Determination of Soil Characteristics and GIS-supported Spatial Analysis of the Iğneada Longoz Forest National Park

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Abstract:

This study determined the soil properties of the İğneada Longoz Forest National Park using GIS techniques supported by spatial analysis. Fieldwork was conducted over a four-day period in September 2024 and soil samples were collected from 52 sampling points. The sampling points were recorded using GPS and prepared for laboratory analysis. Analyses included physical and chemical parameters such as pH, electrical conductivity (EC), lime content, organic matter content, nitrogen content, phosphorus content, potassium content, calcium content, magnesium content, sodium content, iron content, copper content, manganese content, zinc content and texture. The data obtained were transferred to the GIS environment and evaluated by creating digital maps.

The results obtained showed that the soils in the study area were generally slightly acidic, with an average pH of 4.97. Sufficient levels of potassium, calcium and magnesium were found among the macronutrients, while nitrogen and zinc were found to be insufficient. The organic matter content was found to be high in forested areas and low in coastal dunes and alluvial areas. Texture analyses revealed that sandy soils were prevalent along the coast and lakeshores, while clay loam soils were common inland.

Additionally, significant positive correlations were identified among numerous parameters in the relationships between plant nutrient elements and soil groups, forest types, and parent materials. These findings provide important data for managing the sustainability of the ecosystem and biological diversity in the national park. The analysis results are anticipated to contribute to the preparation of soil maps and the development of soil management strategies. This study will provide a scientific basis for the planning and management of ecologically sensitive areas such as the İğneada Longoz Forests National Park..

Keywords:

İğneada, Longoz Forests, Soil characteristics, GIS, Spatial analysis.