Multi-criteria Modelling Using Remote Sensing and GIS for monitoring Urban Microclimate Dynamics and Urban Heat Island due to Urbanization in Visakhapatnam, India

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SUMMARY

Climate change may exacerbate the urban heat island (UHI) effect, which is characterized by a stark temperature difference between nearby urbanized and non-urban areas. Urban heat islands are created when a city has significantly warmer temperatures than the nearby rural areas. It is well-known that the number of impervious surfaces and vegetation affects the urban microclimate. Urban microclimate is the general term for the smaller area of urbanized land that has distinct atmospheric conditions than nearby places. Similar consideration should be given to the fluctuation in urban heat island spatial patterns and how land use changes these patterns over time. This paper presents the study of land surface temperature (LST), detection of UHI hotspot zones and deals with the thermal comfort of people living in Visakhapatnam urban. Landsat OLI/TIRS of the study area for the year 2013, 2016, 2019, 2022 were used to develop LULC and LST images. It shows that the western part of the city is more vulnerable to heat due to large built up areas and industries. The correlation between LST and SAVI shows a negative correlation which shows that the areas with higher SAVI tends to have comparatively lower LST values. Similarly, Normalized Difference Built Up Index (NDBI) is also performed which shows a positive correlation with LST.

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