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**ABSTRACT**

Urban green spaces (UGS) play an essential role in providing urban ecosystem services and creating a livable environment for urban residents. Increasing land use, land cover change, and climate change have considerable impacts on urban green spaces and their ecosystem services. These impacts result in a loss of urban green space and particularly weaken the climate resilience of urban populations. In order to assess urban green spaces and their ecosystem services provided in Bamako and Sikasso, as well as their planning approach design for sustainable land use system and climate change resilience of Bamako and Sikasso. This study made use of remote sensing, Google Earth, Landsat imagery data from 1990 to 2020, climatic data (from Mali-météo), and structured questionnaires for household surveys. From 1990 until 2020, remote sensing data and images were extracted from Landsat photos. Standardised Precipitation Index (SPI), Standardised Precipitation Evapotranspiration Index (SPEI), Mann-Kendal test, and non-parametric test were used to evaluate the spatiotemporal dynamical changes in climate variables (rainfall, minimum and maximum temperatures) between 1990 and 2020. Descriptive statistics were used to examine all semi-structured interviews in order to ascertain how the public views green areas and the ecosystem services they offer. In addition, a climatic analysis was carried out using rainfall and temperature data from 1990 to 2020 to evaluate the climate variability and its effects on urban green spaces according to the population's perception. A maximum likelihood classification was applied for the classification of LULCs. The results of the LULC analysis showed that most of the natural vegetation has decreased in both cities and has been converted into built-up areas, farmland, and bare land. The built-up area increased in Bamako between 1990 and 2020 from 22.08% to 54.37% and in Sikasso from 20.49% to 48.81%, while vegetation decreased in both cities. The results of the survey indicate that most respondents have a strong relationship (social cohesion) with green spaces (96.13%) and attribute a good status to green spaces in Sikasso (64.59%). Rainfall in the two cities is statistically insignificant; however, seasonal minimum temperatures in Bamako City differ statistically significantly ( $p=0.0001$ ,  $R^2=0.4027$ ). The seasonal minimum temperature ( $p=0.0001$ ,  $R^2=0.476$ ) and seasonal maximum temperature ( $p=0.0001$ ,  $R^2=0.6448$ ) in Sikasso differ statistically significantly due to climate change and entropic activities. Bamako city has higher temperature than Sikasso because Sikasso is located in the humid and sub-humid zones, with high vegetation density while Bamako is located in the Sudanese climate zone. The highest values for ecosystem services in both cities are provisioning services. These results can be used to set up some policies on urban green spaces management and development and solve some climate issues in cities in order to improve sustainable cities and climate change resilience, through green spaces and ecosystems services provided. However, the promotion of UGS, perceived by the population as an appropriate way to reduce climate change in cities, are necessities. In order to provide ecosystem services that increase Mali's cities' resistance to climate change, this study suggests safeguarding, preserving, and improving urban green spaces.