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IMPROVING MONITORING OF HISTORICAL SITES BASED ON GEOINFORMATION TECHNOLOGIES (USING THE EXAMPLE OF UZBEKISTAN)

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Abstract
This article broadly and in detail discusses the issues of using geoinformation technologies in the protection, continuous monitoring and management of historically significant lands in the Republic of Uzbekistan. The study is based on the analysis of regulatory legal acts of the Republic of Uzbekistan in the field of land and cultural heritage, as well as local scientific literature. It is substantiated that the capabilities of geoinformation technologies for remote sensing, digital cartography, spatial analysis and monitoring are effective scientific and practical tools for monitoring historically significant territories.

Introduction

The Republic of Uzbekistan is one of the oldest centers of civilization in Central Asia, and many historical cities, architectural objects and archaeological monuments are located on its territory. Cities such as Samarkand, Bukhara, Khiva, Shahrisabz are included not only in the national, but also in the world cultural heritage list. The lands where these historical objects are located are under state protection as lands of historical significance. In recent years, the intensification of urbanization processes, construction work, expansion of transport infrastructure and environmental factors have a negative impact on the condition of historical lands. Therefore, constant and systematic monitoring of lands of historical significance has become an urgent scientific and practical

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issue. Geoinformation technologies are one of the most effective tools in this process. Historically significant lands are understood as land plots where historical, cultural, archaeological and architectural objects are located and are specially protected in accordance with the legislation of the Republic of Uzbekistan. According to the Land Code of the Republic of Uzbekistan, such lands are considered a special category of lands and their use is specially regulated.

Historical sites are divided into the following types:

- areas with historic city centers;
- areas with archaeological sites;
- protection zones around architectural and monumental objects;
- historical landscapes and cultural sights.

The main feature of these lands is that economic activity is limited on them, and any construction and earthworks are carried out under strict control. The protection of lands of historical significance in the Republic of Uzbekistan is regulated by a number of regulatory legal acts. In particular, the Land Code, the Law "On the Protection and Use of Cultural Heritage Sites" and relevant resolutions of the Cabinet of Ministers constitute the legal basis for this area. These documents clearly indicate the issues of establishing protection zones on the territory of historical lands, conducting monitoring, preventing illegal construction and limiting the use of land resources. However, in practice, there is a need to use modern information technologies to fully implement these requirements. Geoinformation technologies (GIS) are a set of information systems designed to collect, store, process, analyze and visualize spatial data about objects located on the surface of the earth. GIS technologies are widely used in the fields of cartography, geodesy, land cadastre and monitoring. The main components of GIS include:

- spatial database;
- digital maps;
- remote sensing data;
- spatial analysis tools.

Satellite images are used to detect changes in historical areas. This method allows monitoring large areas in a short time. Historical sites and their protection zones are displayed on digital maps. This serves to clearly define and control the boundaries of the territory. Through GAT, the ecological state of historical sites,

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the level of anthropogenic pressure and risk zones are determined. In the conditions of Uzbekistan, GAT technologies are of great practical importance in protecting the territories of historical cities. Digital maps and satellite images can be used to assess the condition of sites with historical sites in cities such as Samarkand, Bukhara and Khiva. Monitoring based on GAT:

- identification of illegal constructions;
- prevent the violation of protected areas;
- allows for the preservation of historical landscapes.

To solve these problems, it is necessary to create a single GAT platform, form a special database on historical sites, and strengthen the personnel training system.

Conclusion

In conclusion, improving the system of protection of historical lands and continuous monitoring of their condition in the Republic of Uzbekistan requires the widespread introduction of modern geoinformation technologies. The results of the study show that spatial databases, digital cartography, remote sensing and geoanalytical tools are highly effective in clarifying the boundaries of historical lands, defining protection zones, and assessing the level of anthropogenic pressure. In particular, the monitoring system based on GAT in historical centers such as Samarkand, Bukhara, Khiva, and Shahrisabz will allow for early detection of illegal construction, real-time monitoring of changes in protected areas, and prevention of degradation of historical landscapes. This will accelerate the digital transformation of the state cadastre and cultural heritage management system. Also, the creation of a single integrated geodatabase for historical lands, standardization of spatial data and improvement of mechanisms for their exchange between state bodies will serve to make scientifically based management decisions. The monitoring model developed based on GIS technologies allows for a comprehensive assessment of the ecological condition of historical lands, the level of urbanization pressure and potential risk zones. As a result, the systematic introduction of geoinformation technologies:

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- to strengthen the legal status of lands where historical and cultural heritage sites are located;
- ensure transparency and accuracy in the process of using land resources;
- to establish digital control mechanisms in protected areas;
- serves to implement the concept of sustainable regional development.

In general, improving the system of monitoring historically significant lands based on geoinformation technologies is not only a scientific innovation in the conditions of Uzbekistan, but also of significant practical importance. This approach creates the basis for the formation of an innovative management mechanism that is of strategic importance in preserving historical heritage, preserving national values, and passing them on to future generations.

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