PRIORITY DIRECTIONS FOR THE DEVELOPMENT OF THE LAND CADASTRE SYSTEM IN UZBEKISTAN

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Abstract: This article examines the priority directions for the development of the land cadastre system in Uzbekistan, ongoing reforms, existing problems, and possible solutions. Particular attention is paid to the rational use of land resources, digital transformation, implementation of geographic information systems, artificial intelligence technologies, and improvement of state land control. The study also presents recommendations for the further modernization of the land cadastre system in accordance with current requirements.

Keywords: land cadastre, land resources, digitalization, geographic information systems, artificial intelligence, state land control, land monitoring, electronic cadastre, land management.

Аннотация:В данной статье рассмотрены приоритетные направления развития системы земельного кадастра в Узбекистане, проводимые реформы, существующие проблемы и пути их решения. Проанализированы вопросы рационального использования земельных ресурсов, цифровизации кадастровой системы, внедрения геоинформационных технологий, искусственного интеллекта и совершенствования государственного земельного контроля. Разработаны предложения и рекомендации по дальнейшему развитию земельно-кадастровой системы на основе современных требований.

Ключевые слова: земельный кадастр, земельные ресурсы, цифровизация, геоинформационные системы, искусственный интеллект, государственный земельный контроль, мониторинг земель, электронный кадастр, землеустройство.

Annotatsiya: Mazkur maqolada O‘zbekistonda yer kadastri tizimini rivojlantirishning ustuvor yo‘nalishlari, sohada amalga oshirilayotgan islohotlar, mavjud muammolar va ularni bartaraf etish choralari yoritilgan. Shuningdek, yer resurslaridan oqilona foydalanish, raqamlashtirish, geoaxborot tizimlarini joriy etish, sun’iy intellekt texnologiyalaridan foydalanish hamda davlat yer nazoratini takomillashtirish masalalari tahlil qilingan. Yer kadastri tizimini zamonaviy talablar asosida rivojlantirish bo‘yicha taklif va tavsiyalar ishlab chiqilgan.

Kalit so‘zlar: yer kadastri, yer resurslari, raqamlashtirish, geoaxborot tizimi, sun’iy intellekt, davlat yer nazorati, yer monitoringi, elektron kadastr, yer tuzish.

Introduction

Land serves not only as the primary means for agricultural production but also functions as the necessary spatial foundation for locating industrial enterprises, transport infrastructure, housing, and other social facilities. For this reason, the issues of proper accounting, rational utilization, and effective management of the land fund have always been among the priority directions of state policy.

The land cadastre system is a crucial information system that serves to collect, store, update, and analyze data regarding the legal status, quantitative and qualitative indicators, location, boundaries, and economic valuation of land plots. This system holds significant importance in regulating land relations, organizing the effective use of land resources, exercising state land control, and developing investment projects.

Today, the increasing global demand for land resources, accelerating urbanization processes, population growth, and climate change further intensify the need to improve land management systems. In particular, problems such as the shrinkage of agricultural lands, declining soil fertility, desertification, and land degradation necessitate the scientifically grounded management of land resources. Under such conditions, shaping a modern land cadastre system is a critical factor for the sustainable development of the state.

In Uzbekistan, extensive work is also being carried out to reform land relations, ensure the efficient use of land resources, and develop the cadastre system. In recent years, digital technologies, geographic information systems (GIS), remote sensing technologies, and electronic public services have been introduced into land accounting and control processes. This allows for increasing the accuracy and reliability of information on land plots and provides prompt and transparent cadastre services to the population.

At the same time, certain problems still persist within the land cadastre system, among which the incomplete formation of databases, deficiencies in clarifying land plot boundaries, outdated cadastre information in some instances, a shortage of qualified specialists, and the lack of full integration between information systems can be highlighted. These issues can negatively impact the efficiency of land resource management.

Currently, under the conditions of the digital economy, further developing the land cadastre system and widely applying innovative technologies—such as artificial intelligence, Big Data, drones, and satellite monitoring—stands as one of the urgent tasks. These technologies enable continuous monitoring of the land fund's condition, the detection of illegal land occupation, the automation of land monitoring, and the improvement of managerial decision-making quality.

The purpose of this article is to study the priority directions for developing the land cadastre system in Uzbekistan, analyze current pressing issues in the field, evaluate the effectiveness of ongoing reforms, and develop scientific and practical proposals and recommendations for the further improvement of the system. The article comprehensively covers the current state of the land cadastre system, its development prospects, and the significance of implementing modern technologies.

Current State of the Land Cadastre System in Uzbekistan and Ongoing Reforms

Effectively managing land resources, maintaining their records, and ensuring their legal protection is one of the important directions of state policy in the Republic of Uzbekistan. In recent

years, large-scale reforms aimed at fundamentally restructuring land relations, modernizing the land cadastre system based on international standards, and introducing modern information technologies have been implemented in the country. The main objective of these reforms is to ensure the rational use of land resources, improve the land accounting system, digitalize public services, and increase the accuracy and transparency of land-related data.

Previously, because a large amount of information in the land cadastre system was maintained in paper format, updating, searching, and analyzing it required considerable time. Furthermore, the lack of clearly defined land plot boundaries in some regions, inconsistencies in data, and the separate storage of information across various departments used to give rise to land-related disputes and management difficulties. Today, to eliminate these shortcomings, efforts to fully digitalize the land cadastre system are being intensively carried out.

At present, cadastre bodies are working on entering information about land plots into a single electronic information database, converting old cadastre documents into digital formats, and systematically updating them. This serves to quickly obtain data on land plots, ensure its reliability, and reduce the influence of the human factor.

Another important reform being implemented is the wide introduction of geographic information systems (GIS) and remote sensing technologies into the cadastre system. The condition of land plots is regularly monitored, their boundaries are clarified, and the targeted use of land is controlled through satellite imagery, aerial photography, and drones. These methods significantly increase the accuracy of land monitoring.

Significant changes are also being made regarding the provision of public services in electronic form. Citizens and business entities are increasingly gaining the opportunity to obtain cadastre documents, apply online for certain services, and receive necessary information digitally. This reduces excess time and financial expenses, thereby ensuring the openness and transparency of public services.

In recent years, special attention has also been paid to strengthening state land control. The system of oversight over compliance with land legislation is being improved, and modern control methods are being applied to detect instances such as illegal land occupation, unauthorized land use, and the illegal transfer of agricultural land to other categories. This serves to protect land resources and ensure their rational use.

In addition, extensive work is being carried out to integrate the land cadastre system with other state information systems. By establishing electronic data exchange with tax authorities, construction, architecture, the notary system, and other state organizations, it is intended to create a unified information space for land-related data. This allows for reducing redundant data, making fast and accurate management decisions, and increasing the efficiency of state bodies' activities.

Despite this, certain problems still remain in the process of developing the land cadastre system. Namely, digitalization efforts have not been fully completed in some regions, certain cadastre data is outdated, work on clarifying land plot boundaries is still ongoing, and there is a shortage of qualified specialists capable of working with modern technologies.

Therefore, further perfecting the land cadastre system in the future, fully completing digitalization, widely introducing artificial intelligence and Big Data technologies, as well as regularly upgrading the qualifications of specialists remain urgent tasks.

In general, the reforms being carried out to develop the land cadastre system in Uzbekistan serve to increase the efficiency of land resource management, ensure transparency in land relations, improve the investment climate, and support the sustainable development of the economy. The consistent continuation of these reforms in the future will create a solid foundation for bringing the land cadastre system to the level of international standards and utilizing land resources even more effectively.

Priority Directions for Developing the Land Cadastre System in Uzbekistan

Currently, developing the land cadastre system in Uzbekistan is one of the important directions for improving state governance, efficiently utilizing land resources, and forming a modern management system aligned with the requirements of the digital economy. The land cadastre plays an important role not only in keeping records of land plots but also in regulating land relations, balancing the interests of the state and the private sector, attracting investments, and ensuring ecological stability. Consequently, a number of priority directions have been established to develop the sector.

- **Full Digitalization of the Cadastre System:** One of the most critical directions for developing the land cadastre system is the complete transition of all cadastre data into electronic form. While the main portion of cadastre documents was previously maintained in paper form, efforts to enter them into a unified electronic database continue systematically today. As a result of digitalization, opportunities for rapidly searching, updating, and analyzing land plot information are expanding. Additionally, due to the reduction of the human factor, errors and corruptive situations are minimized, and the quality and speed of public services are enhanced.
- **Wide Introduction of Geographic Information Systems (GIS) Technologies:** Modern geographic information systems are among the most effective tools for managing land resources. With the help of GIS technologies, the geographical location, boundaries, area, soil composition, and other important indicators of land plots are reflected on unified electronic maps. This allows for making precise management decisions regarding land planning, monitoring, evaluation, and rational use. Furthermore, GIS holds great importance in assessing natural disaster risks, developing infrastructure, and comprehensively planning regions.
- **Implementation of Artificial Intelligence Technologies:** In the future, the development of the land cadastre system will be closely linked to the widespread application of artificial intelligence technologies. Using AI, data obtained from satellite imagery and drones will be automatically analyzed, illegal constructions and land occupation cases will be detected, the efficiency of land use will be evaluated, and soil degradation and salinization processes will be forecasted. This will significantly ease human labor and increase the speed and accuracy of decision-making.
- **Expanding the Use of Remote Sensing and Drone Technologies:** Remote sensing technologies represent one of the modern methods of land monitoring. Large territories can be observed with high accuracy within a short time using satellites and unmanned aerial vehicles (drones). These technologies are widely used to assess the condition of agricultural crops, track changes in land areas, identify illegal land occupation, and conduct ecological monitoring. As a result, oversight operations are accelerated, costs are reduced, and the reliability of information increases.
- **Strengthening the Integration of State Information Systems:** Integrating the land cadastre system with the information systems of other state bodies is an important requirement of modern

management. Ensuring the accuracy of land-related data is achieved by establishing a unified electronic data exchange between tax, justice, construction, architecture, notary offices, and other state organizations. This reduces duplicate documentation, simplifies public services, and increases management efficiency.

- **Improving State Land Control:** To ensure the protection and rational use of land resources, it is necessary to improve state land control based on modern technologies. Compliance with land legislation is continuously monitored through digital monitoring systems, GIS, and satellite imagery. This enables the early detection of situations such as illegal land occupation, unauthorized land use, and non-compliance with environmental requirements.
- **Enhancing Human Resource Potential:** The efficiency of the land cadastre system largely depends on the knowledge and qualifications of its specialists. Therefore, expanding modern educational programs on GIS, artificial intelligence, remote sensing, digital cartography, and land monitoring in higher education institutions, increasing the number of practical sessions, and regularly organizing professional development courses are important tasks.
- **Implementing International Experience:** Studying the advanced experiences of developed countries in land cadastre and land resource management and adapting them to the national system is of great significance for Uzbekistan. A cadastre system operating on the basis of international standards serves to attract foreign investment, develop international cooperation, and increase the transparency of the land market.

Conclusion

Developing the land cadastre system in the Republic of Uzbekistan based on modern requirements is one of the important factors for increasing the efficiency of land resource management, supporting economic reforms, and perfecting state governance. As a result of the reforms carried out in recent years, significant results are being achieved in land accounting, digitalizing cadastre data, expanding electronic public services, and implementing modern geoinformation technologies into practice.

However, there are still issues awaiting resolution for the further improvement of the system. These include the incomplete formation of cadastre data in certain regions, insufficient integration between information systems, the remaining need for qualified specialists, and the necessity of organizing continuous land monitoring based on modern technologies. Eliminating these problems will elevate the quality of land resource management to a new level.

In the future, the widespread use of artificial intelligence, geographic information systems, remote sensing, drones, and big data analysis technologies will serve to increase the accuracy, speed, and reliability of cadastre data. Additionally, shaping a unified digital information space among state bodies will simplify the process of making management decisions and ensure transparency in land relations.

The development of the land cadastre system should not be limited solely to technological updates; rather, it must be carried out in harmony with supporting scientific research, systematically improving the regulatory-legal framework, training specialists with modern knowledge and skills in higher education institutions, and adapting international experience into national practice.

In conclusion, comprehensively developing the land cadastre system holds important significance in ensuring the rational and effective use of land resources, maintaining ecological balance, improving the investment climate, and securing the sustainable development of agriculture and other sectors of the economy. Consistent reforms implemented in this direction will make a worthy contribution to the long-term socio-economic progress of the country and the preservation of land resources for the benefit of future generations.

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