IMPROVING AGRICULTURAL MAPPING USING REMOTE SENSING DATA

Egamova Dilchehra Adizovna
Doctoral student of Bukhara Institute of Natural Resources Management of the National Research University of Tashkent Institute of Irrigation and Agricultural Mechanization Engineers
Sulaymonov Javohir Ne'matjon o'g'li
Doctoral student of Bukhara Institute of Natural Resources Management of the National Research University of Tashkent Institute of Irrigation and Agricultural Mechanization Engineers

Annotation: *Geographic information systems (GIS) are the most effective tool for agricultural data, by its very nature, to be spatialized, analyzed and managed. Remote sensing of the Earth (Remote Sensing) data (satellite images) serves as an operational source of geographic information systems. Long-term world experience shows that satellite images of the Earth are an operational control of crop condition and productivity prediction. to improve the collection of agricultural statistical data and ensure uniformity, accuracy and objectivity of observation. Rural research indicates that agricultural research is conducted at the national, regional, local and individual farm levels.*

Key words: *Data base in GIS , spatial analysis , relief of the place, soil properties, hydrological regimes , agricultural maps , land from a distance sounding , satellite images , aerial photographs .*

The use of GAT and YeMZ in the preparation of agricultural maps, on the one hand, serves to increase productivity by implementing agrotechnical measures based on operative and detailed information about the state of cultivated crops, on the other hand, it includes the quantitative and qualitative characteristics of agricultural sectors. taken as a basis for creating reflective agricultural electronic cards.

Using Earth Remote Sensing Data. Remote sensing materials and GAT technologies, which are modern technologies of today, play an incomparable role in the creation of agricultural electronic maps.

Based on remote sensing data, it is possible to create a real-time database on agricultural sectors of the researched area, in particular, agricultural crops, fisheries, agricultural fields and other sectors of agriculture. . Also, remote sensing techniques are of great help in determining crop yield potential, parasite distribution, damage incidence, and soil conditions using space imagery and aerial photography.

At present, satellite images and aerial photographs are used as the main means of monitoring agricultural lands, as well as for the classification of land users, crop productivity and their suitability.

The classification of agricultural sectors and land users through remote sensing of the earth is very important information in today's agriculture management. Because

today there are no sources of accurate and reliable information about the users of agricultural land in the regions and the land they use.

Geospatial information explaining the properties of objects from a distance can be extracted due to specific spectral reflectances of objects, especially plants, soil, water and other bodies. It is more convenient and cheaper to create an electronic card of agricultural sectors through this physical law.

Today, about 5,000 satellites designed for various purposes fly in the earth's orbit. Earth remote sensing satellites from more than 50 agencies and nations orbit the earth at various altitudes, inclinations, periods, and spatial capabilities. Most of them are used for commercial and military purposes.

Sentinel 2 satellites are equipped with 13 spectral optical scanners for continuous monitoring of the earth's surface, of which 4 have the ability to capture space images with a resolution of 10 meters, 6 at 20 meters, and 3 at 60 meters.

Preparing images for processing

When creating agricultural maps based on the data of remote sensing of the earth, it begins with the preparation of the received images for processing.

Typically, remote sensing data from satellite or aircraft-mounted imaging sensors will have errors and omissions. Preparation for processing includes the processes of preparing data for analysis, such as correcting systematic and random errors. Atmospheric correction of images in the process of remote sensing (scattering and stopping in the atmosphere affect the digital numerical values of the surface of the object); the lighting geometry of the sun; erosion of the earth's surface; changes in satellite speed and altitude; The effect of the rotation of the earth, altitude, errors in the operation of the sensor (irregularity in the response of the detector, changes in the vibration of the mirror); is affected by the loss of the fixed imaging line and other errors. But not all of these need to be processed by users, most of them are fixed before they reach the user.

remote sensing data, the most important technologies for data processing are radiometric, geometric, and atmospheric corrections.

Radiometric correction . Radiometric correction of a remotely sensed image involves digital image processing to increase the accuracy of the brightness value. The main purpose of applying radiometric correction is to reduce the effect of errors and inconsistencies in the brightness value of the image. Because these errors can limit a person's ability to process, interpret and analyze images.

Development of a method of mapping agricultural networks by means of remote sensing of the earth

The above programs are used to create agricultural maps based on remote sensing data. There are different classification algorithms for determining agro-ecological conditions and agricultural sectors in regions. All classification algorithms are of two main types: supervised classification algorithm, based on the results of field research and auxiliary data, and the human factor is involved in the classification process; type of unsupervised classification, the image is divided into automatic

clustering algorithms based on pixel data. Recent research has shown that supervised classification algorithms perform better

Supervised classification algorithms, especially maximum similarity algorithm (MLC), random forest algorithm (Random Forest), support vector method (SVM), artificial neutral networks (ANN) algorithms create unique classification possibilities.

Random Forest The random forest algorithm is significant for its high accuracy and fast data analysis by computer. Based on this random forest algorithm, it systematically analyzes the data to classify (classify) the data. Using data from field experiments, the algorithm identifies groups by querying multiple data sets in each system. In other systems, classes are determined by the spectral data voting method, and each pixel is classified based on its own objects.

The maximum similarity algorithm (MLC) is considered one of the most widely used classification algorithms. The algorithm is based on probability, and according to the statistical indicators of the field experiment data, each spectral index is assumed to be normally distributed on the cross-section of classes. The SVM algorithm coordinates the correlations between the measured samples by optimizing the closest location of the field test samples and by calculating the maximum distances of the boundaries between them and divides them into appropriate classes.

An artificial neural network (ANN) algorithm is an algorithm that can provide suitable solutions for detection of sensor data that are usually nonlinearly dependent, complex, inaccurate, and imperfect or error-prone. Image classification using neural networks is performed by identifying texture features and then applying a regression algorithm.

Among the software belonging to the GAT family is the ArcGIS program belonging to the ESRI ArcView GIS company, which includes thematic vector layers, including many layers related to agriculture. There is a set of tools for working with data, and it is possible to carry out analysis using analytical functions. The full capabilities of the ArcGIS program include the ability to convert spatial raster data from one projection to another, transform images and coordinate coordinates, and export from raster format to vector format.

The level of brightness of the space image, which is widely used in the formation of synthesized images, was implemented through the function "Link Channels". Depending on the purpose of the research, the sequence of channels may be different. In the processing of multispectral space images, it is performed by index image transformations. On the basis of mathematical operations, raster images are created based on the matrix of luminance values in channels with a clear sequence. The pixels in these raster images are stored as spectral indices. With the help of the created image, the next stages of the research are carried out.

Vegetation indices are widely used in research and evaluation of agricultural crops. These indices are parts of the visible and near-infrared spectrum of space images, and are based on different bright pixels. Currently, there are 160 types of

vegetation indices, which are classified according to the characteristics of plants and soils and based on experiments.

In our study, the aim was to study the distribution and dynamics of NDVI vegetation indices, and to determine the condition (types) of agricultural crops by using these indices. The NDVI button in the "Image processing" window allows you to change space images in the near infrared - NIR and red - RED imaging zones and determine the vegetation index.

Agricultural mapping requires the selection of a classification algorithm that ensures the reliability and accuracy of data extracted from remote sensing data. Scientific studies and experiments have shown that increasing the accuracy of classification results requires not only choosing the perfect algorithm, but also having high-level knowledge and skills in the field of research. In the mapping of agricultural sectors, in particular, in the classification of crop types, it is necessary to be familiar with the existing crop types in the region, their dependence on natural and climatic conditions, and their development trends.

REFERENCES:

1. Adizovna , ED, & Majiddinovich , UU (2023). SPECIFIC CHARACTERISTICS OF THE GERMAN CADASTRAL SYSTEM. JOURNAL OF INterdisciplinary INNOVATIONS AND SCIENTIFIC RESEARCH IN UZBEKISTAN , 2 (16), 358-362.
2. Egamova , D. A., Bobojonov , S. U., & Mukhamadov , K. M. (2014). POVYShENIE RATsIONALNOGO I EFFEKTIVNOGO ISPOLZOVANIYA ZEMELNYX RESURSOV. The Way of Science , 57.
3. Adizovna , ED, & Majiddinovich , UU (2023). PROPERTY PROTECTION AND FURTHER IMPROVEMENT OF PRIVATE OWNERSHIP FORMS IN UZBEKISTAN. JOURNAL OF INNOVATIONS IN SCIENTIFIC AND EDUCATIONAL RESEARCH , 2 (15), 83-89.
4. Egamova , Dilchekhra , and N. K. Akhadova . "METHODICS AND TECHNOLOGY DESIGN AND EARTH STRUCTURE ." Tsentralnoaziatsky zurnal obrazovaniya i innovatsiy 2.3 (2023): 53-57.
5. Adizovna , ED (2023). SYSTEM OF LAND STRUCTURE DESIGN IN UZBEKISTAN AND ITS MAIN CONTENT. Finland International Scientific Journal of Education , Social Science & Humanities , 11 (3), 155-161.
6. Egamova , D., & Ahadova , N. (2023). LAND STRUCTURE DESIGN SYSTEM AND ITS MAIN CONTENT IN UZBEKISTAN. Tsentralnoaziatsky zurnal obrazovaniya i innovatsiy , 2 (3), 47-52.
7. Khasanov , F., Egamova , D., & Asatov , J. (2023). MEASURES TO IMPROVE THE EFFICIENCY OF AGRICULTURAL LAND DESIGN WITH ENVIRONMENTAL SUSTAINABILITY. Tsentralnoaziatsky zurnal obrazovaniya i innovatsiy , 2 (3), 138-143.

8. Egamova , D., Nurullayev , S., & Ahadova , N. (2023). SPECIFIC CHARACTERISTICS OF FORMATION OF LAND USE MECHANISM AS PRIVATE PROPERTY. Bulleten pedagogov novogo Uzbekistana , 1 (3), 18-23.

9. Adizovna , ED, & Nematovich , SJ (2022). ADVANTAGES OF USING INNOVATIVE TECHNOLOGIES IN GROUND MONITORING. Finland International Scientific Journal of Education , Social Science & Humanities , 10 (11), 1-4

10. Adizovna , ED (2023). LAND RESOURCE MANAGEMENT ISSUES. JOURNAL OF INTERDISCIPLINARY INNOVATIONS AND SCIENTIFIC RESEARCH IN UZBEKISTAN , 2 (16), 173-178.

11. Adizovna , ED (2023). DISTINCTIVE FEATURES OF THE GERMAN CADASTRAL SYSTEM. MODELS AND METHODS FOR INCREASING THE EFFICIENCY OF INNOVATIVE RESEARCH , 2 (20), 178-182.

12. Egamova , D. (2023). Sotsialno-ekonomicheskoe znachenie privatizatsii zemelnykh uchastkov. Basic direction strategy of land reform: problems and solutions, 1(1), 101-108.