resources have not been installed.

According to the results of studies in the field of analysis of the efficiency of drip irrigation, the following advantages of this technology were revealed (Table 3). In order to further develop this technology, the government plans to introduce it additionally in 2013-2019 on 25 thousand hectares, including in all newly created vineyards.

**Table 3 : Saving water with drip irrigation**

Watering methods	Water consumption m <sup>3</sup> ha / season	Productivity, tons / ha
Fruit trees (apple tree)		
Furrows	7,000-8,000	20-30
Drip	2,500-4,000	60-80
Grapes		
Furrows	10,000	20-25
Drip	6,000	55-70

Today, the area of gardens in all categories of farms in the republic exceeds 244 thousand hectares. Moreover, the main part of the plantations was created 40-50 years ago, and is based on outdated cultivation technologies. The yield of such gardens does not exceed 100 kg / ha. Therefore, the Government is taking comprehensive measures to gradually replace existing and create new intensive orchards and vineyards using dwarf and semi-dwarf seedlings. The effect of using such seedlings is achieved by increasing the density of tree planting by 3-5 times and, accordingly, increasing the yield by at least 3-4 times.

So, in 2010-2019, new gardens were planted on an area of almost 50 thousand hectares, including more than 14 thousand hectares of intensive-type orchards, as well as vineyards on an area of 23 thousand hectares. More than 6 million seedlings were imported from Poland, Serbia and other countries to create intensive orchards.

Accordingly, even with the current average price for one seedling within the republic (five to six thousand soums), the effect of import substitution will free up colossal foreign exchange funds. If we consider the same six million seedlings as an example, then, according to rough estimates, this amount can be from 12 to 12.5 million dollars. But this is only one side of the coin. As the annual domestic needs of gardeners for seedlings of intensive varieties are met, export options can be seriously considered.

In 2018, about three million seedlings of fruit trees were grown naturally at the M. Mirzaev Institute in Tashkent and its regional branches. Despite their miniature size - up to two meters in height, with proper care, "dwarfs" and "half-dwarfs" give the same yield as tall trees, or even more. For example, an average of 10–20 tons of apples are harvested from one hectare in an ordinary orchard, while in an intensive orchard, 20 tons is the minimum. In the analyzed year in intensive orchards, established in 2011, the harvest volume reached 25-30 tons. Such a tangible difference between tall and intensive tree varieties in yield per hectare lies in the special planting technology. "Dwarfs" and "half-dwarfs" are planted more densely – agronomists advise keeping a distance of two to 3.5 meters, while tall trees should be four to five meters apart. The main plus of dwarf trees is that, firstly, they begin to bear fruit already in the first year, while tall ones only after eight years. Secondly, they give a harvest every season. With tall, year after year is not necessary. In addition, with bonsai it is much easier and more economical to carry out processing, pruning, etc., not to mention directly the collection of fruits. As for semi-dwarfs, they also begin to bear fruit earlier than tall trees - in the fourth year and give a stable harvest every year.

This is the main economic effect of creating intensive gardens. Today, on the irrigated lands of Uzbekistan, they occupy a total of more than 15 thousand hectares. This is only a few percent of the total area of gardens, however, if we consider that the second logical stage in the development of intensive gardening, marked, in particular, by the creation of an in vitro laboratory, is just beginning, this is a very large indicator.

Several other important changes in intensive horticulture in recent years can be considered the beginning of the second phase. For several years, scientists-agronomists have been actively working on solving the problem of the development of intensive gardening in regions with difficult soil and climatic conditions. Previously, the high level of soil salinity in Karakalpakstan, Khorezm and Syrdarya regions did not allow local farmers to cultivate dwarf tree varieties. The reason was that the root system of "dwarfs" and "half-dwarfs" is located at a depth of just over half a meter, just where the highest salt concentration is. Strong frosts that hit the northern regions are no less destructive for them. More recently, numerous studies and experiments have been crowned with success, during which scientists have developed intensive varieties of trees with a crown of "dwarfs" or "semi-dwarfs" and a root system of tall trees. Thus,

the productivity of the intensive garden has remained unchanged, and the roots that go down two meters in depth do not absorb moisture from the risky soil layer. Pilot projects on the new technology have already been tested in the Tashkent region on six hectares and in the Fergana region on four. When asked why these two regions were chosen, experts answer that the new type of intensive gardens is intended for all foothill and mountain areas, as well as other areas where there are difficulties with irrigation and a high degree of soil salinity. By the way, as for the mountainous and foothill regions, where areas suitable for farming are in the tens of thousands of hectares, absolutely everyone can get land for creating an intensive garden here. All that is needed is start-up capital to purchase seedlings and a detailed business plan.

#### **4. CONCLUSION:**

Thus, the agricultural economy needs innovation, and it is very important that our agricultural producers embark on the path of re-equipment and be able to launch high-quality competitive products on the market. And this is possible only with the help of a global state policy to modernize the economy, develop innovative industries, and change the technological order. And only through the modernization of the economy and the development of innovative industries can one rise to a qualitatively new level of economic development. Innovation activity is one of the new types of intellectual activity aimed at creating, distributing and consuming innovations that significantly change the level of people's livelihoods. Innovative processes in the world space form the level of economic development of states, significantly accelerate scientific and technological progress. Many countries of the world were able to achieve colossal success in the economy in a short historical period not with their natural resource power, but thanks to the transfer of the economy to an innovative development path (Japan, South Korea, Finland, Singapore, etc.). The transition to an innovative economy requires the development of an appropriate mechanism for the formation and development of an innovation system, which will accelerate the processes of converting the results of scientific research into goods and services, will help to increase the efficiency of domestic agricultural producers and the competitiveness of their products in the world market. With the provision of effective management of scientific, technical and innovative activities of the agro-industrial complex (AIC) at the present stage, the importance of state programs, the implementation of which is aimed at the implementation of technological and technical modernization of the industry, is especially increasing. In addition, scientific, technical and innovative programs, implemented on the basis of fundamental and priority applied research in the agricultural sector for the future, are becoming especially important. They must ensure the formation of a fundamental foundation for the creation of new generations of equipment and technologies in order to improve the technological level of the agro-industrial complex. Mastering innovations in production is the key to accelerating scientific and technological progress in the agro-industrial complex.

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