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Spatial analysis of green infrastructures in Tehran's district 22 using the principles of spatial planning

Ebrahimi, A [a,1]. Tavakoli, M [b]. Eftekhari, A.R [b]

[a] MSc Student, Department of Spatial Planning, University of Tarbiat Modares, Tehran, Iran.

[b] Associate Professor, Department of Geography and Rural Planning, University of Tarbiat Modares, Tehran, Iran.

[c] Professor, Department of Geography and Rural Planning, University of Tarbiat Modares, Tehran, Iran.

Extended Abstract

Objective: Green infrastructures and their coherent and effective presence in the urban context have led to the promotion of urban ecological structures and is considered as an effective factor in moving towards urban sustainability. The destruction of green infrastructures, which provide cultural services, is a major issue in urban areas.

Methods: Considering the theoretical approach of the research, the methodology of the present study has been developed in two main stages.
Stage 1: Categorizing images and detecting variations in the target period and location
Stage 2: The spatial analysis of images extracted from the categories using spatial statistics schemas.
To monitor variations in green infrastructures and land use, this research employs IRS-P5 Cartosat-1 images in two periods. The India Remote Sensing Satellite (IRS) series are owned by the Indian Air Force. The two satellites of the series are the IRS-1C / 1D, which have similar technical capabilities.

Results: Data obtained from satellite images were classified using Supervised Classification and Maximum Likelihood Estimation in Erdas Imagine 2014 software. Sampling and familiarity with the studied area are essential to this classification. In this method, the selected samples are determined in terms of land use or land cover and are introduced into the system using certain codes. In this study, Land use codes start from number 1. To classify satellite imagery, the classes have been categorized following geometric correction and image enhancement. Auxiliary information, the Land use map of the area, and field observations have been used to determine the classification of images. The components and principles of green infrastructures are analyzed in time and space using spatial statistics to determine the degree of compliance with the principles of spatial planning. The components analyzed in this research include: Spatial Distribution, Expansion, Neighborhood, Sufficiency. The analysis of hot spots in green infrastructures from 2008 to 2015 reveals that their spatial distribution is not balanced. In fact, hot spots are most common under green infrastructures in area 4 and in constructions in area 1. the directional distribution of the green infrastructures in District 22 has tended towards the center and to some extent to the west of the district from 2008 to 2015. This advance in directional distribution has been due to the

[1] Corresponding author at: Tarbiat Modares University, Tehran, Iran, P.C: 1715713386. E-mail address: aram_ebrahimi69@modares.ac.ir (Ebrahimi, A).

formation of the Persian Gulf Martyrs lake, the densification of Chitgar Park Forest, and the green spaces created in the National Botanical Garden of Iran. The conceptualization of spatial relationships has been used to analyze the neighborhood and the compatibility of various land uses in the studied area. The purpose of this analysis is to identify the acute points in terms of incompatibility between the green infrastructures and the Built-up Lands. As a result, we can achieve better planning in the future. Per capita, changes have been modest in District 22 over the years. In other words, the affluent neighborhoods have become more affluent while other neighborhoods are still facing a shortage.

Conclusion: Considering the status and management of data, there is poor monitoring and control over green infrastructures. The results of this research indicate unbalanced spatial distribution, counter expansion, moderate compatibility, and undesirable Sufficiency. Changes in and expansion of green infrastructures in the time and location of the research do not follow the principles of spatial planning. District 22 includes 3 large green spaces with an area of more than 10 hectares. These spaces perform transdistrictal functions and have a high potential to attract tourists and investment at the national and international levels. Other advantages of green infrastructures in this district, and in Tehran in general, include a major role in reducing thermal islands and increasing healthy air flow.

Keywords: Principles of Spatial Planning, Green Infrastructures, Spatial Analysis of Land Use, RS & GIS, District 22.

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