Analysis of land use/land cover change in Daknong province using multi-temporal satellite images and Markov

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Abstract: The study used the CA-Markov model as a support tool to analyze and forecast the trend of land use and land cover change (LULCC) including forest cover in Dak Nong province. Firstly, the classified accuracy of the two methods of OBIA (Object Based Image Analysis) and MLC (Maximum Likelihood Classification) was evaluated and compared using Landsat satellite image captured in 2017. The results show that the higher accuracy was found by OBIA with 10% compared to MLC method. Therefore, OBIA was applied to classify a dataset of multi-temporal Landsat satellite images collected from 1989 to 2017. In the next step, GIS techniques were used to analyze LULC changes based on LULC maps classified as mentioned above. The results indicated that a significant decreasion of natural forest areas from 1989 to 2017 were detected by around 54%. In the final step, using the transition matrix from the CA-Markov model, the LULC spatial distribution in 2026 was simulated based on two data sources, LULC and multifactor analysis (MCE), including a number of factors of natural and social. The results show that, if there is no plan to protect forests more effectively, the possibility of forests will continue to decrease from 34% (in 2017) to 30% in 2026, corresponding to the loss of natural forest area of 29,000 ha in Dak Nong province.

Keywords: Classification, Land Use Land Cover Change, Multi Criteria Evaluation, Markov.