



INNOVATION IN AGRICULTURE

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ABSTRACT	KEYWORDS
<p>The article is devoted to the innovative development of agriculture and the issues of introducing innovative technologies into the agricultural sector. In modern conditions, the development of agriculture is determined by the level of implementation of innovative technologies and innovative activities of agribusiness. The main areas of innovative development in agriculture, as well as financial support for innovative agribusiness activities, are discussed. Based on the analysis, the following conclusions are drawn.</p>	<p>Agriculture, innovation, agribusiness, innovative development, agricultural production. efficiency.</p>

Introduction

Today, there is competition in the world agricultural product markets by means of reducing the cost of products produced by growing productive livestock and high-yielding agricultural crops, and developing innovative activities that ensure high competitiveness. The main goal of agricultural production is to ensure intensive growth in the volume of agricultural output per unit of labor, land, capital and/or other resources in an expanded process of repeated production, which is closely related to the development of innovative activities. The main directions of the network are: land reclamation; complex mechanization, increasing the energy intensity of labor; improvement of production technologies used on the basis of specialization and development of agro-industry integration (Konovalov and Konovalova, 2015). Agriculture plays a key role in the economy and socio-economic development of all countries in the world, especially most developing countries, as it provides food for the population and resources for the industrial sectors of the economy.

In general, today, within the framework of state agricultural development programs in a number of developing countries, the most important component of sustainable economic growth is the transition

from inertial business to innovative business models. As part of the development of the strategy for the organization and promotion of innovative activities, it is considered necessary for agriculture to develop methodological approaches for evaluating the level of innovative development of the sector (Bautin, 2011; Khodos, 2013). The state influences innovative activity in agriculture by targeted stimulation of research in the necessary areas, and financing of innovations in agriculture is a pressing issue. The government can also increase the innovative activity of agricultural enterprises by using digital technologies and developing cooperation in the field of innovation based on public-private partnerships.

2. Literature review

According to Koshkalda et al. (2019), innovations, innovative forms of production and management in enterprises producing agricultural products are not only a factor determining the modernization of the technical component of production, but also the competitiveness of enterprises. Innovative development can only ensure rapid economic growth, sustainable development, and the widespread and effective use of new resource-efficient, advanced technologies, while taking into account environmental protection (Nasimov, 2018). Given that the problems associated with the development of settlements in rural areas of countries cannot be solved quickly, the optimal solution to increasing the efficiency and competitiveness of agricultural production is the development of innovative activities in agricultural enterprises (Vretenar, 2025). Technological gaps in agricultural production and problems associated with labor shortages indicate that relatively small farms in this sector have limited opportunities to use high technology and implement scientific advances in product production. In developed countries, state support for the development of innovative activities of agricultural enterprises widely uses tax incentives, depreciation policies, and direct budget subsidies to producers of new types of products (Abdullaev and Inomjonova, 2026).

For enterprises in any sector of the economy, the introduction of new technologies in the production of products is considered an innovative activity, even if it does not fully correspond to market innovation. Therefore, the scientific work of economist Joseph Chumpeter serves as a fundamental source in studying the relationship between business and innovation (Vretenar, 2025). According to the classification of economists, the theoretical scientific literature cites the following four main aspects of the advantage of large enterprises over small businesses in implementing innovative activities: large enterprises can distribute fixed production costs over a large volume of manufactured products; large enterprises have wide opportunities to attract resources from financial markets; large enterprises can effectively use the scope and scale of scientific research and development; Large enterprises with diversified production are more likely to benefit from unexpected innovations (the so-called windfall effect) (Martin, 2010). In addition, the introduction of innovations and productivity growth in agricultural enterprises is associated with the introduction of innovative technologies in the processing of agricultural waste, indicating the need to use highly innovative technologies for agricultural by-products in various sectors of the economy (Salati, et al., 2017). The introduction of innovative technologies for the processing of by-products and waste from primary agricultural products, in turn, will reduce production costs and provide additional income for both agricultural producers and industrial producers. It should be noted that large-scale implementation of innovations in the field of agricultural production waste utilization will help to create a more competitive, efficient and ecologically sustainable agricultural production system in the future.

In addition, one of the important instruments in the implementation of the incentive policy for the development of innovative activities in agriculture is the formation of a system of information-consulting services in the field of agricultural innovations. This system encompasses institutions related to science, practice, and personnel training, as well as cooperation with enterprises in various areas of the agro-industrial complex (Khodos, 2013). Scientific research conducted by economists has shown that when developing the main directions of supporting the development of innovative activities in agriculture through information and consulting services, first of all, the need for qualified consultants, taking into account the diversification of the activities of agricultural enterprises, their priority specialization, and the creation of regional agricultural innovation and consulting centers. One of the forms of effective implementation of innovative activities in agriculture is the development of innovative infrastructure, which involves the creation of organizational structures for the realization of scientific and technical products in the innovative market, provision of information and consulting, examination of developments and projects, development of the experience-production base, and the formation of financial and credit structures for financing (Belyakova & Vladimirova, 2010).

3. Methodology of research.

The article reviews the scientific literature on innovative development of agriculture. Innovative directions of agricultural production development and issues of financial support were studied. Scientific abstraction, analysis and synthesis, induction and deduction, descriptive statistics, analysis methods were used in the research of innovative activities in agriculture.

4. Analysis and results.

In Uzbekistan, further deepening reforms aimed at increasing the competitiveness of the agricultural sector are aimed at radically improving state policy, and the following priority areas have been identified:

1. ensuring food security of the population; creating a favorable agribusiness environment and value chain;
2. reducing state participation in industry management and increasing investment attractiveness;
3. ensuring rational use of natural resources and environmental protection;
4. development of modern systems of state administration;
5. gradual diversification of state spending aimed at supporting the sector;
6. development of the system of science, education, information and consulting services in agriculture; development of rural areas;
7. development of a transparent system of network statistics.

A mechanism has been introduced to implement the tasks set out in the Strategy for the Development of the Agricultural Sector for 2020-2030, to develop innovative activities of agricultural enterprises and increase their economic efficiency, to formulate scientific research topics, to implement scientific results in practice, and to take into account the real needs of agroclusters, cooperatives and other agricultural enterprises in personnel training, including:

- ✓ cooperation with higher education and research institutions;
- ✓ scientific achievements, the introduction of innovative technologies;
- ✓ the development of human resources;

The system of supporting agroclusters, cooperatives, economic associations, and other agricultural enterprises that have effectively cooperated in the field of agricultural science and education includes the following:

the formation of scientific and innovative groups consisting of representatives of agroclusters, cooperatives, and other agricultural enterprises, non-governmental and non-profit organizations, and higher education and research institutions to implement joint scientific and practical projects and introduce scientific achievements;

at the International Center for Strategic Development and Research in the field of food and agriculture, a special fund was established to support the implementation of scientific-practical projects, introduction and commercialization of scientific achievements by scientific and innovative groups at the expense of grants from international financial institutions.

In addition, the following are envisaged for the development and increase of the efficiency of scientific and technical research in agriculture:

- ❖ introduction of a system of formation of scientific projects and dissertation topics by higher education and research institutions, regardless of their departmental affiliation, on the basis of studying foreign and domestic experience on problems awaiting their solution in the field of agriculture and food industry, and, as a rule, coordination with the Ministry of Agriculture;
- ❖ topics of dissertations in the field should be aimed at scientific-practical solution of problems, responsibility for their effectiveness and implementation should be assigned to institutions where this project was prepared;
- ❖ consideration of scientific and educational components in the formation of investment and grant (technical assistance) projects aimed at the development of agriculture and its branches of international financial institutions.

In general, the categories of enterprises producing agricultural products in the republic consist of farms, peasants and homesteads, and other enterprises, and the main part of the agricultural products produced corresponds to the contribution of peasants and farms (Fig. 1).

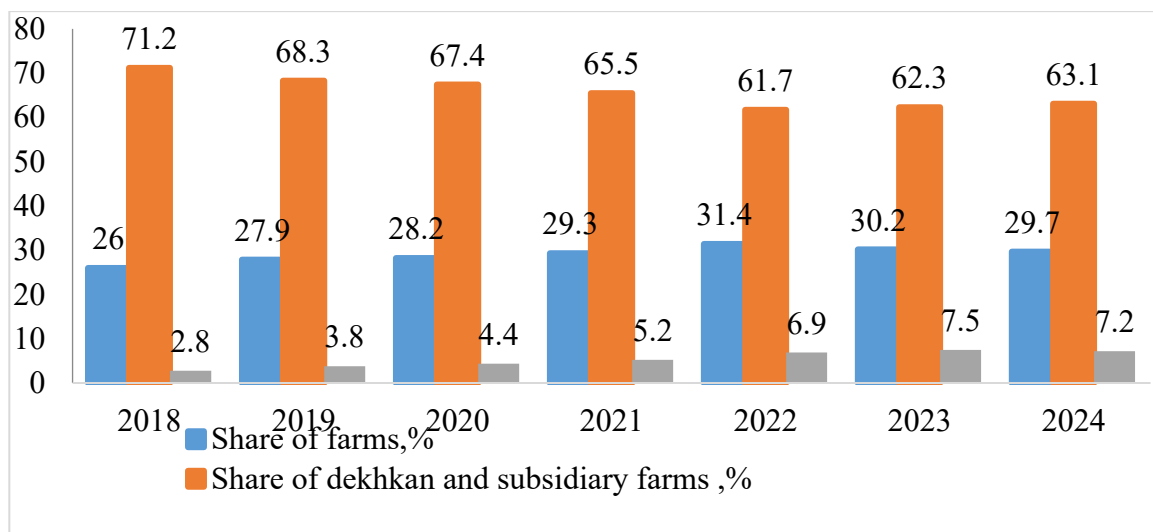


Figure 1. Dynamics of the share of agribusiness entities in the total volume of agricultural products, (stat.2025)

Subsidies allocated from the state budget as part of state financial support for agricultural producers will amount to 4.8 trillion soums in 2020-2024 (Fig. 2). The allocation of these subsidy funds is carried out through the Agrosubsidiya information system. The electronic system of allocation of subsidy funds for the production of agricultural products from the state budget is important in ensuring the transparency of these processes and effective use of funds.



Figure 2. Amount of subsidies allocated to agriculture from the state budget, trillion soums (Ministry of Agriculture, 2025)

In particular, the amount of subsidies allocated to agriculture in 2024 will amount to 311.2 billion soums. 119.7 billion soums were directed to the purchase of productive livestock and other innovative technologies. In particular, 8.0 billion soums for organic agricultural innovations, i.e. 52.3 billion soums for subsidies are directed. It can be seen from this that subsidies allocated from the state budget are important instruments in stimulating the development of innovative activities in agricultural enterprises. In agriculture, the introduction of water-saving technologies in the cultivation of agricultural products is important not only in increasing water resources, but also in increasing production productivity. The Concept for the Development of Water Resources in the Republic of Uzbekistan for 2020-2030 sets the goal of introducing water-saving irrigation technologies to 2,000 thousand hectares by 2030, including drip irrigation technology to 600 thousand hectares. In particular, in 2024, water-saving technologies were introduced on 849.4 thousand hectares of land across the republic, including drip irrigation on 84.9 thousand hectares, sprinkler irrigation on 37.2 thousand hectares, and discrete irrigation technologies on 30.6 thousand hectares. Digitization, biotechnology, use of renewable energy sources and financial support from the state play an important role in the development of innovative activities of agricultural enterprises, and these factors will be important to ensure the economic and ecological sustainability of production in the agricultural sector of developing countries. At the same time, one of the main issues in implementing any model for the development of innovative activities of agricultural enterprises is increasing public and private investments. This requires a systematic approach to technology integration, cross-country

cooperation and technology transfer, support to agricultural producers, and development of educational programs to achieve maximum effectiveness.

In conclusion, financial support measures for the development of innovative activities of agricultural enterprises may not yield the expected results in terms of directing only R&D and R&D activities and increasing the productivity of agricultural production. For this reason, the improvement of the innovative infrastructure of agriculture stimulates the development of innovative activities of agricultural enterprises, and it should be implemented within the framework of mutually beneficial cooperation of science, education and production.

5. Conclusions and suggestions

Innovations in agriculture are new or improved products for consumers, as well as new or improved models and systems for producing products for enterprises. Innovations in agriculture should primarily have economic, social and environmental benefits. The experience of developed countries shows that the use of innovative models of agricultural production allows for a significant increase in agricultural efficiency, minimizing costs and reducing environmental impact. State support for the development of innovative activities of agricultural enterprises includes tax incentives, depreciation policies, and direct budget subsidies to organizations developing new types of products.

The introduction of new technologies into agricultural production and the transition to smart agriculture can lead to farmers using clean energy sources. The use of renewable energy sources by agricultural enterprises not only reduces environmental impact but also leads to increased economic efficiency. It is considered important to establish a digital innovation fund of agriculture in order to financially support the innovative activity of small agribusiness entities.

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