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The Role and Future Prospects of Modern Technologies in the Development of Agriculture and Water Economy

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Abstract: Currently, information and communication technologies occupy an important place in the development of agricultural production. The introduction of these technologies not only improves the quality of agricultural products, but also has a positive effect on the increase in the export of food and other agricultural products. Analysis and processing of a large amount of data using existing agricultural digital technologies, aggregation of various information on one platform, control and reduction of production risks, and education of a large number of agricultural entities with the necessary information can be provided. This article provides for efficient use of land resources, use of new innovative techniques and technologies in agriculture.

Keywords: agriculture, digital technologies, smart agriculture, innovation.

Today, our independent Uzbekistan is taking bold steps in every field. We are reaching great heights in every field. The development of the economy, education, technology, medicine, tourism, agriculture and many other areas, additional measures, decisions and decrees are being adopted in order to achieve higher achievements in these areas. is another big step. An example of this is the work carried out under the leadership of the President of our country, Shavkat Miromonovich Mirziyoyev. In particular, the fact that 2020 has been declared the year of the development of science and digital economy shows how urgent the education system is and how to further develop and improve techniques and technologies based on the needs of the times, to further increase the potential of young personnel based on the age of technology, and creating favorable opportunities for achieving new achievements in the future is the need of the hour. It is one of the primary issues in the modern world to study the experience of developed countries, their knowledge potential, develop new ideas and implement them in the hands of the country's youth on this basis.

Agriculture plays an important role in ensuring food security and achieving sustainable development in the world, and the stability of this industry largely depends on the introduction of information and communication technologies. With the help of digital technologies, it is expected to achieve sustainable development of the society and the state in the social and economic spheres. According to the available literature, it is possible to meet more than 90% of the demand for the production of agricultural products by 2050 due to the introduction of an innovative agricultural system in agriculture. Digital agriculture can be defined as the application of digital technologies in agricultural value chains. In the agricultural system, digital technologies such as the Internet of Things, sensors, drones, robotics, cloud computing, blockchain, artificial intelligence, decision support software are used to optimize agricultural production processes, value chains, agricultural It is used in communication systems and control systems. In general, digital agriculture is seen as a promising field to ensure food security for the ever-increasing world population. Digital technologies not only increase productivity in agriculture, but also have many useful aspects in finding solutions to environmental and social problems. For example, digital agriculture plays an important role in solving the problem of huge demand for scarce resources, ensuring food security, as well as fighting climate change.

DISCUSSION

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According to forecasts, the irrigated land area may decrease by 20-25% in the next 30 years. Inadequate security of land use rights hinders the improvement of farm management efficiency and limits the attraction of investments. Currently, clear and transparent mechanisms for the distribution of land plots and the protection of the rights of land users have not been fully created. Also, the lack of provision for secondary lease of land plots prevents the transfer of agricultural land to relatively potential land users. About 80 percent of the country's water resources are formed at the expense of transboundary water bodies. This situation determines the importance of regional cooperation for sustainable management of water resources in Central Asia, especially in the Republic of Uzbekistan. In the country, 70 percent of irrigation networks do not have anti-filtration coating, as a result, part of the water is lost in the process of delivering it to the fields. Most of the existing irrigation infrastructure, pumping stations are in use for more than 30-40 years and need reconstruction or capital repair. Currently, only 1.7% of irrigated land is drip-irrigated. The situation is likely to be further complicated by the continued use of traditional irrigation methods due to agriculture's high dependence on irrigation, and the dramatic increase in droughts as a result of climate change. According to the forecast of the World Resources Institute, by 2040, Uzbekistan will become one of the 33 countries with the highest water shortage. The reduction in productivity has serious negative consequences for food security and the balance of payments, which creates the need for sustainable management of water resources and the use of resource-efficient technologies in the cultivation of agricultural crops. According to the initiatives of the President of the Republic of Uzbekistan Mirziyoyev Shavkat Miromonovich, the following activities will be carried out over the years in order to accelerate the integration of science and practice in the effective use of land and water resources. Scientific research aimed at increasing soil fertility, preventing soil erosion and degradation will be accelerated. Effective mechanisms for stimulating the participation of the private sector and the public-private partnership mechanism in conducting scientific research in the field of agriculture, developing and introducing innovative developments are widely introduced. Scientific-practical activities and cooperation on localization of high-yielding varieties of agricultural crops and productive breeds and types of livestock of foreign countries will be systematically organized. The training of highly qualified scientific staff with a scientific degree will be expanded through doctoral studies and basic doctoral studies in the field, and all conditions will be created for them to conduct scientific research on problematic and urgent topics. As a result of scientific research, the introduction of the "Smart and digital agriculture" technology, the localization of its technical means and technological equipment in production will be achieved.

Agriculture is an important component of the national economy of Uzbekistan, it employs 33.2% of the workforce and accounts for 28.7% of the GDP. In addition, about 26% of the rural population work in agriculture, and this is very important for Uzbekistan, where 49% of citizens live in rural areas. The main agricultural crops are cotton, wheat, potatoes, fruits and vegetables. However, in recent years, the effects of climate change, water scarcity, increasing crop diseases and other agricultural problems have seriously threatened agricultural productivity and significantly reduced farmers' incomes. Therefore, the need to introduce digital technologies is really urgent. As a result of the penetration of the mobile network and the increase in the use of smartphones in Uzbekistan, the flow of information has increased and the costs of telecommunications have decreased. As a result, new ways of developing digital technologies are expanding. According to Statista.com, the number of mobile subscriptions per 100 inhabitants in Uzbekistan increased from 101.2 in 2019 to 117 in 2022 and is projected to reach 131.8 in 2025, while the rate of internet access is 60 in 2020. It increased from 5 percent to 64.5 percent in 2022. It is predicted to increase to 67.7% in 2025. In Uzbekistan, the use of mobile phones in the provision of various services and delivery of information in banking, energy and agrotechnics is growing rapidly. Based on these data, it can be concluded that Uzbekistan has a great potential for digitalization of agriculture and the entire economy.

Summary. Digital transformation is changing all aspects of the economy and resulting in new business initiatives such as new business models, new products and services. This has affected the operation and management of business processes in all industries. Undoubtedly, the advantages of using digital technologies are known to everyone, and mainly Big Data, Internet of Things, artificial intelligence,

blockchain drones, GPS, and information-advisory mobile applications are widely used. Improved forms of agribusiness supported by digital technologies made it possible to perform agricultural tasks faster and easier, save time and money, increase flexibility and efficiency in production processes. This is an important reason to explore new, advanced possibilities of digital technologies. Of course, there are many advantages of introducing digital agriculture in Uzbekistan, which can be used to rationally use scarce resources, increase labor productivity, and increase crop productivity. Attract funds and grants from international financial institutions for the introduction of "smart and digital agriculture" technology; Based on the tasks of introducing "smart and digital agriculture" technologies, the training of specialist personnel will be started in higher educational institutions in the field of agriculture. Strengthening the material and technical base of scientific research institutes, modernizing scientific laboratories, providing and repairing modern equipment. Taking into account the irrigation zones and the water supply of the region, recommendations on improving the irrigation techniques and technologies of agricultural crops will be developed. Unconventional irrigation technologies will be developed and implemented based on the study of world practice. A system of giving incentives to producers of agricultural goods will be created for the introduction of technology to improve the melioration condition, productivity and water supply of abandoned irrigated and reclaimed forest land.

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