

Land Use and Land Cover Change and Its Factor Analysis in Dakhla Oasis and Kharga Oasis in New Valley Province, Egypt

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The only available water resource in extremely arid areas is groundwater, which is a limiting factor for agriculture. Understanding land use and land cover change (LUCC) and its driving factors is a crucial challenge for predicting the sustainability of livelihoods in extremely arid areas. The purpose of this study is to analyze land use and land cover changes in the typical extremely arid regions of Dakhla Oasis and Kharga Oasis (New Valley Province, Egypt) for 46 years (1973-2019) and their driving factors. In this study, we used Landsat MSS (1973-1976), TM (1984-2011), and OLI (2014-2019) satellite images, and used the object-based image classification method (OBIA) for obtaining land use and land cover maps. We achieved the high classification accuracy and performed LUCC analysis. In this study, five land cover types (i.e., cropland, urban, waterbody, trees, and desert) were divided, and the land use and land cover changes of Dakhla Oasis and Kharga Oasis were extracted. During the 1973-2019, the cropland and urban areas of the Dakhla Oasis and Kharga Oasis gradually increased, changing from desert into cropland is an obvious land cover change. The type of land use/land cover change. The increase in cropland area implied that groundwater consumption is accelerating in the Dakhla Oasis and Kharga Oasis with almost no precipitation. The results from this study will provide useful information for the sustainable development of Dakhla Oasis and Kharga Oasis.

Keywords: Extremely arid area, LUCC, Image classification