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Geoecological Assessment of Zarafshan National Nature Park using GIS Research

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Annotation: Assessment using GIS studies showed that the specific characteristics of the groves of the Zarafshan National Nature Park are the diversity of plant and soil layers, the morphological structure of the groves, and to a certain extent the groves have a complex structure. Consequently, the grove landscapes consist of various hydrogen geocomplexes, and their differentiation is greatly influenced by the environment, the morphological structure of contrasting groves, the mechanical composition of alluvial deposits, the close location of groundwater, the degree of soil salinity, and the heterogeneity of ecological conditions even in local areas.

Keywords: National park, GIS, grove, ecological conditions, air, water, soil, flora, fauna.

Relevance of the topic. It is known that the Zarafshan oasis in Uzbekistan is fundamentally different from other natural geographical areas not only in terms of soil and climatic conditions, but also in terms of plant life. Although modern scientific sources contain information on the natural plant resources of the Zarafshan National Nature Park (formerly the Zarafshan Reserve), information on its geoecological assessment is almost absent. Therefore, the geoecological study

of Uzbekistan, including the Zarafshan National Nature Park, assessment of their condition and their protection are one of the most urgent problems of our time.

The purpose of the study: to conduct a geoecological assessment of the Zarafshan National Nature Park, including anthropogenic changes in natural and natural-anthropogenic systems and their components, as well as to develop a map of the national park using geoecological indicators and NDVI using GIS research.Tadqiqot materiallari va uslublari.

Creating a map of the geoecological assessment of the flora of the Zarafshan National Nature Park using GIS studies of NDVI indicators and satellite data, as well as a map of the boundaries of the Zarafshan National Park.

Satellite data was acquired to collect geospatial information about Zarafshan National Park. A map of Zarafshan National Park was developed using Google Earth and ArcGIS software.

NDVI data provides us with a wealth of valuable information about temporal and spatial changes in vegetation distribution, productivity, and dynamics.

As a result of the research, solutions to many problems and concerns were found by creating new maps using Google Earth and ArcGIS.

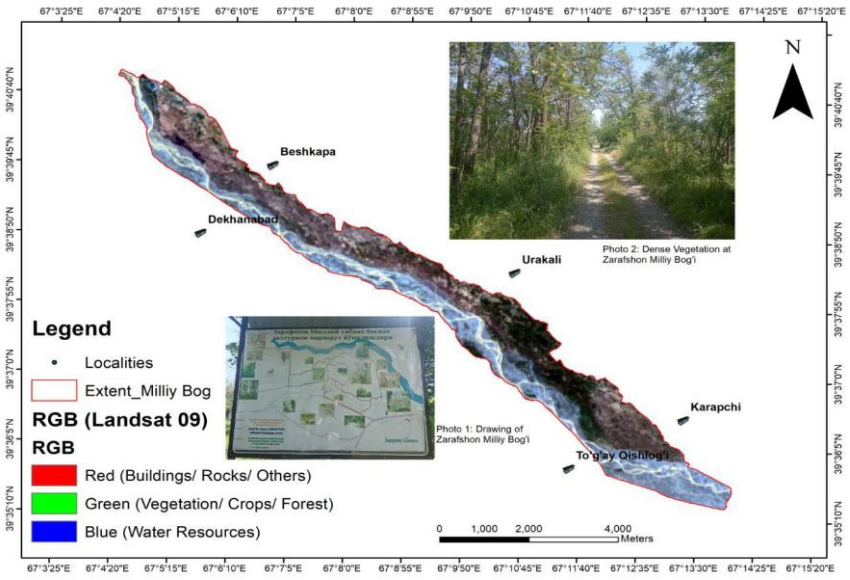
Research results. The processes of developing a color-coded map of the Zarafshan National Park using NDVI and creating its image using satellite imagery were studied.

The geoecological assessment of the Zarafshan National Nature Park using GIS research includes an analysis of the environmental condition in the park and its impact on natural complexes, as well as an assessment of possible changes under the influence of anthropogenic factors.

The assessment includes a study of air, water and soil quality, biodiversity and the state of ecosystems. Potential sources of pollution and their impact on the environment are identified. The impact of tourism and recreational activities on the park's natural complexes is also assessed.

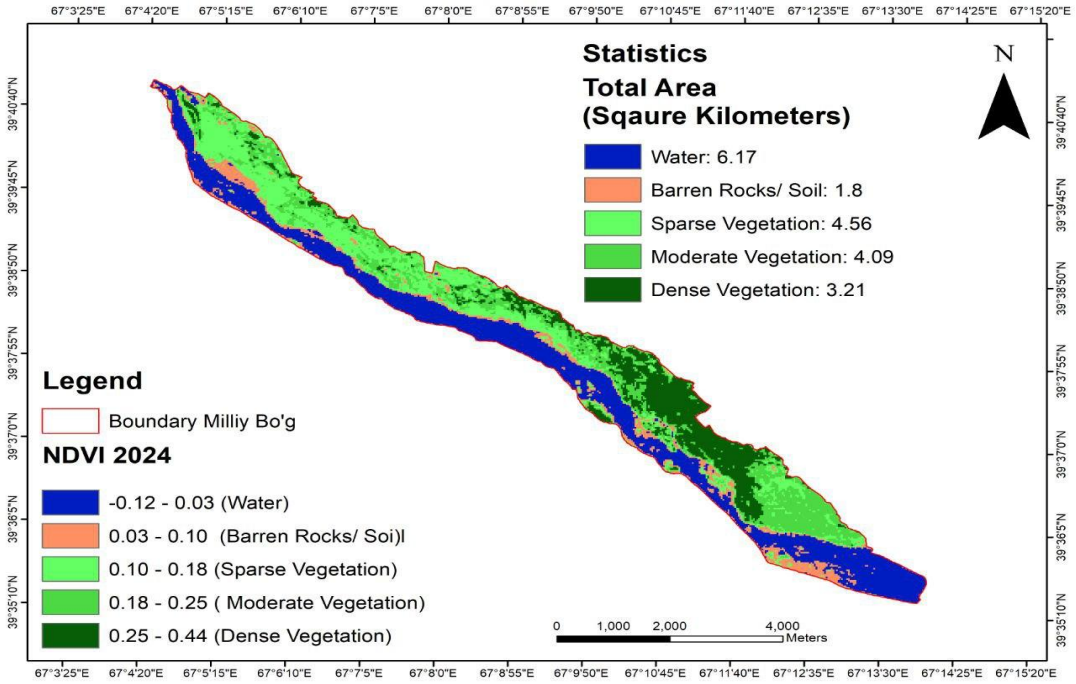
Zarafshan National Park is under strong anthropogenic pressure due to its small size and location in a densely populated area. The regulation of the Zarafshan River flow leads to the drying up of some water bodies. Such areas lose their biodiversity very quickly. Conservation of plants, felling of trees, Erianthus sp. and destruction of reed biotopes by local residents.

Detailed information was provided about all the work carried out, from the initial stages of creating maps of the flora and fauna, working with NDVI and ArcGIS programs, and determining the boundaries of the National Park, to the finalization of the map.



Map 1.1 RGB (Landsat 09) - National Park Boundary Map.

This map is a delineated map of Zarafshan National Park, marked with dots. The red line is the park's boundary, and the red lines indicate landmarks, buildings, rocks, etc. The areas marked in green are vegetation, crops, and forests. The blue lines are water resources.



Map 1.2 is a map of Zarafshan National Nature Park created using the NDVI program.

The red line is the national park boundary. Blue is water, red is rocks and soil, light green is sparse vegetation, green is medium vegetation, and dark green is dense vegetation.

In addition, vegetation areas are also given in sq. km.

Conclusion:

- The boundaries of the Zarafshan National Nature Park were studied using satellite data and several GIS programs.
- We used NDVI to assess the geoecological status of the Zarafshan National Nature Park and determine the state of its flora and fauna, as well as the location of this vegetation layer in it, and to identify areas with sparse and dense vegetation.
- During the process of assessing the geoecological situation in the Zarafshan National Nature Park, we found that the park's territory has expanded further as a result of the retreat of the Zarafshan River basin, so it is possible to prepare a map of the river basin.
- Using Google Earth, we created a map of the boundaries of Zarafshan National Park.

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