ABSTRACT

The objective of this research is to examine the influences of altering land use and land cover on the land surface temperature (LST) of the Lahore metropolitan area. The study region is a rapidly urbanizing city in Pakistan, where land development has accelerated dramatically during the last 30 years. The satellite pictures acquired by LANDSAT-5 (TM) and LANDSAT-8 (OLI) are used to calculate land surface temperature and geographic extent of various land surface features to examine the influence of lush green regions and progressively built-up area on the land surface temperature (LST). They are processed in ERDAS imagine-14 and supervised is classification performed to calculate the area covered by major land features. From their results the area of metropolitan city Lahore is divided into crop area, vegetation area, built-up area, water area, and soil area. The Persistence Matrix, a GIS analysis, was used to examine how intensively the urban area of Lahore was developed at the loss of green land during the study period. The results of the persistence matrix demonstrate that over the research period, there is a net gain of 325.14 square kilometers of built-up area (urbanized area) and a net loss of 300.2 square kilometers of agricultural land *(sum of crop area and vegetative area)*. These figures show that during the research period, urbanization accelerated in tandem with the loss of agricultural land. To apply the econometrics tool the agricultural area *(sum of crop area and vegetation area)* built-up area, water area and crop residue burned area are used as independent variables, and the land surface temperature (LST) is used as a dependent variable in this study. The dependent variable and independent variables were stationary at different levels. To study the link between them, the ARDL model is utilized to examine the long-run relationship, and the ECM is used to assess the short-run association between the dependent variable and the group of independent variables. The ARDL model's findings suggest that Lahore's rapid urbanization has a direct and statistically significant link with land surface temperature (LST), while cultivation area has an inverse and statistically significant relationship with land *Department of Economics GCU Lahore* surface temperature (LST). The presence of long run and short run cointegration among the dependent variable and group of independent variables is also confirmed by ECM results. The conclusions are based on time series data from 1990 to 2021.