

Study of modern solutions for improving land preparation works on agricultural land in Uzbekistan

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Abstract. The article critically evaluates the impact of recent reforms on agricultural lands and proposes contemporary solutions to enhance their efficient utilization. By analyzing the outcomes of these reforms, it identifies the practical challenges faced in land organization and management. The study underscores key issues, such as land fragmentation, soil degradation, and inefficient water usage, which impede optimal productivity. Through a comprehensive examination of current practices and innovative approaches, the article puts forth strategies for addressing these problems. These strategies encompass adopting advanced agricultural technologies, improved land management techniques, and sustainable farming practices. The proposed solutions aim to bolster land productivity, promote environmental sustainability, and ensure the long-term viability of agriculture. The article emphasizes the need for a coordinated effort among policymakers, farmers, and stakeholders to implement these solutions effectively. By fostering collaboration and knowledge exchange, the agricultural sector can surmount existing challenges and achieve a more sustainable and productive future. This research offers valuable insights into the ongoing discourse on agricultural land reforms and provides practical recommendations for their successful implementation.

1 Introduction

It is known that in agriculture, land is not only a spatial base and the main natural resource, but also the main means of production, and through its rational use, the efficiency of the network and the stability of the environment are achieved. Therefore, based on the digitalization of agriculture lies the task of creating "smart agriculture", which is achieved through the methods of "smart land construction"[1]. The rapid development of digitalization in the agricultural sector will be an impetus to bring the organization of the use of land resources, which is the main means of production in this sector, to a new level [2–4].

As a result, there is an increased focus on the implementation of an equal, transparent and market-based procedure for allocating land plots, strengthening property and legal relations

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related to land, protecting land, guaranteeing the property rights of land owners, and turning land into a market asset by determining its economic value [5].

2 Materials and methods

Preparation of the following analytical materials is required before the development of the project of land formation on the change of specialization:

Calculating the demand for agricultural products of the agrocluster and processing enterprises operating in this area, the amount of wheat purchased for state resources, the volume of providing the population with the main types of agricultural and food products in the autumn-spring seasons, and the actual production of agricultural products comparison with size [6,7].

Calculating the water demand of crops grown as a result of the change of specialization and comparing it with the water demand of the current crop type.

Designation (designation) of land plots for the placement (construction) of light construction infrastructure objects in the territory of other types of land not used for agriculture by land users should be carried out based on the following requirements and conditions [8–10]:

the presence of land plots that are not used for agriculture within the land areas leased to the land user for a long term;

absence of state cadastral facilities (gas, communication and energy facilities, roads and railways, natural and man-made high-risk areas, transport pipelines, reclamation and irrigation facilities, protected facilities and areas, etc.) on the land plot;

availability of access to the plot of land where infrastructure objects will be placed (built) without damaging irrigated lands [11–13];

that the infrastructure object does not conflict with the types of activities by the specialization of agricultural land use;

availability of conditions for maintaining the working conditions of irrigation and reclamation facilities and not damaging them.

The user of agricultural land must ensure compliance with the following requirements when placing (building) infrastructure facilities of light construction:

- referring to authorized organizations in issues related to the placement (construction) of light construction objects and connection to relevant energy and communication networks (architecture-planning task, development of project-estimate documents);

- not to harm agricultural lands, primarily irrigated lands;

- not to damage the existing irrigation and reclamation facilities, including compliance with the requirements of the water protection zone;

- compliance with fire protection, nature protection requirements, ecological, sanitary norms, rules and hygiene regulations;

- not to damage the land areas and property allocated to the owners, users, or tenants of other land plots;

- not to create inconveniences in the use of engineering-communication infrastructure facilities;

- observance of the right (servitude) to use another's land plot in a limited way [14–16].

In the "E-IJARA" information system, if an open and transparent system for solving problems related to the placement of crops is created by establishing a state service for changing the specialization of economic entities on agricultural land, the placement of light construction infrastructure objects on the territory of other types of land not used for agriculture by land users (by setting up state services for assigning (indicating) land plots for construction), the cases of changing agricultural land to another category of the land fund will be reduced[5,17,18].

3 Results and discussion

As a result of the land reforms carried out to organize the efficient use of agricultural land, the "E-IJARA" information system (hereinafter "E-IJARA" AT) was created in the Ministry of Agriculture of the Republic of Uzbekistan, and in 2022, the system of open electronic tenders for the lease of agricultural land plots introduced.

Based on it, 574,000 land development projects were developed in the "E-IJARA" information system, and 462,000 hectares of land were leased through open electronic tenders for agricultural use by the winners voluntarily assuming an additional payment of 1.8 trillion soums.

As a result of the research on improving the procedure for the lease of agricultural land plots, starting from March 1, 2024, electronic online auctions were introduced instead of the open electronic competition for the lease of agricultural land plots. Based on it, 166,200 land development projects on an area of 60,500 ha were formed and put up for sale with an initial value of 1.2 trillion soums for auctioning long-term lease rights of agricultural plots (Fig. 1).

However, in practice, there are practical problems related to changing the specialization of land users and placing infrastructure facilities in them. The lack of an automated system for solving these problems makes it difficult to develop the best solutions for internal land development projects on the farm, including crop rotation in multi-disciplinary farms, placing the organisational production structure and production departments (agricultural raw material processing workshops and points), many reduces the possibility of solving the issues of placement of special land massifs for branch productions.

In addition, for the purpose of socio-economic support of the rural population, 73422 irrigated land areas were allocated to 343139 citizens for farming in 2022 with a 10-year lease term [3]. Although a separate order was given to extend the lease term of these land plots, the issue has not been resolved.

Also, in 2022-2023, as a result of the reforms on the organization of farms in the Republic of Karakalpakstan and its regions, 193,000 farms and clusters with good water supply and close to population centres were reduced from cotton and grain, and were separated based on open electronic contests for the management of farms. given [4]. However, as a result of the establishment of peasant farms, the area of farms has decreased, but no changes have been made to their land lease contracts.

Starting from March 1, 2024, tenants are allowed to transfer (re-lease) their rights and obligations regarding land plots leased to another person without changing the purpose of using the land plot, but in practice, the mechanism of transferring a part of the land plot to another person has not been specified.

In order to solve these problems, there is a need to improve the existing systems of land preparation works on agricultural lands.

To improve the construction of land on agricultural land, in "E-IJARA" JSC, to change the specialization of economic entities on agricultural land and to designate (indicate) land plots for the placement (construction) of light construction infrastructure objects in the area of other types of land that are not used for agriculture by land users. it is necessary to establish state services.

During the creation and construction of automated systems for the design of terrain, there is a need to divide it into components, that is, to determine its composition. Such a system has more internal structural content and includes technological complexes that process a large amount of data. It is characterized by the development and constant complexity of the used technological processes.

The implementation of the proposed logical structure of the provision of public services for agricultural land use is reflected in the form of automated systems of land structure design and is carried out in three stages (Figure 1).

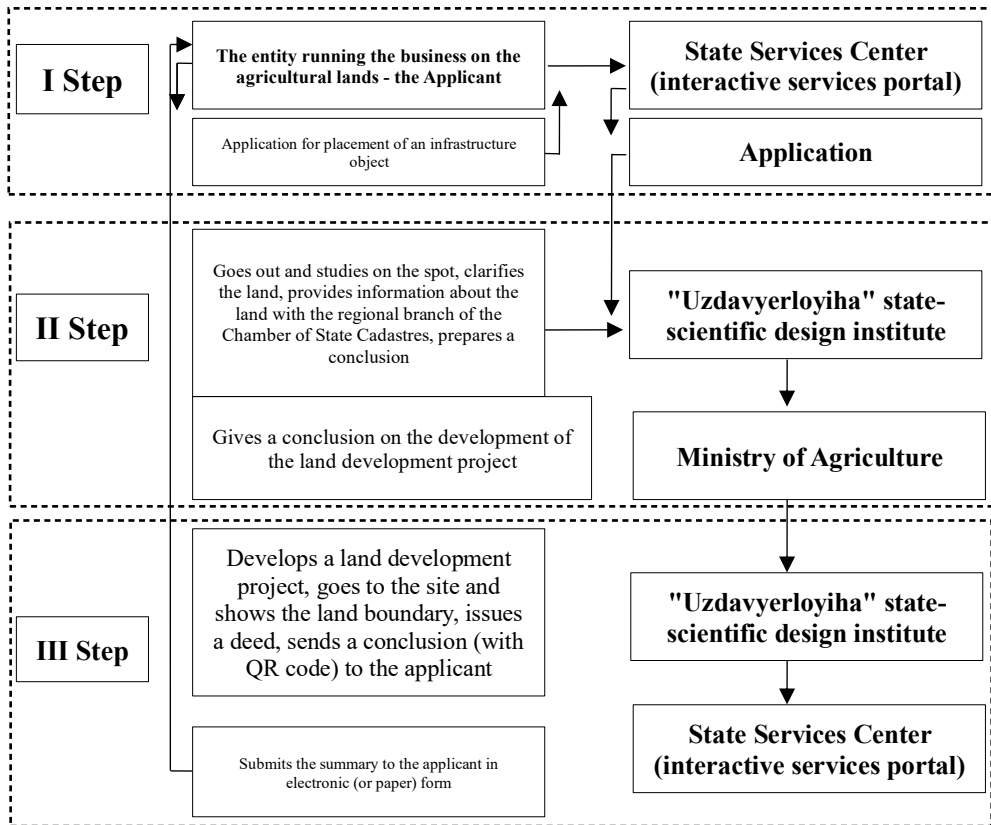


Fig. 1. Regional distribution of land plots submitted to open electronic tenders and auctions for obtaining the right to lease agricultural land plots

In the first stage, the land user applies in person to the State Service Centers or applies to electronic use of the State Service by registering on the Unified Interactive State Services Portal of the Republic of Uzbekistan (hereinafter referred to as the State Service Portal).

At the second stage, the conclusion of the Ministry of Agriculture on the change of specialization or the placement of infrastructure objects is obtained, and the state scientific and planning institute "Uzdavyerloyiha" studies the land plots on site and, based on its actual situation, develops a land development project and approves the project in coordination with the relevant agencies. Also, an additional agreement to the land lease agreement on the change of speciality is prepared.

In the third stage, the prepared documents are presented to the land user and the boundary of the land plot is indicated upon arrival.

As a modern requirement of ensuring the transparency, quality and speed of planning in all areas, including land development works, the use of high-performance technologies is envisaged at all stages of project creation. Among these requirements, priority is given to the main positive aspects:

- creates an opportunity to quickly develop detailed project solutions and assess their economic and environmental efficiency;
- ensures the continuous collection of necessary information at all stages of design and the formation of an information base in this direction;
- ensures openness and transparency of design stages.

These requirements are achieved through digitization of automated systems of design, including automated systems of engineering and cartographic material processing.

Changing the specialization of economic entities on agricultural land should be based on the following requirements:

that a business plan has been developed that substantiates the economic efficiency of the speciality being changed;

transition to full water-saving technologies in the irrigation of the area whose speciality is being changed;

compliance with the main type of permitted use of the land plot to change the specialization of economic entities on agricultural land;

establishment of fully intensive orchards and vineyards in areas undergoing re-specialization;

the existence of a contractual agreement concluded with a buyer (buying enterprise) on the purchase of agricultural products grown after a change in specialization or an export agreement concluded with a foreign buyer (buying enterprise) on the export of products.

4 Conclusions

Based on the above circumstances, it is necessary to implement the following as modern solutions for improving land preparation works on agricultural land in "E-IJARA" AT:

1. Approval of the following administrative regulations for the provision of state services related to the use of agricultural land:

a) Development of a land formation project on changing the specialization of economic entities on agricultural land, formation and formalization of an additional agreement to the land lease agreement, change of specialization of economic entities on agricultural land;

b) land plots for the placement (construction) of light construction infrastructure objects in the territory of other types of land not used in agriculture of land users, which provides for the procedure for the application, review and development, formalization, approval and conclusion of the land construction project for the placement (construction) of infrastructure objects to mark (show).

2. Establishment of state services in the following areas related to the regulation of contractual relations on the lease of land intended for rural development:

a) extending the lease term of agricultural land plots;

b) making changes to the land lease agreement as a result of returning a part of the land plots intended for agriculture to the reserve;

v) re-registration of a land lease agreement as a result of transferring one's rights and obligations to another person (re-leasing) on part of the agricultural land plots that have been leased for a long period of time.

References

1. S. Avezbaev, O. Avezbaev, S. Tashpulatov, and S. Sharipov, *E3S Web Conf.* **386**, 05006 (2023)
2. A. Inamov, S. Sattorov, A. Dadabayev, and A. Narziyev, *IOP Conf. Ser.: Earth Environ. Sci.* **1068**, 012016 (2022)
3. M. K. Khamidov, K. T. Isabaev, I. K. Urazbaev, U. P. Islomov, and A. N. Inamov, *European Journal of Molecular and Clinical Medicine* **7**, 1649 (2020)
4. M. Khamidov, A. Inamov, U. Islomov, and Z. Mamatkulov, *E3S Web of Conf.* **365**, 01008 (2023)

5. S. Sharipov and A. Rasulov, E3S Web of Conf. **389**, 03105 (2023)
6. M. Khamidov, A. Inamov, U. Islamov, Z. Mamatkulov, and B. Inamov, (2023)
7. Z. Mamatkulov, E. Safarov, R. Oymatov, I. Abdurahmanov, and M. Rajapbaev, E3S Web of Conferences **227**, 03001 (2021)
8. U. Mukhtorov, B. Sultanov, M. Li, K. Khushvaktova, S. Saidova, and Z. Valieva, E3S Web Conf. **386**, 05011 (2023)
9. G. Yakubov, K. Mubarakov, I. Abdullaev, and A. Ruziyev, E3S Web of Conferences **227**, 03002 (2021)
10. R. K. Oymatov, Z. J. Mamatkulov, M. P. Reimov, R. I. Makhsudov, and R. N. Jaksibaev, IOP Conference Series: Earth and Environmental Science **868**, (2021)
11. Z. Abdullaev, D. Kendjaeva, and S. Xikmatullaev, in *2019 International Conference on Information Science and Communications Technologies (ICISCT)* (IEEE, 2019), pp. 1–3
12. S. Abdurakhmonov, I. Abdurahmanov, D. Murodova, A. Pardaboyev, N. Mirjalolov, and A. Djurayev, in *InterCarto, InterGIS* (Lomonosov Moscow State University, 2020), pp. 319–328
13. A. N. Inamov, O. Ibragimov, and S. Mukhamedayubova, IOP Conf. Ser.: Earth Environ. Sci. **1068**, 012008 (2022)
14. O. Ibragimov, A. Inamov, Sh. Mukhamedayubova, and A. Khamraliev, E3S Web Conf. **386**, 06004 (2023)
15. A. Khurmamatov, O. Ismailov, R. Yusupov, J. Isamatova, and G. Aminova, E3S Web Conf. **497**, 01022 (2024)
16. I. Musaev, A. Bokiev, and M. Botirova, E3S Web of Conferences **227**, 05004 (2021)
17. D. Atanasov, B. Ivanova, R. Beluhova-Uzunova, M. Shishkova, K. Hristov, S. Sharipov, and I. Khasanov, E3S Web Conf. **386**, 05002 (2023)
18. S. Avezbayev, K. Khuzhakeldiev, F. Umarova, and S. Sharipov, IOP Conf. Ser.: Mater. Sci. Eng. **883**, 012059 (2020)
19. S. Islomov, I. Aslanov, G. Shamuratova, A. Jumanov, K. Allanazarov, Q. Daljanov, M. Tursinov, and Q. Karimbaev, in XV International Scientific Conference “INTERAGROMASH 2022,” edited by A. Beskopylny, M. Shamtsyan, and V. Artiukh (Springer International Publishing, Cham, 2023), pp. 1908–1914
20. S. Goibberdiev, G. Ikromkhodjaev, Z. Tajekeev, T. Ismailov, U. Mukhtorov, and I. Aslanov, E3S Web of Conf. **443**, 06013 (2023)
21. U. Mukhtorov, I. Aslanov, J. Lapasov, D. Eshnazarov, and M. Bakhriev, in XV International Scientific Conference “INTERAGROMASH 2022,” edited by A. Beskopylny, M. Shamtsyan, and V. Artiukh (Springer International Publishing, Cham, 2023), pp. 1915–1921