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JGSR
Journal of Geosciences Research
Vol. 6, No.2, July, 2021
pp. 213-219

Spatio-Temporal Variation of Vegetation and Urban Sprawl Using Remote Sensing and GIS: A Case Study of Cuttack City, Odisha, India

P.K. Patra, Duryadhan Behera*, S.P. Naik and Shreerup Goswami

Department of Earth Sciences, Sambalpur University, Burla-768019 (OR), India
*(*Corresponding author, Email: dbeherasbp@gmail.com)*

Abstract

The present study has been conducted to detect the vegetation changes and urban sprawl of Cuttack city, one of the ancient towns of Odisha, India. Morden and integrated techniques of remote sensing and GIS approaches have been deployed to assess the land use/ land cover dynamics of the city over 13 years. The proposed study has been undertaken by the help of Landsat -5 TM (2005) and Landsat-8 (OLI/ETM) (2018), as these are freely available on USGS earth explorer (https://earthexplorer.usgs.gov) Two different periods of Landsat satellite imagery data i.e., Landsat -5 TM (2005) and Landsat-8 (OLI/ETM) (2018) were examined. The land use/ land cover dynamics of the city over the duration from 2005 to 2018 was enumerated. Landsat satellite imagery was analysed through advance and sophisticated GIS software like Arc GIS 10.1 and ERDAS IMAGINE 2013.Using Maximum Likelihood Classification Technique images were classified to find the land use/land cover for both the study year. The result reveals that built-up area increase by 49.52%. we use D_{NDVI} method to map vegetation change over the period from 2005 to 2018, D_{NDVI} value between -0.2899 to -0.0145 represent loss of vegetation and threshold value 0.0371 and above shows vegetation gain.

Keywords: Remote Sensing; GIS; NDVI; Maximum Likelihood Classification, Cuttak City, Odisha