An assessment of landscape changes in Mediterranean region. A case study of Algarve, southern Portugal.

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Currently, the application of remote sensing techniques is a key factor for the planning and land management to ensure a sustainable development of the regions. Algarve, the most southern region of Portugal is characterized by its Mediterranean climate. This climate is described by irregular precipitation throughout the year with drought during summer months. The regional climate has a profound influence on its particular vegetation and wildlife turning it in a unique habitat for many species. Since the 1970s, increases in tourism have greatly affected the coastal region. This has led to great landscape pressure and urban growth, resulting in population increases due to local economic prosperity. Across Algarve, in recent decades, lawns areas have grown dramatically. Landscape water use has increased mainly because homeowners seldom pay the 'true' cost of water. Continued expansion of water supply is not, therefore, a viable management option in the future, particularly given the anticipated increase in the frequency and severity of droughts in Portugal. There's a need to change the perception of landscape relative to water consumption. Algarve needs a sustainable, 'demand-led' approach to water resource management, focusing on conserving water and using it more efficiently. The water resources available in the Algarve are limited, and decisions regarding sustainability must consider the environment.

The aim of this study is to apply the remote sensing techniques to analyse the landscape changes in three municipalities of Algarve (Portugal): Albufeira, Loulé and Faro. The three Landsat images, from April 9th 1973 (Landsat1), March 23th 1989 (Landsat5) and April 26th 2013 (Landsat8) were used. The images were classified based on the radiometric information and the Normalized Difference Vegetation Index (NDVI). These range of dates of the Landsat images used allowed for the differentiation between classes of the landscape. Land use and water resources are closely linked with each other and with regional climate. The understanding of the interconnecting relations involved in this system is an essential step for elaborating public policies that can effectively lead to the sustainable use of water resources. This study could contribute to a better characterization of the region allowing the developing policies and measures for sustainable management regional landscapes.

Keywords: Water resources, Land use, Landscape dynamics, Remote sensing