ISSN 2181-9408

Scientific and technical journal



Sustainable Agriculture



№4(24).2024







Chief Editor

Salohiddinov Abdulkhakim

Vice-rector for international cooperation

Professor at "Tashkent Institute of Irrigation and Agricultural Mechanization Engineers"

National Research University, Doctor of technical sciences

Scientific Editor

Yunusov Iskandar

PhD, "Tashkent Institute of Irrigation and Agricultural Mechanization Engineers"

National Research University

Editor

Hodjaev Saidakram

Associate professor at "Tashkent Institute of Irrigation and Agricultural Mechanization Engineers"

National Research University, Doctor of technical sciences

Candidate of technical sciences

EDITORIAL TEAM:

SH.Khamraev, PhD, minister, Ministry of the Water Resources of the Republic of Uzbekistan; **H.Ishanov,** PhD, chief specialist, Cabinet Ministers of the Republic of Uzbekistan; **Dr.Prof.B.Mirzayev,** Rector of "TIIAME" NRU; **Dr.Prof.T.Sultanov,** Vice-rector for research and innovations, "TIIAME" NRU; **Dr.Prof.M.Khamidov,** "TIIAME" NRU; **Dr.Prof. A.Pulatov,** PhD, associate professor, "TIIAME" NRU; **B.Pulatov,** PhD, "TIIAME" NRU; **G.Bekmirzaev,** PhD,"TIIAME"NRU; **M.Amonov,** PhD, associate professor,"TIIAME" NRU; **Sh.Khasanov,** PhD, associate professor, "TIIAME" NRU; **M.Tursunov,** PhD, "TIIAME" NRU; **B.Sultanov,** PhD, "TIIAME" NRU; **Dr.Prof.N.Khushmatov,** Chief Scientific Secretary of the Agricultural and Food Supply Production Center; **Sh.Murodov,** PhD, "TIIAME" NRU; **Dr.Prof. O.Tursunov,** "TIIAME" NRU; **M.Juliev,** PhD, "TIIAME" NRU; **Dr.Prof. A.Karimov,** "TIIAME" NRU.

EDITORIAL COUNCIL:

Dr.Prof.N.Vatin, Peter the Great St. Petersburg Polytechnic University, (Russia); **Dr.Prof.Y.Ivanov,** Russian State Agrarian University - Moscow Timiryazev Agricultural Academy, executive director of Engineering and Land Reclamation named after A.N. Kostyakov, (Russia); **Dr.Prof.D.Kozlov,** Moscow State University of Civil Engineering – Head of the Department Hydraulics and Hydraulic Engineering Construction of the Institute of Hydraulic Engineering and Hydropower Engineering, (Russia); **D.Ziganshina,** PhD, Scientific Information Center of Interstate Commission for Water Coordination in Central Asia; **J.Lubos,** associate professor at "Department of Water Recourses and Environmental Engineering" of Slovak University of Agriculture in Nitra, (Slovak); **Acad.Dr.Prof.P.Kovalenko,** National Academy of Agricultural Sciences of Ukraine, Advisor to the Director of the Research Institute of Melioration and Water Resources, (Ukraine); **Prof.N.Xanov,** Head of the Department of Hydraulic Structures RSAU – MAA named after K.A.Timiryazev, (Russia); **Krishna Chandra Prasad Sah,** PhD, M.E., B.E. (Civil Engineering), M.A. (Sociology) Irrigation and Water Resources Specialist. Director: Chandra Engineering Consultants, Mills Area, (Janakpur, Nepal); **Dr.Prof.A.Ainabekov,** Department Mechanics and mechanical engineering, South Kazakhstan State University named after M.Auezov, (Kazakhstan); **Acad.Dr.Prof.T.Espolov,** National academy of sciences of Kazakhstan, Vice-President of NAS RK, (Kazakhstan); **I.Abdullaev,** PhD, the Regional Environmental Center for Central Asia, Executive Director; **Sh.Rakhmatullaev,** PhD, Water Management Specialist at World Bank Group; **A.Hamidov,** PhD, Leibniz Centre for Agricultural Landscape Research|ZALF, (Germany); **A.Hamidov,** PhD, Leibniz Centre for Agricultural Landscape Research|ZALF, (Germany). **A.Gafurov,** PhD, Research scientist at the department of hydrology, GFZ Potsdam (Germany). **Dr,Prof. Martin Petrick,** Justus-Liebig-Universität Gießen JLU Institute of Agricultural Policy and Market Research; **Eldiiar Duulatov,** PhD, Research Fellow, Institute of Geology, National Academy of Sciences, Kyrgyzstan; **Gisela Domej,** University of Milan-Bikokka Professor of Earth and Environmental Sciences, Italy; **Moldamuratov Jangazy Nurjanovich,** PhD, Taraz Regional University named after M.Kh. Dulati, Head of the Department of "Materials Production and Construction", Associate Professor, Kazakhstan; **Muminov Abulkosim Omankulovich,** Candidate of Geographical Sciences, Senior Lecturer, Department of Meteorology and Climatology, Faculty of Physics, National University of Tajikistan. Tajikistan; **Mirzoxonova Sitora Oltiboevna,** Candidate of Technical Sciences, Senior Lecturer, Department of Meteorology and Climatology, Faculty of Physics. National University of Tajikistan. Tajikistan; **Ismail Mondial,** Professor of Foreign Doctoral Faculty, University of Calcutta, India; **Isanova Gulnura Tolegenovna,** PhD, Associate Professor of Soil Ecology, Research Institute of Soil Science and Agrochemistry named after UUUspanov, Leading Researcher, Kazakhstan; **Komissarov Mixail,** PhD, Ufa Institute of Biology, Senior Research Fellow, Soil Science Laboratory, Russia; **Ayad M. Fadxil Al-Quraishi,** PhD, Tishk International University, Faculty of Engineering, Professor of Civil Engineering, Iraq; **Undrakh-Od Baatar,** Head of the Central Asian Soil Science Society, Professor, Mongolia; **N.Djanibekov,** Dr, External Environment for Agriculture and Policy Analysis (Agricultural Policy), Leibniz Institute of Agricultural Development in Transition Economies (IAMO) Theodor-Lieser-Str. 2 06120 Halle (Saale) Germany; **A.Karimov,** Dr, Head of the ICBA Regional representative office for Central Asia and South Caucasus.;

Designer: Kodir Nosurullaev.

Note: Only the authors of the article are responsible for the content and materials of the article. The editorial board does not respond to the content of the article!

Founder: Tashkent Institute of Irrigation and Agricultural Mechanization Engineers

Our address: 39, Kari-Niyaziy str., Tashkent 100000 Uzbekistan , www.sa.tiiame.uz, www.susagr.uz

The journal "Sustainable Agriculture" is registered in the Press Agency of Uzbekistan on the 12th of February in 2018 (license № 0957).

In 2019, the journal is included in the list of recommended scientific publications by the Higher Attestation Commission of the Republic of Uzbekistan.

ECONOMY. ECONOMIC SCIENCE. OTHER BRANCHES OF THE ECONOMY.

Sh.A.Mirzaev, F.T.Egamberdiev
Islamic finance and digital economy: New horizons for sustainable agricultural development.....5

Z.S.Shokhojaeva, U.R.Sangirova
Modernization of agriculture in the transition to a digital economy.....9

I.O.Yunusov
Directions of state support for food supply of fish farms.....12

Sh.K.Narbaev, A.A.Akhmadaliev
Issues of technical and technological modernization of land management.....15

Sh.Mirzaev, A.Akhmedov, M.Mirmahmudov
Islamic Finance Operations for Achieving Environmental Sustainability.....18

A.M.Maksumkhanova
Ensuring employment of rural population: problems and solutions.....22

G.D.Dusmuratov
Foreign experience of public-private partnership in water management.....26

M.M.Yakhyaev
Dynamics of changes in the volume of meat production in pasture livestock farming Kashkadarya region in the example.....30

A.Suvanov
Trends and growth in agricultural production from dekhkan and subsidiary farms in Uzbekistan.....32

A.Estekov
Agribusiness and areas of its support.....34

Sh.A.Mirzaev, A.Abbosjonov
Islamic Finance: examples of key instruments and their features.....36

M.Kholikulov
Methodology for calculating the effectiveness of investments in the fruit and vegetables sector.40

D.R.Mukhtarova
Theoretical bases of organizational and economic foundations of floral production.....43

N.Makhmudova
Improvement of methods of accounting intangible assets.....47

U.A.Nurmanov
The importance of economic analysis of the impact of monetary funding on sustainable development.....49

ENVIRONMENTAL PROTECTION. WATER MANAGEMENT, HYDROLOGY.

Z.S.Bobomuradov, Z.R.Boboqulov, J.B.Fayzmurodov, J.I.Sakiboyev
The effect of different planting dates and schemes on the growth and grain yield of maize hybrids.....51

HIGHER EDUCATION. PEDAGOGY.

D.I.Mukumova, Z.I.Temirova
Impact of increased environmental anxiety on the youth of Uzbekistan.....53

D.I.Mukumova, Z.I.Temirova
The role of socio-psychological factors in the formation of the image of a modern pedagogue.....56

POWER ENGINEERING, ELECTRICAL ENGINEERING, AUTOMATICS. COMPUTING TECHNOLOGY.

A.J.Parpieva, B.N.Rakhimov, N.A.Makhmudov, K.A.Shavazov
Mathematical solution of problems of distribution of fuel products in extreme conditions...62

A.M.Plakhtiev, G.A.Gaziev, Akbarova, O.Ch.Donierov
Efficient Continuous High-Current Transducers.....66

S.Sh.Aripov
Definition and importance of natural gas in the energy sector.....69

DYNAMICS OF CHANGES IN THE VOLUME OF MEAT PRODUCTION IN PASTURE LIVESTOCK FARMING IN CASE OF KHASHKADARYA REGION

M.M.Yakhyaev - PhD, «Tashkent Institute of Irrigation and Agricultural Mechanization Engineers» National Research University

Abstract

This article expects that meat production in the Kashkadarya region will increase by 108.3% in 2026 compared to 2022. This is due to the growing demand of the population for meat and meat products, and proposals for the development of food supply based on an analysis of its effectiveness are prepared.

Keywords: *cattle breeding, selection, livestock clusters, model, factors, forecasting, pasture systems, wool, leather, pasture forage base, pasture cattle breeding.*

Introduction. As organizational directions of development of pasture livestock farming it covers such directions as creation of modern forms of management of pasture livestock farming, organization of modern service system, introduction of modern methods of management of scientific breeding farms, development of private breeding farms. entrepreneurship, as economic directions of support of cultivation of livestock products using pastures, development and introduction of mechanisms of stimulation of increase of productivity of pastures, taxes, it is desirable to include such current directions as creation of effective system of insurance, crediting and subsidizing, introduction of customs privileges in export-import practice.

It is known that the influence of state incentives is not always effective in service markets where there is demand for pastures, but supply is not formed. In such conditions, the state must take responsibility for organizational issues. Thus, based on the geographical location of pastures in our republic, the type of pastures and breed of cattle, as well as the state of pastures, in 2026, an increase in meat production in the Kashkadarya region is expected by 108.3% compared to the same period in 2026. 2022. The reason for this can be explained by the growth in population demand for meat and meat products and the widespread implementation of measures to further improve food supply.

Table 1.

Dynamics of changes in meat production volumes and forecast values for 2023-2026. Kashkadarya region in 2013-2022.

Years	Meat production volume, thousand tons	Livestock population, thousand heads	Amount of precipitation, mm	A thousand hectares of degraded pastures in the region	Average annual temperature C°.
	You	x_1	x_2	x_3	x_4
2013	231.5	4171.4	255	218.13	15.4
2014	269.45	4874.6	197	233.41	13.8
2015	271.8	5342.7	185	244.5	15.5
2016	274.6	5553.6	178	229.64	15.8
2017	281.9	4486.1	161	218.85	15
2018	2 8 7.6	4543.2	136	208.9	14.9
2019	2 9 4.7	4614.2	142	195.21	15.8
2020	2 97.3	4726.9	165	187.6	14.6
2021	310.8	4893.3	186	178.6	15.7
2022	318.14	6545.12	218	167.4	15.8
2023*	***330.29***	***7200,15***	***143.69***	***135.95***	***15.91***
2024*	***335.09***	***7352,45***	***140.18***	***129.38***	***15.97***
2025*	***339.88***	***7504,75***	***136.67***	***122.81***	***16.04***
2026*	***344.68***	***7657.05***	***133.16***	***116.24***	***16.1***

It is based on information from the Department of Agriculture of the Kashkadarya Region.

Note: (*) – forecast values for these years.

The results of the forecast show that if we analyze the livestock population in the region, if in 2022 it averaged 6545.12 thousand, then by 2026 this figure may reach 7657.05 thousand or increase by 1.17 times compared to 2022. possible The main reason for this is the development of agriculture in the region, especially the livestock industry, as well as the high demand of the population for livestock products. Therefore, there may be an objective need to establish cooperative relations and further develop the cluster system.

In addition, it is advisable to focus the greatest attention in the region on improving the condition of pastures degraded to varying degrees, for this it is necessary to encourage the system of alternate use of pastures, and it is also advisable to take measures to prevent a decrease in pasture productivity. In this regard, according to the results of the model, it is expected that in the number of degraded pastures in the region will reach 116.24 thousand hectares, and compared to 2022, this figure may decrease by 51.16 thousand hectares.

In addition, the average annual rainfall in the region is expected to be 133.16 mm by 2026, which is certainly 84.8 mm less than the average for 2022, and this situation may lead to a decrease in pasture productivity due to the decrease in rainfall in the future. The average annual temperature in 2026 is expected to be 16.1 °C , which means it may increase by 101.9% compared to 2022.

In 2022, the number of small cattle in the region is 6,545.12 thousand heads, which is 1.57 times more than in 2013. It is expected that in 2023, compared to 2022, it will increase by 110.0%, and by 2026 - by 116.9%. In 2022, the volume of meat production increased by almost 1.4 times compared to 2013, and in 2026 it is expected to increase by 1.5 times (figure 1).

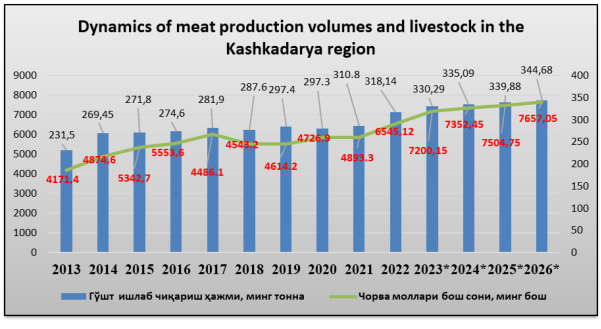


Figure 1. Volume of meat production in Kashkadarya region and changes in livestock numbers.

In Kashkadarya region, as in other regions, various consequences of global climate change are felt. For example, the average annual precipitation in the region in 2013 was 255 mm, and by 2022 this figure will be 218 mm or a decrease of 85.5 percent.

It is expected that by 2026 this indicator may again have a downward trend, that is, reach 133.6 mm, or a decrease of 61.3% compared to 2022. This, of course, can have a negative impact on agriculture, including pasture livestock farming. Therefore, based on foreign experience, the development of desert-pasture crop production; prevention of pasture degradation; conservation of meadow biodiversity; prevention of sand and dust storms and fires on desert pastures; Maintaining water balance in pastures is important in the development of pasture livestock farming.

Conclusions. Development Directions for Pasture Livestock Farming:

1. Significant progress can be achieved through the establishment of modern management systems, service mechanisms, and private entrepreneurship in pasture livestock farming. Focused attention on scientific breeding farms and the development of private breeding farms can significantly enhance productivity and quality. Economic Incentives and Support:

The introduction of effective systems for insurance, crediting, and subsidies, along with customs privileges in export-import practices, can provide vital economic support. Mechanisms that stimulate pasture productivity, such as taxation incentives, should be further developed to sustain livestock farming in degraded areas. Impact of State Incentives:

In situations where the demand for pasture services outpaces supply, state-organized measures play a critical role in ensuring balanced development. Cooperative and cluster systems can address systemic organizational challenges, especially in high-demand regions such as Kashkadarya. Forecasted Growth in Livestock and Meat Production:

By 2026, meat production in the Kashkadarya region is forecasted to grow by 108.3% compared to 2022, driven by population demand and agricultural development. The livestock population is projected to increase by 17% by 2026, emphasizing the need for robust infrastructure and sustainable practices. Climate Challenges and Pasture Degradation:

Climate change is adversely affecting pasture livestock farming, with significant reductions in annual rainfall and increased temperatures impacting pasture productivity. Although efforts to restore degraded pastures are projected to reduce affected areas by 51.16 thousand hectares by 2026, ongoing measures are required to mitigate further damage. Long-Term Sustainability Measures:

Global climate change has created a pressing need to adopt sustainable practices such as desert-pasture crop production, prevention of biodiversity loss, and control of environmental risks like dust storms and pasture fires.

References:

1. Land Code of the Republic of Uzbekistan, https://lex.uz/acts/152653
2. State Statistics Committee, https://stat.uz/uz/
3. H. Steinfeld is Senior Officer (Programme, Policy and Planning) and J. Mäki-Hokkonen is Senior Officer (Livestock Systems), Animal Production and Health Division, FAO, Rome, Italy. http://www.fao.org/3/v8180t/v8180t0y.htm
4. Livestock industries. https://geographyofrussia.com/otrasli-zhivotnovodstva/
5. Kuchchiev Yu. Main directions of development of livestock service infrastructure. Tashkent - "Agro ilm" scientific supplement of the agricultural journal of Uzbekistan. - 2017. - No. 4. -B. 103-105
6. Information from the Republican Association Karakollik. www.qorako'l.uz
7. Information from the Cocoa and Livestock Development Committee.
8. Khushmatov N. Rakhimova G. Problems of coordination of development of livestock industry in market conditions / Economic information of Uzbekistan // Zh. - No. 12. -2008. -B.13-14
9. Nosirov Yu.N., Nosirov F.K., Nosirov T.Yu. Classical and modern methods of selection in animal husbandry. Stone. StoneDAU. RHIZOGRAPH. 2008.
10. Decree of the President of the Republic of Uzbekistan dated September 2, 2020 No. PF-6059 "On measures for the further development of cocoon farming and cattle breeding in the Republic of Uzbekistan"
11. Resolution of the President of the Republic of Uzbekistan PQ-4420 of August 16, 2019 "On measures for the comprehensive development of the pirate network"
12. No. PF-4947 of the President of the Republic of Uzbekistan dated February 7, 2017 "Strategy of Actions for the Further Development of the Republic of Uzbekistan"
13. Yusupov S. Yu., Mukimov T. Kh. I am a doctor. Recommendations for the management of pasture livestock farming, Tashkent, 2007 – 24 p.
14. Sayed Nasrat. Afghanistan Carpet Industry: Problems and Challenges. Economic Alternatives, Issue 4, 2016
15. Mukimov T., Rabbimov A., Bobokulov N., Radjabov T., Recommendations for rational use of pastures and their improvement. Tashkent 2017. – P. 8-16. 62
16. Ashirov M.E., Abduvasikov A.A., Nazarkulov U., Ballasov U.Sh. Wildlife of the desert. Monograph. Tashkent 2012. – pp. 20-37.