

Mapping the spatiotemporal changes in the vegetation cover of UAE

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Abstract:

Over the past few decades new cities have appeared around the world in undeveloped areas. Although development has expanded significantly and become bolder and more innovative, the above-average scale at which the countries of the Persian Gulf are growing stands one level above the rest. The United Arab Emirates (UAE) has seen a tremendous growth in the last decades developing advanced urban centers in the world. Needless to say, the development has permanently changed the country's landscape. Such a rapid development can put the environment under significant stress. This creates a need for continuous monitoring of the vegetation cover and ecosystem changes to make informed decisions.

The purpose of this project is to investigate vegetation cover changes in the UAE using high and medium resolution satellite datasets from past several decades. The vegetation cover needs to be analysed within different ecosystem classes and the change pattern needs to be studied in both, spatial and temporal domains. Remote sensing and GIS techniques will be employed in this project to provide a holistic overview of the vegetation cover changes. Various classification approaches will be tried out to identify best performing algorithms for different vegetation types based on post-classification accuracy assessment of the results. While on the one hand, plantation activities and growth of vegetation cover area modulates the atmosphere and the environment, the intensified artificial expansion of vegetation impacts groundwater resources too in the UAE. Thus, studying vegetation changes and its impacts is both, important and tricky in the regional context. The application of sustainable methods in development activities is crucial, particularly in this part of the world with very few natural resources other than petroleum and natural gas.

Hence, the main objectives of this research are:

1. To develop effective satellite image classification routines for various vegetation cover types of the UAE
2. To perform spatiotemporal analysis of vegetation cover changes in the UAE

3. To identify vulnerable areas due to drastic vegetation changes and to suggest strategies for sustainable plantation