Optimum Locating of Urban Green Spaces using GIS and ANP  
(Case Study: Ardabil City)

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Extended Abstract

1. Introduction

The green space as one of the indicators of the development of societies has environmental, social, cultural, economic and physical dimensions and the first and most important step is to determine the appropriate places for it, so that it can fulfill its roles. Urban green spaces and the distribution of urban land in cities are of high importance. Generally, locating is an activity that evaluates and analyzes the spatial and non-spatial deployments of a territory to select the appropriate location for a particular use. Urban green spaces are part of urban open spaces where natural or often artificial areas are covered by grasses based on human supervision and management and considering the rules, regulations and related specialties for the improvement of living, residences and welfare of citizens and non-rural population centers (Management and Planning Organization, 2008). So the main question of this research is that which part of Ardabil city is the best place to create green space? Since the main goals of urban planning are health and beauty, the proper location of urban green space as one of the most important elements of urban environment has a great role in the desirability of space for citizens.

2. Review of Literature

Vatanparast, Oladi Ghadiklaee and Akbari (2015) planned studied green paths using Analytical Hierarchy Process (AHP) and Geographic Information System (GIS) in District 11 of Mashhad. Using this method in the district resulted in proposing a green path of 11.5 acres. The shape of the city and the more human interaction and interaction with the city space are walkable, convenient and doable. Khavaninzadeh, Sarbaz and Ahmadian (2017) investigated the trend of green spaces changes in Yazd city in the last three decades (1987, 1999 and 2015) using remote sensing. The result of the study showed that urban areas of Yazd have decreased to 271.71 ha over the past 30 years, while the population of the city has increased to 332124 during this period. The greatest reduction in green spaces has been 209 hectares in the District 2 during these years. The results showed that green spaces Districts 1 and 2 have decreased in the mentioned years.

As the green spaces in Ardabil city (in four districts) are not divided evenly, using Weighted Sum, GAMMA 0/9, PRODUCT, and Weighted Overlay in GIS, the prior places for creating green spaces were identified.
3. Method

This inquiry is an applied research. A descriptive-analytical approach was taken to conduct the research. The data was gathered through documentary analysis, using library sources, field study, and using the needed information of relevant organizations. The criteria of locating were selected based on locating principles and using the ANP method in Super Decisions software paired comparisons and the weight of each index were done to prepare the layers for Spatial analysis was performed in ARC GIS 10.2. Finally, using the results of the weighted layers integration, in GIS environment with the help of GAMMA 0/9, Weighted Overlay, Weighted Sum priority locations that are in appropriate land and that were relatively suitable were identified and proposed for creating urban green spaces in Ardabil.

4. Results and Discussion

By standardizing the layers to perform the analysis and identify the optimal location for green space creation, all the criteria were compared to see their relative importance based on their value in green space locating. Then, the weights obtained in the effective layers in the GIS environment were identified with the help of Weighted Overlay, PRODUCT, Weighted Sum commands, in order to create urban green space in Ardabil.

Ardabil city, due to its inappropriate population distribution, does not have proper distribution of urban green spaces. In some districts of Ardabil city, there is less green space for the population and in some others there is more green space for the population of the areas. Among the areas are Districts 3 and 4 which that despite the high population density, have less green spaces than District 1 and 2. Therefore, selecting optimal locations for urban green spaces according to the usual criteria as well as criteria such as pollution, population density and worn out units can be an effective step in balancing the population and reducing the amount of urban pollution. The optimal place for urban green spaces was specified in Ardabil city through GAMMA 0/9.

5. Conclusion

In order to achieve the ultimate goal of this study, which is to determine the optimal locating of urban green spaces, suitable locations for urban green space were identified in Ardabil city using the methods used (zones 1, 3 and 4).

Suggestions are as follows:

- Since inaccurate land use location in cities will cause problems, the use of Geographic Information System (GIS) is important for selecting the optimal location for urban land use.
- According to the results of this study, attention should be paid to locating green areas in Ardabil 3 and 4, as well as area 1 which has significant green space deficiency.

Keywords: Location, Green Spaces, ANP, Ardabil City

References (In Persian)


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