

ISSN 2181-9408

Scientific and
technical journal

Sustainable Agriculture

Nº3(19).2023



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:

S.Umurzakov, PhD, Deputy Prime-Minister for Investments and Foreign Economic Affairs - Minister of Investments and Foreign Trade of the Republic of Uzbekistan; **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 "TIAME" NRU; **Dr.Prof.T.Sultanov**, Vice-rector for research and innovations, "TIAME" NRU; **Dr.Prof.M.Khamidov**, "TIAME" NRU; **Dr.Prof. A.Pulatov**, PhD, associate professor, "TIAME" NRU; **B.Pulatov**, PhD, "TIAME" NRU; **G.Bekmirzaev**, PhD, "TIAME" NRU; **M.Amonov**, PhD, associate professor, "TIAME" NRU; **Sh.Khasanov**, PhD, associate professor, "TIAME" NRU; **M.Tursunov**, PhD, "TIAME" NRU; **B.Sultanov**, PhD, "TIAME" NRU; **Dr.Prof.N.Khushmatov**, Chief Scientific Secretary of the Agricultural and Food Supply Production Center; **Sh.Murodov**, PhD, "TIAME" NRU; **Dr.Prof. O.Tursunov**, "TIAME" NRU; **M.Juliev**, PhD, "TIAME" NRU; **Dr.Prof. A.Karimov**, "TIAME" 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; **Eldiir Duulatov**, PhD, Research Fellow, Institute of Geology, National Academy of Sciences, Kyrgyzstan; **Gisela Domej**, University of Milan-Bicokka 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 Sitara Olitboevna**, 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 UUSpanov, 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: Dilmurod Akbarov.

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-Niyazi str., Tashkent 100000 Uzbekistan, [www. sa.tiame.uz](http://www.sa.tiame.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.



POWER ENGINEERING, ELECTRICAL ENGINEERING, AUTOMATICS. COMPUTING TECHNOLOGY.

<i>R.Yunusov</i> Increasing traction and energy indicators by simulation of operation modes and electromagnetic circuits of a linear asynchronous motor.....	5
<i>Ubaydullaeva Sh.R.</i> Graph models and algorithm for studying the dynamics of a linear stationary system with variable delay.....	8
<i>P.I. Kalandarov, A.A.Mutalov</i> Comparative analysis of moisture measurement of bulk granular materials.....	13

ENVIRONMENTAL PROTECTION. WATER MANAGEMENT, HYDROLOGY

<i>A.Khojiev</i> The effect of changes in the groundwater level and mineralization on the yield of autumn wheat	18
---	-----------

HIGHER EDUCATION. PEDAGOGY.

<i>D.Mukumova, Z.Temirova, M.Abdurakhimova</i> Improvement of pedagogical conditions for increasing the creativity of students of professional education.....	20
<i>O.A. Kim</i> Linguistic and cultural competence as necessary component of mastering Korean language.....	23
<i>S.R. Men</i> Culturological approach as a basis for the formation of foreign language culture in the process of teaching Korean language.....	25
<i>Sh.Ubaydullaeva, Z.Gulyamova, G. Tadjiyeva, N.Kadirova, D.Subanova</i> The role of interactive educational materials in the process of digitalization of education in Uzbekistan.....	28

ECONOMY. ECONOMIC SCIENCE. OTHER BRANCHES OF THE ECONOMY.

<i>S.Umarov</i> Main directions for assessing the effectiveness of innovative activities in poultry farming.....	32
<i>M.Kholikulov</i> Strategies for improving the marketing system in the agricultural sector of Uzbekistan.....	34
<i>M.Saidova, Z.Salomova</i> Organizational and economic problems of clusterization in agriculture.....	37
<i>I.Yunusov</i> Studying the concept and essence of the economic efficiency of fish production.....	39
<i>K.Nosurullaev</i> Current state and development directions of Agroinsurance relations.....	43
<i>Sh.Xodjimuxamedova, S.Arashova</i> International finance reporting standards in the republic of Uzbekistan.....	45
<i>A.Ashurov</i> Social and economic role of judicial land fund in Uzbekistan.....	47
<i>G.Tashxodjayeva, M.Saydamxojayeva</i> Growth and development of the tourism industry in Uzbekistan.....	50



<i>V. Akhmadaliyev</i> <i>The procedure for establishing livestock farms and allocating land to them.....</i>	<i>52</i>
<i>G.Dusmuratov</i> <i>Application of public-private partnership mechanisms in the construction of irrigation and melioration facilities.....</i>	<i>54</i>
<i>M.Yaxyayev</i> <i>Determination of forecast values for the volume of meat production in pastural animal husbandry.....</i>	<i>58</i>

ORGANIZATIONAL AND ECONOMIC PROBLEMS OF CLUSTERIZATION IN AGRICULTURE

M.Saidova - Associate Professor;

*Z.Salomova – PhD student, “Tashkent Institute of Irrigation and Agricultural Mechanization Engineers”
National Research University*

Abstract

The article analyzes the role and importance of cluster structures in the development of the agricultural sector and foreign experience in organizing their activities. The authors also assessed the organizational mechanisms of agro-clusters and their role in improving the efficiency of cluster performance. From a methodological point of view, the “face” of a cluster, its specialization and name are formed by the cluster core companies, and this is of fundamental importance. Companies that belong to one cluster core cannot access the core of another cluster, but can participate in another cluster at the second or third level of the cluster structure. As a result of the research, recommendations have been developed to improve the organizational and economic mechanisms of agro-clusters in Uzbekistan.

Keywords: Innovation economy, economic efficiency, cluster management, modernized technologies, food products, agro-cluster

Introduction. The place of agriculture in the world economy as the main food potential is very great. To achieve high innovation and competitiveness, digitalization of this industry is relevant. The agricultural reform of the Republic of Uzbekistan is aimed primarily at its integration with industry, which is based on clustering. For the first time, a proposal for cluster reform of agriculture in Uzbekistan was put forward by the President of the Republic of Uzbekistan Sh. Mirziyayev in 2017, during a visit to the Bukhara region, where the idea was stated: “the cotton industry has invested heavily in the industry, and now we need a guaranteed amount of raw materials for the textile industry. Businessmen in the textile industry can easily get involved in this” [1]. The correctness of the choice of the course of agricultural reform has been confirmed by time; if in 2017 there was one cluster operating in Uzbekistan, then in 2018 there were already 16 of them, and in 2019 - 77, in 2020 - 99, in 2021 - 122, and today Every day, 134 cotton and textile clusters operate in the republic on an area of 1,034 thousand hectares. [2]

Despite the above achievements, there are some disadvantages of the clustering process associated with contractual relations between its participants.

Materials and methods. Food and goods for human needs are essential for a healthy lifestyle for the entire population of the globe, and year after year the demand for them in the world market is steadily growing. This situation makes it necessary to develop the agricultural sector. There is not much experience in creating agricultural clusters in Uzbekistan, but there are already positive results from their activities.

In this regard, the introduction of a cluster system in the republic, especially in cotton, grain, horticultural production, as well as in other areas of agriculture, is of great importance. The system mainly consists of clusters of cotton growing areas.

A study of the activities of cotton-textile clusters for 2018-2022 showed a stable growth in their activities (Table 1).

Over the past five years, the volume of cotton production has increased almost 4 times, cotton yield per hectare has increased from 25.9 to 36.6 centners per hectare, and the number of employees in the industry has increased 3 times. There is also an increase in the export of cotton textile products by 2.8 times over the period under study.

Discussion. Along with the above positive results in the activities of clusters, there are a number of omissions that

need to be addressed. During the research conducted by the Ministry of Justice of the Republic of Uzbekistan in 2021 as part of the “Support for Farmers” campaign, errors were discovered in the concluded agreements between farmers and purchasing organizations, clusters and suppliers that owed farms over 180 billion soums. [4]

Also, over 156 thousand errors and shortcomings were identified in contractual relations between farmers and purchasing, supply and service organizations. The study found that in 565 cases a land lease agreement was not concluded with farmers, and in 794 cases a copy of this document was not provided to farmers, 34,861 cases where agreements between producers, service providers and farmers were concluded late. There were cases of untimely payments to farmers; over 24 thousand farms across the republic were not paid more than 180 billion soums of funds on a timely basis; in particular, cotton and textile clusters had debts to farmers of 39 billion soums. [4]

Our study of the results of the activities of cotton-textile classers showed that unforeseen losses incurred in 2022 amounted to 6 trillion soums, due to the identified difference between the domestic and world prices for cotton raw materials. The price set by the Ministry of Agriculture of the Republic of Uzbekistan in 2022 for medium-fiber raw cotton was 10,025 soums per 1 kg, while world prices were two times lower.

In this regard, the Government of Uzbekistan has taken a number of measures to expand state support for clusters:

- cluster debts on loans worth 3 trillion soums will be repaid for a period of 1.5 years;

- 50% of transportation costs for the delivery of cotton and artificial fiber will be covered;

- exempt from paying customs duties for a period of three years, expenses for raw materials and supplies;

The Decree of the President of the Republic of Uzbekistan “On additional measures to support the activities of cotton raw material producers” dated January 26, 2023 No. PP-23 was adopted. In accordance with it, starting from the 2023 harvest, every year until October 1, cotton-textile clusters enter into futures contracts with farms to grow raw cotton for the next year’s harvest.

Conclusions. World experience has shown that farming through clustering indicates the effectiveness of horizontal integration with the formation of network structures. Clustering ensures the sustainable development of agricultural production on the principles of self-development and improving the conditions for organizing and managing various forms of management.

Analysis of the activities of cotton-textile clusters

Performance indicators	Single change						In 2022 to 2018, %
		2018	2019	2020	2021	2022	
Cotton production volume	Billion soum	127,2	1436,3	3944,4	4693,7	4909,8	3,9 times
Cotton yield	quintal, hectare	25,9	26,9	29,0	35,2	36,6	141,3 %
Number of employees	person	452,1	567,3	843,9	1134,4	1506,5	3,3 times
Export	Million dollar USA	239,0	246,0	391,6	786,7	664,8	2,8 times
Import	Million dollar USA	148,5	259,5	258,8	246,0	285,3	192,3 %

Source: Initial indicators according to the Statistics Agency under the President of the Republic of Uzbekistan [3].

Developed countries of the world, such as Great Britain, Sweden, the Netherlands, Austria, Norway, the USA, Japan, have achieved innovative development of agriculture through clustering and achieved positive results. A study of the experience of these countries showed that innovation, the development of mutual assistance between cluster participants, the combination of cooperation with competition, the openness of the exchange of information, knowledge, know-how and patents are the key elements of clustering.

An important component and advantageous aspect of clustering is the improvement of relations between the enterprises and institutions that are part of it. It is effective

connections between partners that ensure further innovation and commercialization [3].

Using the example of Uzbekistan, one can see the purposefully pursued state policy of financial support for cluster associations, which will undoubtedly lead to an increase in the quality of life and employment of the rural population, an increase in the role of agriculture in the structure of the state, an increase in export potential and an increase in the level of competitiveness in the agricultural market.

Based on the above, the following is proposed:

- improving market mechanisms in the agricultural sector, reducing the methods of administrative management of farms by local authorities;
 - improving contractual relations and strengthening control over their compliance by the production participants themselves;
 - concluding contracts based on current market relations;
 - widespread introduction of digital management to increase the information content of cluster activities.
- Improving legal documents on the main tasks and activities of agricultural departments, the Council of farmers, dekhkan farms and owners of household lands of Uzbekistan.

References:

1. Djurabaev Otabek Djurabaevich Current state and level of development of productive forces of cotton-textile clusters // JMBM. 2023. No. 4.
2. Nazarov Anton Dmitrievich Clustering as an element of digitalization of agriculture // International Journal of Applied Sciences and Technologies "Integral". 2019. No. 3.
3. Korabaev Mukhtar Matmusaevich Cluster system in Uzbekistan: problems and solutions // JMBM. 2022. No. 6.
4. Internet resources:
5. <https://kun.uz/ru/>
6. <https://nuz.uz/ekonomika-i-finansy/1249380-uzbekskie-hlopkovyie-klasteryi-vpered-i-vverh.htm>
7. <https://stat.uz/ru/>
8. <https://www.gazeta.uz/ru/2021/08/25/farmers/>