



The Importance of Improving the Process of Agro-Ecological Monitoring of Land Areas

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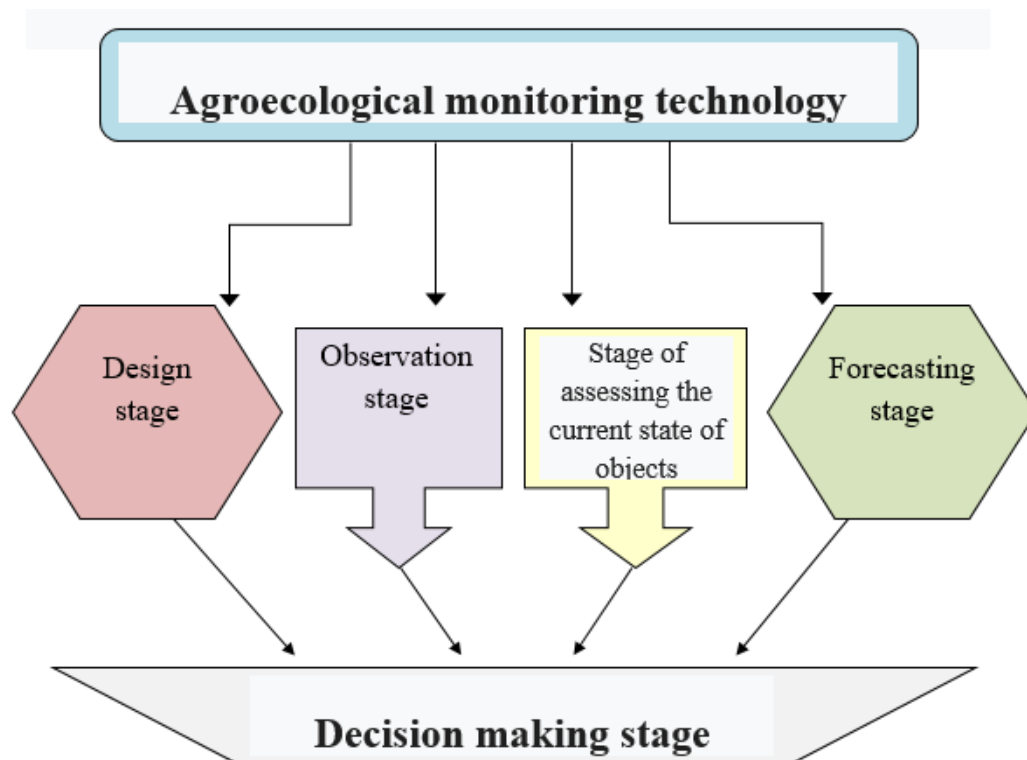
Annotation. This article provides information on the scientific basis and comparative analysis of the principles for developing a geopositional database of an automated information system to improve the process of agroecological monitoring of land plots and monitoring of agricultural lands.

Keywords: Land, agroecological monitoring, fertility, land fund and geoinformation systems.



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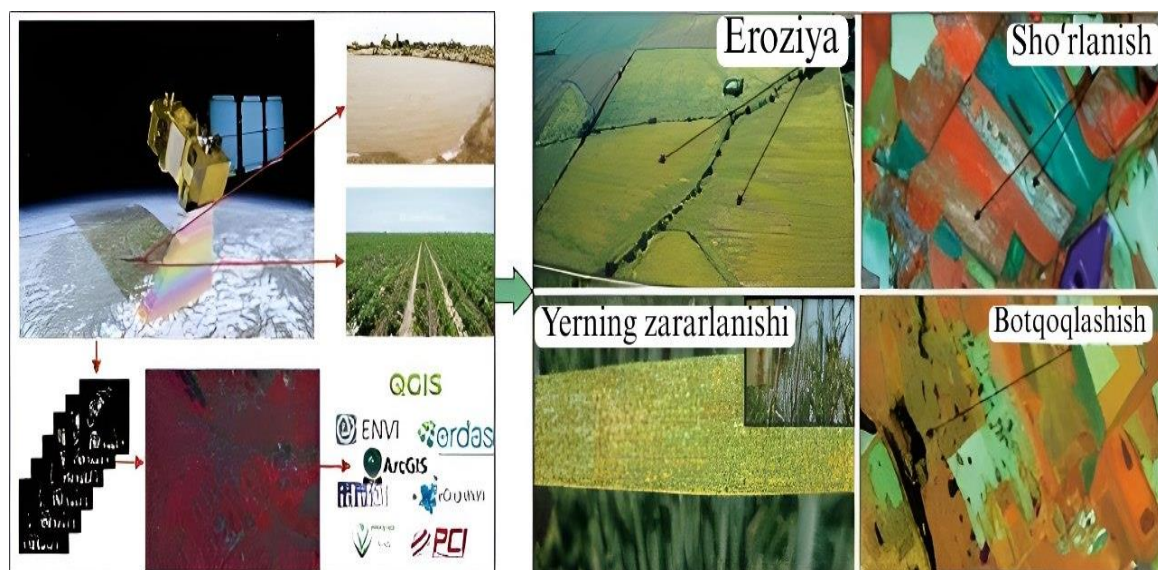
Introduction. Land is our national treasure. In our country, the use of land is the competence of ministries and agencies, as well as legal entities and individuals who have been assigned to use it for a specific purpose. Land users submit annual reports on the availability of land and its general condition; economic, social and ecological benefits of land use; to have access to scientifically based methods of land use efficiency assessment, appropriate land cadastral information supply and land information system; in cooperation with the state planning bodies, develops programs for the use of lands given for the purpose of use; provides recommendations and proposals for long-term improvement of land use and quality, their protection and reproduction [1].



Picture-1. Technology of agroecological monitoring of land resources.

For this reason, it is necessary to carry out control over purposeful and effective use of land and their protection by the authorized bodies of the state by legal and natural persons, and this in itself shows that land monitoring is an integral part of land use. Land monitoring information is necessary to solve all problems of land use, including: rational and efficient use of land, increase of land resources, their protection, compliance with the legal regime of land use, planning of their use, etc. [2].

Today, the world's land fund is 13.2 billion. hectares, of which 1.6 billion hectares (12.0%) are suitable lands for the cultivation of agricultural crops. Quantity and quality of land suitable for agricultural use is decreasing as a result of the negative effects of various natural and anthropogenic factors. Therefore, in different regions of the world, one of the urgent problems is to increase the productivity of the land, which has fallen out of the structure of agricultural land due to its deteriorating condition.



Picture-2. Agroecological monitoring of agricultural lands.

The methodology for this study on improving agroecological monitoring of agricultural lands focuses on establishing a positional database for an automated information system, which is essential for land use management. Initially, data collection involved gathering geospatial data on land use and environmental conditions to form a foundation for the monitoring system. This data was analyzed to assess current land fertility, areas of degradation, and the effects of both natural and anthropogenic factors on soil health. Based on this analysis, the study then moved to design and implement the automated monitoring system using Geographic Information System (GIS) technology, which integrates data on land type, usage patterns, and environmental impacts. This system was also designed to allow real-time monitoring and predictive modelling to assess future land productivity. Finally, the decision-making component was implemented, where the automated system supports governmental bodies and agricultural enterprises by providing actionable insights and recommendations for sustainable land use. This streamlined approach to monitoring is expected to contribute to more informed land management practices, enhance the sustainability of agricultural lands, and ultimately align with national goals outlined in Uzbekistan's development strategy for 2022-2026.

In the development strategy of New Uzbekistan for 2022-2026, “Development of 464 thousand hectares of new and abandoned lands, improving the system of providing agricultural services based on science and innovation, providing raw materials to agricultural enterprises and increasing production volumes.” its size by 1.5 times” is identified as an important task. For this reason, it is important, on the basis of comprehensive land development projects, to reintroduce land plots degraded under the influence of natural and anthropogenic factors into agricultural use and use them effectively [3].

Along with the acquisition of new lands for the purposes of residence and agricultural use by the population of our republic, reclamation damage, erosion, drought, increased salinity and the impact of groundwater, industrial and transport structures, mining operations as a result of open-pit exploitation, the process of withdrawing agricultural lands from circulation causes rapid growth.

According to statistics, as of January 1, 2022, the number of agricultural enterprises and organizations in the republic is 116,977, and the total area of land used by them is 27,148.5 thousand hectares, or 60.5% of the land fund of the republic. In the republic, the area of agricultural land is 22,116.1 thousand hectares, of which irrigated 3,694.9 thousand hectares, or 8.23% of the total land area. Of this area, the area of agricultural land is 22,116.1 thousand hectares. 60.5% of the territory of our republic is occupied by agricultural land, which is the main means of agricultural production [5].

In general, the analysis of the current state of the organization of the use of agricultural land, in particular irrigated arable land, theoretically shows that agricultural land, especially irrigated arable land, is excluded from agricultural accounting in the following cases, when it becomes land or land moves to other categories of land that are not used at all:

- allocation of agricultural land, including irrigated arable land, for non-agricultural purposes. Distribution and redistribution of land, in which the allocation of agricultural land for non-agricultural purposes is a legal process, is due to the fact that the population is growing, exceeding its needs in everything, that is, the sectors of the economy are constantly developing in accordance with these requirements, there is a need to carry out land allocation work. This, in turn, leads to the loss of part of the agricultural land. At the same time, of course, it is always necessary to allocate for the above purposes land that is not used in agriculture, unproductive, unprofitable;
- lack of water supply due to lack of irrigation water. Most crops in the irrigated fields of our republic are irrigated with water from transboundary water sources. However, in subsequent years, irrigation water in these water sources has decreased somewhat. This situation has led

to a slight decrease in water allocated to the republic. As a result, this has created several problems with the water supply of existing irrigated lands.

Over the past 30 years, the reduction of arable land on the scale of our country has amounted to 153.6 thousand hectares, of which 155.2 thousand hectares are irrigated arable land. Conversely, it has been established that the area of perennial trees and gray lands has increased.

In conclusion, it can be said that one of the main tasks facing us is the organization of systematic and effective use of the land fund of our republic. To solve this problem, we need to carry out regular agroecological monitoring of land resources and improve the process of automation of this process with the help of modern geoinformation technologies. It is necessary to develop practical proposals and recommendations for carrying out protective work in order to develop the ability of the population to properly use land and control the condition of land plots in use and ensure their effective production.

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