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METHODOLOGICAL PRINCIPLES OF USING LAND CADASTRAL INDICATORS IN WATER FUND MANAGEMENT

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Abstract
Keeping the land accounting in the correct modern methods and carrying out a complete survey of the land areas and rational use of land resources, the accuracy of the cadastral data, determining the amount of the water fund lands by transferring them to the disposal of the relevant organizations is of great importance in ensuring economic stability in the regions. From this point of view, the article provides information on increasing the economic efficiency of cadastral indicators, the use of water fund lands in the regions and their control.

Keywords Cadastre, water, water fund lands, state cadastres, unified system of state cadastres, land account, cadastral system, socio-economic stability, territory, efficiency.

INTRODUCTION

In the course of the transition to market relations of the Republic of Uzbekistan, the objective basis of managing the effective use of land resources is the mechanism of market economy laws. Regulation of land relations serves to regulate land relations as part of production relations based on the legal basis of management [6]. In our republic, comprehensive measures are being implemented in the field of land cadastre, in particular, within the framework of digitalization of all land-related information, comprehensive measures are being implemented to automate the water fund land accounting system, and certain results are being achieved. Water bodies, rivers, lakes, water reservoirs, hydrotechnical and other water management structures of great importance for the economy of our republic, as well as for water management needs in the region separated along the banks of water bodies and other water bodies, are given in the prescribed manner to enterprises, institutions and organizations lands belong to the category of water fund lands [1]. As of January 1, 2024, water fund lands totaled 827.3 thousand hectares or 1.84% (percent) of the country's total territorial area. Due to the fact that the database of these fund lands has not been formed in the geographic information system (GIS), it is required to calculate the total water fund lands. that is, only large inter-farm canals and collectors were taken into account as water fund lands, internal canals and collectors were included in the agricultural fund lands. Therefore, it is important to carry out research work on improving the method of keeping accounts of water fund lands [2].

PF-6061 of the President of the Republic of Uzbekistan dated September 9, 2020 “On measures to fundamentally improve the system of land accounting and state cadastre management”, June

8, 2021 "Ensuring equality and transparency in land relations, reliable protection of rights to land and their market PF-6243 dated May 7, 2024 on measures to transform water into an asset" and PF-74 dated May 7, 2024 "On setting priorities for the introduction and development of a modern management system in the water industry", July 10, 2020 "On the development of the water industry of the Republic of Uzbekistan Decree No. PF-6024 "On approving the concept for 2020-2030", the importance of land relations in the management of water resources and the economic efficiency of their territories are defined. [3].

Basically, it is required to improve the water fund land management system and database with the help of information and communication technologies, and to ensure their transparency, to create a unified system of state cadastres (USSC) on a scientific basis.

The analysis of scientific literature related to the field shows that, along with foreign scientists, several scientists of our republic have also conducted scientific research on land accounting using high-level GIS software, transparent and fast basing of subjective indicators of land. Therefore, the theoretical and methodological foundations of the issue of maintaining a geo-information system were obtained from foreign scientists J. Bouma, P.A. Burrough, J.J. de Gruijter, E. Van Ranst, A.K.L. Johnson, & A.B. McBratney and others researched the theoretical and methodological foundations of process automation by A.A. Varlamov, K.M. Melikhov, S.V. Kozmenkova, S.V. Kasyanov, V.I. Kusov, A.L. Ilinikh, Yu. Developed by V. Ryabov, E.V. Belorustseva, M.E. Bukovsky, and others. According to the works of A.S. Altiev, A.R.Bobojonov, and Q.Rakhmonov, among the scientists of our republic, it includes studies on the calculation of land in terms of quantity, their distribution by certain administrative-territorial units, land users, and land types.

Today, in different regions of our country, the researches on conducting and forming the land account in modern ways, integrating the results of field research into the geodatabase, geovisualization of objects using the interpolation method, analysis, processing, digitization of processes based on the "ArcGis" program have not been sufficiently studied [4]. For this reason, there was a need to digitize the land accounting system based on the ArcGis program.

METHODS

It is necessary to use modern technologies to obtain the exact value of land cadastral data. 8 categories of land fund and their land users are taken into account, changes are made according to the appropriate type of the agricultural land category, and the transfer of the agricultural and forest fund categories to the water fund and other categories is taken into account, the organization, analysis, coordination of land transfer works, Changes to the land fund have been made for reasonable differences. Ensuring economic stability in regions by collecting, systematizing, analyzing, summarizing the state land cadastre data and evaluating the compatibility of the lands of the water fund with the land cadastre data of the Ministry of Water Management.

During the years of independence in our country, a number of reforms were implemented in the field of land fund management, the emergence and development of new forms of land use rights of legal entities and individuals, and as a result, changes in the land allocation procedure were observed. Each of the categories of the land fund has its own characteristics, which have a significant impact on the economy of the regions. In this regard, the analysis and processing of information requires the use of information in various format units of GIS software. Since the data structure of a particular GIS is unique, it is up to the user to change it. Converting data from raster format to

vector format is considered a more complex task. Compared to this, it is much easier to integrate information from the vector format into the geodatabase. As a result of integrating the vector format data into the geodatabase, it can be observed that certain errors occur. It is more convenient to work on data in vector format with the help of ArcGIS software applications belonging to the GIS software family, it is possible to analyze, delete, draw a new one, change the information and change the type of layers (from area layer to linear or point layers) while saving attributive information [8].

On the basis of the above GIS technologies, the technological stages of comparison with the current land account data by obtaining the land fund account were developed (Fig. 1). We can say that the basic principles of land cadastre have been fulfilled through the implementation of these technological steps [5].

By processing the results of field research, the geodatabase of the lands of the Republic of Karakalpakstan will be fully formed as of 2023. In the geodatabase, land originally allocated for agriculture, forest fund land, cultural heritage objects, settlement land, highways, landscaping (general use) land, electric power facilities, high-pressure gas pipelines, gas distribution stations, water fund land (domestic and external canals, external ditches, pumping stations), land in areas adjacent to high-rise buildings, a database was formed in order to compare USSC with the current land report using GIS software.

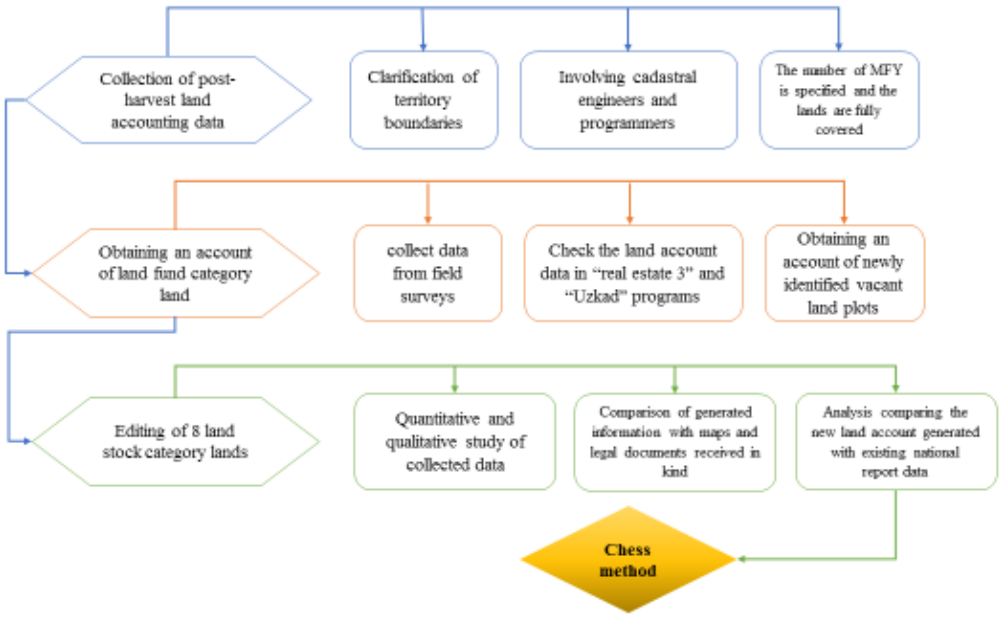

Figure 1. Technological steps for obtaining land fund account.

Until now, the land account has been taken on the basis of tables in paper form. Production came untaxed in place of unaccounted for land types associated with the expansion of new industries. Until now, the land account has been taken on the basis of tables in paper form. Production came untaxed in place of unaccounted for land types

associated with the expansion of new industries.

With the help of ArcGIS software, the land areas of the 8 land fund categories of the Republic of Karakalpakstan were determined and formed in vector themed layers, thus empty land plots that were not used by anyone or were arbitrarily occupied, water bodies (natural and artificial lakes for fishing) were identified. (Figure 2).

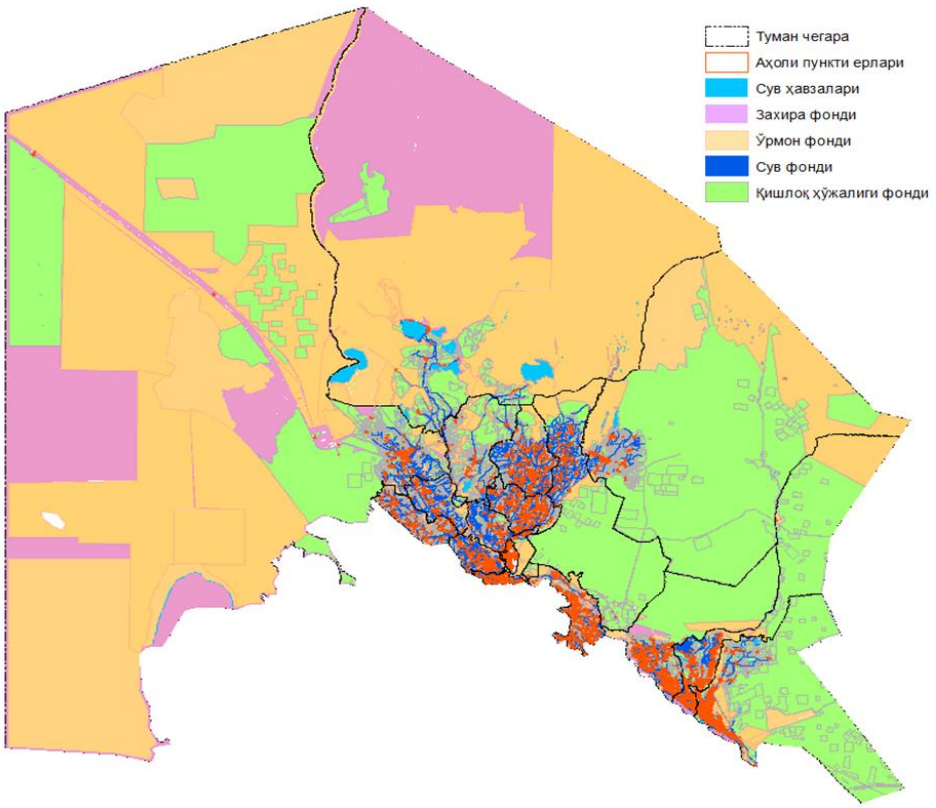

Figure 2. Visualization of land accounting data for the Republic of Karakalpakstan in a geodatabase

The scope of the works being carried out is wide, the reason is that the electronic database of the existing 8 land categories of the land fund has been formed. This is an important factor in the management of land accounting and state cadastre. In addition, the rights of many local land users were not established in the electronic database, and their rights were determined and accounted for through correspondence.

RESULTS

Violation of the established order of transfer of land from one type to another is considered illegal and grounds for finding the right to a plot of land created on its basis invalid and rejecting its state registration [6] .

In our country, effective measures are being taken every year to bring the degraded lands to use, according to which the improved land plots are divided into specified types depending on the purpose of use.

The methodological basis of using the land cadastre data formed by the results of the land accounting in the management of the land fund was improved, according to which the categories of the land fund

were newly developed in the chess style (Table 1).

Table 1.

Analysis of changes in 8 land fund categories based on land accounting data in the Republic of Karakalpakstan

N	Category of land fund	"According to the National Land Report as of 01.01.2023, hectares"	Change +,-	Dynamics of increase or decrease by land categories								Change +,-	Total land area, ha (forecast) as of 01.12.2024	Difference (- , +)	The field entered into the Uzkad program during the chat, to (01.12.2023)
				A	B	C	D	E	F	G	H				
				"Agricultural lands"	Forest fund lands	Industrial, transport, communications, defense and other purpose lands	Water fund lands	Nature protection, health and recreation fund	Background of lands of historical and cultural importance	Lands of settlement fund	State reserve lands				
	Republic of Karakalpakstan total	**16 656 123**	+	**55 060**	**794**	**12 426**				**5 026**		**73 306**	**16 656 123**		**16 203 960**
			-	**12 995**	**99**	**15 611**	**9 005**		**24**	**35 572**		**73 306**			
I	"Agricultural lands"	**6 242 635**	+		694	12 301						12 995	**6 200 569**	-42 065	5 767 281
			-		99	10 497	8 994		24	35 447		55 060			
II	Forest fund lands	**6 462 633**	+	99								99	**6 461 937**	-696	5 729 466
			-	694		100						794			
III	Industrial, transport, communications, defense and other purpose lands	**56 331**	+	10 497	100					5 015		15 611	**59 516**	3 185	8 624
			-	12 301						125		12 426			
IV	Water fund lands	**81 111**	+	8 994						12		9 005	**90 116**	9 005	26 486
			-												
V	Nature protection, health and recreation fund	**2 194 851**	+										**2 194 851**		2 193 313
			-												
VI	Background of lands of historical and cultural importance	**2 896**	+	24								24	**2 920**	24	
			-												
VII	Lands of settlement fund	**33 461**	+	35 447		125						35 572	**64 007**	30 546	
			-			5 015	12					5 026			
VIII	State reserve lands	**1 582 207**	+										**1 582 207**		2 478 790
			-												

The land value information for the area was compared with the data of the land plots in the field by taking a printed copy of the space map and making sure that the information is correct. Then, in the ArcGIS program, the analysis of the data of the category of land in the camera conditions and the compatibility of the potential of land resources with the development programs of the district was started.

Chess method. Data on the 8 land fund categories available in our republic are given in the sequence of Roman numerals in the national report issued annually.

Based on this, Roman numerals are given on the sides of the chessboard, and Latin initials are given on the top. Using this, the data of the land account obtained as a result of the khatlov in the Republic of Karakalpakstan was subtracted from the land of one fund category and transferred to the fund category land that should actually be in the account. As a result, 8 land fund categories were formed in a new version based on the relevant laws. According to him, only one water fund belonged to the land, but 8,994 ha of land was in the account of the agricultural fund, 12 ha was in the account of the settlement land fund. As a result, 9,006 hectares of land occupied by water bodies were not monitored, relevant projects and other practical works were not carried out, and as a result, they were buried and disappeared (Fig. 3).

Figure 3. An abandoned and buried water body

In the land balance of these lands through the chess method, it was determined that the water fund in the Republic of Karakalpakstan is 90,116 hectares of 81,111 hectares of land, that is, 8,994 ha of land was subtracted from the agricultural fund, 12 ha was added to the water fund from the settlement land fund, and these lands were transferred to the Ministry of Water Management. In addition, the length of the roads has been calculated in the regions until now, and the area occupied by the roads has been created by creating a base of the register of addresses based on geo-information technologies. As a result, the area occupied by internal streets in the settlement area was determined and the total land calculation was made.

Construction of internal canals and collectors in the territory at the expense of water fund lands. The Ministry of Water Management of the Republic of Karakalpakstan has calculated water consumption for each region, and developed projects for digging new internal canals and collectors. As a result, monitoring works were started, and the works of restoring neglected and out-of-service collectors were carried out. This is due to the correct administration of water tax in the regions and the

prevention of excess water consumption, and the imbalance between water consumption and the tax received from it [7].

DISCUSSION

As a result of incorrect land accounting, contracts for water supply between farms and water management in the regions were not concluded. The large inter-farm canals under the Ministry of Water Management are collectors, and since the internal canals that supply water to the main farmers and the population are in the agricultural fund, the non-governmental organization Water Consumers' Union (WCU) has been engaged in the districts. The reason for this is that internal canals and collectors are neglected, collectors are buried out of operation, in some areas, collectors are buried and transplanted to the land, buildings are built and as a result, underground seepage water rises, the condition of the land deteriorates, the level of productivity of the land decreases, and a lot of land is damaged due to the use of land. out. The canals were not excavated on time, concreting measures were not taken, as a result of which water consumption increased and water shortage occurred.

In the course of the work, there is a lack of specialists who maintain water and hydrotechnical construction cadastres in the regions, insufficient information on land areas and hydrotechnical structures used by water management organizations and their electronic maps and attributive data, the Ministry is responsible for the State Water Cadastre and State Cadastres of Hydrotechnical Structures. the lack of integrated software that electronically sends cadastres to the unified system, justifies the lack of accounting of water fund lands [8].

It is necessary to obtain the materials of survey and geodetic work on water fund lands and hydrotechnical structures belonging to water management organizations and compile them in the database created in the ArcGIS program.

It is necessary to create an electronic platform based on the database created in the ArcGIS program and integrate it with the Unified State Cadastre System, as well as to prepare information on the water fund land areas intended for lease on the electronic platform and send it directly online to the "E-Auction" AAT platform necessary.

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