Research Paper

EVALUATION OF URBAN GREEN AREA EXISTENCE IN ISTANBUL PROVINCE SARIYER DISTRICT EXAMPLE

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ABSTRACT

The growth rate of green areas in cities doesn't comply with the population growth rate, and the amount of green areas per capita decreases. For this reason, green areas should be handled and implemented within a plan in terms of quantity, distribution and usage. In the research, green areas have been identified. Green areas of Sarıyer are divided two groups such as active and passive green areas. Existing situation of green areas were compared with the green area norms so that green area deficit was calculated. Following the green area situation determination throughout the district, the green area situation at the neighborhood level was determined. The aim of research is to determine the sufficiency in urban level of the active green areas using remote sensing and geographical information technologies in Istanbul City case according to demographic information, population density, planning criteria's depending existing laws and regulations. It is thought that the research will contribute to the studies for determining the planning principles of green areas and measuring the effectiveness of green areas. The results of the research can provide a comprehensive background to the planning and green system and can guide the determination of the places where new green areas should be made. The main materials of the research consist of quantitative data for Sarıyer green areas. The methodology of the research is based on the investigation of the quantitative data obtained for the green areas of Sarıyer district within the frame of spatial adequacy in terms of areal size and per capita values. As a result of the research; it was revealed that the green areas show an unbalanced distribution in the whole Sarıyer district in terms of spatial adequacy possibilities and they are insufficient in terms of spatial standards.

Keywords: Active green areas, passive green areas, spatial sufficiency, Sarıyer
Word count: 3045

1. INTRODUCTION

Green areas play an important role in the success of planning studies in cities. Green areas play an major role in the establishment of mass-space balance in urban spaces and in shaping the physical structure of the city (Gül and Küçük, 2001).

Urban green areas take part in a major part in maintaining the balance between natural and built environment (Haq, 2011; Kabisch and Haase, 2013). Green areas have varied functionalities lending to develop the quality of the city living by exchanging weather standard, support bodily activities and sociable relationship, decreasing stress, noise and controlling heat and temperature (Zhang et al., 2017).

Balanced spatial distribution of green areas is of public importance as it has a quality affecting many factors, especially the population. Spatial analysis is the starting point for the evaluation of the distribution of green areas that are formed according to the needs of the society.

The aim of the research is to determine the spatial adequacy level of urban active green areas in terms of population, density, planning criteria according to current regulations and standards, and to examine the situation in Istanbul City Sarıyer District sample and reveal the conceptual framework. It is seen that no planning and design criteria are taken into consideration in the spatial distribution of the green areas of Sarıyer district. In this study, it was revealed that the green areas of Sarıyer district were inadequate in terms of space and numerical terms. There is no homogeneous distribution in the spatial distribution of active green areas. Urban green areas should meet the needs of the population, and their balanced distribution in spatial and functional staging should be ensured throughout the urban area.

Giving the per capita rate of the green area in m² is based on the assumption that the green areas are distributed homogeneously throughout the settlement. However, the distribution of green areas in the Sarıyer district is haphazard and there is an imbalance in terms of its impact areas. It is thought that the research will contribute to the studies for determining the planning principles of the green areas of Sarıyer District and measuring the effectiveness of the green areas. The results of the research can form a comprehensive background for planning and green system and can be a guide in determining the places where new green areas should be made (Aksoy, 2019).

2. MATERIAL AND METHOD

A literature study was conducted to create the theoretical part of the research. The existing green areas of the district have been identified on site. Data of Sarıyer Municipality and Istanbul Metropolitan Municipality were used. Satellite images belonging to 35 neighborhoods of Sarıyer district were used in the study. 1/1000 scaled base maps, 1/5000 scaled master plan and 1/5000 scaled topografic maps of Sarıyer Municipality were used.

The data showing the distribution of the green areas belonging to the research area and the population data of the Sarıyer district on the basis of neighborhoods were determined as non-graphic data in order to determine the green areas per capita.

The main materials of the research consist of quantitative data for the green areas of Sarıyer District. When the functional distribution of the green areas of Sarıyer is examined; park areas constitute all active green areas.

The methodology of the research is based on the analysis of the quantitative data obtained2nda re active green areas of Sarıyer District in terms of spatial adequacy in terms of spatial size and per capita values. As a result of the research; It has been revealed that active green areas 2nda an unbalanced distribution at the district level in terms of spatial adequacy possibilities 2nda re insufficient in terms of spatial standards.

3. GREEN AREA NORMS

There are some standards with the aim of assessing the ecological sustainability of cities, defined by various organizations. One such application is determining the per capita green area extent of a city (Laghai and Bahmanpour, 2012). This value represents the extent of green area in square meters (m2) for a single citizen.

Norms (standards) are calculated in square meters (area) per person. In the urban texture; factors determining the green area norm; needs (requirements) are classified as population, size of the city, geographical location, climate and density of use. The most important factor that determines the need for green area is the population. The size and distribution of green areas are closely related to the population and the distribution of the population in the city (Aksoy, 2001).

Green area norms are directed towards future growth of the city and its immediate surroundings. It is not possible to reach the suggestion green area norms with urban renewal interventions in the city center and in dense settlements. However, if the active green areas in and around the city are evaluated, it is possible to increase the amount of active green areas per capita (Aksoy, 2017).

As stated in the Zoning Law No. 3194, the amount of active green area is given as 10 m2 per person. However, here, a uniform standard has been determined for active green areas and the standards that should be included in these areas are not specified. In this case, the arrival of green areas causes beautiful planning and implementation and as a result, unhealthy places appear. However, the types, contents of the green areas, the action types and sizes in the green area vary according to the size of the population served, the physical characteristics of the settlement (topography, soil capability etc.) and the natural characteristics (climate, vegetation, etc.). Factors determining the

norms of green areas; population, size, geographical location, climate, usage distance and density of the city (Aksoy, 2017).

4. SPATIAL DISTRIBUTION OF GREEN AREAS

Factors affecting the use of urban spaces are divided into five groups: natural, social, cultural, economic and urban factors (Mc Bride, 1999). Green areas are divided into two groups as active and passive green areas and are in the group of urban factors.

Green areas have the potential to sustainably reduce the negative effects caused by urbanization. In addition to the contributions of green areas to urban ecology, they also have a positive impact on the well-being of societies.

An accessible, high-quality green area provides recreational opportunities and contributes to social cohesion; It increases the quality and livability level of the settlements (Aksoy, 2017).

Spatial analysis of green area status in Sarıyer Dıistrict

Spatial analysis is the starting point for the evaluation of the distribution of green areas that are formed according to the needs of the society. Jim (2004) argues that the use of space and urban development patterns create different geometry, distribution and composition in green areas.

Accordingly, the amount of green area tissue is a prerequisite for understanding the spatial distribution of green areas and their change over time.

It is examined the quantitative (numerical) change of the green areas of Sarıyer. In this research, as quantitative, just size of the green areas and the increasing size considered .Green areas ofSarıyer are divided two groups such as active and passive green areas. The green areas that are actively used are designated as children's playgrounds, park areas, sports fields, and public grove and forest areas for recreational purposes. Green areas that are not used actively are open areas that are not used for recreation and sports but are included in the green area in terms of function. These are afforested areas, meadows, nurseries and forests, visual green areas, refuge and squares, grove areas, and cemeteries. Existing situation of green areas were compared with the green area norms so that green area deficit was calculated. Following the green area situation determination throughout the district, the greenarea situation at the neighborhood level was determined.

5. RESULTS

Rapid development of our cities has a substantial effect on the green areas. Appropriate access to urban green areas for people and distribution of balanced urban green areas increase urban ecological efficiency, and consequently bring better environmental, economic, social, and psychological conditions for citizens and provide decent living conditions in cities. The growth rate of green areas in cities doesn't comply with the population growth rate, and the amount of green areas per capita decreases. For this reason, green areas should be handled and implemented within a plan in terms of quantity, distribution and usage.

When the green area situation of Sarıyer district in the last 39 years is analyzed within the relationship between population and green area: the total green area amount in 1980 in Sarıyer district is 4.394.360 m2. While actively used green areas of 884.200 m2 constitute 20% of the total green area;

3.510.160 m2 of non-actively used green areas (passive green areas) constitute 80% of the total green areas. In 1980, the actively used green area per person was 8 m2, the non-actively used green area was 31.8 m2 and the total green area was 39.8 m2 (Table 1).

Table 1. Population-Green Area Status of Sarıyer District by Years (Aksoy, 2019).

Years	Population	Active Green Areas Surface (m²)	Per Person Active Green Area (m²)	Passive Green Areas Surface (m²)	Per Person Passive Green Area (m²)	Total Green Areas (m²)	Per Person Total Green Area (m²)
1980*	110.469	884.200	8	3.510.160	31,8	4.394.360	39,8
2000*	241.234	832.475	3,5	6.186.630	25,6	7.019.105	29,1
2019**	342503	996.438	2,9	4.390.108	12.8	5.386.546	15,7

* Aksoy, Y. (2001). The Determination of exciting green area situation Istanbul, Ph.D Thesis, İTÜ Graduate School of Science Engineering and Technology, Istanbul.

** It was produced from Sarıyer Municipality Park and Gardens Directorate and İstanbul Metropolitan Municipality Parks and Gardens Directorate Sarıyer Regional Directorate data.

When the population growth between the years of 1980-2000 was examined, despite the increase of 130.765 people, the active green area decreased by 51.725 m2; while in passive green areas there was an increase of 2,676,470 m2. In terms of population green area relationship, 4.5 square meters of active green area per person and passive green areas of 6, 2 square meters occur, whereas 10.7 square meters of total green area decreases per person.

While Sarıyer District has a total of 7,019,105 m2 green area in 2000, this value has been 5,386,546 m2 in 2019. While the amount of active green area, which was 832.475 m2 in 2000, increased to 996.438 m2 in 2019; Green areas, which are 6.186.630 m2, which are not used actively, have decreased to 4.390.108 m2. In 2000, a total of 29.1 square meters of green area per person falls, of which 3, 5 square meters of actively used green area, 25.6 square meters of non-active green area. In 2019, the amount of actively used green areas per person decreased to 2, 9 m2 and the amount of unused actively reduced to 12, 8 m2. There is a total of 15, 7 m2 green area per person.

The population of Sarıyer district in 2000 is 241,234 people. In 19 years, it increased by 101,269 people and reached 342,503 in 2019. A green area of 1,012,690 m2 would have to be built for a person in 19 years, following the green area norm of 10 m2 actively used. However, a green area of 163,963 m2 has been realized during this period and this constitutes 16% of the value to be realized.

If we examine the green area situation of Sarıyer District in terms of green area types as of 2019; The population of Sarıyer, which is 342.503, has 99.64 Ha as active green area, 439 Ha as passive green area, and 538.65 Ha in total. From here, there is a total of 15.7 m2 green area per person, 2.9 m2 active green area and 12.8 m2 passive green area.

The green area situation of Sarıyer district should not be regarded only as population-area relationship. It is necessary to look at the locations and distribution of these areas within the neighborhood settlement texture.

In Sarıyer district, the most active green area per capita is Emirgan with 55.5 m2, Zekariyeköy with 3.8 m2, Uskumruköy with 3.6 m2, Kumköy (Kilyos) with 3.5 m2; the least is in Gümüşdere with 0,1 m2 and in Maslak (Pınar) neighborhood with 0,3 m2 (Table 2).

Table 2. Population-Green Area Status of Sarıyer District at the Neighborhood Level (Aksoy, 2019).

Neighborhood	Area (m²)	Population	m²/ person
Ayazağa	18988	34740	0,5
Bahçeköy	6864	11204	0,6
Baltalimanı	10.574,00	5122	2,1
Büyükdere	4036	8719	0,5
Cumhuriyet	12637	10887	1,2
Çamlıtepe	2.280,00	5950	0,4
Çayırbaşı	19976	4905	4,1
Darüşşafaka	4.263,00	9423	0,5
Demirciköy	2134	1308	1,6
Emirgan	485.765,00	8751	55,5
Fatih Sultan Mehmet	7.620,00	15557	0,5
Ferahevler	27.429,00	14991	1,8
Garipçe	379	387	1,0
Gümüşdere	316,00	3914	0,1
Huzur	5.098,00	8020	0,6
İstinye	48491	15692	3,1
Kazım Karabekir Paşa	7963	7998	1,0
Kısırkaya	385	350	1,1
Kireçburnu	18405	6986	2,6
Kocataş	1838	4383	0,4
Kumköy (Kilyos)	12233	3465	3,5
Maden	14520	13260	1,1
Maslak (Pınar)	7.252,00	20815	0,3
Poligon	2.875,00	6667	0,4
PTT Evleri	1982	5342	0,4
Reşitpaşa	10.381,00	17902	0,6
Rumeli Feneri	3597	5208	0,7
Rumeli Hisarı	20.021,00	10736	1,9
Rumeli Kavağı	5817	3722	1,6
Sarıyer Merkez	15.506,00	12568	1,2
Tarabya	19864	17724	1,1
Uskumruköy	30311	8482	3,6
Yeni Mah.	7797	3400	2,3
Yeniköy	17.907,00	15218	1,2
Zekeriyaköy	70759	18707	3,8
SARIYER (TOTAL)	**996438**	**342503**	**2,9**

Green areas determine the main structure of the urban area or urban area, play an important role in the urban landscape in the context of urban development; It forms green structures on their own and makes them independent. The urban green area system is broadly connected with green areas and is the stepping stone to ensure the continuity of green areas (Aksoy, 2019).

The amount of green areas is calculated with the m2 value per person. This calculation is made considering that active green areas are homogeneously distributed in residential areas.

As a result of this research, it was revealed that the distribution of green areas in Sarıyer district does not show a homogeneous distribution in terms of their impact areas.

When looking at the functional distribution of green areas; Park areas constitute all of the active green areas. There are also children's playgrounds and sports areas within the park areas. Independent children's playground and sports areas are not available in Sarıyer District.

In order to examine the current green space situation of Sarıyer district from a spatial perspective, an evaluation of the last 39 years has been made within the population-green area relationship. As a result of the evaluation made; According to the situation in 2019, there is a green area deficit of 848727 m2, which means 2.48 m2 of green space per person.

Urban green areas should be able to meet the needs of the population in a balanced distribution within the spatial and functional stratification in the whole urban area. This study for Sarıyer district should be carried out for other districts and green space strategies should be evaluated with national and international standards and legislative arrangements should be made within the urban planning system for this.

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