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APPLICATION OF LANDSCAPE METRICS FOR ASSESSMENT OF LAND USE/ LAND COVER (LULC) CHANGES IN VARJIN PROTECTED AREA, IRAN

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Abstract

Protected areas are valuable ecosystems standpoint providing various ecological processes and functions. Unfortunately, during the recent decades, population growth and human development have been changed the land use/land cover of the most protected areas in the world. Varjin Protected Area is one of the oldest protected areas. In this study, landscape metrics were used to reveal landscape patterns in Varjin Protected Area using Landsat satellite imagery from 1986, 2000 and 2010. For this purpose, remotely sensed images have been corrected in terms of geometric and radiometric distortions and were then classified through hybrid method. The resulting land cover map was divided into four categories: residential, orchard, good rangeland quality, and poor rangeland quality. The proportion of the Class Area (CA) regarding residential class increased from 1986 to 2010 whereas the proportion of orchard class area was rather stable among the three dates. Concerning the poor rangeland quality, its total class area increased from 1986 to 2000 and then slightly declined from 2000 to 2010. Based on the Largest Patch Index (LPI), the dominant land cover class across the three dates was poor rangeland quality although the number of patches was shifted between the years 1986 and 2000. The isolation/proximity metrics represented by ENN_MN showed an increase of the residential class area, whereas the changes among other classes were limited. The main driving force of the residential area increase was the willingness of local people to sell their agricultural lands for a lot of money, so as rich Tehranian people to abandon air and noise pollution of the capital and immigrate to the protected area region, specifically to the “Villa Building”. This study highlighted the importance of landscape metrics in monitoring land use/land cover change over time.

Key words: fragmentation, landscape metrics, protected area, remote sensing, satellite image

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