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The use of remote sensing technologies in the design of maps of agricultural land

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Abstract: This article provides information on the use of remote sensing technologies in the design of agricultural land maps, the purposes of remote sensing mapping, the methods of mapping in remote sensing and area monitoring

Key words: remote sensing, map, aerial photography, aerial photography, land, land resources, GIS, ecology, telecommunications, geological prospecting, cartography, meteorology, seismology.

Introduction.

In the developed countries of the world, the rapidity of land information shows its positive aspects significantly in all directions of the land system. It is no secret that modern technologies and scientific achievements are used in the creation of maps of land types even in the developed countries, which are at the top of the world in terms of the use of land resources. The land is the source of society's wealth, the natural basis for creating material wealth for humanity and providing raw materials for production. In the process of production of material wealth, the land participates as a basis (basis) and means of production.

It is known that land resources are the general means of economy, i.e. production. It is embodied in agriculture, industry, transport, as well as in all other aspects of human material activity as a place for people to live, a work tool and a means of production.

It should be noted that in the Decree No. PF-5806 of August 30, 2019 "On the development of space activities in the Republic of Uzbekistan" with the concept documents for the development of the space network of the Republic of Uzbekistan in 2020-2030, space, in particular, was commissioned to develop a basic concept for the introduction of satellite technologies into the economy of the country, as well as to form a unified state policy in the field of space research management, to provide an integrated system of space network management, the "Uzbekcosmos" agency was established. In order to fulfill the directive documents mentioned above, the concept of space network development of the Republic of Uzbekistan for the period from 2020 to 2030 was developed. In our republic, it is felt that the work on the use of remote sensing systems in cases where modern techniques and technologies are used in the management of land resources is insufficient. Determining the reasons for this and improving the use of geoinformation systems in the management of land resources in economic conditions is an urgent issue today [1-5].

Therefore, it is necessary to improve the use of modern methods in the management of land resources, and for this purpose, to search for available opportunities and to develop a remote sensing basis for mapping land types

Methods.

In the developed countries of the world, the rapidity of land information shows its positive aspects significantly in all directions of the land system. It is no secret that modern technologies and scientific achievements are used in the creation of agricultural maps even in the developed countries, which rank high in the world in terms of the use of land resources. We will study several cases including it.

Studying the work done by Uzbek and foreign scientists on the topic of updating land use maps using space data and GIS technologies and the articles published based on this work. In the world, and first of all, in the United States, developed countries of Europe and the Russian Federation, research has been carried out on the issues of improving the efficiency of land use, which, in turn, has led to the development of scientifically

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based methods of creating maps of land types and improving them using modern GAT technologies and remote sensing methods. requires. Such research is carried out by foreign scientists D.I. Kozlova S.V. Koplova, Pavlov A.V., Kutumov A.A., Shvedov D.O. Anikeneva I.A., Zaichko V.A. Conducted by Ben-Dor, Banin, Dwivedi, Mettyernicht, Zinck, et al. Among them: E.Yu.Safarov, T.Mirzaliyev, I.Musayev, E.Kh Isakov, A.Rakhimov, Z.Mamatkulov, I.Abdurakhmonov, Sh.Prenov and R.Oymatov, the proposals and recommendations are bearing fruit.

It is worth noting that scientific research on the identification and assessment of land types, the creation of improved attributive maps and monitoring of regions by processing remote sensing data with the help of GIS technologies has not been carried out enough [6-10].

Results And Discussion.

The decree of the President of the Republic of Uzbekistan No. PF-5806 of 30.08.2019 on "Development of space activities in the Republic of Uzbekistan" was signed. According to the decree, space research such as remote sensing of the earth, satellite communication, navigation systems, which can increase the efficiency of the fields of agriculture and water management, ecology, telecommunications, geological exploration, cartography, meteorology, seismology and urban planning, and activities in the field of technologies are almost not carried out. active investment policy aimed at expanding existing scientific and technological directions and creating new directions with high demand, as well as program measures to improve the standard of living and quality of the population requires the use of highly scientific, technological and large-scale areas of activity that have not yet been used, such as innovations, nano-technologies, atomic energy, space industry. We know that new technologies are introduced every year. One of these is remote sensing technology. It really has a lot of potential [11-15].

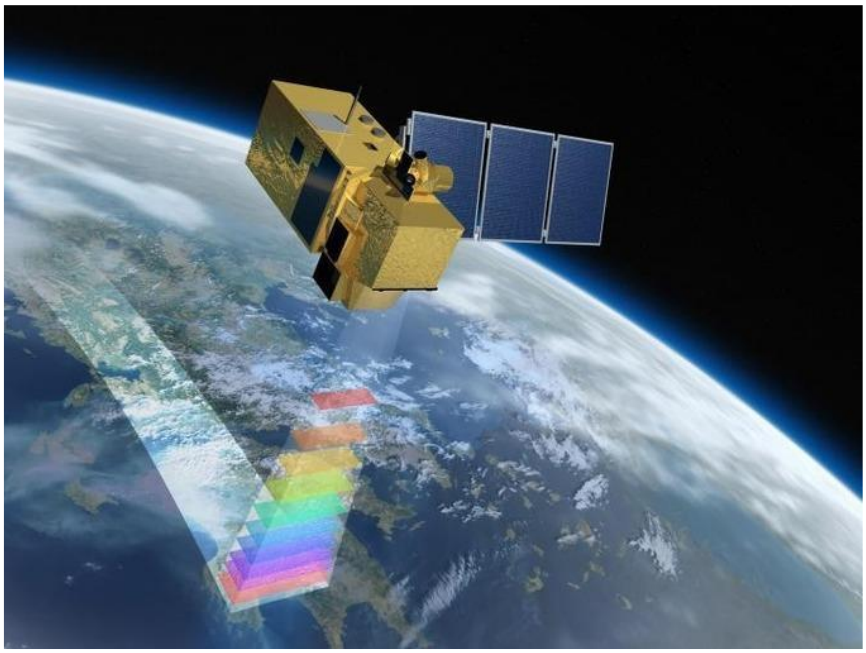

Figure 1. Functional process of creating an electronic map using remote sensing data.

Remote sensing is the data obtained by analyzing the information obtained with the help of equipment that is not in direct contact with the object, field or phenomenon under investigation. In the world of geospatial science, remote sensing is also known as "Earth observation", which means observing the Earth using sensors at a high distance from the Earth's surface. Sensors are similar to ordinary cameras, except that they do not use visible light, but use other ranges of the electromagnetic spectrum, namely infrared, microwave and ultraviolet ranges. Sensors are becoming very advanced, with the help of which it is possible to take pictures of very large areas.

Currently, remote sensing is carried out using aerial methods using airplanes and satellites. Also, in remote sensing, not only photographic films, but also digital cameras, scanners, videos, radar and thermal sensors are

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used. In the past, remote sensing was limited to the use of the visible part of the electromagnetic spectrum, the part of the spectrum that is invisible to the human eye can now be used with the help of spectral filters, photo films and other types of sensors. Also, the view of the Earth was applied to practice and solving life problems, for example, we can cite air reconnaissance during World War II. Aerial photographs provided an opportunity to observe the location of the enemy's army quickly and more safely than observation from the ground. Aerial photographs made it possible to quickly and relatively accurately update military maps and information about strategic locations.

Nowadays, remote sensing is widely used in environmental management, a field that requires fast, accurate and new data collection. Satellite technologies and the creation of multi-spectral sensors have further expanded the possibilities, with the help of these technologies it is possible to obtain information about the environment from very large areas of the earth that are invisible to the human eye [16-20].

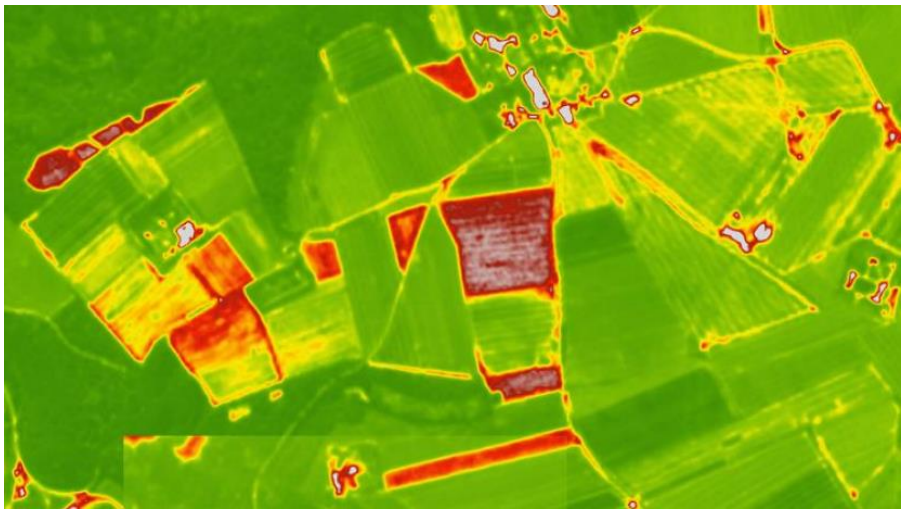

Figure 2. Application of satellite images and remote sensing data for agricultural maps.

One of the most common methods of remote sensing of the Earth is to image the Earth's surface using different spectral intervals using different methods. With the help of multispectral images, it is possible not only to identify situations and objects, but also to evaluate them quantitatively. In the process of thematic analysis of images, various sources are often used, for example, digital topographic and thematic maps, graphs, city schemes, external databases. The size of multispectral images is characterized by the degree of possibility to determine the characteristics of the smallest objects in the image. Depending on the problem, low-level (more than 100 m), medium-level (10-100 m) and high-level (less than 10 m) images are used. Survey images consist of low-level planar images, but can simultaneously cover a large area, up to an entire hemisphere. Such information is widely used in the field of meteorology. Today, mid-level imagery is the best source of data for environmental monitoring. In recent years, high-resolution imagery has been widely used for military purposes, as well as in commercial space systems and geo-information systems, as it allows for high-resolution analysis.

The demand for the use of remote sensing in map development is increasing day by day, and it is used to perform the following tasks: stereo coverage, frequent imaging, timely data delivery, large area coverage, global coverage, for future map updates. storage in digital format and adaptation with modern GAT technologies.

Users of the maps include forestry, mining and oil companies, service engineering organizations, utilities and infrastructure development organizations (pipelines, telecommunications, transportation and power services), government mapping organizations and defense systems. From defense to commercial applications, information and its scale and accuracy are increasing the demand for the use of map products [21-23].

Remote sensing is used in mapping for the following purposes:

• Creating a contour map;
• Creating a digital elevation model (DEM);

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• Making a main thematic map, making a topographic map.
There are 3 main methods of mapping in remote sensing and area monitoring:
1. Collect data using field imagery-geodesic measuring instruments, observation and location maps.
2. Taking digital pictures of the Earth's surface with the help of equipment specially installed on aerial photography devices (planes, helicopters).
3. Spatial imaging - taking pictures of the earth's surface with the help of special equipment installed on space apparatus (sputnik).

Conclusion.
Based on the information given above, it can be said that the information obtained by remote sensing serves as the most convenient source in every field, because we can get an effective result by spending less time on the information we receive. This creates great opportunities for effective use of limited resources. Especially in the fields of agriculture and water management, the use of remote sensing materials makes mapping easier.

References.
1. Eshnazarov D. et al. Describing the administrative border of Koshtepa district on an electronic digital map and creating a web map //E3S Web of Conferences. – EDP Sciences, 2023. – Т. 452. – С. 03009.
2. Ganiyev Y. Y., Murodilov K. T., Mirzaakhmedov S. S. EVALUATING THE PRECISION OF GOOGLE MAPS IN COUNTRYSIDE REGIONS //ITALY" ACTUAL PROBLEMS OF SCIENCE AND EDUCATION IN THE FACE OF MODERN CHALLENGES". – 2023. – Т. 14. – №. 1.
3. Yusufovich G. Y., Shavkat o‘g‘li S. Y. CARTOGRAPHIC RESOURCES USED IN THE CREATION OF ELECTRONIC AGRICULTURAL MAPS OF FERGANA REGION //Finland International Scientific Journal of Education, Social Science & Humanities. – 2023. – Т. 11. – №. 3. – С. 1001-1009.
4. Abdurakhmanov A. A., Mirzaakhmedov S. S. H. DEVELOPMENT OF MECHANISM FOR CARTOGRAPHIC SUPPORT OF REGIONAL DEVELOPMENT //Finland International Scientific Journal of Education, Social Science & Humanities. – 2023. – Т. 11. – №. 3. – С. 1110-1118.
5. Abduvakhabovich A. A., Shavkat o‘g‘li S. Y. IMPROVING THE METHOD OF MAPPING AGRICULTURE USING REMOTE SENSING DATA //Finland International Scientific Journal of Education, Social Science & Humanities. – 2023. – Т. 11. – №. 3. – С. 1093-1100.
6. Akhmedov B. M. Methods of Calculating Function Range Calculations in Accuracy Assessment. Evaluation of Parametric Determination of Equation //Texas Journal of Engineering and Technology. – 2023. – Т. 21. – С. 57-62.
7. Akhmedov B. M. GEODETIC SURVEY NETWORKS (CREATING LEVEL-HEIGHT GEODETIC SURVEY NETWORKS IN ENGINEERING-GEODETIC RESEARCH FOR CONSTRUCTION) //Finland International Scientific Journal of Education, Social Science & Humanities. – 2023. – Т. 11. – №. 3. – С. 1040-1052.
8. Турдикулов Х. Х., Қосимов М. Численный Анализ Напряженно-Деформированного Состояния Высокой Грунтовой Плотины С Учетом Данных Натурных Наблюдений //Central Asian Journal of Theoretical and Applied Science. – 2022. – Т. 3. – №. 6. – С. 349-357.
9. Turdikulov K. Calculation of the stability of ground dam under seismic loads //E3S Web of Conferences. – EDP Sciences, 2023. – Т. 452. – С. 02021.
10. Valievich M. X., Bakhodirjon o’g’li M. B. LARGE-SCALE ENGINEERING AND TOPOGRAPHIC PLANS //Finland International Scientific Journal of Education, Social Science & Humanities. – 2023. – Т. 11. – №. 3. – С. 1119-1125.
11. Ganiyev Y. et al. Examining the managerial structure and operational aspects of geodesy, cartography, and cadastre production //E3S Web of Conferences. – EDP Sciences, 2023. – Т. 452. – С. 03013.
12. Maxsimov K. DURABILITY OF REINFORCED CONCRETE PILES IN AGGRESSIVE SOIL CONDITIONS //Spectrum Journal of Innovation, Reforms and Development. – 2023. – Т. 21. – С. 270-273.
13. Ibaevich M. K. DESIGN OF BASES AND FOUNDATIONS ON SALINY SOILS //Spectrum Journal of Innovation, Reforms and Development. – 2023. – Т. 21. – С. 267-269.

ISSN NO: 2771-8840
Date of Publication: 06-12-2023

14. Abboskhonovich M. A. et al. PROCESSES OF INTRODUCING THE DIGITAL ECONOMY ON IRRIGATED LAND //Finland International Scientific Journal of Education, Social Science & Humanities. – 2023. – T. 11. – №. 3. – C. 1126-1131.
15. Marupov A. et al. Procedure and method of marking administrative-territorial boundaries on the basis of digital technologies //E3S Web of Conferences. – EDP Sciences, 2023. – T. 452. – C. 03007.
16. Xakimova K. et al. Theoretical and methodological issues of creating the “ECO FERGANA” mobile application of tourist objects and resources of Fergana region //E3S Web of Conferences. – EDP Sciences, 2023. – T. 452. – C. 05025.
17. Akhmedov B. Using the fundamentals of the theory of measurement errors in performing geodesic measurement and calculation works //E3S Web of Conferences. – EDP Sciences, 2023. – T. 452. – C. 03012.
18. Abdurakhmanov A. A., Mirzaakhmedov S. S. H. DEVELOPMENT OF MECHANISM FOR CARTOGRAPHIC SUPPORT OF REGIONAL DEVELOPMENT //Finland International Scientific Journal of Education, Social Science & Humanities. – 2023. – T. 11. – №. 3. – C. 1110-1118.
19. Ganiyev Y. Y., Murodilov K. T., Mirzaakhmedov S. S. EVALUATING THE PRECISION OF GOOGLE MAPS IN COUNTRYSIDE REGIONS //ITALY" ACTUAL PROBLEMS OF SCIENCE AND EDUCATION IN THE FACE OF MODERN CHALLENGES". – 2023. – T. 14. – №. 1.
20. Arabboyevna A. M. et al. CREATION OF A SATELLITE GEODESIC BASE ON THE TERRITORY OF THE REPUBLIC OF UZBEKISTAN //Finland International Scientific Journal of Education, Social Science & Humanities. – 2023. – T. 11. – №. 3. – C. 1033-1039.
21. Mirzakarimova G. M. REMOTE SENSING DATA: INTERNATIONAL EXPERIENCES AND APPLICATIONS //ITALY" ACTUAL PROBLEMS OF SCIENCE AND EDUCATION IN THE FACE OF MODERN CHALLENGES". – 2023. – T. 14. – №. 1.
22. Yusufovich G. Y. et al. USING A DATA BANK THAT AUTOMATES DIGITAL MAPS IN THE ArcGIS APPLICATION //American Journal of Technology and Applied Sciences. – 2023. – T. 18. – C. 67-70.
23. Yusufovich G. Y. et al. UPDATING LAND USE CARDS USING AEROSPACE DATA AND GIS-TECHNOLOGIES //International Journal of Advance Scientific Research. – 2023. – T. 3. – №. 11. – C. 232-237.