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IMPROVING THE COMPARATIVE METHOD IN PROCESSING INFORMATION ON BUILDING AND CONSTRUCTION CADASTRES

B. Uspankulov
An Independent Researcher of TIIAME National Research University

Annotation

These days, the demand for state registration of rights to immovable property is increasing. It is known that in order to carry out transactions related to immovable property, sale, inheritance, rent, gift and other actions, the rights to land plots, buildings and constructions shall first be registered by the state body. Information obtained as a result of state registration is used for collection of land and property tax and other purposes. It should be noted that the preliminary data is formed as a result of determining the quantitative, qualitative and legal status of the object based on the registration. In turn, these data are calculated from the main data of the state cadastre of buildings and constructions.

As a result of research carried out in the research object, it was found that after the formation of the main data, changes are recorded on the basis of registration, if the owner of the property does not apply for further current data formation. This process is scheduled to be carried out once every 5 years. It should be noted that most of the owners of immovable property, after completing the actions related to the objects namely sale, inheritance, rent, gift, etc., have been observed to transfer the rights to certain buildings and constructions from the state register in a timely manner. However, the fact that property owners construct additional buildings and constructions based on their needs without architectural projects and permission from the relevant organization reduces the level of reliability and transparency of cadastral information. More specifically, the cadastral data is causing discrepancies with the field survey data. In order to solve such problems, we recognize the need to create state cadastre information on buildings and constructions based on the use of modern technologies.

Keywords. State registration of rights to real property, drones, object classification, property tax, multispectral camera, orthomosaic.

Introduction and analysis of the state of the problem

In order to study the current state of formation of state cadastral information on buildings and constructions, it is necessary to analyze the geoinformation data in

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the cadastral system. The analysis covers the years 2017-2021. According to the data of the cadastral agency under the Ministry of Economy and Finance of the Republic of Uzbekistan, as of 2021, information on 7,694,803 99% of objects in the republic is included in the unified system of state cadastres.

According to the analysis, it was found that 2,647,905 – 35% of the data in 2017, 3,634,000 – 49% in 2018, 4,011,668 – 54% in 2019, and 7,285,527 – 98% in 2020 was included in the unified system. In 2022, the total number of registered objects in the republic was 8,152,229. It is also recognized that this information may change with the creation of a new buildings. Including, it was determined that the level of reliability of the information should be checked. In particular, in order to determine the level of reliability of the generated information, appropriate monographic studies were conducted in “Buston” neighborhood (mahkalla) of Kybray district of the Tashkent region. At first, the data of the State Cadastre Chamber under the Ministry of Economy and Finance of the Republic of Uzbekistan and its branch in Kibray district was analyzed.

According to the analysis, a total of 837 land users (in 2021) included in the single database of the research object were identified, of which 15 were non-residential objects (Fig. 5). In particular, as a result of the research, attention was paid to the fact that the objects in the section of the neighborhood are not fully included in the single database. That is, it was observed that the buildings and constructions located on some land plots were not included in the cadastral database. In order to solve this problem and clarify it, the object of research was using the chronological space photographs taken on the basis of the Google earth Pro electronic program.

In order to carry out the research, initially, the space velocity of the object obtained in 2016 was taken as a cartographic basis. The cadastral data was compiled and compared with the cadastral data collected in 2018-2020. As a result, it was observed that the cadastral data created for 2016 is outdated for 2018-2020. It is assumed that the main reason for this is that the owners of the property will build new buildings and constructions. In particular, according to the analysis, 109 objects were identified in 2018 and 108 newly constructed buildings and constructions in 2020.

As we mentioned above, 8,152,229 objects registered on the scale of the Republic change periodically. Such changes can be observed in the boundaries of each land user or in the buildings and constructions located on it. This requires rapid state registration of objects where changes have occurred.

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We recognize that the cadastral base shall be of high accuracy in order to create reliable information according to the research results. That is, it is necessary to create a cartographic basis first, and then registration. After the initial information is formed, the subsequent mapping work can be carried out on the basis of the target mapping after the initial cameral work. The cartographic basis can be made using a multispectral camera or a simple camera.

Multispectral camera, geospatial objects can be divided into classes, that is, research can be carried out through specified indices. For instance, it is possible to analyze plant vegetation, damages and other negative consequences, their elimination, and the identification of roof coverings of buildings and constructions. However, since this technology is expensive, the scope of work is relatively complex, it is recommended to create a cartographic basis of cadastre data of buildings and constructions in ordinary cameras.

The cadastral database is compared on the basis of simple technology, and it becomes possible to identify illegal devices or objects that have not been state registered in time, and to have them state registered. This creates an opportunity to bring additional funds to the state treasury in exchange for the timely collection of property taxes. It is recommended to perform such work in accordance with the following algorithm:

In the 1st step:	**In the 2st step:**
Registration work is carried out. The registration work is carried out in the section of the neighborhood.	**Drones are applied.** Quadrocopter of the DJI Phontom pro (or other) model is launched at a height of 70-100 meters.
In the 3rd step:	**In the 4th step:**
The cartographic basis of the object is created. The photos taken from the drone are processed to create an orthophoto plan of the object. 	**The cadastral base is formed.** A cadastral database was formed basing on the results of registration and a high-resolution orthophoto plan. 

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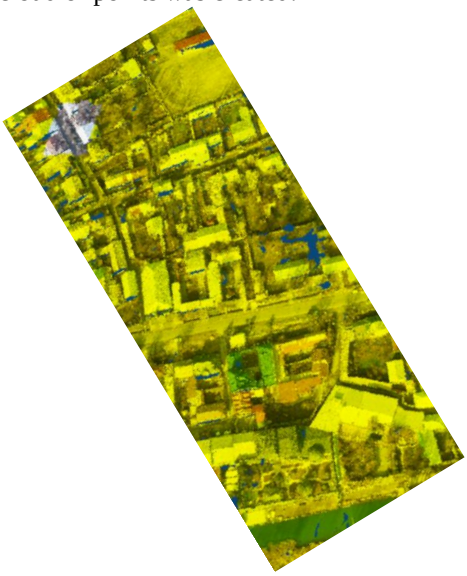
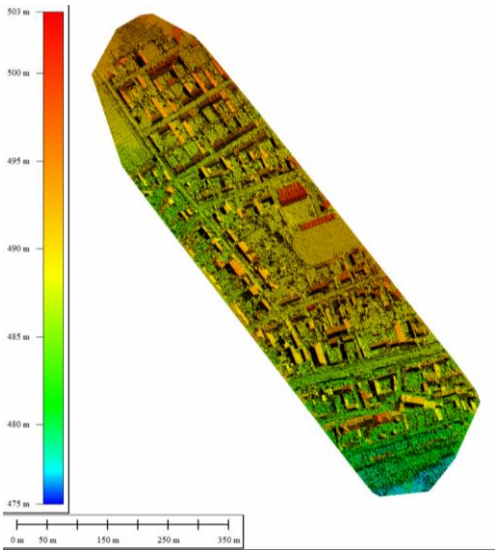
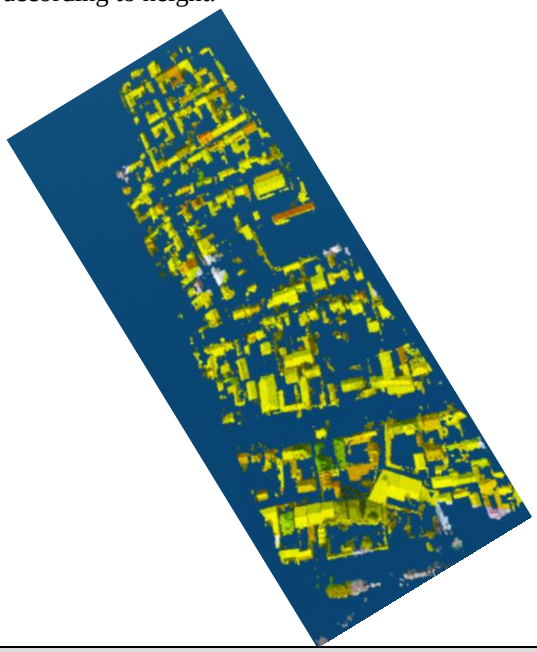
In the 5th step:	In the 6th step:
It is processed in a special electronic program. The cartographic basis of the object was processed and a cloud of points was created. 	**3D model of the object is created in a special electronic program.** DEM model of the object has been created. 
In the 6th step:	**In the 7th step:**
In a special electronic program, the object is divided into classes. Buildings and constructions were divided into classes according to height. 	**The fragment of buildings and constructions divided into classes will be integrated with the cadastral database.** The fragment of buildings and constructions divided into classes according to the height of the object comparing with the cadastral base. 
In the 8th step:	**In the 9th step:**

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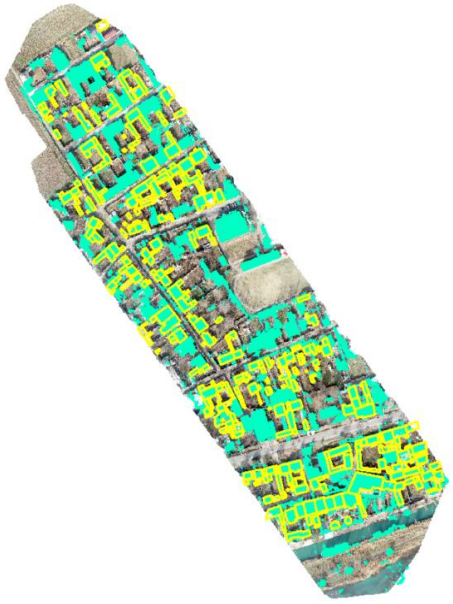
Analytical works are carried out.
As a result of the analysis, cadastral objects that have not been registered in the state body will be identified.



The final result is achieved.
(Owners of objects that have not passed the state register are identified and notices are sent to them regarding the state registration of the identified objects. Objects that have not applied for state registration in time are identified by information management drivers based on targeted identification) The cadastral database of the area has been updated basing on the target map.

Based on the execution of the above actions by a specialist, objects that do not exist in the cadastral database will be identified, besides, as recognized in the previous sections, it will be possible to identify the observed changes in the area, including newly constructed buildings and constructions, and to transfer them to the state register in a timely manner.

Conclusions

In order to improve the comparative method in the development of information on the cadastre of buildings and constructions, the following suggestions and recommendations are developed:

At the present time, the confidence in maintaining the state cadastre of buildings and constructions requires the formation of information, as well as the creation of a high-precision cartographic basis. In particular, in order to form such information in the republic, it is appropriate to create orthophotoplans with the help of Dji Phontom pro technology. It is recommended to create this cartographic basis in a section of the territory of a specific neighborhood;

in order to form reliable information about the state cadastre of buildings and constructions, it is recommended to designate the state unitary enterprise “Republic Center of Aerogeodesis” and “Geoinnovation Center” as a driver enterprise, and using them to create a cartographic product according to the

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recommended algorithm. Basing on the direction of activity of these enterprises, the presence of modern technologies for creating geodetic and cartographic bases is acknowledged.

Carrying out the work of carrying out the work of carrying out the works of the cadastre of buildings and constructions with the use of orthophotoplans created with high accuracy, as a result, the formation of an appropriate information base will be achieved. In particular, the application of the comparative method in the development of information on the cadastre of buildings and constructions creates opportunities for identifying illegal buildings, timely state registration of cadastral objects, and as a result, timely collection of property tax.

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