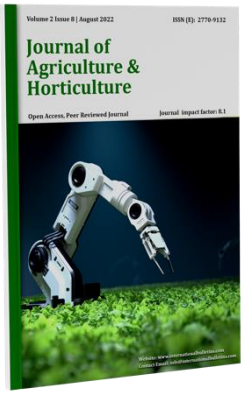

PROSPECTS FOR THE DEVELOPMENT OF LIVESTOCK BREEDING IN THE CONTEXT OF THE FORMATION OF SMART AGRICULTURE

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https://doi.org/10.5281/zenodo.17213750

Annotatsiya. Based on the experience of foreign countries in the formation of smart agriculture in the field of livestock farming, the article presents a classification of factors influencing the formation of the global market for smart agriculture, the formation of smart livestock farming and increasing efficiency. milk production, their impact was assessed based on quantitative methods, the prospects for the development of livestock farming in the context of the formation of intelligent farming are substantiated and conclusions are drawn on the development of proposals and recommendations to improve the efficiency of the industry.

Key words: Smart agriculture, livestock farming, efficiency, market segment, intensive, extensive, digitalization. global smart agriculture.

Introduction: In the construction of New Uzbekistan, special attention is paid to issues such as intensive development of agriculture on a scientific basis, increasing and protecting soil fertility, improving the system of providing quality agricultural services, and digitizing agriculture. Goal 32 of the Development Strategy of New Uzbekistan for 2022-2026 sets out tasks such as increasing the volume of livestock production by 1.5-2 times and strengthening the feed base. In this regard, it is advisable to organize large-scale research on the areas of effective development of the sector and the forecast parameters of product production, as well as the widespread use of digital technologies in the effective management of the sector.

Decree of the President of the Republic of Uzbekistan No. PF-60 dated January 28, 2022 “On the Development Strategy of New Uzbekistan for 2022-2026”, Resolutions No. PQ-237 dated June 7, 2022 “On additional measures to effectively organize the implementation of the tasks set in the Strategy for the Development of Agriculture of the Republic of Uzbekistan for 2020-2030”, Resolutions No. PQ-4776 dated July 3, 2020 “On additional measures for the accelerated development of livestock sectors in the Republic of Karakalpakstan”, Resolutions No. PQ-121 dated February 8, 2022 “On measures to further develop livestock farming and strengthen the livestock feed base” and other relevant decisions in the field This research work serves to a certain extent in implementing the tasks set out in regulatory legal documents.

Literature analysis and methodology: The formation of smart agriculture and the development of livestock farming are covered in the scientific works and works of various foreign scientists Alessandro Scandurra, Chiara Ruffino, William Fillipe Rocha da Silva, Giulia Antonucci, Alessandro Castiello D'Antonio, Stefano Picchio, Morena Pietraccini, Angelo Marguglio, Emiliano Coraretti, H. Bruggeman, M. Danse, P.G.H. Engel[2], and others.

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In the Republic of Uzbekistan, the scientific works of scientists such as S.S. Gulyomov, T.Kh. Farmonov, U.P. Umurzakov, J.K. Saukhanov, O. Murtazayev, Q. Choriev, B. Berkinov, I.S. Abdullaev, B.R. Ruzmetov, N.N. Turayeva, M.O. Yadgorova, O.E. Khudaiberdiev, B.S. Ilashov, K. Ubaydullaev[1] on the development of smart agriculture and livestock farming have studied the concepts of smart agriculture and its elements, livestock farming and its development, and the conditions for their formation.

Results: Currently, the use of digital technologies is rapidly developing in almost all areas of human activity on a global scale. Agriculture is no exception. Therefore, in our country, in recent years, special importance has been attached to the development of the digital economy in the network. According to analyzes, during the production season of agricultural products (in short periods), more than 40 different organizational decisions have to be made. Most of them are considered objects of digitalization and affect production efficiency. According to calculations, 33 percent of the crop is lost during planting, cultivation, storage and transportation. In such conditions, smart agricultural technologies that ensure the rational use of available land, water, material and technical and labor resources are of great importance.

On this basis, proposals were developed for the formation of smart agriculture in the Republic of Karakalpakstan.We have developed our own definition of the concept of smart agriculture. According to him, Smart Agriculture or Agriculture 4.0 is the process of automatically analyzing agricultural production processes using digital technologies, managing resource use using agro-industrial robots and drone technologies through wireless communication networks, and reducing human intervention in agriculture. refers to a unified system that reduces labor workload, increases productivity, optimizes the use of chemicals in soil and crops, and improves the quality of agricultural products and reduces production costs.

The importance of establishing smart agriculture for farms is very high, where, based on systems supporting the Internet of things and cloud technologies, consisting of wireless sensor communication networks, farmers can remotely connect to their farms regardless of location and time to monitor and control their farm activities.

Smart agriculture should and is equipped with drone technologies, automated data analytics solutions, Internet of Things and cloud technologies, software, agricultural network robots and wireless sensor networks. Drones equipped with high-resolution hyperspectral cameras can be used to collect data from various sources in agricultural fields, and agricultural network robots can be used to perform repetitive tasks on farms. Computer applications can be used to analyze the collected data and assist in the decision-making process. Smart agriculture in the livestock sector means using more efficient and sustainable methods of management. These practices have been adopted and implemented by many (foreign) countries around the world. Experiences with them were reviewed during the research.

Furthermore, the “Smart Farming Market” is expected to grow to $9.5 billion over the next few years, growing by more than 15 percent in Asia and 11 percent in North America by 2025. The South American market, which is worth more than $600 million, is expected to grow by more than 10 percent in Argentina, Mexico, and Brazil. New technologies and smart agriculture are also benefiting Africa, which has more than a quarter of the world's arable

land and accounts for 15 percent of its gross agricultural product. The continent's agricultural output is worth about $100 billion a year.

For example, Ethiopia, Kenya, and Rwanda are adopting technological tools that innovate agricultural practices to address and prevent challenges arising from climate change and population growth."[4] The global smart agriculture market was valued at $15.06 billion in 2022 and is expected to reach $33.0 billion in 2027, after a CAGR of 16.99% between 2022 and 2027.

The growth of the global smart agriculture market is expected to be driven by the increasing use of information technology and artificial intelligence, the digitization of agricultural operations, and the increasing reliance on advanced technologies to increase production worldwide[5].

In our opinion, the categorization of the global smart agriculture market segmentation looks like this:

Segment 1 - By Technology Use: Advanced Agriculture, Livestock Monitoring and Management, Aquaculture, etc.;

Segment 2 - By Product Type: Technologies - Equipment, Software;

Segment 3 - By Region:

- North America - US, Canada, and Mexico;
- Europe - Germany, France, Italy, Spain, Netherlands, Greece, Ukraine, Belgium, Switzerland, and Rest of Europe;
- China;
- United Kingdom;
- Asia-Pacific - India, Japan, Australia, and New Zealand, Thailand, South Korea, and Rest of Asia-Pacific;
- Middle East and Africa - Israel, South Africa, Turkey, and Middle East and Rest of Africa;
- South America - Brazil, Rest of South America.

North America dominated the smart agriculture market in 2021 and is expected to maintain its dominance during the forecast period. The growth in the market is mainly attributed to the increase in research and development and the widespread adoption of digital technologies.

The Common Agricultural Policy (CAP) represents a set of rules that have been accumulated since the formation of the European Union and recognizes the crucial role of the agricultural sector for the fair and sustainable development of its member states.

The CAP aims to help farmers produce enough food for Europe, guaranteeing its safety and quality at affordable prices. It aims to ensure a fair standard of living for all, and to protect against excessive price volatility, market crises and imbalances in the food supply chain. Therefore, it is essential to invest in the modernisation of farms in order to ensure the well-being of agriculture in the EU and to create and support jobs in the food industry. At the same time, it is intended to protect the environment, animal welfare and biodiversity, and mitigate climate change through the sustainable use of natural resources.

It was observed that the value of livestock products in Karakalpakstan in constant prices amounted to 422.3 - 940.4 billion soums in 2010-2022, and the share of the territory increased from 3.3% to 4.0%. It can be assessed that in the future, opportunities for further development of this sector can be found in the republic.

Looking at the growth rates in livestock farming, the Republic of Karakalpakstan had a growth rate of 108.4% in 2010 and 104.0% in 2022, which showed that the growth rates in

livestock farming were higher. Based on this, if livestock farming is organized in the region in innovative ways and with the formation of smart agriculture, even better results can be obtained in the future.

In the Republic of Karakalpakstan, an increase in the number of all types of livestock was observed in 2010-2022, including an increase in the number of cattle by 473.5 thousand or 1.7 times.

Conclusion. The value of livestock products in Karakalpakstan in constant prices for 2010-2022 was 422.3 - 940.4 billion soums, and the share of the territory increased from 3.3 to 4.0 percent. Thus, if the opportunities for the development of livestock farming in Karakalpakstan compared to other sectors of agriculture are traditionally being used, then in the future the republic has opportunities for further development of this sector. The volume and value of livestock production in the republic are increasing.

If we study the growth rate in livestock farming, it is shown that in 2010 it was 108.4 percent, and in 2022 it was 104.0 percent, which shows that the growth rates are higher. Based on this, if livestock farming is organized in innovative ways in the future, with the formation of smart agriculture, it means that even better results can be obtained in the future. It can be observed that sheep and goat meat grown in the vast pastures and boundless steppes typical of Karakalpakstan has increased by more than 3 times, and poultry meat production has increased by almost 4 times.

In the next five years, the number of cattle in the region will experience positive growth, but the growth rate will have a decreasing trend. That is, if in 2024 it will increase by 4.2 percent compared to the previous year, in 2025 it will increase to 4.6 percent, but in subsequent years it will have a decreasing trend, and in 2028 it will be 2.5 percent. The average growth rate will be 3.7 percent. As a result, in 2028 the number of cattle will reach 1,481,281 units. The volume of output per head of cattle will increase from 784.5 thousand soums to 818.6 thousand soums during the forecast period. All these values are real values, expressed in 2010 prices. If we pay attention to the growth rate, it will reach 1.9 percent by 2028, indicating that the share of intensive growth in the growth rate in the sector will increase. The implementation of the developed scientific, theoretical and practical proposals and recommendations will contribute to the implementation of the tasks set out in the "Uzbekistan-2030" development strategy and increase the share of livestock breeding in the agricultural output of the Republic of Karakalpakstan.

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