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Geoanalysis of Perennial Trees of Localities on the Example of Ferghana District

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Annotation: *This article covers the fundamental geoanalysis of perennial trees on the sites of settlements of stock land plots for partial monitoring by sounding.*

Keywords: *geoanalysis, geodetic sensing, monitoring, perennial trees, human settlements.*

INTRODUCTION.

Developing human society continuously interacts with the natural environment, often disrupting the stability and balance of the ecosystem. This problem affects every stage of society's development, dictating the need for sound environmental management, which would lead to the stabilization of all the resources of the agro-ecosystem.

The discrepancy between the existing specialization of agriculture and the potential resource capabilities of the landscape leads to the development of negative processes, to a violation of the natural and anthropogenic balance, especially in landscapes with unstable natural balance [1-5].

Such an impact can be considered rational, which ensures the correct resource turnover, expanded reproduction of renewable landscape resources (increasing soil fertility, productivity of natural and cultural phytocenoses, etc.) (Chernikov et al., 2000).

THE MAIN PART

Features of perennials. At the same time, many gardeners prefer perennial flowers that can grow in one place without transplanting for several (from 2 to 5) years. Properly selected plants will help you create a flowerbed, front garden, landscape composition, to maintain a spectacular view of which you will not need to apply significant physical and time costs. The use of perennials has a number of advantages:

- there is no need to worry every spring about preparing seedlings, purchasing planting material. Most of them belong to frost-resistant crops and they do not need to be dug up and sent for storage in the basement or other dark and cool place.

- from overgrown perennials, by dividing the bush, you can always get seedlings for improving a new garden area. You can share them with your neighbors, receiving from them as a gift another unusual or even exotic flower.
- perennials are quite unpretentious. In the rhizomes of plants, buds are laid in the autumn for the development of shoots, which, with the arrival of warm days, wake up from sleep and begin the next growing season without the participation of the flower grower.
- perennial flower crops have a very long flowering period, much longer than that of annual flowers. it is only important to cut the wilted flowers in a timely manner to allow the plant to form new buds [1-10].

However, it should also be taken into account that not all perennials delight gardeners with lush flowering in the first year after planting. For some, it will take a year or two to settle down well in a new place, grow, and gain strength.

Methods of geoinformation analysis, mapping and modeling, methods of preliminary and thematic processing of remote sensing data were used to implement the tasks set in the study.

The key materials of the satellite survey were the following types of data. [2-15]

- MODIS medium spatial resolution images and information products based on them: MOD13Q1 [Vegetation Indices] and MOD09GQ. MOD13Q1 are composite images of the values of the normalized vegetation index NDVI for 16 days [Justice, 2002]. The time series of MOD13Q1 products currently includes continuous data from 2000, which makes it possible to conduct both seasonal and long-term analysis of the dynamics of the vegetation index. The use of this type of information products has a number of limitations for mapping the structure of crop rotations. At the same time, it has shown significant opportunities in analyzing seasonal changes in vegetation, identifying plowed fields, and evaluating the projective cover. [16-22]
- High-resolution Landsat images (15-30 m) can be used to map the boundaries of cultivated fields, but their main advantage is the ability to identify specific types of crops, detect clean vapors [Terekhin, 2014], update the contours of sown areas annually, and verify the results of processing MODIS images for specific dates.
- High-resolution SPOT-5 images (5 m) were used to create a vector layer of contours of the cultivated areas of the region. Thematic and geoinformation processing of satellite data was carried out in the software packages ERDAS IMAGINE and ArcGIS. With the help of ArcGIS, thematic mapping of crops and modeling of their biophysical parameters were carried out.

The ground-based information block included information on the type of crops, their biophysical parameters and seasonal development features, collected during 2010-2016 in a number of districts of the Ferghana region from almost 100 test fields. In addition, data from agricultural organizations on the structure of crop rotations from more than 1,200 sown areas located in various administrative districts of the region were used to effectively analyze the state of vegetation based on satellite data. [23-30]

Next, we will look at Figure-1 using geoanalysis for perennial trees of settlements in the central part of the Ferghana region.



Figure-1. Geoanalysis of perennial trees of settlements in the central part of Ferghana district.

The picture clearly shows that the perennial trees were actually the first in this area. Localities were formed only in the next 50 years.

Using satellite data of medium and high spatial resolution, a geoinformation implementation of the system for monitoring and evaluating the state of sown areas was carried out on the example of the territory of the Belgorod region. A detailed assessment of the area and number of cultivated fields in the region was carried out. With the use of multi-year series of the vegetation index calculated on the basis of MODIS images, the possibility of current and retrospective assessment of the state of sown areas is realized [31-36]. In particular, the determination of their degree of plowing for specific periods with an interval of 16 days throughout the year, estimates of the projective cover.

The possibility of assessing the state of fields based on the threshold values of the vegetation index (NDVI), studying the seasonal dynamics of vegetation in sown areas is shown.

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