

## **ABSTRACT**

In the modern era of urbanization, the world is facing the transformations of natural surfaces into built-up, anthropogenic areas which result into urban areas encountering high surface temperature. The present study has been carried out to identify the seasonal sprawl of surface temperature for Jaipur and Ahmadabad cities. Remote sensing data from the MODIS sensor (on board on Aqua and Terra platforms) for day and night time have been used. The study has been undertaken for summer, monsoon and winter seasons, prevailing over the study area, by utilizing data of thirteen years from 2003 to 2013. Analysis of 8-day MODIS land surface temperature data for two different time periods i.e. day and night show presence of higher surface temperature and higher UHI intensity during day time in the outskirts of the cities. The temperature gradient follows almost similar pattern over the study area throughout the year.

The present study observes that rural areas of Jaipur are warmer than urban areas during day time and urban areas are warmer than rural areas during night time but in Ahmadabad urban areas are warmer than rural areas both in day and night time. The study includes the correlation analysis between Aqua and Terra derived day-night LSTs which signifies the better results during day-day, night-night and poor results for day-night, night-day for all three seasons for both rural and urban areas for both the cities. Surface temperature characteristics and variations have been observed more uniform during night time compared to day time as there is no interfering passive energy source. To compare 8-day data retrieved LST analysis another study has been done by taking 1-day MODIS data for Jaipur, Ahmadabad and Ludhiana.

This study also involves the comparison of LST correlation values with vegetation indices parameter NDVI for the similar duration. The results for Jaipur and Ahmedabad remain almost similar from 1-day and 8-day. The results for Ludhiana city show better correlation in day-night and night-day LST as compared to day-day and night-night for 2004, 2009, 2012 and 2015. This betterment in correlation is due to the availability of highly dense vegetation outside the city. This vegetation maintains uniformity in temperature variations during day and night.