Abstract

Akure is one of the cities undergoing rapid growth in Nigeria, which has resulted to remarkable Urban Heat Island (UHI) effect. To examine the impact of this development in the city and its environs, this study derived the brightness temperatures and land use land cover (LULC) types using Landsat images between 1984 and 2016, of 190/55 path and row. Normalized Difference Built up Index (NDBI) and Normalized Difference Vegetation Index (NDVI), were used as LULC indicators for sub-pixel analysis. The results of this study revealed a remarkable change in built-up area at the expense of vegetation (forest) and bare lands. The sub-pixels analysis between land use/cover indicators and temperature revealed a strong correlation between LULC and temperature in the area. Findings revealed a 4.63 °C temperature increase in vegetated areas between 1984 and 2016; and an overall temperature values ranged from about 14 to 36 °C, which have been categorized into six classes (< 20 °C, 20 °C to < 24 °C, 24 °C to < 28 °C, 28 °C to < 32 °C, and ≥ 32 °C). The temperature increase over the years and the strong correlation between temperature and land use land cover suggests, that any small undesirable change in land use land cover in the future would lead to severe environmental condition.

Keywords: Urban heat island (UHI), Land use/cover change (LUCC), NDBI and NDVI Sub-pixels Environmental condition