

Evaluating and Locating the Land Use of Urban Parks in District 9 of Mashhad Municipality through Network Analysis

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Extended Abstract

1. Introduction

Urban green space is one of the land uses whose distribution and dispersion throughout cities is of paramount importance and constitutes an inextricable part of city structure. Thus, city green space is a sort of urban land use covering manmade vegetation and boasting both social and ecological output. City parks should be geographically distributed in ways that are easily accessible. Moreover, along with the rapid growth of urbanization and constructions in recent decades, the appearance of the city of Mashhad, the second metropolis in Iran, has changed in such way that a dire dearth is noticeable in terms of the land use of city parks. Casting a quick look at the status of parks in Mashhad, one can realize that the city, with a total number of 193 parks spanning an area of 605058 square meters and a per-capita ratio of 2.01 square meters has a smaller number of parks as compared with the number suggested in the city master plan (2.62 square meters). Therefore, it explicates the necessity of creating local green spaces in the neighboring citizens' residential abodes. To this end, of the 13 districts in the city of Mashhad, district 9 of the municipality was chosen as the area under study due to its rapid economic growth, high price of land, population density, having apartments in most residential units and a younger population. Data show that, in district 9, 1.3 square meters of green space is available per capita, a figure which is a far cry from the standards provided in the city master plan, indicating a need for creating new parks in district 9.

2. Theoretical Framework of the Research

The question that needs to be answered is that in which locations and close to what kinds of land use

should parks and green spaces be created and, in fact, which places are more suitable for creating parks and what factors are important in their location finding. Therefore, the present study aims to identify the influential factors in locating parks in district 9 of Mashhad municipality in three neighboring, local, and regional scales, emphasizing the principles of minimum distance allocation and evaluating the district's potential for creating such parks. To this end, the hypotheses of the research are formulated in the following:

- 1) Considering the potential of undeveloped lands in the district, locations proposed by the study seem to be located in these areas, eliminating the districts' need for green spaces.
- 2) It seems that in choosing the location of present parks, principles and standards of locating and land-use compatibility are not observed in terms of land use.

3. Methodology

The present research is of a descriptive-analytical type. The required data, based on theoretical and exploratory principles, was gathered through document analysis and field study considering the distance of the land from adjacent land-uses and its compatibility with and dependency on them along with interviews conducted with green space experts and specialists in the municipality of district 9 and 6 factors were identified for locating suitable areas, including population center, distance from educational institutes, distance from cultural institutes, availability of transportation networks, distance from existing parks and availability of potential lands.

In analyzing the data, mixed methods comprising qualitative and quantitative methods were used. Taking into account the principle of minimum distance allocation, a method for finding the

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location of parks in the vicinity of other types of land-use was used. To this end, Spatial Decision Support Systems (SDSS) was used. For the purpose of managing optimal land-use location finding, data analysis along with overlaying and combining the data layers was conducted through Network Analysis in GIS.

4. Findings and Conclusion

From the perspective of urban planning, land-uses that are within one another's sphere of influence should be consistent in terms of their activity and be compatible and not impeding each other's activities. Thus, the factors that were considered for locating city parks in the present study in line with land-use compatibility of green spaces with other sorts of land use are as follows: population center, distance from educational institutes, distance from cultural institutes, availability of transportation networks, distance from existing parks and availability of potential lands (undeveloped lands).

According to the investigations undertaken in this study and through identifying the optimum spots using network analysis in GIS, the minimum radius of action was delimited to be 300 meters for educational and cultural institutes, 100 meters for transportation networks and 250, 375, and 750 for neighboring, regional and local parks, respectively. Consequently, regions which did not have proper access to parks and were in need of planning were identified. New parks should be added to green

spaces of the identified regions considering their per capita ratio and required green space areas. In the end, suggested locations for creating parks, taking into account such factors as vicinity to population centers, educational land use, cultural land use, urban streets, being located at a proper distance from existing parks and being currently undeveloped, were identified using network analysis in GIS. These regions were identified at two levels of priority for the region.

5. Conclusion and Suggestions

The surface area of the identified lands for creating new parks amounts to 615146 square meters or 61 Acres: in case, eighty five percent of this area is turned into parks, the region's shortage which amounts to 52.8 acres will be met. Thus, the first hypothesis of the research regarding the placement of all the suggested locations in undeveloped lands to meet the shortage of green spaces is confirmed. With respect to the second hypothesis, regarding the possibility of not incorporating the principles and factors of locating and land use compatibility in choosing the locations of the existing parks, the findings reveal that vast swathes of educational and cultural land uses are not in the vicinity of parks, which confirms the second hypothesis as well.

Keywords: Minimum distance allocation, Parks' land use, Location, District 9, GIS.

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