

Exploring the Relationship between Land Surface Temperature and Land Use Land Cover in Kenya. (A case study of Nairobi County).

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Abstract

The environmental and social effects of predicted climate change are expected to increase in our built-up environments as a result of increased temperatures which are attributed to the phenomenon known as the Urban Heat Island (UHI). With vegetation cover that could provide for cooler microclimates through its process of evapotranspiration being depleted to pave way for the concrete urban jungle, then its predicted for the worse effects of the climate change. Land surface temperature (LST) forms an important climate variable related to climate change and is an indicator of the energy balance at the surface since it's a key parameter in the physics of the land surface processes. The main aim of the study is to explore the relationship between the LST and the LULC through analysis of the LST difference NDVI and LULC for a period of 24 years. The study area is Nairobi between 36°4' and 37°10'. Landsat satellite images of 1986, 1995, 2002 and 2010 were used to derive land use land cover (LULC), normalized difference vegetation index (NDVI) and LST. It was found out that LST and NDVI shared an inverse relationship, implying that an increase in vegetation abundance would generally reduce surface temperature and thus UHI intensity. The relationship demonstrated the existence of distinct differences depending the on LULC type hence indicating that decrease in amount of vegetation as a result of urbanization and lack of controlled development would increase the UHI intensity. The study therefore illuminates which types of actions would be most conducive to mitigate this effects.

Keywords— Landuse Landcover, Land Surface Temperature, Normalized Difference Vegetation Index, Urban Heat Islands.