Analysis of Road Network, Land use Land Cover and Temperature Variation of Mangalore City using QGIS & Remote Sensing

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Abstract

This study investigates the land use, land cover, temperature changes and road pattern in Mangalore city using QGIS and remote sensing techniques. Landsat 8 satellite imagery from 2004, 2014, and 2022 was used in the study, together with supervised classification, to categorize the land use and land cover of the city. The study also used temperature data from MODIS satellite pictures to analyzetemperatur e variation inthe city.The results showed that urban areas had warmer average temperatu res than do forested areas. The study's analysis of the vegetation cover using NDVI values showed that woodland areas have a higher level of vegetation than urban and agricultural areas. The study's overall conclusion highlights the need of using GIS and remote sensing techniques to investigate city land use, land cover, temperature variation and vegetation cover. The study's findings can be used to improve urban planning and management in Mangalore City as well as promote environmental friendly development. The results of the investigation revealed a substantial correlation between temperature variation and road density in Mangalore city. The study also found that a variety of factors, such as geography, land cover, and human activities, affected temperature.

Keywords: QGIS, MODIS, NVDI, Land Use, Land Cover

1. Introduction

Using QGIS and remote sensing methods, this study examines the temperature change, road and land cover in Mangalore City. The study employed supervised classification and Landsat 8 satellite images from 2004 to 2023 to classify the city's land use and land cover. The city's overall area is made up of 26.7% urban area and 31.3% and 40%, respectively of agricultural regions and wooded areas. The study also examined the city's road network and discovered that it has a 1.73 km/km^2 road density. In order to analyze temperature fluctuation across the city, the study also employed temperature information from MODIS satellite images *[9]*.

Mangalore is a city located in the Karnataka state in southern India. The region experiences a tropical monsoon climate, which is marked by high humidity, little or no precipitation, and consistent temperature throughout the year. Mangalore typically experiences its maximum temperatures in April and May, which range from 20°C to 35°C (68°F to 95°F). The monsoon season in Mangalore, which lasts from June to September, is when the majority of the city's yearly precipitation falls. In Mangalore, winter time temperatures normally range from 18°C to 32°C (64°F to 90°F) from December to February. Despite being close to the sea, the city rarely has unusually bad weather *[1]*.

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