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**Assessment of Land Cover Changes in the Allala Watershed Based on Object Based Image Analysis Using Landsat and Sentinel-2 Images.**

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Abstract : The coastal city of Ténès, located in northwestern Algeria, is exposed to several natural hazards, such as floods, earthquakes, landslides, and forest fires. Due to human activities, socio-economic constructions, agricultural activities, and the resulting population acceleration, land cover and land use (LULC) dynamics in the city are changing over time. Hence, the understanding of LULC changes and its interactions with human activities and natural hazards is essential for appropriate land management and decision-making. In this study, we investigate LULC changes in the Allala watershed, including the city of Ténès, using remote sensing methods and Geographic Information System (GIS) tools. Object-based image analysis (OBIA) based on random forest (RF) and support vector machine (SVM) machine learning algorithms was performed to provide LULC classification maps, and then, LULC changes were assessed using GIS. In order to assess LULC changes, we used three images acquired using remote sensing, corresponding to 3 years; 1999, 2009, and 2020. A Sentinel-2 image and two Landsat images were used as input data in our methodology. Our LULC classification results showed that RF outperformed SVM on the three input data periods, with an overall accuracy of 95.6% obtained with the Sentinel-2 image. Given the changes over time, it is clear that the Allala watershed has undergone significant changes over the years, particularly an increase in building infrastructure and agricultural land due to population and urbanization growth. Analyzing and mapping the trends of LULC changes in the study area provide a basis for strategic planning and managing, and results of LULC changes can be used as a decision support tool and provide further help in regional and national land management.

KEYWORDS : LULC changes ; Allala watershed ; Landsat images ; Sentinel-2 ; Object-based image analysis (OBIA) RF ; SVM

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