

Abu Dhabi Island: analysis of development and vegetation change using remote sensing (1972-2000)

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Abstract

Over the past few decades new cities have appeared around the world in undeveloped areas. And 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 obtained independence in 1971 with a GDP of 6.5 billion Dirhams (US\$1.6 billion); this figure ballooned to 379 billion Dirhams (US\$ 103 billion) in 2004. During this timeframe, the country had undergone tremendous development through petroleum exports and foreign investments. Needless to say, development has permanently changed the country's landscape. The purpose of this paper is to investigate land cover changes in the capital city of Abu Dhabi and surrounding regions from 1972 to 2000 using Landsat imagery. Two primary (land and vegetation) and two secondary (shallow and deep water) features were selected as measures of development. Remote sensing and GIS were used to perform the classification and post-classification analysis of the imagery and visualize the results. Results for the two primary features, vegetation and land, have shown an increase of 3,700% and 17% respectively between 1972 and 2000. The creation of new land from the by-products of dredging activities has negative effects on seafloor habitat while the intensified artificial expansion of vegetation impacts groundwater resources, both being direct consequences of rapid development. 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.

Keywords: United Arab Emirates, Abu Dhabi, land cover change, rapid development, land reclamation, Landsat.