New Solutions for Forming Database of State Cadasters of Buildings and Constructions Based on Geoinformation Programs.

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ABSTRACT

The article describes the creation, optimization and rational use of a system that provides the current state, dynamics and changes of location indicators by conducting state cadastral works of buildings and structures using modern mapping technologies based on geoinformation systems, and the scope of work of state cadastral works of buildings and structures and issues such as serving in solving productivity problems are covered.

Keywords :	building and structure, state cadastres, geoinformation systems, settlement, agriculture, reconstruction, GIS (geoinformation systems).

1.Introduction.

Implementation of comprehensive measures in the field of land cadastre in our republic, in particular, within the framework of digitization of all land-related information, comprehensive measures are being implemented in connection with the automation of the land accounting system of settlements, and certain results are being achieved.

According to the state cadastre, the buildings and structures of extremely important importance for our republic make up 80,455 hectares or 2.8% (percent) of the total territory of the country. is decreasing per year, for this reason, the unplanned and undefined increase of settlement land at the expense of agricultural land requires sufficient digitization of settlement land accounting. Therefore, it is becoming important to carry out research work

on improving the method of accounting for settlement lands.

The establishment of a national geo-information system is being carried out, in addition to the fact that settlement land is overcrowded and year after year settlement land is expanding at the expense of irrigated land, which will lead to a decrease in agricultural products and food shortage in the future, land allocation to the population and It shows how important it is to keep track of it.

2. Materials and methods

It is an interface and application that displays information about settlement land accounting using innovative methods and technologies, creating a geovisualized electronic database of settlement objects, and using ArcGIS software.

improvement of the automated system for geovisualization of attributive indicators of settlement land users;

grounding methods of digitization of geodatabase analysis of settlement lands; improvement of keeping register of addresses in the territory of the settlement on the basis of geoinformation technologies;

development of a method of analyzing seasonal USSC(unified system of state cadastres) data in the geodatabase using a module created in additional ArcGIS software. the method of settlement land calculation has been improved, taking into account the accuracy of the scale based on the data of drones;

the method of land area analysis of settlement land users has been improved based on ArcGIS software;

the method of digitization of the register of addresses in the territory of the settlement has been improved on the basis of geoinformation technologies;

the method of organizing settlement land account based on geoinformation technologies was developed and modularized.

Based on the photos taken by drons, using the ArcGIS program, a vector format geodatabase of state cadastres of buildings and structures of a certain settlement area was created. That is, the land value information for the area was obtained from a paper copy of the space map and compared with the data of real estate objects under field conditions, and the accuracy of the information was ensured. Then, in the ArcGIS program, the creation and analysis of USSC data of the settlement lands in camera conditions was started. and this method has been proven to be convenient, fast, cost-effective, and reliable in all respects.

3. Research results

It was possible to clarify the state cadastre of buildings and structures in each neighborhood of Kashkadarya region, and with this, it was determined which NCM(Neighborhood citizens meeting) the land users belong to, as well as the electronic database created in the ArcGIS program for the project of registering the population of each building and structure, as well as the boundaries of the neighborhood and its information is the main base.

Figure 1. The mechanism of using drons to create a basis for the formation of information in the direction of the state cadastre of buildings and structures of the USSC of settlement lands.

In addition to the formation of data on buildings and structures based on photographs taken with the help of drons, the method of analyzing the land areas of the users of the settlement lands, the method of analyzing the land areas of the data of the state cadastre of buildings and structures of the users of the settlement lands improved on the basis of ArcGIS software It was introduced in the system of the Cadastre Agency under the State Tax Committee of the Republic of Uzbekistan (Cadastre Agency reference No. 05-04-489 of May 30, 2022). As a result, it is possible to use ArcGIS software for conducting land accounting with a high level of accuracy, transforming geodata and quickly analyzing the accuracy level of data of users of settlement lands;

According to the established procedure, state land accounting in the regions is carried out by the Chamber of State Cadastres and its district (city) branches. The data of users of the land of the settlement formed in the district was analyzed for accuracy level with the data of the electronic cadastre program in the Excel program using the "VPR" command. Due to the fact that there is no possibility to visualize the land plots of the land users of the settlement in the electronic program of the state cadastre of buildings and structures, or the indicators are entered incorrectly, it takes time to find out exactly which land plot it is and the location of the land plot. required.
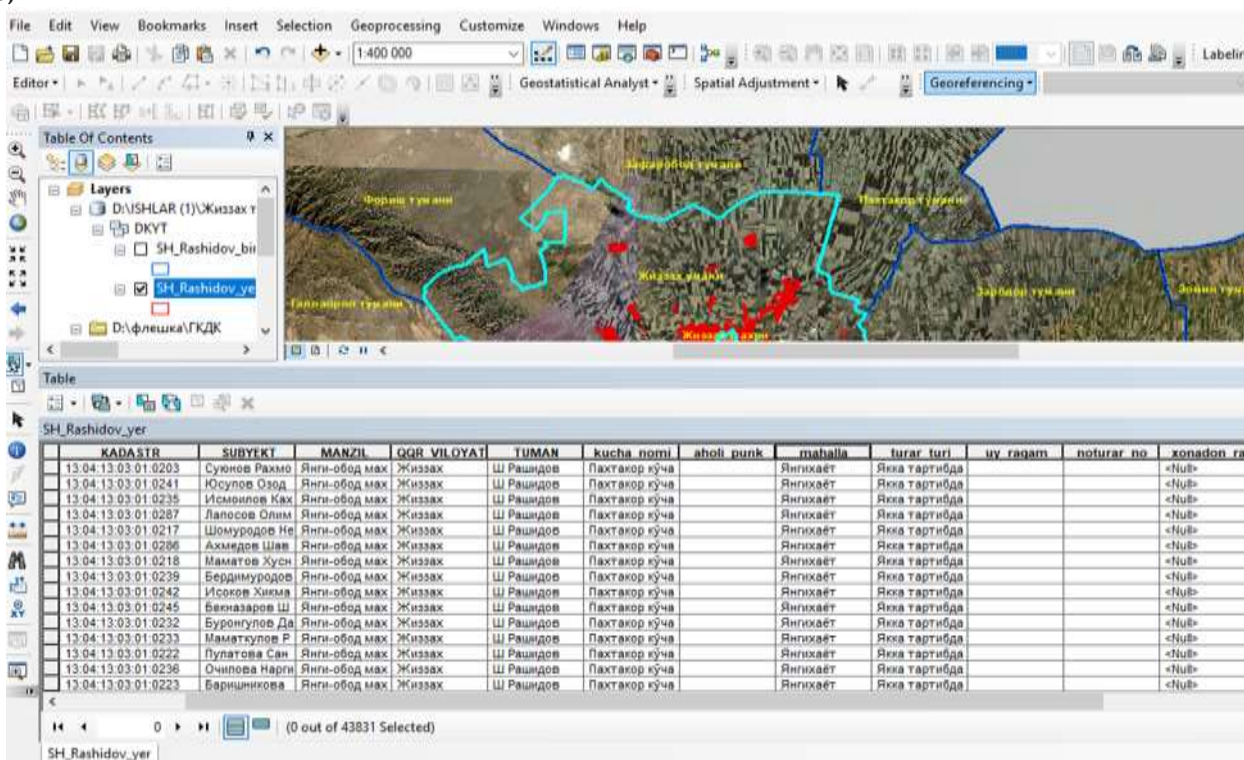

Figure 2. The structure of integrating USSC information into the geodatabase

Also, there were misunderstandings, such as situations that were overlooked when finding wrongly formed land plots, and incorrect output of tax payments.

The data obtained from the online program of the state cadastre data of buildings and structures in Excel format was downloaded to the ArcGIS program ArcMap in the form of a layer and interacted with the USSC data of the

settlement formed in the area through the "joing" command. integrated. In this case, the USSC database, which is not connected with the downloaded data, is visualized in the layer view and stands out in the view of a separate layer. After that, the cadastral engineer of the region was able to find out which buildings and constructions have errors and where they are

located, and since the cadastral engineer himself kept the account of that area, the solution to the problem and the elimination of the error was quickly implemented. In the ArcGIS program, the work of updating and analyzing the USSC data of the settlement lands was started according to the recommended method
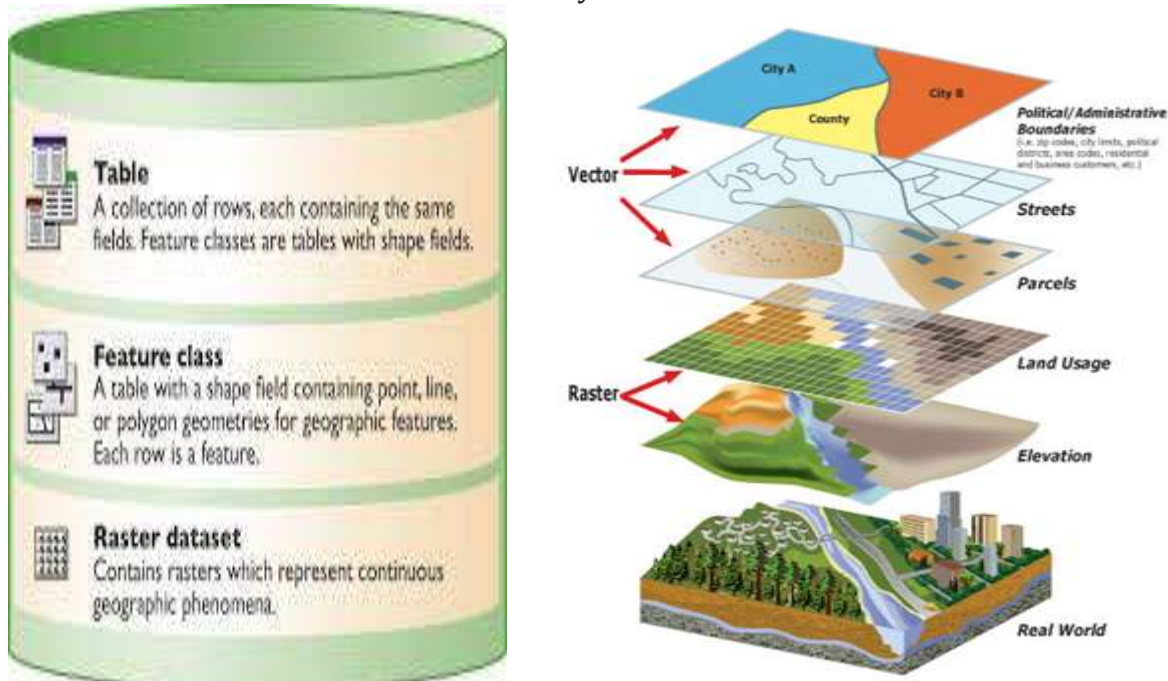
Figure 3. Scheme of collecting data and forming them into a geodatabase.

Figure 4. Schedule for identifying errors and defects and sending them to regions.

Digitization method of the register of state cadastres of buildings and constructions based on GIS improved state cadastral data of buildings and structures based on the ArcGIS program digitized method of forming the

register of addresses of settlements based on the results of the research, it was possible to create a base of registers of addresses on the lands of the settlement and use geo-information technologies to obtain their account.

Figure 5. Indicators of the use of the cadastre online program and more accurate information.

According to the results of the conducted research, the formation of the register of addresses in the territory of the settlement, geospatial linking and its use created great convenience not only for providing interactive services to the users of the land of the settlement located in urban areas and villages, but also for identifying the population by the address of the place of residence. made it possible to automate the registration work. When allocating land to residents for building a house, the exact address was determined by street names.

As a result, the exchange of various wrong information was prevented. More accuracy of information was provided for ministries and agencies using the cadastre online program. At the same time, it was possible to achieve high-precision results in land accounting.

4. Discussion

By forming a database based on geoinformation technologies, it was possible to determine the area occupied by roads in addition to buildings and structures. As a result, the area occupied by the interior streets of the building was determined and a total land calculation was made. Also, the geodata of another category of land fund located on the lands of the settlement was formed and as a result of the research, it was compared with the reports kept in the district land resources report (balance) and 7305.64 ha of land areas where land tax has not been paid until now were determined. Proposals for creating a register of settlement land addresses, identifying adjacent territories, and starting analysis work were based on the ArcGIS program, which proved that the method of accurately calculating the area of settlement land is convenient in all respects.

The method of organizing the account of building and construction state cadastral land

based on the geo-information system was developed and modularized.

Using the ModelBuilder algorithm model, as a result of large-scale research on determining the boundaries of territorial changes of residential areas through the analysis of remote sensing materials, it was proved that the field research works carried out mechanically in this process are not necessary. In turn, due to the fact that this process causes excessive costs and time-related problems, it was not possible to provide an interactive service to the government. At the same time, most importantly, it served as a convenient opportunity to create a conflict of interests between experts and landowners.

In order to ensure the transparency of the above-mentioned processes and increase productivity, we improved the method of analysis based on the ModelBuilder algorithm model of the ArcGIS program in camera conditions and developed a digitized method of the processes.

In automating the process, the research results of 2020 and 2021 were entered into the geodatabase, and a module was developed using the symmetric difference finding tool. As a result, it was possible to determine the territories occupied by the autocracy and to geovisualize them with the help of thematic layers in the form of vectors with different colors. At the same time, the application of this process was released in the form of a command button in the standard panel of the ArcGIS program,

In order to carry out these processes in a digitized manner, the results of the existing maps were downloaded to the geodatabase. Vector layers are calculated in the form of an area, where the correspondence data is related to the plot of land. The downloaded data was analyzed by Symmetrieal Difference using the Overlay method using the ArcToolbox panel. As a result, the software automatically created a new vector layer in the form of a red area, showing the differences between them. This, in turn, indicates the expansion of residential areas at the expense of irrigated lands.

In conclusion

1. Accurately and accurately obtain information from the unified system of state cadastres, register existing buildings and structures in the area, use drones to solve legal and economic issues related to land and real estate, provide addresses to places and monitoring is of great practical importance in the development of the country's economy and effective use of land and real estate.

2. To improve the maintenance of the register of addresses in the territory of the state cadastre of buildings and constructions, to create its base, to clearly indicate the location and boundaries of the land areas used by land owners, land users and tenants, as well as farms, and to provide them with cadastre in the prescribed manner was introduced to provide numbers, to show the location of infrastructures serving the population and to be used in many other areas.

3. Thus, in conducting cadastral works, in the process of forming cadastral information and in the process of studying the state of land use of buildings and construction state cadastres, the use of drones and their data, the formation of a register of addresses on the spot, with the account of rational and efficient use of real estate at the same time, it made it possible to save costs and time spent on conducting cadastral works. This will contribute to the growth of the country's economy.

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