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كل الحقوق محفوظة للمدرسة الوطنية العليا للري.

**Abstract:** Land cover maps can provide valuable information for various applications, such as territorial monitoring, environmental protection, urban planning and climate change prevention. In this purpose, remote sensing based on image classification approaches undergoing a high revolution can be dedicated to land cover mapping tasks. Similarly, deep learning models are considerably applied in remote sensing applications; which can automatically learn features from large amounts of data. Prevalently, the Convolutional Neural Network (CNN), have been increasingly performed in image classification. The aim of this study is to apply a new approach to analyse land cover, and extract its features. Experiments carried out on a coastal town located in north-western Algeria (Ténès region). The study area is chosen because of its importance as a part of the national strategy to combat natural hazards, specifically floods. As well as, a simple CNN model with two hidden layers was constructed, combined with an Object-Based Image Analysis (OBIA). In this regard, a Sentinel-2 image was used, to perform the classification, using spectral index combinations. Furthermore, to compare the performance of the proposed approach, an OBIA based on machines learning algorithms mainly Random Forest (RF) and Support Vector Machine (SVM), was provided. Results of accuracy assessment of classification showed good values in terms of Overall accuracy and Kappa Index, which reach to 93.1% and 0.91, respectively. As a comparison, CNN-OBIA approach outperformed OBIA based on RF algorithm. Therefore, Final land cover maps can be used as a support tool in regional and national decisions.

**Key words:** Land cover ; Sentinel-2 ; Convolutional neural networks (CNN) ; Object based image analysis (OBIA) ; machine learning ; Ténès

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