



## Importance of Investing in the Introduction of Water-Saving Digital Technologies in Agriculture

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**Annotation:** This article examines the importance of investing in the introduction of water-saving digital technologies in agriculture. An analysis of modern technologies in the field of water use in agriculture was carried out and the advantages and disadvantages of their implementation are identified. The article also discusses various forms of financial support for the introduction of digital technologies in agriculture. Based on the analysis, conclusions were drawn about the importance of investing in the introduction of water-saving digital technologies in agriculture to improve its efficiency and sustainability.

**Keywords:** agriculture, water use, digital technologies, water saving, investment, direct investment, politics.

### Introduction.

Investment in agriculture is crucial for ensuring food security, reducing poverty, and promoting economic development. Investment in agriculture can also contribute to achieving broader development goals, such as reducing poverty, promoting gender equality, and addressing climate change. Women, who make up a significant proportion of the agricultural workforce in many countries, can benefit from investment in agriculture by gaining access to resources and training that can help them increase their productivity and income. Investment in sustainable agriculture practices can also help mitigate the impact of climate change by reducing greenhouse gas emissions and increasing resilience to extreme weather events.

The importance of investing in the introduction of water-saving digital technologies in agriculture is relevant and important at the present time. Agriculture plays a key role in food security and economic development in many countries. However, with population growth and climate change, agriculture is facing a number of challenges, including limited resources, including water.

Water-saving digital technologies in agriculture are an innovative solution to solve this problem. They allow more efficient use of limited water resources and reduce the unnecessary use of chemical fertilizers, which leads to a reduction in environmental pollution. The introduction of such technologies can also improve the yield and quality of agricultural products.

However, the introduction of water-saving digital technologies requires financial investments, which can be a problem for many farmers. Therefore, the relevance of this topic lies in finding ways to financially support farmers for the introduction of digital technologies and increase their awareness of the benefits of these technologies.

The introduction of water-saving digital technologies is an important step to improve the sustainability and efficiency of agriculture, which makes this topic relevant and significant.

## Literature review.

During our research, we turned to the following sources.

“Digital Agriculture and Food Systems: Current Trends and Future Directions” is a study conducted by FAO (Food and Agriculture Organization of the United Nations) that examines the role of digital technologies in agriculture, including water saving technologies<sup>1</sup>.

“Smart Agriculture and Precision Farming: Empirical Research on Adoption and Impacts in Developing Countries” is a study conducted by the World Bank that examines the effectiveness of digital technologies in agriculture in developing countries, including water saving technologies<sup>2</sup>.

Researchers K. Kashina and I. Simakov analyzed the effectiveness of the use of water-saving technologies in the agro-industrial complex<sup>3</sup>. N. Mikhailova and S. Potekhina assessed the potential for introducing digital technologies to improve water use in animal husbandry<sup>4</sup>.

Khamidov M. and others conducted research on measuring instruments in the field of irrigation and melioration, measurement and accounting of water consumption in irrigation systems<sup>5</sup>.

## Methodology.

We used a wide range of observational, data collection, grouping, plotting and analysis methods to explore the application of digital technologies for water management in agriculture. The experience of developed countries was also analyzed and recommendations for field research were formulated. The experience of foreign countries in attracting investment in agriculture has been studied. The practical activities of the leading economic entities of Uzbekistan are analyzed.

## Results.

There are several approaches to attract investment in agriculture, including government support, private investment, and international cooperation. Government support may include measures such as subsidies for investment in water-saving technologies, tax incentives, and training programs. Private investments can be attracted through investment funds, banks and other investment organizations. International cooperation can be useful for the transfer of technology and knowledge between countries.

Some countries have introduced investments for water-saving digital technologies in agriculture and have positive experiences.

For example, Israel, where water for agriculture is very limited, has successfully applied digital technologies to optimize water consumption. New technologies such as drip irrigation and water management systems have been developed in Israel to accurately dose water and increase crop yields without increasing water consumption.

Also, China, the second largest agricultural water user, has invested in digital technologies such as water management systems and smart farms to improve efficiency and reduce water consumption. China has also developed new varieties of rice that use less water to grow.

Various technologies have also been developed in the US, such as soil moisture sensors and water monitoring systems, to help agricultural businesses manage their resources more accurately.

<sup>1</sup> United Nations Development Programme (UNDP). (2019). Digital innovation for sustainable agriculture: A policy brief for the Asia-Pacific region. Retrieved from <https://www.undp.org/content/dam/undp/library/SDGs/SDG%20Support/Asia%20Pacific%20region%20Digital%20Innovation%20for%20Sustainable%20Agriculture.pdf>

<sup>2</sup> World Bank. (2019). Enhancing water use efficiency in Indian agriculture: opportunities, challenges, and policies. Washington, D.C.: World Bank Group. Retrieved from <https://openknowledge.worldbank.org/handle/10986/31648>

<sup>3</sup> Kashina, K., & Simakov, I. (2020). The efficiency of water-saving technologies in the agro-industrial complex. *Journal of Environmental Management and Tourism*, 11(8), 2047-2057.

<sup>4</sup> Mikhailova, N., & Potekhina, S. (2020). Digital technologies for improving water use in livestock farming. *E3S Web of Conferences*, 175, 14015.

<sup>5</sup> Khamidov M., Botirov Sh., Suvanov B., Yulchiev D. "Measurement and instruments of water resources". T.: Textbook. 2018. -185 p.

Economic assessments show that the introduction of water-saving digital technologies can lead to significant savings in water costs and increase the profitability of agricultural enterprises. For example, a US study found that implementing agricultural water management systems can lead to up to 50% lower water costs and 25% higher returns (source: “The Economic Impacts of Improved Irrigation Management: An Overview of the Literature”).

Some countries in Africa have also begun investing in digital technologies to improve crop yields and reduce water consumption, such as Kenya and South Africa.

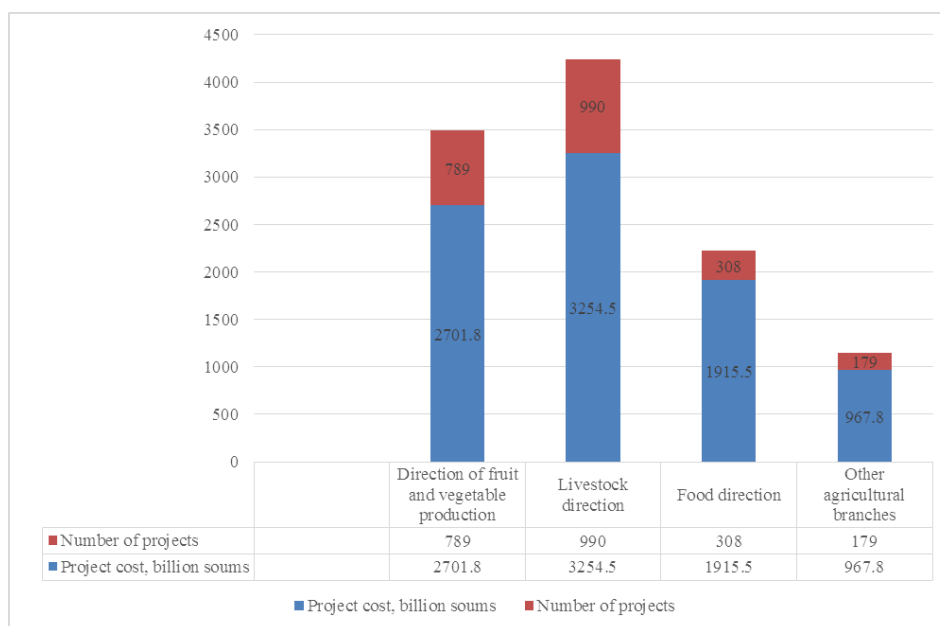
A study in India found that the introduction of drip irrigation systems resulted in a 55% increase in cotton yields and a 50% decrease in water consumption (source: “Water-saving technologies for agriculture in developing countries: A review of the literature”). In another study in Kenya, the use of water-saving technologies for irrigating land resulted in a 37% increase in potato yields and a 50% decrease in water consumption (source: “Water productivity improvements in rainfed agriculture: case studies from Ethiopia, Sudan and Tanzania”).

Many countries are already implementing water-saving digital technologies in agriculture, which allows to increase crop yields and reduce water consumption, which in turn has a positive effect on the environment and the economy. Concrete figures confirm that the introduction of water-saving digital technologies in agriculture can lead to significant water savings and improved yields, which in turn can increase the profitability of agricultural enterprises and ensure food security.

The scale of the increase in irrigated areas in the world: 8 million hectares in 1800, 48 million hectares in 1900, and now 265-270 million hectares. They make up 17% of the world's cultivated land, and almost 50% of agricultural production is grown on these lands. The productivity of irrigated areas is 5-6 times higher than on land. At present, the number of countries involved in artificial irrigation is more than 120, the average is China-70, India-48, USA-27.1, Pakistan-15.4, Iran-5.7, Indonesia-7.1, Mexico- 4.9, Japan-3.0. , Romania-3.0, Egypt-2.5, Vietnam-1.8, Iraq-1.8, Australia-1.6, Bulgaria-1.2, France-1.1, Korea-1.1, Cuba -0.9, including in Uzbekistan 4.3 million hectares of area is artificially irrigated annually<sup>6</sup>.

During the first quarter of 2023, a total of \$9.78 million in loans is planned to be disbursed, including \$7.5 million from foreign loans and \$2.28 million from the Recovery and Development Fund<sup>7</sup>.

In 2022, our country produced a gross domestic product worth 888 trillion soums, of which the volume of agricultural, forestry and fisheries production amounted to 208 trillion soums or 25.1% of gross domestic product.



<sup>6</sup> Mukhamedov A.K., Begmatov I.A. Introduction to water management and land reclamation; -T.: TIMI, 2014: -168 p.

<sup>7</sup> <https://water.gov.uz/public/uz/page/1/6>

### Diagram 1. Investment projects in agriculture and food industry for 2022<sup>8</sup>.

In total, 2,266 investment projects were implemented in the agro-industrial complex and food industry in 2022. In total, 8.8 trillion soums were spent for these purposes. 789 projects worth 2.7 trillion soums were implemented in horticulture, 308 projects worth 1.9 trillion soums in the food industry, 990 projects worth 3.3 trillion soums in livestock farming, 179 projects worth 968 soums in other agriculture. billion soums. In total, as a result of the launch of projects, 33,236 new jobs were created.

#### Conclusion and suggestions.

In conclusion, the research work has shown that investing in the introduction of water-saving digital technologies in agriculture is of great importance for improving the efficiency and sustainability of this industry. By adopting such technologies, farmers can better manage their water resources, increase productivity and quality of agricultural products, and reduce their negative impact on the environment.

The study has also revealed various forms of financial support for the adoption of digital technologies in agriculture, including grants and subsidies that can be used by farmers to purchase necessary equipment and software for automating water management processes. Moreover, investing in training and retraining of personnel in digital technologies can help farmers use these technologies more efficiently.

Based on the findings of this research, several suggestions can be made. Firstly, it is important to increase awareness among farmers and other stakeholders in the agricultural sector about the benefits of adopting water-saving digital technologies. Secondly, governments and other organizations should continue to provide financial support to farmers to facilitate their transition to more sustainable farming practices. Thirdly, there is a need for further research to identify new and innovative ways of promoting the adoption of digital technologies in agriculture.

Investing in the introduction of water-saving digital technologies in agriculture is a crucial step towards achieving more sustainable agricultural practices and addressing the global challenge of water scarcity. It requires a concerted effort from all stakeholders, including governments, farmers, and technology providers, to ensure that these technologies are widely adopted and effectively utilized in the agricultural sector.

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<sup>8</sup> Prepared by the author based on information from the Ministry of Agriculture of the Republic of Uzbekistan.

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