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EXTENDED ABSTRACT

Modeling Land Changes forest Using by LCM in Fandoqhlo Forest Area (Ardabil)

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1. Introduction

Over the past decade, science and politics in societies have shown increasing interest in monitoring and modeling land surface change. Dynamic environment modeling helps to understand the changes that are currently taking place as well as to predict future developments. Future cloning supports decision-making for environmental management and land planning. This is particularly the case for advances in land-change modeling (Paegelow, 2013). Models of earth changes, are increasingly used to predict future landscapes and influence politics. The aim of this study is to modeling forest use changes using the LCM modeler based on the neural network. In order to make maps, the images of Landsat 5 and 8 were used for land use maps for 2010, 2015 and 2019, and Landsat 8 panchromatic band, Aster and Sentinel2 images were to merge Used. The object-oriented classification and Assign class method were used to classification forest, pasture, agricultural land, water boundaries and land made.

2. Methodology

In this research, remote sensing data such as satellite images of Landsat 8, 5, ASTER and Sentinel 2A. For extract land use information from digital satellite imagery, different methods have been proposed, each with its own limitations and capabilities (Blaschke, 2010). which can use basic and object-oriented pixel methods to classify images. Principles of operation The basic pixel classification method is based on the spectral reflection of ground phenomena received by the sensor; Whereas in object-oriented classification, the object-oriented classification method was used to determine the classification classes and the CN Spectral Sharpening method was used to integrate the images.

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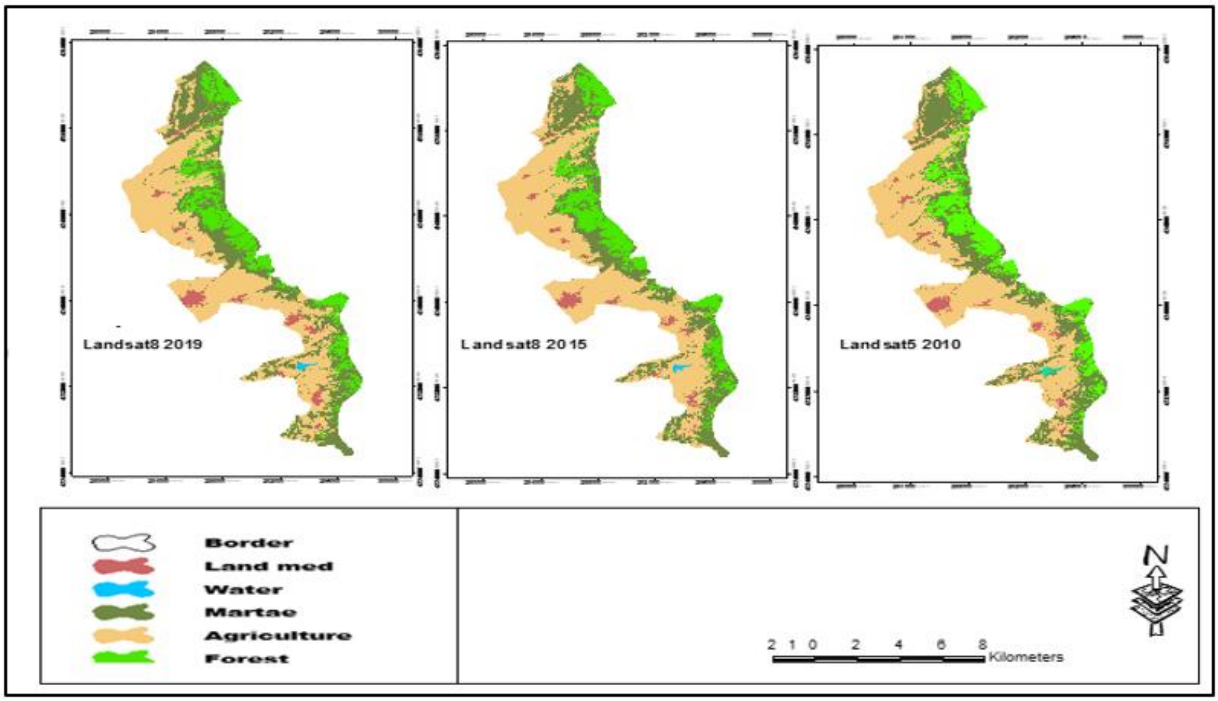

Fig. 1. Results from object-oriented classification for the years studied

2.1. Land Change Modeling

Various methods have been developed to analyze and detect land use changes, but their comparison is difficult in terms of efficiency and accuracy, but LCM is widely used (Mishra, 2014). The multilayer perceptron neural network described by Rumelhart et al. 1961 is one of the most common artificial neural networks. Multi-layer perceptron neural network training based on post-diffusion algorithm, which is a training monitoring algorithm that is a common method of training artificial neural networks (Vare, 2014).

3. Results and discussion

For modeling the potential of each sub-model using the seven variables mentioned earlier, for both periods 2010-2015 and 2015-2019, the potential modeling of input variables in land use changes was performed. Comparison of the predicted map with the terrestrial reality map for 2019 was predicted with a high accuracy of 0.8, the results for 2019 and 2025 are presented in Fig (2, 3).

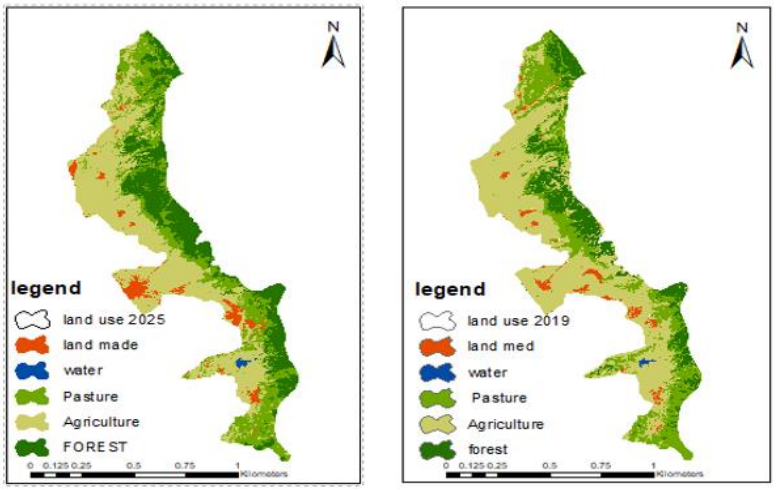

Fig. 2. a) Display of Predicted land use map for 2019, b) 2025

Calculation of agreement and disagreement of real mapping and mapping of modeling In this method, the predicted map and the actual map are compared in terms of the number of cells for each class as well as the location of the cells in the two images, and the kappa index is used to compare between zero and one to interpret the results (Penius et al., 2000) (Fig. 3).

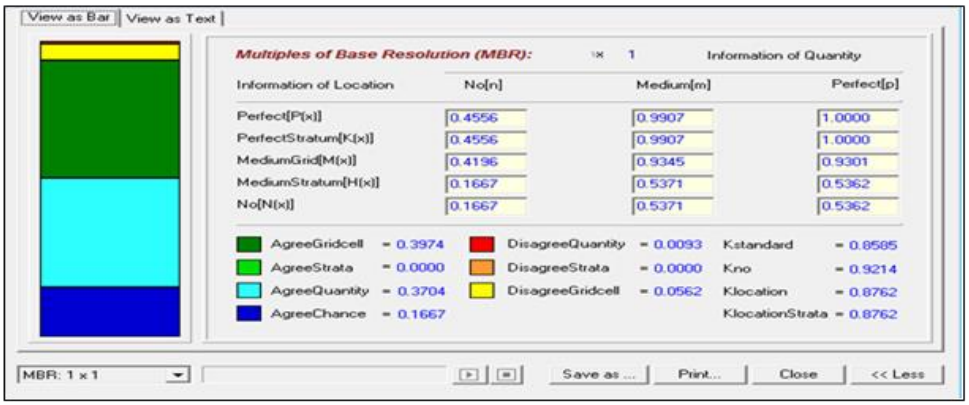

Fig. 3. Agreement and disagreement between the actual and predicted to year 2019

4. Conclusions

The result of the LCM model showed which forecast for 2019 was obtained with almost 90% agreement in accordance with the terrestrial reality map, which indicates the efficiency of the LCM model in the study area. According to the modeling result for 2019, the obtained map for 2025 will also happen with high probability. According to the results of forest lands in the Namin Fundoghlo region during the first period of the year shows a decrease of more than one percent, which in the second period has decreased, which is due to increased protection by the Natural Resources Organization. The area north of the valley is about 20%. The only factor in this restoration is the increase in protection by the Natural Resources Organization of this area, but in terms of quality and density of forest community in areas that are in contact with agricultural land.

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