

Investigating forest level changes using LCM model in satellite images in northern Iran with human geography approach

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Abstract

Introduction: The purpose of this research was to compare the forest level changes using the LCM model in satellite images in Talash forests. Studying the amount of changes and destruction of resources in the past years and the feasibility and prediction of these changes in the coming years can be the necessity of conducting research in line with planning and optimal use of natural resources.

Materials and Methods: The trend of usage changes in the study area was processed using the satellite images of TM, ETM, and OLI sensors in the years 2000, 2010, and 2020 with the supervised neural network method. Land use classification map including residential use, agriculture, pastures, dense forest, semi-dense forest, and thin forest was identified in the region. For this purpose, Google Earth software images and field visits were used to prepare educational points. Multi-layer perceptron neural network was used for image classification. Finally, the accuracy matrix was formed for each map. Modeling with TerrSet2020 software has made it possible to investigate the changes in land use between the researched years and display the results with different charts and maps in a quantitative and qualitative manner.

Results and Discussion: The changes in land use from 2000 to 2020 with the artificial neural network method showed that residential areas increased by 210% and agricultural use by 1500%, semi-dense forest use by 200%, and thin forest by 340% of hectares, and dense forest use by 50% and pasture by 30%. had. The accuracy of the classification maps in this research was 0.88, 0.8950, and 0.9150 respectively in 2000, 2010, and 2020, which was acceptable.

Conclusion: The research showed that the expansion of agricultural activities and the construction of residential areas on pasture and forest ecosystems have turned pastures and thin forests into less valuable land. In general, in this research, it can be concluded that there have been changes in use in the studied area, and according to the results of the studies, the main changes are related to the change of use of pasture to agricultural and residential land, the change of untouched forests and It has been dense to semi-dense and thin forests. Using images with higher resolution in the scope of the research and comparing it with the research results of other researchers can be useful. Therefore, it is necessary to monitor user changes and control user changes within the scope of studies to be paid attention to by officials and planners.

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Keywords: Forest changes, Remote sensing, Talesh city, Dense forest.

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