

PROSPECTS FOR THE DEVELOPMENT OF INNOVATIVE AGRICULTURE IN UZBEKISTAN

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Abstract

Uzbekistan, a country with a rich agricultural heritage, faces numerous challenges in its agricultural sector, including climate change, soil degradation, and inefficient farming practices. To overcome these challenges, the adoption of innovative agricultural techniques is essential. This article explores the prospects for developing innovative agriculture in Uzbekistan, emphasizing the benefits of technology integration, government support, and sustainability practices. It presents an overview of the current trends, potential investment opportunities, and obstacles to innovation in the agricultural sector, highlighting the importance of modernizing agriculture to enhance productivity, economic sustainability, and food security.

Keywords: innovative agriculture, Uzbekistan, agricultural technology, sustainable practices, precision agriculture, government support, investment opportunities, resource efficiency.

Introduction

Agriculture plays a crucial role in Uzbekistan's economy, contributing significantly to national GDP, employment, and food security. The importance of agriculture can be confirmed by figures: in 2023, this sector accounted for 24,3% of gross domestic product, 5,7% of investment, 7,8% of export earnings and 25% of employed population. According to preliminary data of the Statistics Agency under the President of the Republic of Uzbekistan, the total volume of products (services) of agriculture, forestry and fisheries in January - December 2023 amounted to 426 264.0 billion soums, including in crop and livestock production, hunting and provision of services in these areas – 411 594.6 billion soums, forestry – 10 399.5 billion soums, fisheries – 4 269.9 billion soums. In 2023, all categories of farms produced 8 426.6 thousand tons of cereals (an increase of 5.5% compared to 2022), 3 574.1 thousand tons of potatoes (an increase of 3.8%), 11 553.7 thousand tons of vegetables (by 3.5%), 2 553.5 thousand tons of melons (by 5.5%), 3 121.7 thousand tons of fruits and berries (by 4.1%), 1 737.6 thousand tons of grapes (down 1.3%), 3 710.3 thousand tons of raw cotton (by 6.0%), 2,833.3 thousand tons of meat in live weight (by 3.9%), 11,968.7 thousand tons of milk (by 2.9%), 8,487.5 million eggs (by 4.4%), 38.6 thousand tons of wool were cut (by 3.6%), 1,321.1 thousand pieces of karakul skins (by 2.6%), were obtained and 198.9 thousand tons of fish were caught (by 7.3%). [6]

However, the sector faces various challenges, including climate change, soil degradation, and outdated farming practices. To address these issues, there is a growing need for innovative agricultural practices that leverage new technologies and means of production. The essence of innovative development of various sectors of the national economy does not contain any



fundamental differences. However, in the agro-industrial complex and, especially, in agriculture, the nature and main directions of this process differ significantly. The main features of the formation and development of the innovation process in agriculture of Uzbekistan include the following: differences in the regions of the country in natural and climatic conditions and production specialization; a variety of types of agricultural products, processed products, a significant difference in the technology of processing products, keeping and feeding animals; a large difference in the periods of production of individual types of agricultural products and processed products; a large dependence of production technologies in agriculture on natural and climatic conditions, road and transport networks, remoteness from supply centers and markets for the sale of products and other factors; isolation of agricultural producers, remoteness from information and consulting services and organizations producing scientific and technical products. [1]

Materials and methods of the research

In preparing this article, we relied on theoretical and methodological approaches to assessing the impact of innovations on the agricultural sector, as well as foreign and domestic works on agricultural economics and the use of resource-saving technologies in the industry. The regulatory framework for the study was legislative and regulatory acts of government bodies of the Republic of Uzbekistan on sustainable development of agriculture. The study used such methods as logical and qualitative analysis, system and situational analysis, economic and statistical analysis, expert assessment method, etc.

Results and Discussion

The development of innovative agriculture in Uzbekistan holds significant potential due to the country's rich agricultural resources, strategic location, and growing demand for food both domestically and internationally. Here are several prospects and methods for fostering this development:

1. Adoption of Modern Technologies

- Precision Agriculture: Utilizing GPS, drones, and IoT sensors to monitor crop health, soil conditions, and water usage can optimize resource management.
- Biotechnology: Developing genetically modified crops that are resistant to pests and diseases or can thrive in arid conditions can improve yield.

2. Sustainable Practices

- Organic Farming: Promoting organic farming techniques can enhance soil health and reduce chemical inputs while catering to the growing market for organic products.
- Water Management Innovations: Implementing drip irrigation systems and rainwater harvesting techniques to ensure efficient water use is crucial in a region facing water scarcity.

3. Research and Development

- Collaboration with Research Institutions: Partnering with universities and research organizations to develop new agricultural practices, crops, and technologies tailored to local conditions.



- Investment in Agricultural Tech Startups: Supporting emerging companies focused on agricultural innovations can drive progress in this sector.

4. Capacity Building and Education

- Training Programs: Educating farmers about modern farming techniques, sustainable practices, and technology use through workshops and extension services.
- Knowledge Sharing Platforms: Creating networks for farmers to share experiences, challenges, and solutions related to innovative agricultural practices.

5. Policy Support

- Government Incentives: Implementing policies that provide financial assistance or subsidies for adopting innovative practices could encourage farmers to transition from traditional methods.
- Regulatory Frameworks: Establishing clear regulations regarding biotechnology use, land rights, and environmental protection can create a conducive environment for innovation.

6. Market Access Improvements

- Supply Chain Optimization: Enhancing logistics infrastructure (roads, storage facilities) will help farmers reach markets more efficiently.
- E-commerce Platforms: Developing online marketplaces where local farmers can sell their produce directly to consumers can increase profitability.

7. Diversification of Crops

- Encouraging the cultivation of high-value crops such as fruits, vegetables, nuts, or medicinal plants instead of traditional staples could enhance income stability for farmers.

8. Climate Resilience Strategies

- Developing crop varieties that are resilient to climate change impacts (droughts, floods) is essential for maintaining productivity under changing environmental conditions. [2]

Innovative Agriculture and Its Benefits

Innovative agriculture encompasses a range of practices that integrate technology, data, and sustainability into traditional farming methods. Key innovations include precision agriculture, smart irrigation systems, and the use of biotechnology to enhance crop yields.

Currently, to activate the production of innovative crop products, it is common to use and implement the achievements of breeding and genetic engineering. In 2021, 66 breeding achievements were registered in State Registers. 61 plant varieties and three animal breeds were registered in the name of national applicants, and two plant varieties were registered in the name of foreign applicants (Table 1). According to genera and species, the registered plant varieties and animal breeds were distributed as follows: cotton – 30; soft wheat – 5; potatoes – 8; soybeans, grapes and citrus three each, apple, sunflower, corn and silkworm two and one each – cucumber, grapefruit, chickpeas, durum wheat, barley, the Karakul sheep. [7]

Table 1. Information on registration of breeding achievements

Indicator	2017	2018	2019	2020	2021	Total
Total registered breeding achievements	40	54	36	55	66	251
Of these, by plant varieties	39	45	36	55	63	238
By animal breeds	1	9	-	-	3	13
By applicants:						
National applicants	40	54	36	54	64	248
Foreign applicants	-	-	-	1	2	3

Innovative farming techniques can significantly enhance crop yields by optimizing resource use. Precision agriculture, for instance, allows farmers to use data analytics to make informed decisions about planting, irrigation, and pest control, leading to better outcomes and reduced waste. [3]

1. **Resource Efficiency:** Innovative methods promote efficient use of water, fertilizers, and pesticides. Smart irrigation systems, which utilize sensors and data analysis, ensure that crops receive the right amount of water, reducing consumption and preserving vital water resources in a country where water scarcity is a pressing issue.

2. **Sustainability:** The adoption of sustainable practices such as crop rotation, organic farming, and integrated pest management can improve soil health and biodiversity. These methods not only protect the environment but also ensure long-term productivity and resilience against climate change.

Prospects for Innovative Agriculture in Uzbekistan

The development of innovative agriculture in Uzbekistan is supported by several factors:

1. **Government Support:** The government of Uzbekistan has recognized the importance of agricultural innovation and has implemented various policies aimed at modernizing the sector. This includes investment in research and development, subsidies for innovative equipment, and training programs for farmers.
2. **Investment Opportunities:** Uzbekistan presents significant investment opportunities in the agricultural sector. Foreign investors are increasingly drawn to the country due to its strategic location, rich natural resources, and a young workforce eager to embrace new technologies.
3. **Adoption of Advanced Technologies:** The introduction of digital technologies such as blockchain, big data, and the Internet of Things (IoT) can revolutionize the agricultural landscape. These technologies can enhance supply chain transparency, improve market access for farmers, and enable better decision-making. [4]

Challenges and Barriers

Despite the promising prospects, there are several challenges to the development of innovative agriculture in Uzbekistan:

1. **Technological Barriers:** Limited access to advanced technologies and lack of technical know-how can hinder the adoption of innovative practices. Many farmers may lack the skills or resources needed to implement new technologies effectively.



2. **Economic Constraints:** While the government is supportive, funding for innovation may still be limited. Smallholder farmers, in particular, may struggle to invest in new technologies without financial assistance.

3. **Cultural Resistance:** There may be resistance to change from traditional farming practices deeply rooted in the culture of rural communities. Overcoming this resistance requires effective communication and education about the benefits of innovative approaches. [5]

Conclusion

The prospects for the development of innovative agriculture in Uzbekistan are promising, driven by government support, investment opportunities, and the adoption of advanced technologies. However, addressing the challenges of technological barriers, economic constraints, and cultural resistance is essential for realizing the full potential of innovative agriculture. By embracing change and fostering a culture of innovation, Uzbekistan can enhance its agricultural productivity, ensure food security, and promote sustainable development, ultimately contributing to the well-being of its population and the economy at large.

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