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Land Cover Change Analysis Using Remote Sensing

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Abstract : Land cover change analysis plays a significant role in understanding the trends of urban sprawl and land use transformation due to anthropogenic activities. In this study, the spatio-temporal dynamics of major land covers were analyzed in the last twenty years (1988-2016) for District Lahore located in the Punjab Province of Pakistan. The Landsat satellite imageries were downloaded from USGS Global Visualization Viewer of Earth Resources Observation and Science Center located in Sioux Falls, South Dakota USA. The imageries included: (i) Landsat TM-5 for 1988 and 2001; and (ii) Landsat-8 OLI for 2016. The raw digital numbers of Landsat-5 images were converted into spectral radiance and then planetary reflectance. The digital numbers of Landsat-8 image were directly converted into planetary reflectance. The normalized difference vegetation index (NDVI) was used to classify the processed images into six major classes of water, buit-up, barren land, shrub and grassland, sparse vegetation and dense vegetation. The NDVI output results were improved by visual interpretation using high-resolution satellite imageries. The results indicated that the built-up areas were increased to 21% in 2016 from 10% in 1988. The decrease in % areas was found in case of water, barren land and shrub & grassland. There were improvements in percentage of areas for the vegetation. The increasing trend of urban sprawl for Lahore requires implementation of GIS based spatial planning, monitoring and management system for its sustainable development.

Keywords : land cover changes, NDVI, remote sensing, urban sprawl
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