

**VEGETATION CHANGE DETECTION USING REMOTE  
SENSING AND GIS IN MAKHADO TOWN, LIMPOPO  
PROVINCE, SOUTH AFRICA**

BY

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## Abstract

Vegetation is one of the most important renewable natural resources to play a role in the preservation of the environment and biodiversity. Various land use activities such as urbanization, population growth and other anthropogenic activities, as well as climate change have been some of the major drivers which alter vegetation cover and contribute to biodiversity loss. This research study uses remote sensing and Geographical Information System to quantify vegetation and land cover change in Makhado over a five-year period (2007 - 2012). This study used multi-temporal satellite image data to identify the dynamic pattern of vegetation change and the negative impacts it has on the environment. The research uses remote sensing techniques and GIS software to analyse data. In addition, satellite imageries were used to study the spatial and temporal distribution of vegetation. The results of the study show that settlement areas have been on a stable positive and mostly uncontrolled expansion from 17.73% of the study area in 2007 to 30.52% in 2012. Vegetation on the other hand, has been on a steady decline, from 10.65% in 2007 to 5.92% in 2012, as well as the ecosystems quality on which biodiversity depends for their existence and to a greater extent the climate conditions, with an increase in temperature, methane, nitrous oxide and carbon dioxide. The monitoring of vegetation change can play a vital role in knowledge generation, best practices and as well as Environmental Monitoring and Evaluation which can be abated in the near future. This study recommends that the South Africa Government and public agencies concerned develop policies and strategies to bring about balanced, coordinated and sustainable development in the municipality and its district.

**Keywords:** GIS; Remote sensing; Satellite image; Makhado and Environmental Monitoring Evaluation