Assessment Of Land Use Land Cover Accuracy Using Geospatial Technology

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ABSTRACT

Land Use and Land Cover (LULC) plays a crucial role in connecting human activities with environmental monitoring, aiding in the detection of deviations from achieving a sustainable environment. Remote sensing plays a vital role in tracking LULC, assisting in decision-making for their allocation. Remote Sensing and Geographical Information System (GIS) methods were employed to analyze geospatial LULC dynamics and assessing LULC accuracy and Kappa statistics using random sampling method with 500 ground truth points in Google Earth Pro. The primary goal was to achieve a quantitative comprehension of the LULC pattern and assessment of accuracy of LULC thematic map of the study area. The research utilized the Maximum Likelihood Classification (MLC) Algorithm in ArcGIS 10.8 to examine the LULC pattern using Landsat 8 OLI-TIRS satellite data from USGS Earth Explorer. The region was divided into six main categories: Water body, Built-up area, Sand, Agriculture land, Forest and Barren land. The result findings indicated that forest and agriculture land were the major land covers with an area of 2154.7 Km^2 (44.47%) and 1525.2 Km^2 (31.47%) , whereas barren land and sand were minor covers with the area of 90.2 Km^2 (1.87%) and 184.24 Km^2 (3.80%), meanwhile 506.68 Km^2 (10.46%) and 384.59 Km^2 (7.93%) of total area covered by waterbody and built-up land respectively. The overall accuracy and Kappa coefficient have also been determined and found that the overall accuracy of classified covers was 92% and Kappa coefficient was 0.88. The results will help guide well-informed decisions, leading to improved land use management and more effective environmental conservation efforts.

Keywords:, Maximum likelihood classification, Geographic information system, Land use land cover Remote sensing, accuracy assessment