Assessment of innovative support of the agricultural industrial complex

Jumakhon Tagoev1*, Bahodur Nabiev1, Nizomiddin Komilov2, Asomuddini Ramazoni1, and Aliakbar Vohidov3

1Tajik National University, Rudaki Avenue, 17, Dushanbe, 734025, Republic of Tajikistan
2Kulob State University named after Abuabdullo Rudaki, S Safarov Avenue, 16, Kulob, 735360, Republic of Tajikistan
3Tajik State Institute of Culture and Arts named after M. Tursunzade, Borbad Avenue, 73A. Dushanbe, 734033, Republic of Tajikistan

Abstract. This article discusses the issue of innovative support for the agro-industrial complex of the Republic of Tajikistan. An assessment is made of the current state and level of investment in the agricultural sector and agricultural enterprises. It is noted that innovation is the main lever for the development of agricultural production. In justifying the need for an innovative – investment approach to the use of land resources, one should proceed from the understanding that the loss of valuable productive lands, soil degradation, the current decline in their fertility and the deterioration of environmental functions from the standpoint of awareness of the limitations of land resources should be considered as a threat to economic independence and even national security. It should be noted that in conditions of climate warming and water shortage, an innovative method of cultivation, including drip irrigation technology, is the main factor in the efficient use of water resources and at the same time obtaining high yields. Proposals for introducing innovations and conducting research in the field of agriculture are presented. At the same time, the process of foreign investment in agricultural enterprises was analyzed and discussed, its importance in the modern conditions of agriculture of Tajikistan was noted.

1 Introduction

Agriculture is considered a high-risk industry, as it depends on weather conditions, has a long production cycle and low profitability. All of the above hinders innovation in this industry. Innovations in agriculture, especially in irrigated agriculture, are not introduced as often as in other sectors of the economy, and therefore the development of promising land reclamation technologies in an arid region largely depends on the intensification of agro-industrial production.

Currently, the most important priority of the economic policy of our republic is the task of modernizing the economy and transferring it to an innovative path of development, or the so-called “digitalization”. One of the modernization tools is the introduction of modern

* Corresponding author: firdavs300@mail.ru

© The Authors, published by EDP Sciences. This is an open access article distributed under the terms of the Creative Commons Attribution License 4.0 (https://creativecommons.org/licenses/by/4.0/).
digital, information and intellectual technologies in all sectors of the country’s economy. In recent years, labor productivity in various sectors of the national economy has generally been reversing, which reflects the dynamics of gross domestic product. World practice shows that the development of the agro-industrial complex is taking place in the era of digital globalization, based on new ideas, information and innovations. The introduction of digital technologies and the Internet in irrigated agriculture will allow agriculture to become a high-tech industry capable of increasing productivity and reducing costs in the entire reclamation process [1].

Currently, the digital concept is used not only in high-tech industries, but also in other sectors of the economy, including agriculture and, in particular, irrigated agriculture. In many countries, agricultural producers use elements of innovative technologies, in particular, various online applications that allow them to analyze, take into account production, carry out the necessary calculations, and control the movement of products from the field to the end consumer.

The global experience of digitalization of agriculture has shaped such industry areas as precision farming, animal monitoring, management of agricultural machinery, monitoring of greenhouses and farms, and others [2].

2 Materials and methods

The purpose of the study is to substantiate the role of investment in the development of ecological agriculture and the development of practical recommendations aimed at the development of ecological agriculture. We propose to analyze the investment process of agriculture and identify the constraints to their development, propose mechanisms for investment support in the ecological development of agriculture, identify ways to improve investment in agriculture. Our analysis spans 14 years from 2008 to 2022.

The study used methods such as: logical operations (analysis, synthesis, generalization, induction, deduction) - to determine the characteristics of trends in investment, formulation of conclusions about the impact of land reform on investment; index - to identify quantitative changes in nominal and real volumes of investments, factors of influence; trend analysis - to determine trends in changes and build investment trend functions in different periods; factorial and correlation analysis - to identify factors and density of connection and dependences of investment volumes on individual factors (profit, prices, interest rates, government support); graphic - for visual presentation of investment dynamics.

The study was carried out on the basis of regulatory legal acts of the Republic of Tajikistan, decrees of the Government of the Republic of Tajikistan, statistical data of the Agency on Statistics under the President of the Republic of Tajikistan, the Ministry of Agriculture, as well as materials collected personally by the author [3, 4, 5].

3 Results and discussion

Agricultural activities are associated with receiving a large flow of information: weather forecast, market prices, demand from retail chains, agricultural equipment manufacturers, etc. In online applications, all information is presented in accumulated form and is available to various users.

Agricultural producers can use it to determine the timing of planting crops grown in irrigated agriculture, the optimal amount of fertilizer, the required moisture rate, the choice of harvest time, etc.

Each individual economic entity on earth must link the results of production activities with its financial achievements. Currently, in Tajikistan, the solution to environmental and
economic problems is associated with the introduction of the latest achievements of scientific and technological progress, which can ensure the intensive development of social production and the growth of its competitiveness.

It is difficult to implement the process of innovation and innovative technologies without attracting foreign investment. Because in today's conditions, agricultural enterprises do not receive sufficient harvests due to climate warming and lack of water. Therefore, it is necessary to attract investors to apply innovative technologies in the process of processing and use of agricultural products.

Attracting investment and intensifying investment activity at the regional level of the agro-industrial complex has its own characteristics and nuances, since the nature of the economic and production specialization of each region has a direct impact on these processes. Based on this, each investment project is developed for a specific focus, and the choice of region for its implementation is carried out depending on the conditions created in a certain territory.

In recent years, special attention has been paid to attracting foreign investment in innovative technology in agriculture. Thanks to the developed and adopted strategic documents, the improvement of the regulatory framework, the provision of various tax benefits and customs preferences, huge investment resources were attracted to the country's economy (Figure 1).

As can be seen from the data in Figure 2, significant changes are taking place in the distribution of foreign investment across the regions of the republic. The largest share of foreign investment falls on the city of Dushanbe, amounting to 47.8% or 5672 million US dollars. The Sughd region, among other regions, has achieved significant success in introducing innovations in the field of agriculture and attracting foreign investment. In recent years, this region has seen the application and use of innovative technologies in agricultural production, which has led to an increase in the region's gross regional product.

In this regard, huge investment resources are directed to the agro-industrial complex of the region (Table 1).

**Table 1.** Information on investments in the agro-industrial complex of the Sughd region for 2022 (thousand US dollars).

<table>
<thead>
<tr>
<th>Industries</th>
<th>Accumulated at the beginning</th>
<th>Received for 2022</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>direct investments</td>
<td>other investments</td>
</tr>
<tr>
<td>Total</td>
<td>852031.0</td>
<td>224341.8</td>
</tr>
</tbody>
</table>

![Fig. 1. Receipt of foreign investment by region in 2008-2022 (million US dollars) [4].](image)
The table data indicates that in the analyzed year, investment resources were attracted in almost all key subcomplexes of the regional agro-industrial complex. In 2022 alone, $465.5 thousand was allocated for growing crops, commercial vegetable growing, and horticulture. USA, and these funds are aimed at introducing drip irrigation technology, sowing crops, processing products, etc. In addition, 2 million 268 thousand dollars were allocated for the cultivation of agricultural crops, which were used to increase the productivity of agricultural products, reduce the level of erosion and land degradation, improve drainage and introduce innovative technology. Our research has shown that the agro-industrial complex of the Sughd region, as well as the entire state, despite existing problems, remains investment-attractive, especially for foreign investors.

Today, with the participation of foreign capital, a huge number of production facilities for processing agricultural raw materials have been created in the region. In addition, if we compare the structure and capabilities of the regional economy with other regions of the country, the agro-industrial complex of the Sughd region has a number of distinctive features and advantages that increase the investment attractiveness of the region. In this regard, investment projects exist and are being implemented in almost every district or city.

**Table 2.** Information on foreign investment by type of economic activity of enterprises of the Republic of Tajikistan for 2022 (thousand US dollars).

<table>
<thead>
<tr>
<th>Name of types of economic activity</th>
<th>Cost of investment at the beginning of the reporting year direct investments</th>
<th>Transactions for the reporting period</th>
<th>Cost of investment at the end of the reporting period direct investments</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOTAL</td>
<td>3631746.5</td>
<td>326761.9</td>
<td>220259.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>received</td>
<td>redeemed (withdrawn)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>direct investments</td>
<td>direct investments</td>
</tr>
<tr>
<td>including: agriculture, hunting and related services</td>
<td>84939.0</td>
<td>17870.0</td>
<td>13076.1</td>
</tr>
<tr>
<td>Growing crops, commercial vegetable growing, horticulture</td>
<td>81017.3</td>
<td>17638.4</td>
<td>13035.8</td>
</tr>
<tr>
<td>Calculated from: [6, 7]</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Livestock

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th>-</th>
<th>-</th>
<th>-</th>
<th>-</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raising chickens for</td>
<td>3861.8</td>
<td>231.6</td>
<td>40.3</td>
<td>4053.1</td>
</tr>
<tr>
<td>meat production</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fish farming</td>
<td>59.9</td>
<td>-</td>
<td>-</td>
<td>59.9</td>
</tr>
</tbody>
</table>

**Calculated from:** [6.7.8]

An important and main source of financing investment projects in the region’s agriculture is attracting foreign investment. In recent years, the region has seen an increase in the influx of foreign investment in agriculture, food and processing industries. Information on attracting foreign investment by type of economic activity of enterprises of the Republic of Tajikistan for 2022. (Table 2).

Thus, the development of the innovation process in the region’s agro-industrial complex, in our opinion, requires the creation of an innovation center, the founders of which will be manufacturing enterprises in the agricultural sector. In recent years, the agro-industrial complex has acted as a state customer for processing and research (research and development).

The funds allocated for these purposes will be used for scientific research in the following priority areas:

- saving energy and fuel resources at all technological stages;
- improvement of agrotechnical methods for growing crops in the agro-industrial complex;
- creation of new types of grains and legumes, potatoes and vegetables, fruits and berries, animal feed;
- improvement of breeding work in livestock and poultry farming;
- development and implementation of promising technologies for the production of livestock products;
- prevention and treatment of infectious and non-infectious diseases of livestock, poultry, etc.

In modern conditions, the transition of the agro-industrial complex to an innovative path of development can be carried out by:

- increasing the level of government support and the role of scientific research in the formation of competitive agro-industrial production, cooperation between agribusiness management bodies and research organizations in addressing issues of agro-industrial complex development, development of mechanisms for transferring achievements of scientific and technological progress in production;
- development of the infrastructure necessary for innovation activities that ensure the commercialization of innovations;
- creation of a system of advisory support for agricultural producers;
- creation of an information system on innovations and best practices;
- formation of associations of scientific, educational, experimental organizations and other subjects of the innovation process;
- personnel transition of the agro-industrial complex to a qualitatively new level that meets the needs of innovative agricultural development, the development of all levels of the system of continuous professional education, science and other areas in order to develop knowledge, skills and behavior among workers in the agricultural sector and the rural population as a whole;
development of the organizational and economic mechanism of innovation in the agricultural sector, based on the regulatory framework for regulating innovation, new financial and economic means of stimulating and providing public resources for innovation and investment in the agro-industrial complex, etc.

Thus, the modern agro-industrial complex must function on a new organizational, economic and technological basis, which includes a unified production and technological system of enterprises, industries and related industries that have a single ultimate goal - to provide the population with the necessary amount of food at an affordable price.

4 Conclusion

The agro-industrial complex of the Sughd region is developing steadily. The main parameters characterizing the state of the industry and the dynamics of development are mostly positive. But, to realize the potential and expand production, and ensure the foundations of sustainable development, additional investment is required. The transition to an investment growth model makes it possible to create a modern innovative agro-industrial production, whose products will be competitive, and whose economic entities will function effectively.

References

4. K.A. Sodikov, F.P. Arabov, Digitalization is a key factor in the sustainable development of agriculture in Tajikistan, in Materials of the International Scientific and Practical Conference Integration of Sciences Krasnodar, pp. 85-90 (Krasnodar, Russia, 2021)