Analysis of Spatial Distribution and Access to Urban Parks (Case Study: Shiraz)

Zeinab Keramati[1*], Hassan Izady [2], Ali Soltani [3], Sahand Lotfi[4]

1. MA in Urban and Regional Planning, Iran
2. Assistant Professor of Geography and Rural Planning, Faculty of Art and Architecture, Shiraz University, Iran
3. Associate Professor of Urban Planning, Faculty of Art and Architecture, Shiraz University, Iran
4. Assistant Professor of Urban Planning, Faculty of Art and Architecture, Shiraz University, Iran

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Expanded Abstract

Introduction

Urban parks are part of the green spaces that have been designed and built within city boundaries. Besides, the urban parks create a permanent relationship between people. They are regarded as the main element of urban structure. Urban parks and open green spaces have strategic importance for the quality of life in our increasingly urbanized society. They also play an important role in urban sustainability.

Urban parks provide ideal open spaces for leisure-time physical activity. They are considered as a desirable environment for raising children and comfort. Furthermore, they are an indicator for quality of life, and the development of community. Moreover, urban parks are the most important factors to shape social sustainability and social interaction and solidarity. They also play an important role to strengthen the mind and the body and form the bases of the cities and neighbors. Therefore, the distribution and suitable location of urban parks in the cities and their access are the essential need in every city. They have an important role to achieve equality, social and location justice in the society.

Methodology

In order to analyze the distribution of urban land uses, e.g., green space and parks, there are numerous mathematical and statistical methods. In this study, we have used some various geo-processing tools including buffer, union, erase and also the nearest neighbor analysis and K function. The mathematical methods such as Entropy Index, Lorenz curve, Gini Coefficient, Location quotient (LQ), distribution coefficient and concentration measurement have been used to measure the concentration and spatial equilibrium of parks in different areas of the city. To analyze the spatial distribution of the urban parks, we used the Iranian park classification system to classify them into five classes according to their size, facilities available and functional radius such as neighborhood, community, regional, and district (Table 1). We studied 169 parks in 5 categories in Shiraz (Table 2).

* Corresponding Author: Zainab.keramati1390@gmail.com

Table 1. Classification of urban parks in Iran

Type of park	Area (Hectare)	Functional radius (Meter)
neighborhood	Less than half a hectare	100-200
community	0.5 -2	400-600
regional	2-4	800-1200
district	4-10	1500-2500
Urban	More than ten hectares	3500-4000

Table 2. The number of urban parks in Shiraz (Based on Iranian classification system)

Municipal district	Neighborhood park	Community park	Regional park	District park	Urban Park
1	11	4	1	0	2
2	10	3	1	3	0
3	5	9	0	0	0
4	9	12	1	1	1
5	15	6	2	1	0
6	8	9	0	0	0
7	22	2	1	1	0
8	13	1	0	0	0
9	10	5	1	0	0
Total	103	50	7	6	3

Results and Discussion

In order to assess the distribution of parks in Shiraz, we used two methods: "the nearest neighbor analysis" and "K function". The results of these two methods indicate that the spatial distribution of parks is clustered. Then, the spatial distribution of the urban parks was measured by two methods: "Entropy Index" and "concentration measurement". The findings indicate that the level of concentration of parks in Shiraz is very low. The distribution coefficients of parks in each of the nine regions have been calculated by LQ method and distribution coefficients. The results of both methods indicate that the parks are more concentrated in 5 and 7 municipal districts. According to the findings, it can be concluded that the distribution of parks are semi-balanced in Shiraz and there are little difference among municipal districts, although there is more equilibrium in the distribution of neighborhood and community.

We used the buffer tool in GIS so as to measure access rate to urban parks. At first, the buffer radius (Meters) was determined for the five categories of urban parks and then buffer map was created for each category (Table 3).

Table 3. The Buffer Radius to Urban Parks in Shiraz (Meter)

Type of Park	neighborhood	community	regional	district	Urban
Buffer Radius (meter)	200	600	1200	2500	4000

The results of this method indicated that despite the lack of access to different parks in the most municipal districts of the city, 6 municipal districts are the most deprived in terms of access to the parks. The regions 2, 4 and 8 had the best access situation. Based on the total surface of buffer around the parks, 74% of the city is covered by parks and only 26% of the total area of the city is suffered from insufficient access to the parks.

Conclusion

The planning of urban parks is considered to be as one of the most challenging tasks of managers and urban planners. Spatial distribution and access to urban parks have great importance in planning and urban development. Planners and policy makers should not only increase the number of parks, but they should also improve the spatial distribution pattern. The access and the spatial distribution of urban parks have a mutual impact on each other. Use of appropriate methods to measure the access and spatial distribution pattern of urban parks are essential to achieve spatial and social justice. To achieve this aim, changes in criteria and standards for site selection study of urban parks is necessary. The results of this research can be effective in the field of spatial distribution of urban parks in Shiraz.

Keywords: access, Shiraz, spatial distribution, urban park.

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