ANALYSIS OF URBAN HEAT ISLAND AND ITS RELATION WITH LAND USE LAND COVER IN NAGALAND, INDIA

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EXTENDED ABSTRACT: The impact of urbanization has been far reaching. Urbanization has impacted not only the lives of human but the physical landscape has also taken a whole new turn. In the process of urbanization, vegetation and agricultural lands have given ways to concrete infrastructural development. Along with anthropogenic development and progress, environment has taken a backfoot which can become lethargic, if no proper planning's are undertaken. This study is an attempt to estimate the relation between landuse landcover and urban heat island (UHI) in Dimapur, Nagaland, India. Dimapur, the main economic hub of Nagaland lies towards the northeastern part of India. It has witness tremendous anthropogenic activities over a short period of time. The study plans to bring out the impact of urbanization especially surface heat effect owing to anthropogenic intrusions. The main objective was to determine the urban heat island phenomena with respect to different land use land cover classes. Remote sensing techniques as a tool have helped in estimation of various geospatial applications. Satellite imagery data's like Landsat data has the potentiality to estimate the earth surface temperature with high accuracy and precision. In this study, Landsat 7 ETM+ and Landsat 8 OLI have been analyzed to generate normalized differentiation vegetation index along with emissivity parameter. Land use landcover classification was performed after pan sharpening using maximum likelihood classifier for classes such as builtup, vegetation, agricultural land and water body. The urban heat island and its relation with land use land cover was calculated and correlated basing on time series period from 2003 to 2020. It was observed that from 2003 to 2020, the city of Dimapur has witness increase in UHI mainly in the builtup zones. The result of UHI was in 2003 reading of UHI showed builtup had minimum temperature of 15.24 °C and maximum was 23.97°C, vegetation had minimum temperature 15.54°C and maximum temperature 21.99°C, water body had minimum temperature 15.23 °C and maximum temperature was 21.13°C. Agricultural land had minimum temperature of 15.54 °C and maximum temperature 24.25°C. In 2020 the temperature of the various classes are- builtup had minimum temperature 22.08 °C and maximum temperature was 29.59°C, vegetation had minimum temperature 21.83°C and maximum temperature 28.81°C, water body had minimum temperature 15.23 °C and maximum temperature was 21.13°C. Agricultural land had minimum temperature of 20.89 °C and maximum temperature 26.49°C. Proper planning and management is needed to tackle the issue of urban heat island in an ever increasing urbanization city such as Dimapur.

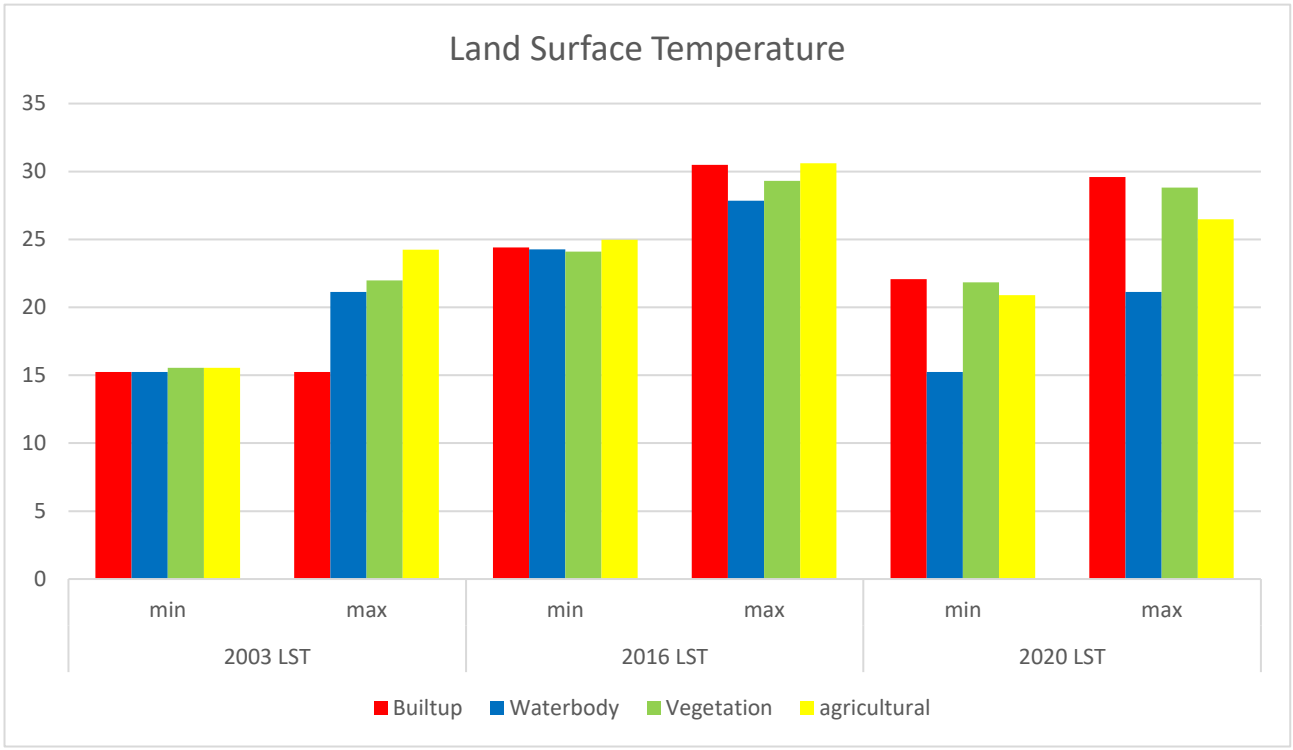

Figure 1. UHI of different parameters shown in the study area.