

Implementation Of Remote Sensing In Monitoring Urbanization And The Resultant Urban Heat Islands With The Integration Of Biophysical Parameters From 1998-2022 In Matsapha, Eswatini

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The use of remote sensing has seen great application in various environmental issues. The environmental degradation evident with urbanization is one aspect well studied using remote sensing data coupled with other ancillary variables such as socio-economic data. Satellite data from Landsat 5 and 8 were used to study the development of urban heat islands (UHI) over an area of high urbanization. UHIs are known to cause elevated surface temperatures and come with land use land use land cover (LULC) changes. A broad range of indexes like the normalized difference vegetation index (NDVI), normalized difference built up index (NDBI), population growth rate and energy consumption can be used as supporting data in outlying the changes that go hand in hand with urbanization. Through the use of 2 satellite systems, the research aims to do an extended analysis of how these urban heat islands have evolved over the years. Due to the need to identify and delineate urbanized areas from non urbanized ones, the study made use of Visible Infrared Imaging Radiometer Suite Night Time Lights (VIIRS NTL) to delineate urbanized areas as proposed by other scholars. With such techniques as remote sensing, the UHI effect can be properly studied with very high spatial coverage of mega cities and even at a global scale.

Keywords: Urban Heat Islands, Visible Infrared Imaging Radiometer Suite Night Time Lights, Normalized Difference Vegetation Index, Normalized Difference Built Up Index, population growth rate and energy consumption