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The Thesis Submitted for the Degree of M.Sc
(in the field of range management)

Classifying rangeland vegetation type and coverage using satellite images in Sistan region

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Februery 2023

Abstract:

Vegetation map is one of the most important tools for pasture management and planning to sustainable development of natural resources. In fact, the vegetation map of a pasture includes measures to focus on the location of the data related to the plants in it, which provides the possibility of making decisions about a pasture. So far, at this level, a comprehensive map of grassland vegetation has not been prepared for the entire region of Sistan, and the available vegetation maps are related to small and scattered areas in the region, which were produced in different studies, and these maps are also often old and lack sufficient accuracy. The purpose of this research is to prepare a vegetation map of Sistan region's pastures and then to prepare a map of vegetation types in the area using Landsat satellite data (OLI sensor) and field harvests in 2019 and 1400 .

The Sistan region with an area about 16,503 square kilometers in the north of Sistan and Baluchistan province has a semi-arid climate with an average annual rainfall about 60 mm in the long term. The natural vegetation of Sistan region has three types of vegetation: grass, shrub and tree, a large area of which is of herbaceous species, and in some areas, depending on the environmental conditions, it has scattered growth or a complex of tree and shrub species. To prepare a vegetation map using remote sensing data, radiometric and geometric correction of the prepared satellite images is done first, and then SAVI and NDVI indices are calculated using ENVI software. In order to determine the appropriate index, the coefficient of index data was determined with 150 field samples, and while determining the most suitable index, a map of vegetation cover was prepared based on that index, and based on the output of the index, the amount of vegetation cover in the area was divided into four classes: no cover, good, average and weak. In order to prepare a map of the vegetation types of the pastures of the region, first, using the land use map, the use of the pasture was separated from other uses, and by visiting the area, the dominant plant species were determined. At this stage, relatively homogeneous plant units were identified and coded, and after preliminary identification and naming of types, their approximate borders were drawn on 1:50000 maps. Then, in order to create a comprehensive vegetation cover map of the pastures of Sistan region, the produced maps of the amount of coverage and type classification were combined in the ARCGIS software to accurately overlap the boundaries of the vegetation types, and finally, a comprehensive vegetation cover map of the Sistan region was prepared.

Key words: Vegetation percentage, satellite images, normalized vegetation index, Sistan.