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Adequacy and Accessibility Analysis of Open and Green Spaces in Osmaniye Center

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ABSTRACT

The scarcity of open and green spaces, which should be an integral part of the urban fabric and urban planning, is not a big metropolitan city problem in Turkey anymore but is a challenging problem of even medium and small-sized cities, one of which is the Osmaniye city today. This study examined the neighborhood-level quantitative adequacy and accessibility of the current and future open and green spaces in Osmaniye city center. The analyses were performed using ArcGIS 10.0 software following the Spatial Plans Construction Regulation. Accordingly, it was found that there were 48 open and green spaces with an area of 278566.33 m^2 in the Osmaniye city center, which had 1.15 m^2 open and green spaces per person. It was concluded that no neighborhood had enough open and green space. Children playgrounds were the fewest open and green spaces in the research area, and more than half of Osmaniye city center lacked access to children playground. Therefore, suggestions were made to solve the open and green spaces' unavailability and access problems in neighborhoods considering the study results.

Anahtar Kelimeler:
Erişebilirlik,
Yeterlilik,
Açık ve yeşil alanlar,
Osmaniye kenti,
Kentsel planlama.

ÖZ

Kentsel dokunun ve kent planlamasının vazgeçilmez unsuru olması gereken açık ve yeşil alanların yetersizliği, ülkemizde sadece büyük metropol kentlerin sorunu olmaktan çıkıp günümüzde orta ve küçük ölçekli kentlerde bile hissedilir hale gelmiştir. Bu kentlerden biri de Osmaniye kentidir. Bu çalışmada Osmaniye kent merkezindeki mevcut ve planlanan açık yeşil alanların mahalle düzeyinde nicel yeterliliği ve erişilebilirliği analiz edilmiştir. Analizler ArcGIS 10.0 bilgisayar yazılımı kullanarak Mekansal Planlar Yapım Yönetmeliği'ndeki sınıflandırmaya göre gerçekleştirilmiştir. Çalışmanın sonucunda Osmaniye kent merkezinde 278566.33m^2'lik alana sahip 48 adet açık ve yeşil alan olduğu ve kişi başına 1.15 m^2 açık yeşil alan düştüğü belirlenmiştir. Mahalleler düzeyinde ise hiçbir mahallenin yeterli açık ve yeşil alana sahip olmadığı tespit edilmiştir. Araştırma alanında erişim yoksunluğu en fazla olan açık yeşil alan sınıfı çocuk parklarıdır. Osmaniye kent merkezinin yarısından fazlasının çocuk parkı erişiminden yoksun olduğu saptanmıştır. Bu kapsamda çalışmanın sonucunda açık ve yeşil alan yoksunluğu ve erişim sorunu yaşanan mahalleler için öneriler geliştirilmiştir.

1. Introduction

In the late 18th century, the Industrial Revolution led to massive population movements from rural areas to industrial zones around small urban centers. During this period, the requirements for housing, recreation, infrastructure, and transportation systems increased, which created modern urban planning [1]. It can be suggested that the initial attempt of modern urban planning was to balance between the buildings and open and green spaces in cities. However, open and green spaces have been neglected in the urban planning of the countries that could not effectively integrate environmental policies into other sectoral policies. As Gül and Küçük (2001) stated, the identity of a city is not defined only by its urban composition but also by the relations between the architectural structures and open and green spaces [2]. In this sense, urban open and green spaces are critical for providing urban comfort with ecological, economic, and social functions.

Ecologically, open and green spaces reduce air and noise pollution, contribute to the treatment of ground and surface waters, prevent floods by controlling the surface flow and heat islands, which is one of the most critical problems in urban areas, by tempering the climate [3-5]. Economically, open and green spaces are tourist attractions that contribute to investment and employment opportunities in cities and increase land values [6-9]. They also provide several social benefits to the residents of densely built and populated urban areas detached from nature. They contribute to urban residents' social and cultural development and health by offering recreational grounds and sports facilities with aesthetic values [6, 8, 10]. According to Manavoğlu and Ortaçeşme (2015), open and green spaces also ensure a balanced integration and organization of all other spatial units regarding occupancy and land use in cities [11]. In urban planning, the qualitative and quantitative parameters such as the number, size, accessibility, distribution, and equipment should be considered to take advantage of open and green spaces for the urban ecosystem [11, 12]. Each country establishes open and green space systems following its urban planning legislation and administrative procedures.

The primary urban planning legislation in Turkey is the development plan law. The open and green spaces in the laws and regulations are determined per person (m^2). The legislation on the use of open and green spaces has not changed in the Spatial Plans Construction Regulation, published in the Official Gazette of 14.06.2014 (No: 29030), and is still in force. Accordingly, the amount of open and green space per person is a minimum of 10 m^2. Annex-2 of the regulation has been amended with the regulation published in the Official Gazette of 17.05.2017 (No: 30069).

The amendment was about the classification of open and green spaces and the area per person. In cities as level of district the child playground, park, square, sports field, botanical park, and recreational grounds should be planned 10 m^2/per person. Addition to this amount 5 m^2/per person zoo, urban forest, afforested area, hippodrome, and fair and festival areas should be planned in city level. However, many studies show that the open and green spaces in cities are below the standard in Turkey [11-21].

The scarcity of open and green spaces, which should be an integral part of the urban fabric and urban planning, is not a big metropolitan city problem in Turkey anymore but is a challenging problem of even medium and small-sized cities. As the 80th province of Turkey, Osmaniye is one of those cities. Osmaniye was one of the districts of Adana until it became a province in 1996, which was a breaking point in population growth and city planning of Osmaniye. Multi-story residences have replaced single or double-story detached houses with gardens. The increasing population has highlighted the need for open and green spaces.

Nevertheless, as Ergan (2011) stated, a decline in open and green spaces has been observed in Osmaniye province since the zoning plan of 1987 [16]. Especially the precedent principle adopted in 2017 has worsened this problem. The precedent principle refers that as the parcel area increases, the construction rights such as precedent and maximum height expand, and theoretically aims to control the balance between open spaces and housing by allowing the houses with gardens. However, in practical terms, it has created densely built and populated areas. This situation has led to a decline in the amount and quality of open and green spaces per person, especially in the city center. The precedent principle, which has been in force since 2017, has required the re-organization of the open and green spaces in Osmaniye.

According to the current legal regulations, this study aimed to evaluate the size, per capita amount, neighborhood-level distribution, and accessibility of open and green spaces in Osmaniye city center. The open and green spaces in the development plans were also discussed in the study, and necessary suggestions were made accordingly.

2. Material and Method

The central district of Osmaniye was the primary study area. Located in the east of the Mediterranean Region, Osmaniye is on the transition road between the east and west of Turkey. The Central Taurus Mountains surround Osmaniye from west to north and the Amanos Mountains from east to southeast. Osmaniye is the neighbor of Gaziantep in the east, Hatay in the south, Adana in the west, and Kahramanmaraş in the north. It has seven districts: Bahçe, Düziçi, Hasanbeyli, Kadirli, Sumbas, Toprakkale, and Central district (Osmaniye), chosen as the primary research area due to its densest population and the fastest urbanization rate (Figure 1).

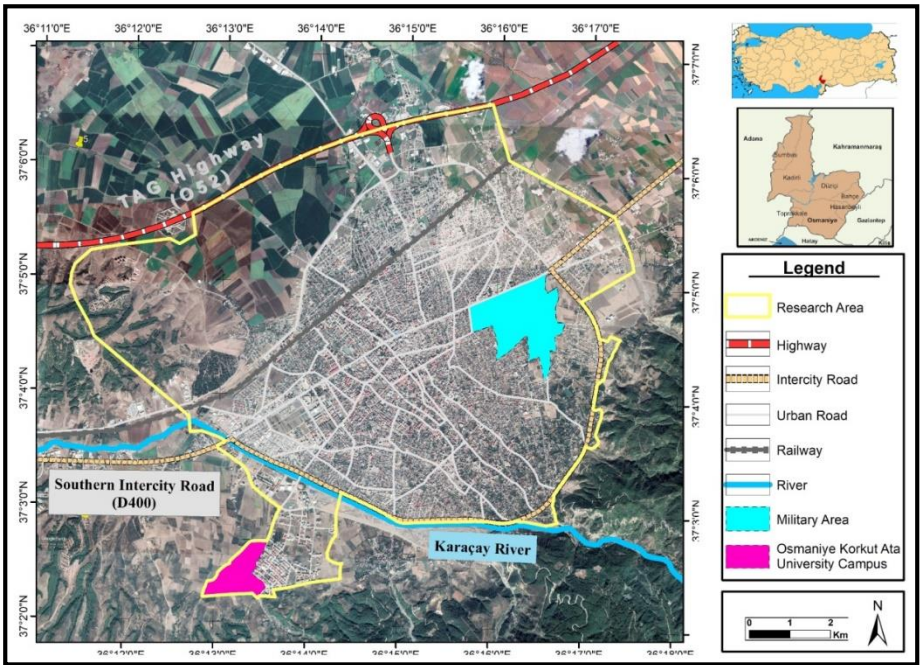

Figure 1. Location of the study area.

There are four main stages and substages in the study. In the first stage of the study, information about the population size and density in the neighborhoods of Osmaniye was obtained from the Turkish Statistical Institute to determine the adequacy of the available open and green spaces in the city center [22]. The neighborhood-level population density was mapped using ArcGIS software, and neighborhoods were classified according to the population density. In the second stage, the open and green spaces in Osmaniye city center were categorized according to the Spatial Plans Construction Regulation-Annex-2 (Table 1).

Table 1. Standards and minimum area sizes for open and green spaces in different population groups [23]

Spatial Plans Construction Regulation Annex-2			population groups per person m^2			
			0- 75000	75001-150000	150001-500000	501000-+
open and green spaces	Planning within the district boundaries	Child playground	10.00	10.00	10.00	10.00
		Park				
		Square				
		District sports field				
		Botanical park				
		Promenade				
		Recreation				

The classification process was done in ArcGIS 10 software using Google Earth satellite images, field studies, and development plans retrieved from Osmaniye Municipality. The distribution and per capita amount of open and green spaces in Osmaniye city center were determined at the neighborhood level. Urban forests, cemeteries, city parks, and refuges/safety islands, which are not included in the regulation but acknowledged as urban green spaces in the literature, were also added to the calculation, and a separate calculation was performed to determine the open and green space per capita in the city center. The results were compared with the minimum values ($10m^2$ /person) in the Spatial Plans Construction Regulation-Annex-2, and open and green spaces per capita in the study area were determined at the neighborhood level. Then, the future open and green spaces planned for Osmaniye city center in the development plan amendment 2017 were revised.

In the third stage, the accessibility (service area) of children playgrounds, neighborhood parks, and sports fields, commonly used open and green spaces by city dwellers, were analyzed. Buffer areas, which determine the optimal transportation distance, were created using ArcGIS 10 software. According to the Spatial Plans Construction Regulation (Article 12) playgrounds and sports fields should be planned within 500 m service area. But according to many studies such as Ersoy (2007), Uz (2005), Altunkasa (2004), Oh and Jeong (2007), Kellett and Matthew (2009), Duncan et al., (2011), the optimum service area for neighborhood parks is 800 m [1, 10, 24-28]. Similarly, Van Herzele and Wiedemann (2003) state that it is 400 m for the playground and recreational areas at the neighborhood level, and 800 m at the district level [29]. In this study, the optimum service area was determined 400 m (10-minute walk) for children playgrounds and 800 m (approximately 20-minute walk) for neighborhood parks and sports fields. At the last stage of the study, the past and present sufficiency and accessibility of open and green spaces in Osmaniye were discussed, and particular suggestions were made for the current situation and future planning at the neighborhood level. Accordingly, it was suggested to prioritize the open and green spaces in urban planning, which was calculated as the minimum 10 m^2 open green area per person at the neighborhood level in the given regulation.

3. Results

3.1. Population Density in Osmaniye City Center

According to TÜİK (2020), Osmaniye's population is 243490 living in 36 neighborhoods [22], and the area is 4303.81 hectares. According to the population density measurements, the research area's most densely populated (more than 200 ha/person) neighborhoods are Mehmet Akif Ersoy and Raufbey neighborhoods (Figure 2).

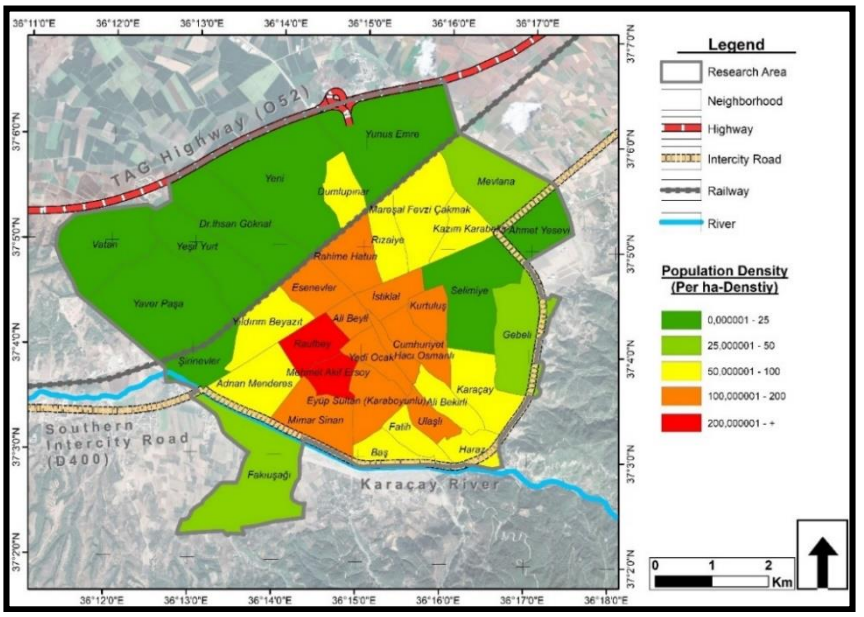

Figure 2. Population density map of Osmaniye district

The population density of 11 neighborhoods around the given two neighborhoods is more than 100 ha/person. Neighborhoods with low population density are generally in the west of the railway line, where single or two-story buildings are widespread.

3.2. The Available and Future Open and Green Spaces in Osmaniye City Center

There are children playgrounds, neighborhood parks, squares, and sports fields in the Osmaniye city center, among the open and green spaces categorized in the Spatial Plans Construction Regulation. The distribution of those spaces in Osmaniye city center was determined in Figure 3.

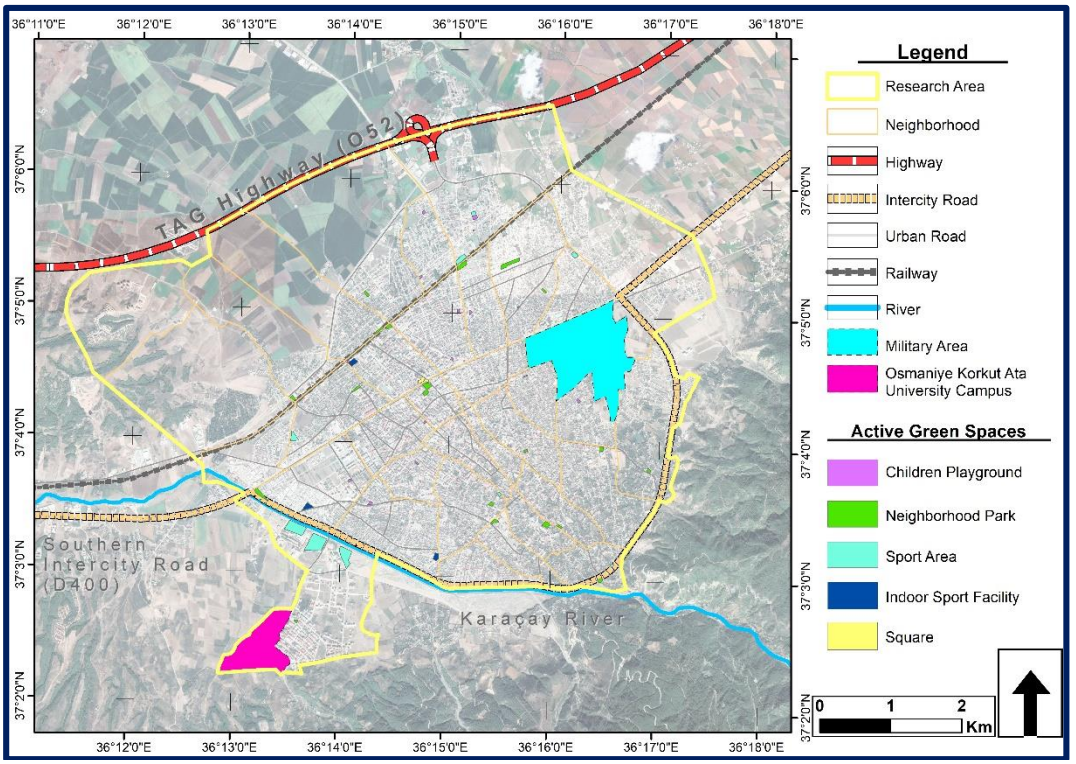

Figure 3. Distribution of open and green areas in Osmaniye district

According to the study results, there were 48 open and green spaces in the city center of Osmaniye, including 15 children playgrounds, 20 neighborhood parks, 12 sports fields/facilities, and 1 square, and they covered a total area of 278566.33 m^2. The amount of open and green space per person was 1.15 m^2 in the research area, which is well below the minimum value of 10 m^2 in the Spatial Plans Construction Regulation. In addition to the spaces specified in the regulation, there were also a "Masal Park" thematic park (33414 m^2), cemetery (519700 m^2), military area (1318800 m^2), refuges/safety islands (38800 m^2), Osmaniye Korkut Ata University campus (330000 m^2), and forest area (23000 m^2). The forest area is only categorized as an open and green space in the mentioned regulation, while other spaces are not. In addition, these areas are not suitable for active use by the public as open and green spaces. However, a second measurement was made, including the given spaces due to their benefits to the city residents. The results showed that the amount of open and green spaces available in Osmaniye city center was 2542280.33 m^2 and 10.44 m^2 per person. According to the distribution of open and green spaces at the neighborhood level, 36 neighborhoods had 12 children playgrounds, 18 had neighborhood parks, and nine had sports fields. There were no open and green spaces in 9 neighborhoods (Table 2).

Table 2. Open and green areas in the study area according to Spatial Plans Construction Regulations

Neighborhood		children playground	Neighborhood Park	Sports Field and Facility	Square	Total Area	Ratio to Neighborhood Area %	m^2/person
Adnan Menderes	Number	1	1	1	-	3	1.48	2.22
	Area (m^2)	1484.07	8603.45	7811.31	-	17898.83		
Ahmet Yesevi	Number	-	-	-	-	-	0.00	0.00
	Area (m^2)	-	-	-	-	-		
Ali Bekirli	Number	-	1	-	-	1	0.35	0.39
	Area (m^2)	-	2012.31	-	-	2012.31		
Alibeyli	Number	-	2	-	-	2	3.20	2.44
	Area (m^2)	-	11369.83	-	-	11369.83		
Baş	Number	-	-	-	-	-	0.00	0.00
	Area (m^2)	-	-	-	-	-		
Cumhuriyet	Number	-	1	-	-	1	0.22	0.17
	Area (m^2)	-	1584.95	-	-	1584.95		
Dr.İhsan Göknal	Number	-	1	-	-	1	0.16	1.05
	Area (m^2)	-	3359.68	-	-	3359.68		
Dumlupınar	Number	2	-	-	-	2	0.47	0.77
	Area (m^2)	3045.97	-	-	-	3045.97		
Esenevler	Number	1	1	1	1	4	2.30	1.94
	Area (m^2)	1095.98	3056.27	7330.76	6010.00	17493.00		
Eyüp Sultan	Number	-	1	1	-	2	0.60	0.48
	Area (m^2)	-	3106.45	2217.74	-	5324.19		
Fakıuşağı	Number	**-**	**1**	**3**	-	**4**	**4.04**	**9.51**
	Area (m^2)	**-**	**1593.50**	**113780.25**	-	**115373.75**		
Fatih	Number	-	1	-	-	1	0.75	1.03
	Area (m^2)	-	3652.87	-	-	3652.87		
Gebeli	Number	-	1	-	-	1	0.13	0.39
	Area (m^2)	-	2265.21	-	-	2265.21		
Hacı Osmanlı	Number	-	-	-	-	-	0.00	0.00
	Area (m^2)	-	-	-	-	-		
Haraz	Number	-	1	1	-	2	0.75	1.45
	Area (m^2)	-	2931.65	1365.55	-	4297.2		
İstiklal	Number	-	-	-	-	-	0.00	0.00
	Area (m^2)	-	-	-	-	-		
Karacay	Number	-	1	-	-	1	0.30	0.48
	Area (m^2)	-	3383.16	-	-	3383.16		
Kazım Karabekir	Number	-	-	1	-	1	0.77	0.93
	Area (m^2)	-	-	5020.98	-	5020.98		
Kurtuluş	Number	1	-	-	-	1	0.20	0.15
	Area (m^2)	1017.88	-	-	-	1017.88		
Mehmet Akif Ersoy	Number	1	-		-	1	0.21	0.07
	Area (m^2)	1028.94	-	-	-	1028.94		
M. Fevzi Çakmak	Number	1	2	-	-	3	1.06	1.09
	Area (m^2)	577.78	14909.90	-	-	15487.68		
Mevlana	Number	-	-	-	-	-	0.00	0.00
	Area (m^2)	-	-	-	-	-		
Mimar Sinan	Number	1	-	1	-	2	0.68	0.58
	Area (m^2)	2059.82	-	6175.39	-	8235.21		
Rahime Hatun	Number	2	-	-	-	2	0.27	0.19

	Area (m^2)	2547.34	-	-	-	2547.34		
Raufbey	Number	1	-	-	-	1	0.12	0.06
	Area (m^2)	875.40	-	-	-	875.40		
Rızaiye	Number	1	1	-	-	2	1.39	1.52
	Area (m^2)	1419.13	8394.28	-	-	9813.41		
Selimiye	Number	1	-	-	-	1	0.08	0.41
	Area (m^2)	1776.13	-	-	-	1776.13		
Şirinevler	Number	-	-	-	-	-	0.00	0.00
	Area (m^2)	-	-	-	-	-		
Ulaşlı	Number	-	1	-	-	1	1.38	1.35
	Area (m^2)	-	6283.88	-	-	6283.88		
Vatan	Number	-	-	-	-	-	0.00	0.00
	Area (m^2)	-	-	-	-	-		
Yaverpaşa	Number	-	-	-	-	-	0.00	0.00
	Area (m^2)	-	-	-	-	-		
Yedi Ocak	Number	-	-	-	-	-	0.00	0.00
	Area (m^2)	-	-	-	-	-		
Yeni	Number	-	1	-	-	1	0.09	0.73
	Area (m^2)	-	3119.72	-	-	3119.72		
Yeşil Yurt	Number	-	1	-	-	1	0.17	0.92
	Area (m^2)	-	2814.11	-	-	2814.11		
Yıldırım Beyazıt	Number	-	1	1	-	2	1.20	1.67
	Area (m^2)	-	3299.75	9316.15	-	12615.9		
Yunus Emre	Number	2	-	2	-	4	0.54	2.67
	Area (m^2)	3622.30	-	13246.51	-	16868.81		
TOTAL	Number	**15**	**20**	**12**	**1**	**48**	**0.63**	**1.15**
	Area (m^2)	**20550.74**	**85740.95**	**166264.64**	**6010.00**	**278566.33**		

Among the neighborhoods with open and green spaces, Fakıuşağı neighborhood had the most considerable amount of open and green spaces per person. However, it was still below the minimum value of 10 m^2 per person as specified in the regulation. In the revised development plan approved by Osmaniye Municipality Council on 06.01.2017, the recommended amount of open and green spaces is 489008 m^2. If the recommendations are followed, the total amount of open and green spaces in Osmaniye city center will be 767574.33 m^2, and the per capita amount will be 3.15 m^2. However, it is still below the minimum value in the regulation.

According to the distribution of planned open and green spaces at the neighborhood level, no open and green space construction is planned for Mehmet Akif Ersoy and Raufbey Neighborhoods, which currently have the least open and green space per capita. Additionally, no neighborhood park and children playground construction are planned for the nine neighborhoods that do not have open and green spaces. It is only planned to build one sports field in Baş, Ahmet Yesevi, and Yaverpaşa Neighborhoods (Figure 4). Yedi Ocak, Vatan, Şirinevler, Mevlana, İstiklal, and Hacıosmanlı Neighborhoods, which lack open and green spaces, were not included in the open and green space planning in the 2017 revised development plan.

On the other hand, according to the 2017 revised development plan, the future amount of open and green space per person in the neighborhoods increased significantly. For example, it is planned to increase the current open and green space of 9.51 m^2 to 10.98 m^2 per person in the Fakıuşağı Neighborhood, which thus will become the only neighborhood in Osmaniye city center that meets the minimum value in the regulation.

According to the 2017 revised development plan, the new open and green areas do not meet the needs of the city dwellers due to the high population and urbanization rate. Approximately 1670000 m^2 of open green spaces are required in the city center to meet the minimum value specified in the regulation (Table 3).

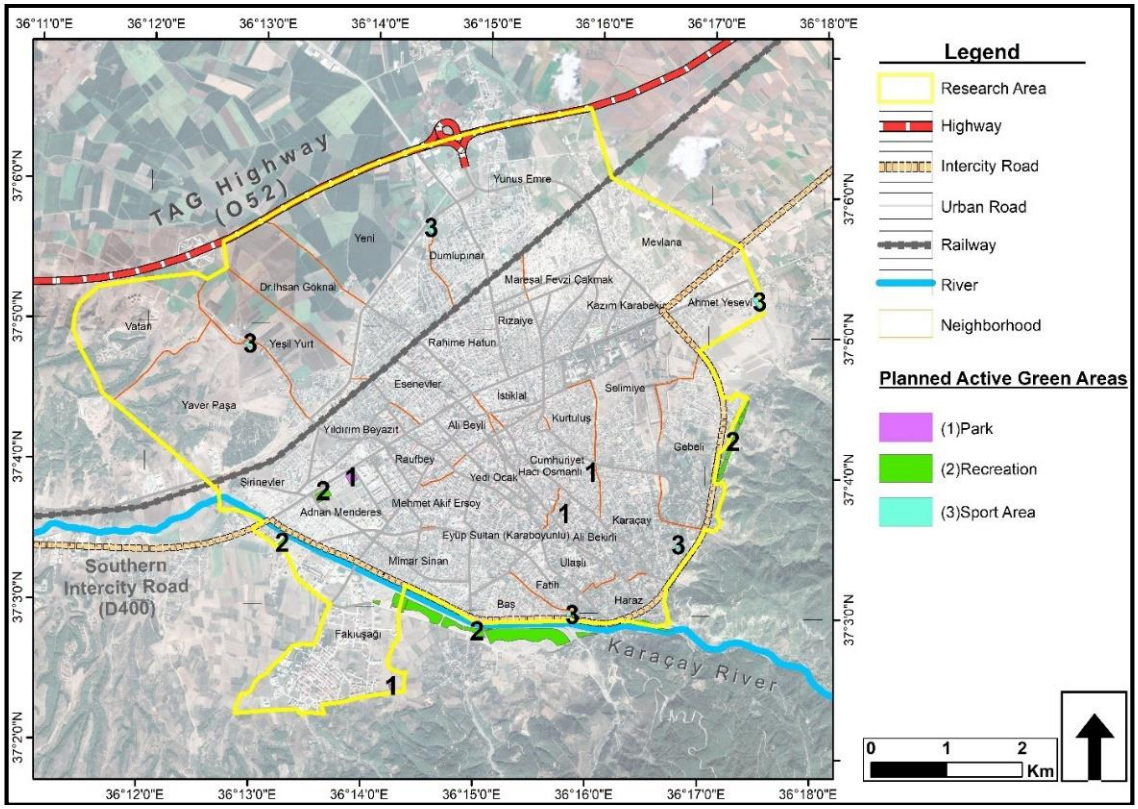

Figure 4. Open and green areas envisaged in Osmaniye City Center 2017 Revision Development Plan

Table 3. Evaluation of existing and planned open green space areas within the scope of Spatial Plans Construction Regulation

	existing and planned open green space	With the 2017 Revision Contraction Plan	The area that should be according to the minimum value of the regulation	Required open green space
Area (m^2)	278566.33	767574.33	2434900	-1667325.67
m^2/person	1.15	3.15	10.00	-6.84

Besides, Osmaniye Governorship (2020) plans to build a National Garden on the land of the General Directorate of Forestry next to the Theme Park in the Osmaniye city center [30]. Although the spatial size of the National Garden is not known, it will increase the total amount of open and green spaces in Osmaniye city center.

3.3. Accessibility of Open and Green Spaces in Osmaniye City Center

The inadequacy and unbalanced distribution of open and green spaces in the Osmaniye city center required analyzing the accessibility to those spaces (Figure 5).

The analysis results revealed that 16.52% (7108070 m^2) of the research area was children playground, 51.60% (22209831.19 m^2) was neighborhood parks, and 46.22% (19887732.44 m^2) was sports fields/facilities. Most of the children playgrounds were in the center of the research area. Approximately 80% of the neighborhoods in Osmaniye city center lacked children playgrounds. Especially the distance of the closest children playgrounds in the periphery neighborhoods can be up to 2000 m. Neighborhood parks were more accessible than children playgrounds due to the

higher number of neighborhood parks and their distribution within the area. The neighborhood park accessibility distance (service area) was measured at 800 m 52% of the research areas at the neighborhood level were the neighborhood parks. The most disadvantaged neighborhoods in accessing the neighborhood parks were Vatan, Mevlana, Mimar Sinan, Selimiye, Mehmet Akif Ersoy, and Raufbey neighborhoods.

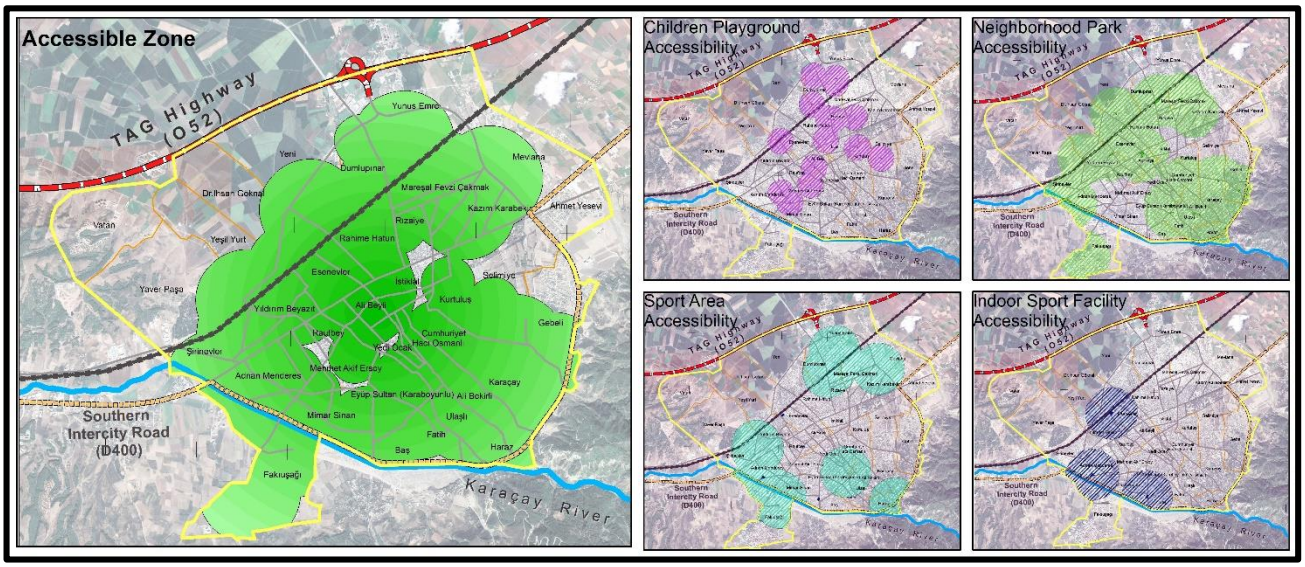

Figure 5. Accessibility of green areas in Osmaniye district

When the sports field and facilities were discussed in terms of accessibility, it was found that 33% of the neighborhood area was sports fields, and 14% were sports facilities. There was a sports field or sports facility in about half of the research area (47%). However, their distribution was quite uneven. They were primarily located in the south and north periphery neighborhoods, and all the neighborhoods in the center were out of the sports fields' service area. When the accessibility to open and green spaces in Osmaniye city center was addressed in general, it was found that 67% of the research area was within the service area of open and green spaces. Furthermore, the neighborhoods that did not have much access to open and green spaces were Selimiye, Ahmet Yesevi, Yaverpaşa, Yeşil Yurt, Dr. İhsan Göknal, and Yunus Emre Neighborhoods. The Vatan Neighborhood did not have any open and green space.

4. Discussion

Open and green spaces with ecological, economic, and social benefits provide livable and comfortable environments to city dwellers. According to Manavoğlu and Ortaçeşme (2005), a systematic planning framework, from macro to micro scale, is necessary to provide the multifaceted benefits of open and green spaces to the urban ecosystem and residents [11]. Gül and Küçük (2001) stated that open and green space planning should be done by considering the physical structure and all components of a city, including the physical and mental needs of city residents [2]. However, as Hepcan (2013) stressed, open and green spaces are constructed randomly in Turkey, rather than adopting an approach that considers the needs of the city and residents and natural landscape, which leads to the inadequacy and unbalanced distribution of open and green space in cities [31] The results of this study also revealed the shortcomings caused by the lack of a systematic approach to open and green spaces in the city of Osmaniye (Table 4).

Table 4. Comparison of case studies on open and green spaces in various cities with the result of this study

Study	City	Green Area Per Person m²	Open and green space classification
[32]	Antalya	4.4	active green space
[13]	Kayseri	5.4	active green space
[15]	Kahramanmaraş	1.4	Children playground, park and sports field
[16]	Osmaniye	0.4	Neighborhood park, children playground, sports field
[17]	Burdur	4.0	children playground, sports field
[11]	Antalya	4.2	active green space
[18]	Kırklareli	1.6	Children playground, park and sports field
[20]	Niğde	4.0	Children playground, park and sports field
[33]	Konya/ Selçuklu	12.53	Neighborhood park, children playground, urban forest
[34]	Nevşehir	3.30	Active green space
[35]	Çanakkale	3.05	Active green space
Results of this study	Osmaniye	1.15	Children playground, park and sports field
		10.44	Children playground, park and sports field, refuge, cemetery, urban forest, thematic park, university campus

The open and green spaces per person in many cities of Turkey are far below the minimum value in the Spatial Plans Construction Regulation. One of them is Osmaniye district. However, when the categories of open and green spaces in Annex -2 of the Regulation (district boundaries) are taken into account, the amount of open and green spaces per capita in Osmaniye remain quite low compared to many studies listed in Table 4. The amount of open and green space per capita in Osmaniye is significantly higher compared to other studies when not only the Regulation categories but also all open and green space categories are taken into account.

5. Conclusion

Rapid population growth, multi-story buildings, and unplanned urbanization cause several social, economic, and environmental problems in Osmaniye. This situation negatively affects the life quality of urban residents. The new open green areas do not meet the needs of the Osmaniye city dwellers due to the high population and urbanization rate. After Osmaniye became a province in 1996, the city population increased rapidly. The settlement previously consisted of single or double-story houses with orchards, but multi-story buildings have replaced them. The precedent principle in the revised zoning plan 2017 also triggered the population growth, making the need for open and green spaces more evident. However, the available open and green spaces in Osmaniye city center were not compatible with the population growth.

There is an urgent need for new open and green spaces for both legal regulations and urban residents. The locations of the new open and green spaces should be determined considering the requirements at the neighborhood level. The available open and green spaces in all neighborhoods in Osmaniye city center are below the minimum value in the regulation. Out of 36 neighborhoods, nine do not have any open and green space. The low amount of open and green spaces per person and the unavailability of open and green spaces in 9 neighborhoods underline the importance of accessibility. Especially Vatan and Ahmet Yesevi Neighborhoods did not have any open and green spaces or any access to close green space. Thus, it can be inferred that these neighborhoods were in the most disadvantaged position, and they should be prioritized for providing open and green spaces. There is an urgent need for open and green spaces in those neighborhoods. However, there has been no realistic or practical submission and offer for the number and spatial size of open and green spaces in neighborhoods so far, especially in the neighborhoods in the south of the railway, as those neighborhoods had multi-story buildings and dense populations. They also did not have enough space for the planned open and green spaces. Therefore, the planned open and green spaces in Osmaniye city center were listed to prioritize the open and green space category and accessibility.

The neighborhoods that have few open and green spaces in Osmaniye city center were Vatan, Ahmet Yesevi, Yaverpaşa, Şirinevler, Mevlana, Baş, İstiklal, Hacı Osmanlı and Yedi Ocak neighborhoods. Except for the Vatan Neighborhood, all were densely populated neighborhoods. Therefore, a significant number of residents suffered from the lack of open and green space. There was not much multi-story construction, only in the Vatan Neighborhood in the north of the railway. The neighborhood's population density and construction rate were not high, which allowed planning the open and green spaces considering residents' needs. Besides, this region had enough space to construct a city park necessary for Osmaniye city center. The city park, which would be built following the spatial size and equipment standards, would increase the total amount of open and green spaces in Osmaniye city center

On the other hand, the densely populated neighborhoods in the south of the railway where multi-story buildings were prevalent did not have enough space for open and green spaces. It was a severe problem, especially for the Yedi Ocak, Hacı Osmanlı, İstiklal, Baş, Mevlana, Gebeli, and Ahmet Yesevi Neighborhoods, which did not have any open and green spaces. Although most could use other neighborhoods' neighborhood parks and sports fields, they were inadequate in number and size.

The study results showed that the attempts to realize open and green space standards specified in the revised zoning regulation for city centers failed. The open and green space planning should be executed with urban planning and should consider the population density, life quality, and accessibility factors [2, 11].

According to the results obtained from this study, the amount and types of open green areas recommended at the neighborhood level for Osmaniye district are shown in Table 6.

Table 6. Classes and quantities of open and green space recommended primarily at neighborhood level

Neighborhood	**Existing open and green space**			**Required open and green space**		
	open and green space class	**Total area m^2**	**m^2/ person**	**priority open and green space class**	**Total area m^2**	**m^2/ person**
Neighborhoods without open and green spaces						
Vatan	-	0.00	0.00	children playground, neighborhood park, sports field	26670.00	10.00
Ahmet Yesevi	-	0.00	0.00	children playground, neighborhood park, sports field	18510.00	10.00
Yaverpaşa	-	0.00	0.00	children playground, neighborhood park	11980.00	10.00
Şirinevler	-	0.00	0.00	children playground	17770.00	10.00
Mevlana	-	0.00	0.00	children playground, neighborhood park	58250.00	10.00
Baş	-	0.00	0.00	children playground, sports field	41520.00	10.00
İstiklal	-	0.00	0.00	children playground, sports field	62000.00	10.00
Hacı Osmanlı	-	0.00	0.00	children playground, sports field	41230.00	10.00
Yedi Ocak	-	0.00	0.00	children playground, sports field	97810.00	10.00
neighborhoods in the north of the railway where multi-storey construction is not dense						
Yeşil Yurt	1 neighborhood park	2814.11	0.92	children playground, neighborhood park	27695.89	9.08
Dr. İhsan Göknal	1 neighborhood park	3359.68	1.05	children playground, neighborhood park	28530.32	8.95
Yeni	1 neighborhood park	3119.72	0.73	children playground, sports field	39530.28	9.91
Yunus Emre	2 neighborhood park 2 sports field	16868.81	2.67	children playground	46201.19	7.33
neighborhoods with dense multi-storey construction						
Mehmet Akif Ersoy	1 children playground	1028.94	0.07	neighborhood park, sports field	139261.06	9.93
Raufbey	1 children playground	875.40	0.06	neighborhood park, sports field	153154.60	9.94

Rahime Hatun	2 children playgrounds	2547.34	0.19	children playground, sports field	130572.66	9.81
Alibeyli	2 children playgrounds	11.369,83	2.44	sports field	35140.17	7.56
Cumhuriyet	1 neighborhood park	1.584,95	0.17	children playground, sports field	93865.05	9.83
Kurtuluş	1 children playground	1017.88	0.15	children playground, sports field	65842.12	9.85
Eyüp Sultan	1 neighborhood park 1 sports field	5324.19	0.48	children playground, neighborhood park	105115.81	9.52
Esenevler	1 children playground 1 neighborhood park 1 sports field 1 square	17493.00	1.94	children playground	72467.00	8.06
Mimar Sinan	1 children playground 1 sports field	8235.21	0.58	children playground, neighborhood park	133504.79	9.42
Ulaşlı	1 neighborhood park	6283.88	1.35	children playground	40216.12	8.65
Mareşal Fevzi Çakmak	1 children playground 2 neighborhood park	15487.68	1.09	children playground	126742.32	8.91
Rızaiye	1 children playground 1 neighborhood park	9.813,41	1.52	sports field	54436.59	8.48
Ali Bekirli	1 neighborhood park	2.012,31	0.39	children playground	49687.69	9.61
Kazım Karabekir	1 sports field	5.020,98	0.93	children playground	49029.02	9.07
Fatih	1 neighborhood park	3652.87	1.03	children playground	41520.00	8.97
Yıldırım Beyazıt	1 neighborhood park 1 sports field	12615.90	1.67	children playground	62734.10	8.33
Adnan Menderes	1 children playground 1 neighborhood park 1 sports field	17898.83	2.22	children playground, neighborhood park	789501.17	7.78
Karacay	1 neighborhood park	3383.16	0.48	children playground, sports field	67596.84	9.52
Dumlupınar	2 children playgrounds	3.045,97	0.77	neighborhood park, sports field	36574.03	9.23
Haraz	1 neighborhood park 1 sports field	4297.20	1.45	children playground	25242.80	8.55
Fakıuşağı	1 neighborhood park 3 sports field	115373.75	9.51	children playground	5976.25	0.49
Gebeli	1 neighborhood park	2265.21	0.39	children playground, sports field	55174.79	9.61
Selimiye	1 children playground	1776.13	0.41	neighborhood park, sports field	41833.87	9.59

Competing Interest / Conflict of Interest

The authors declare that they no conflict of interest. None of the authors have competing interests in the manuscript.

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