Abstract

The land use land cover (LULC) changes affect the temperature of urban areas. Due to no clear mitigation plan, LULC pattern of Pakistan have undergone huge change since 1900s. This study investigated the effect of LULC changes on surface temperature of Vehari city, Punjab Pakistan during 1992 to 2022. Satellite imagery was processed and maximum likelihood classification was performed to produce LULC maps of 1992, 2002, 2013 and 2022. Prediction of LULC was done for year of 2035 by using CA-Markov model. The thermal bands were also used to compute the land surface temperature for the same time period of the city. Similar prediction model was used to predict LST in future (year 2035). The LULC analysis revealed that built-up area increased from 3.70 km^2 (18.75%) to 11.32 km^2 (56.6%) and vegetation cover decreased from 7.10 km^2 (35.5%) to 2.75 km^2 (13.75%) during 1992 to 2022 of the cities. Both land covers are expected to change in future (year 2035) by 15.36 km^2 (76.8%) in built-up and 1.21 km^2 (6.05%) in vegetation. Area of water bodies and barren land also decreased over time. These LULC changes were found affecting the LST of the study area (Vehari city). The conversion of vegetation covers into built-up and barren land area resulted in increase in LST. An increase of 3.13°C in summer and 4.81°C in winter in LST of Vehari was observed during 1992 to 2022 and it is further expected to increase 1°C to2°C in 2035. There is need to promote sustainable land use practices and proper planning to manage the area for next generations to have healthier place to breathe in. This study helps provide information to environmentalists and policy makers to make informed decisions and promote appreciate land use planning. By developing comprehensive local and national land management strategies, the government authorities will be better able to manage land resources. Furthermore, tree plantation and promotion of urban green cover will help in reducing urban heat island effect.