

ASSESSING THE IMPACT OF LAND COVER CHANGES ON LAND SURFACE TEMPERATURE IN *DEDURU OYA* RIVER BASIN

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Land use changes and urban activities cause environmental degradation and climate change. Therefore, understanding how changes in land use and land cover (LULC) affect land surface temperature (LST) is essential for sustainable environment management. This study aimed to assess the thermal impacts of various LULC types within the *Deduru Oya* river basin over the past two decades using geospatial techniques. This study utilized Landsat data from Google Earth Engine (GEE) for 2003, 2014, and 2023. Image classification of each year was performed in GEE using the Random Forest classification technique with Google Earth Pro serving as a reference. An accuracy assessment was also conducted in GEE achieving more than 88% overall accuracy for each year. ArcGIS was used to change analysis of LULC. LST maps were retrieved from GEE. The Pearson correlation coefficient was performed between LST and several parameters such as the Normalized Difference Vegetation Index (NDVI), the Normalized Difference Built-up Index (NDBI), and the Normalized Difference Water Index (NDWI). The correlation analysis between LST and NDVI revealed consistently negative relationships across all years, with varying strengths. Weak negative correlations in 2003 and 2023, indicate a modest inverse relationship, whereas the stronger negative correlation observed in 2014 indicates a more pronounced impact of vegetation density in reducing LST. The correlation analysis between LST and NDBI revealed consistently positive relationships across all years. The moderately stronger correlation in 2014 and 2023 could reflect increased urbanization during this period, and the lower correlation in 2003 may suggest that urban areas had less pronounced thermal impacts compared to later years. Correlation between NDWI and LST showing positive correlations from 2003 to 2023 could indicate that as water content increases LST tends to rise as well. It could indicate that the importance of targeted land management strategies to mitigate urban heat effects and promote conservation within the basin.

Keywords: Google Earth Engine, Landsat, Land surface temperature, Remote sensing