



Identification of Temporal Changes in Land Use/Land Cover, Normalized Difference Vegetation Index, and Land Surface Temperature in Matara Municipal Council Area Using Geo-Spatial Techniques

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Several studies have investigated the relationship between land surface temperature and urban vegetation patterns, and they have discovered that remote sensing is a timely and effective method for this type of analysis. Change detection in LULC of any geographic location by using multi-temporal satellite imagery helps in understanding landscape dynamics. The purpose of this research is to apply LULC, and NDVI in the evaluation of land surface temperature using Geospatial techniques and RS in the Matara MC area. Open source Landsat satellite data obtained from the United States Geological Survey (USGS) in two different years were utilized to identify and quantify LULC, NDVI, and LST changes. The obtained satellite images were used for data processing and analysis after pre-processing processes and clipping the area through Arcgis 10.8 software. These images were categorized using the Maximum Likelihood Classification algorithm under the supervised image classification there is a standard mathematical procedure for calculating NDVI and it can be done using the Raster calculator command. Significant growth in building area formation in land use can be identified in 2021 compared to the year 2001. It was 6.77 km² in 2001 and 10.8 km² by 2021. Vegetation cover is gradually decreasing with increasing population and seasonal variation in land use patterns. By 2021, with the development of road networks, buildings, and other infrastructure, higher temperatures were reported in those areas. On the other hand, the minimum temperature was 17.6 °C and the maximum temperature was 29.8 °C. Preliminary findings indicate that there has been a significant increase in built-up areas within the Matara Municipality area over about 20 years. The future urban environment can be used productively in achieving sustainable urban development and planning through eco-friendly approaches. Geospatial techniques such as GIS and Remote Sensing and these methods can be used as an effective factor in the implementation of urban planning and policies in other urban areas.

Keywords: *LST, LULC, Matara MC Area, NDVI, Temporal*