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IMPROVING THE SYSTEM FOR USING GEOINFORMATION TECHNOLOGIES IN MONITORING PASTURE LANDS (IN THE EXAMPLE OF VOBKENT DISTRICT)

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Abstract

In this article, the geoinformation technology system allows you to monitor the condition, quantity and effective use of pasture lands. Geographic information system technologies allow you to simultaneously monitor many areas, determine their condition, increase their efficiency, and implement preventive measures. It is possible to monitor pastures through space and aerial photographs, determine their condition and implement the necessary measures, and by observing the expansion or contraction of pastures, it is possible to determine the results of the measures taken by comparing annual reports and annual results over the years. With this information, it is possible to effectively use pastures and improve their condition. Pasture lands also play an important role in the production of food in livestock farming.

Keywords: Geoinformation technologies, preventive measures, space and aerial photographs, information about pasture lands.

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Introduction

Currently, the development of the livestock sector in the Republic of Uzbekistan largely depends on the state of pasture resources and the level of their use. In recent years, the ecological state of pastures has been deteriorating due to climate change, anthropogenic factors and mismanagement. In particular, problems such as pasture degradation, sparse grass cover, and deterioration of water supply are intensifying. Therefore, in such conditions, geoinformation technologies - GIS, remote sensing (RS), drone images and digital maps - are among the most reliable tools for sustainable management and effective monitoring of pastures. GIS can be used to determine the current state of pastures, assess the degradation process, model livestock loads, and analyze vegetation indices. This study is devoted to improving pasture monitoring based on geoinformation technologies using the example of Vobkent district. Agriculture, in particular, the livestock sector, plays an important role in the economic development of the Republic of Uzbekistan. The effective operation of livestock farming is directly related to the state of pasture resources. The ecological state of pasture lands, the quality indicators of grass cover, water supply, soil fertility and the degree of degradation directly affect the stability of the livestock sector. In recent years, due to climate change, increased anthropogenic load, water shortage and mismanagement, pastures have been significantly degraded in many regions of our republic, including the Vobkent district of the Bukhara region. In particular, the degradation of pastures leads not only to a decrease in economic indicators, but also to a disruption of the ecological balance. Factors such as a decrease in grass cover, exposure of soil to wind and water erosion, the growth of weed plants, and a decrease in organic matter sharply reduce the efficiency of pasture use. As a result of the continuation of these processes, the shortage of fodder in livestock farming will increase, the volume of production will decrease, and economic losses will increase. At the same time, proper management of pasture use, accurate monitoring and timely assessment of their condition remain the need of the hour. Traditional methods,

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namely field surveys, assessment based on paper maps, and reliance on statistical data, do not meet today's requirements. Because these methods are time-consuming, have low accuracy, do not fully cover large areas, and do not allow for real-time monitoring of changes. Therefore, geoinformation technologies — GIS (Geographic Information System), remote sensing (RS), satellite imagery, and drone monitoring — are making it possible to assess pastures in an accurate, systematic, and modern way. Today, the use of geoinformation technologies not only speeds up monitoring, but is also becoming the main scientific and practical tool in developing a strategy for sustainable pasture management. What can be done with the help of geoinformation technologies:

- The real state of pastures is measured;
- Vegetation development is determined by grass cover density, botanical composition, and NDVI;
- a map of the level of degradation can be created;
- the dynamics of changes over time are observed;
- livestock load is modeled;
- Water supply, infrastructure, and relief indicators are evaluated.

In the case of Vobkent district, the capabilities of GIS technologies for organizing pasture monitoring are especially important. Because the natural and geographical conditions of this area are arid, water resources are insufficient, and the livestock sector is expanding from year to year. Therefore, the need for making scientifically based decisions on the rational use of pastures and their protection is increasing. This work considers the issues of assessing the current state of pasture lands in Vobkent district, identifying degradation processes, improving the monitoring system based on geoinformation technologies, and developing proposals. The scientific novelty of the study is that it conducts accurate spatial analysis based on the integrated use of GIS and remote sensing technologies. This plays an important role in creating a sustainable development and effective management strategy for pastures. The relevance of using

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geoinformation technologies for Vobkent district is that this region has arid climatic conditions, and limited water resources make it difficult for the natural regeneration of pastures. The annual increase in the number of livestock, improper planning of seasonal and direct use of pastures leads to a decrease in grass cover by up to 40–50 percent in some areas. Therefore, the need to determine the real state of pastures, map the level of degradation and plan their use on a scientific basis is increasing. In this regard, this work highlights the issues of monitoring the state of pastures in Vobkent district using geoinformation technologies, identifying degradation zones and developing an improved management system for sustainable use of pastures. The results of the application of GIS and RS technologies allow maintaining ecological balance in the region, increasing the efficiency of livestock farming, and rational use of pasture resources. The sustainable development of livestock farming in Vobkent district is directly related to the ecological state of existing pasture resources and the level of their rational use. The study found that in recent years, as a result of climate change, water scarcity, increased anthropogenic load and mismanagement, the degradation process of pastures has intensified, grass cover has significantly decreased and soil fertility has decreased. This situation leads to a decrease in the efficiency of livestock farming, disruption of the ecological balance and increased economic losses.

This study showed that traditional monitoring methods do not meet today's requirements. The inability to cover large areas, not providing quick results, and low spatial resolution create serious limitations in assessing the condition of pastures. Therefore, geoinformation technologies — GIS, remote sensing, satellite imagery, and drone monitoring — have once again been confirmed as the most effective and modern method for pasture management.

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Conclusion

According to the results of the study, using GIS and RS technologies, it is possible to accurately assess the current state of pastures in Vobkent district, map degradation zones, monitor ecological changes based on grass cover density and vegetation indices (NDVI). It was also found that it is possible to develop an optimal strategy for pasture use by modeling livestock loads, analyzing water sources and relief factors. The rate of pasture regeneration in Vobkent district is low, therefore, it is necessary to manage them on a scientific basis. Geoinformation technologies allow for early detection of degradation processes and timely measures to combat them. Sustainable use of pastures requires the creation of a management system based on spatial information. Based on the monitoring results, it is necessary to regulate livestock loads, restore degraded areas, and develop planned use measures around water sources. It is recommended to systematically use GIS and remote sensing technologies in assessing pastures in Vobkent district. Conducting spatial analysis based on satellite images, drone monitoring, and NDVI indices two to three times a year will allow for early detection of degradation processes. Given that the current stocking rate in some regions is 1.5–2 times higher than the norm, it is necessary to introduce a system of seasonal distribution and rotation of livestock.

References

1. Information on the "Uzbekistan-2030" strategy of the Republic of Uzbekistan.
2. Law on Geodesy and Cartography.
3. ASchertovskii, AK Bazarov. Sistema zemlepolzovaniya Uzbekistana. Science. 2007, 212 p.
4. Volkov SNZemleustrochtvo//Uchebnik. T 2: Vnutrikhozyatstvennoe zemleustroystvo. M.: Kolos, 2001, 648 pages.

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5. S. Avezbayev, SN Volkov. Economics of land management //Textbook.TIMI, 2016.265.
6. Decree of the President of the Republic of Uzbekistan "On measures to radically improve the system of land accounting and state cadastre maintenance". September 7, 2020 PF-6061
7. Resolution of the President of the Republic of Uzbekistan "On the organization of the activities of the Cadastral Agency under the State Tax Committee of the Republic of Uzbekistan" dated September 7, 2020 PQ-4819.
8. Decree of the President of the Republic of Uzbekistan "On additional measures to improve the system of use and protection of agricultural lands"
8. www.nature.uz
9. www.ekonazorat.uz
10. WWW.president.uz