

Assessing impact of Settlement Expansion on Green Space Cooling Intensity:Case study -Kampala Metropolitan Area

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Key words: Remote sensing; Spatial planning; land cover; land surface temperature; green space cooling intensity; GIS

SUMMARY

Urbanization in Kampala has led to transformation of green spaces (natural greenery) into other urban land uses. Clearing of vegetation for development of industries, commercial centers and settlement leads to an increase in the amount of heat produced from the built up structures such as buildings, pavements and other artificial surfaces (Nastaran, 2014). They absorb and re-radiate solar radiations leading to Urban Heat Islands in areas with a low percentage of vegetation and reflective surfaces. These developments also impact on the cooling intensity of the green spaces hence human comfort conditions in the cities become an imperative issue to address. This study evaluates the impact of urbanization on the green space cooling intensity using remote sensing and GIS techniques. Landsat images of 1984, 1989, 1995, 2003, 2010 and 2015 were used for mapping the Land cover and land cover changes of Kampala Metropolitan Area and its surrounding areas. A supervised image classification approach was adopted basing on the Maximum Likelihood Classifier (MLC). The land cover changes were examined through supervised classification of satellite images combined with GIS spatial analysis. The land cover change analysis showed that vegetation reduced at a rate of 16%, built up and water increased at a rate of 23% and 1% respectively. Land surface temperature was obtained using a method developed by Artis & Carnahan, 1982. An overall increase in the green space cooling intensity as the vegetation decreased was observed. It was also observed that a decrease in vegetation cover of 7.96% brought about an increase of approximately 0.37°C in the cooling intensity throughout the study period.

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FIG Congress 2018

Embracing our smart world where the continents connect: enhancing the geospatial maturity of societies
Istanbul, Turkey, May 6–11, 2018