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Mohammadtaqi Masoumi[1]
Seyyed Rahim Moshiri[2]

Using Landscape Spatial Metrics and Remote Sensing Data for Spatio-Temporal Urban Land Use/Cover Changes Analysis, A Case Study of Ardebil Municipality

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Abstract

In various parts of our country observed environmental changes can have extensive unforeseen ramification. The objective of this research were to map and determine the nature, extent and rate of changes and to analyze the spatio-temporal land use/cover change patterns and fragmentation that has occurred in Ardebil Municipality. Multi-temporal satellite images (TM1988, ETM+ 1998 and IRS2007) and required thematic maps were acquired and land cover maps for 1988, 1998 and 2007 were generated and change detection analysis was performed. Distinct changes have occurred on the land use/cover. Built up areas increased from 2241.2 ha (10.59%) to

1 - Ph.D. in Geography and Urban Planning, Science & Research Branch, Islamic Azad University, Tehran, Iran.
2 - Department of Geography and Urban Planning, Science & Research Branch, Islamic Azad University, Tehran, Iran.

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3310.9 ha (15.64%) from 1988-1998 and to 4504.5 ha (21.27%) in 2007. While non-built-up area (water bodies, irrigated and non-irrigated crops, pastures and bare soils) decreased from 89.4% to 84.36% and 87.73% respectively. The rate of change was +5.3% for built up areas. The spatial metric calculation e.g., number of patch (NP), large patch index (LPI), mean patch size (MPS) and percentage of landscape (PLAND) revealed a continued growth in the built up surface and Three stages (i.e. diffusion, coalescence and scale up) can be seen in built up areas in Ardebil municipality and Rapid urban growth was contiguous to the historical urban core with middle fragmentation.

Keywords: Land Use/Cover, Spatial Metrics, Remote Sensing, GIS, Ardebil.

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