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# Assessment of Urban Heat Island through Remote Sensing in Nagpur Urban Area Using Landsat 7 ETM+ Satellite Images

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**Abstract :** Urban Heat Island (UHI) is found more pronounced as a prominent urban environmental concern in developing cities. To study the UHI effect in the Indian context, the Nagpur urban area has been explored in this paper using Landsat 7 ETM+ satellite images through Remote Sensing and GIS techniques. This paper intends to study the effect of LU/LC pattern on daytime Land Surface Temperature (LST) variation, contributing UHI formation within the Nagpur Urban area. Supervised LU/LC area classification was carried to study urban Change detection using ENVI 5. Change detection has been studied by carrying Normalized Difference Vegetation Index (NDVI) to understand the proportion of vegetative cover with respect to built-up ratio. Detection of spectral radiance from the thermal band of satellite images was processed to calibrate LST. Specific representative areas on the basis of urban built-up and vegetation classification were selected for observation of point LST. The entire Nagpur urban area shows that, as building density increases with decrease in vegetation cover, LST increases, thereby causing the UHI effect. UHI intensity has gradually increased by 0.7°C from 2000 to 2006; however, a drastic increase has been observed with difference of 1.8°C during the period 2006 to 2013. Within the Nagpur urban area, the UHI effect was formed due to increase in building density and decrease in vegetative cover.

**Keywords :** land use/land cover, land surface temperature, remote sensing, urban heat island
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