

Evaluating and Predicting Vegetation Changes Pertaining to Land Use Changes using LCM Model and CA-Markov Chain (Case Study: Ahvaz City)

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Abstract

Monitoring land use and vegetation changes plays an important role in urban management. The purpose of this study was to investigate the changes in vegetation cover of Ahvaz metropolis pertaining to land use changes. First, satellite imagery was prepared through object-oriented vector machine-based algorithm, classified method, and land use maps. To increase the accuracy of the maps, three normalized indices of vegetation difference, soil effect modifier and relative vegetation were used separately in the classification. The results showed that soil effect modifier index had higher capability and its maps with the highest kappa coefficients and overall accuracy were entered into land change modeling to detect changes. Changes in the next 10 years were also predicted using the Markov chain automated cell model. The results of the changes showed that the vegetation has a decreasing trend, so that 1339.65 hectares the vegetation in the period 1989-1989 and 1860.50 hectares in the period 2019-2002, have reduced. The most changes are related to the conversion of vegetation into man-made areas with 686.44 hectares in the period 1989-1989 and 1032.51 hectares in the period 2019-2002. The least changes are related to the conversion of vegetation into water areas with 7.18 hectares in the period 1989-2009 and 9.33 hectares in the period 2019-2002. The results of forecasting changes by 2029 also confirmed the reduction of vegetation. In 10 years, 785.77 hectares of vegetation will be reduced and the area will reach 2923.24 hectares.

Keywords: Vegetation, Object-Oriented, Land Change Modeling, Markov Chain, Ahvaz

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