

## **An Integrated Approach to Assessing Urban Nature as an Indicator to Mitigate Urban Heat Island Effect: A Case Study of Lahore, Pakistan**

**Authors :** Muhammad Nasar-u-Minallah, Dagmar Haase, Salman Qureshi

**Abstract :** Rapid urbanization significantly change land use, urban nature, land surface vegetation cover, and heat distribution, leading to the formation of urban heat island (UHI) effect and affecting the healthy growth of cities and the comfort of human living style. Past information and present changes in Land Surface Temperature (LST) and urban landscapes could be useful to geographers, environmentalists, and urban planners in an attempt to shape the urban development process and mitigate the effects of urban heat islands (UHI). This study aims at using Satellite Remote Sensing (SRS) and GIS techniques to develop an approach for assessing the urban nature and UHI effects in Lahore, Pakistan. The study employed the Radiative Transfer Method (RTM) in estimating LST to assess the SUHI effect during the interval of 20 years (2000-2020). The assessment was performed by the available Landsat 7/ETM+ and Landsat 8/OIL\_TIRs data for the years 2000, 2010, and 2020 respectively. Pearson's correlation and normalized mutual information were applied to investigate the relationship between green space characteristics and LST. The result of this work revealed that the influence of urban heat island is not always at the city centers but sometimes in the outskirts where a lot of development activities were going on towards the direction of expansion of Lahore, Pakistan. The present study explores the usage of image processing and spatial analysis in the drive towards achieving urban greening of Lahore and a sustainable urban environment in terms of urban planning, policy, and decision making and promoting the healthy and sustainable urban environment of the city.

**Keywords :** urban nature, urban heat islands, urban green space, land use, Lahore

**Conference Title :** ICUHIMS 2022 : International Conference on Urban Heat Island Mitigation Strategies

**Conference Location :** Helsinki, Finland

**Conference Dates :** July 19-20, 2022