

AN ANALYTICAL STUDY OF THE URBAN GREEN SPACES SURROUNDING THE ROYAL CEMETERY

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ABSTRACT

The spaces surrounding the royal cemetery were chosen for the purposes of the practical study as they are an important historical, cultural, and urban landmark not only for the Adhamiya district, but at the level of Baghdad governorate. The research aimed to increase environmental awareness and strategic planning among the designers of urban green spaces and decision-makers in the design and implementation of these spaces to increase their efficiency and functionality. The research followed the comparative-descriptive-analytical approach to extract data for these spaces, which went through two phases before development in 2020 and after development in 2021 in the light of five tools for collecting and analyzing information: field survey, climatic factors analysis, urban fabric analysis, personal interviews, and a questionnaire. The results of the study also confirmed the importance of afforestation in reducing temperatures for the micro-climate of spaces, increasing relative humidity, reducing wind speed, and changing its direction.

Keywords: royal cemetery, urban fabric, Adhamiya district, strategic planning.



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INTRODUCTION

The Iraqi environment considered one of the rich environments with its civilizational and cultural heritage throughout its history, which extends deep into the history of mankind, in which it shares and competes with the rest of the other civilizations. Accordingly, international organizations recommend the necessity and preservation of civilized values to constitute an attractive factor for people (Al-Jumaily, 2016). Al-Murshidi & Al-Saghir (2017) defined the residential complex (Mahalla) as the smallest planning unit in which a person lives and interacts with his fellow humans, and it is the environment in which human relations are established, which in turn drives the fulfillment of the psychological and social needs of its inhabitants and has a role in the stability of societies. Alwan & Omran (2023) pointed out the importance of the historical natural urban spaces as being one of the basic and necessary

components towards developing the quality of urban life in the city. Cities are experiencing increasing environmental pressures due to the sharp rise in urban population, and the consequent loss and degradation of urban green spaces, so landscape architects play an important role in preserving human environment and well-being through planning, designing and managing urban landscapes more than ever before (Cheng *et al.*, 2021). Al-Mousawi (2018) and Li *et al.* (2025) defined urban green spaces as a space within a population cluster or a geographical region dominated by the botanical element, also, represents a physical and essential need for air purification, and these spaces give an aesthetic formula to the urban fabric of the city (Hamd & Jasim, 2024). Urban vegetation's role in mitigating air pollution by absorbing gaseous pollutants and offering ecological stability serves as a crucial function in urban areas (Pawar, 2026). Where other reserchers

(Mahrous *et al.*, 2020 and Tariq, 2018) indicated that green spaces are characterized by many natural healing qualities that humans are instinctively attracted to, in addition to the results of psychological impact experiments on humans. Urban green spaces have begun gaining renewed attention during the COVID-19 pandemic. As has been confirmed by several studies so far, the COVID-19 pandemic has urged people to reconsider the significance of urban green spaces (Hockings, 2020). The study also includes governmental and non-governmental actors active in the community gardening movement. Many researchers also focused on the participation of the users of green spaces in the smart management of the community participation of these spaces and the attached playgrounds, who have the best understanding of their needs and expectations, not to mention their interest in improving their living standards (Nguyen, 2021). Ahmad (2019) indicated the importance of designing urban green spaces and the efficiency of their use and their equitable distribution by specialists with experience in this field and their requirements and distribution in residential complexes. Where the study focused on the green spaces in the Al-Mlazemin district in Omdurman in Sudan, most of them were unprepared for the purposes for which they were planned and designed. Badlawy (2017) explained in a study of the green spaces in the city of Adrar, which is in the far south of Algeria, which is characterized by its hot and dry climate. The study concluded that green spaces are an essential and important element in the city due to its importance and its various effects. When planning and designing green spaces, conditions and regulations that work to achieve balance must be adhered to. Preserving biodiversity is one of the most important goals of sustainable development, as green spaces play an important role in balancing the ecosystem, The inherent ecological characteristics of a particular area are measured in terms of the percentages of green spaces in it to the total area, where green spaces protect biodiversity (Ismail, 2021). Al-Musawi (2018) reached by studying the reality of green spaces for the cities of Sabratha,

Libya and Dubai in the United Arab Emirates, reached the importance and distribution of green spaces, their design and coordination in these cities, and the extent of its relationship to the distribution of the population, and the provision of the basic environment for the establishment of green spaces in a way that achieves satisfaction and recreational sufficiency for the residents of the Arab city. And Al-Mailif (2017) conducted a field study of urban green spaces for localities 336 and 338 in the city of Baghdad, where the study found a decline around green spaces due to the change of land uses and the continuous encroachments on it. It emphasized the increased environmental awareness of the importance of greening and its functional and visual role for the urban landscape. Marando et al. (2022) indicated in their studies the importance of using modern technology and adopting geospatial techniques in managing green spaces and climatic conditions, as it allows collecting a lot of data easily and quickly. As well as spatially analyzing and interpreting them to enhance the role and importance of these spaces in urban cities. The uses of the aquatic element in green spaces give it a vitality in addition to the importance of the environment.

MATERIALS AND METHODS

The royal cemetery was chosen as the facade and the most important and prominent historical, cultural, and urban landmark for the Adhamiya district and Baghdad. And the meeting point that connects the three urban districts, 308-310-312, in the middle of the Adhamiya district at the end of the street extension from the intersection between Adhamiya Preparatory School for Girls, Al-Noman Park, and Adhamiya Police Station. Where the royal cemetery or royal mausoleum was established between 1934 and 1936 by the British architect G.P. Coper, on a land formed by what was deposited by the waters of the Tigris in past ages (Khatib & Alami, 2014). During the period of the field survey for the study area, the Adhamiya Municipality developed these spaces and changed many of their features in 2021 AD, where the field study of the site took the period from 1/1/2020

to 1/1/2022. The field study included five tools for collecting information:

FIRST: The Field survey

The site of the royal cemetery spaces was surveyed, as it went through two phases before development in 2020 AD and after development in 2021 AD to study and analyze the site through frequent field visits, and through the site observation of the four spaces, the differences emerged between the urban green spaces before and after development, which was carried out by Adhamiya Municipality in 2021. The results of the field survey which included three axes, namely.

Spatial determinants: It turned out that the spaces were of medium size due to its division into four parts. The area of the first spaces was 586 m², the second is 1354 m², the third is 1560 m² and the fourth is 1466 m², and the shapes of the spaces are different, where the first space is rectangular, the second is circular, and the third and fourth are irregular. The four spaces are bounded by the public streets of each space, and the location of the space is in the eastern part of the four sides. The space is located in the middle of the Al-Adhamiya residential complex and at the junction of three districts 308-310-312 in addition to that the spaces are visible to people without fences.

Components of green spaces:

Which includes two types of components: the plant content, which was the content of green spaces before development only trees, shrubs, and green surface, and the content of the spaces after development is trees and a green surface, and this shows that there is no diversification of plant content, and the complementary components, of which the content of the spaces was very few before the development, as it contains only a few seats for sitting and walkers in the second circular space. As for the content of the spaces from these components after development, they contain benches, walkways, waste baskets and lighting elements to extend the enjoyment in the judiciary.

Maintenance of spaces: It includes the level of maintenance work for the spaces, as it became clear that the spaces before the development were neglected and there is no one to carry out these operations, which distorted their view, and these spaces were left by the people. As for the spaces after

development, maintenance and maintenance operations were carried out well on a weekly basis by workers and technicians specialized for this purpose, affiliated with the Adhamiya Municipality, which encouraged the people of the area to visit and enjoy it.

Second: Analysis of the climatic factors of urban green spaces:

The information on the climatic conditions of the urban green spaces of the royal cemetery was collected by (Vantage Pro2)* the personal automatic winding station, where the station was installed in the middle of the space for which the climatic conditions were to be measured. The climatic conditions of the green spaces were measured before development in the summer season on 2020.7.28 and on 2021.7.28 at 2-4 pm after development. From Table 1, we noticed a decrease in maximum temperatures from their normal average for the city of Baghdad by 5° C for the first space, 7° C for the second and third space, and 6° C for the fourth space, and an increase in relative humidity at high rates, and a decrease in wind speed from its daily rates for the city of Baghdad, and a change in its direction, as a result of high and dense trees in these spaces, which reached a rate of 45-90%. As for the green spaces after development, we noticed a slight decrease in maximum temperatures from their normal average for the city of Baghdad, 1° C for the first and second space and 3° C for the third and fourth space, and a small increase in relative humidity, and increasing the wind speed above its daily rates for the city of Baghdad, in addition to changing its direction, as a result of the decrease in afforestation which ranges between 30-50%. This confirms the importance of afforestation in reducing temperatures for the micro-climate of spaces, increasing relative humidity, reducing wind speed, and changing its direction, and this indicates the neglect of the environmental aspect when designing, implementing and developing urban green spaces, and not taking into account the percentage of afforestation and the general climate factors of the city and its impact on the micro-climate of the green spaces.

Table 1. shows measuring the climatic factors outer spaces of the royal cemetery in summer

Climatic factors	Baghdad weather station in 28.7.2020	Personal weather station befor development				Baghdad weather station in 28.7.2021	Personal weather station After development			
		1	2	3	4		1	2	3	4
Space										
Mximum Temperatur (C ⁰)	52	48	45	45	46	48	47	47	45	
Relative humidity%	45									
Wind speed(k/h)	14	18	30	28	24	22	22	24	27	
Prevailing Wind	29									
	18	16	11	10	14	8	14	17	7	
	5									
	NW	S	NW	NW	WS	W	NW	NW	W	
	NW									
Plant Density Ratio%		45	85	90	85		30	45	50	
	50									

Third: urban fabric analysis

The choice of the location of the royal cemetery is very successful from a design point of view within the criteria of city planning, as the mausoleum represents the end point of the street extending in front of it, which represents the visual axis identical to the motor axis, which divides the green spaces surrounding the royal cemetery, which earned it a distinct and important position in the urban fabric of the area as a horical heritage area, but through field investigation it was found that the design of green spaces was poorly suited to the urban and historical value of the royal cemetery, which caused the weakness of the aesthetic value of the urban scene. It is also possible to sense the poor general configuration of the space, which consists of the lack of components of outdoor spaces and street furniture. The absence of proper strategic planning for the network of urban green spaces surrounding the royal cemetery before and after development affected the identity of the distinctive landscape that reflects the spirit of the place and the culture that characterizes the urban environment around the spaces.

Fourth: Personal interviews

In meetings with specialists and stakeholders who are important to express their opinion on the research, inquiries were made, and certain aspects were monitored that we find necessary to supplement the data we obtained and which they were briefed on. The nature of the questionnaire form and its design was presented to the specialists to obtain credibility

in the results to prove that the tables and results were not spontaneous. After conducting a quick test session with the families participating in the questionnaire, and after collecting the information and opinions of specialists, the final form of the questionnaire was obtained for the purpose of submitting it to the residents of the area from the people and specialists to know their views and desires.

Fifthly: The questionnaire

The nature of the questionnaire form and its design was presented in two ways, where a quick session test experiment was conducted with the families who participated in the questionnaire from the residents of the area to reach their opinions and desires. Then it was presented to the specialists to express their comments and make amendments to them to obtain credibility in the results to prove that the tables and results were not spontaneous. It was tested through 100 questionnaires (where the sample was chosen according to the opinion of the residents and my observations of the percentage of visitors to the spaces) consisting of 16 questions using the Triangular Likert scale distributed to the residents of the area before the development of urban green spaces, and 100 questionnaires consisting of 16 questions using the Triangular Likert scale distributed to the residents of the area after development , 15 questionnaires consisting of 16 questions using the Triangular Likert scale distributed to specialists from the residents of the area before the development of urban green spaces, and 15 questionnaire forms consisting of 16 questions using the Triangular

Likert scale distributed to specialists from the residents of the area after development. To study the required relationships according to the study objectives of the independent factors and the items within the axes covered by the questionnaire, the statistical program (Statistical Analysis System for Carrie company (Cary, 2012) was used in analyzing the data obtained from the questionnaire tables and the significant differences between the averages were compared with the (Least Significant Difference – LSD) test and T and F tests. The significant differences between percentages (calculated by dividing the part by the whole 150 and multiplying by 100) were compared with the Chi-Square χ^2 test. The average and weight for each paragraph were calculated according to the sum of multiplying the numbers for each answer in the degree of the answer that was determined according to importance (yes = 3, somewhat = 2, no = 1) and then dividing by the total number to calculate the average and dividing by (6) to extract the weight or the relative importance, which represented the sum of the

aforementioned degrees of importance and was therefore arranged from the highest to the lowest, and the reliability and validity coefficient were estimated.

RESULTS AND DISCUSSION

Results in Table 2 show that most of the region's residents are educated and hold higher degrees and a bachelor's degree, and the level of family income is mostly middle-income and the least proportion of the well-to-do income. The knowledge of the educational attainment of the users of the spaces has an importance and an impact in increasing or decreasing the demand for green spaces and taking care of them and maintaining them and the possibility of benefiting from their functions as they are multifunctional spaces. The level of family income is also one of the economic indicators that influence the demand for public places for recreation and entertainment. Nawrath and other researchers (Nawrath *et al.*, 2022) found in their study that redoubling efforts to increase access to urban green spaces supports the health status of users of these spaces in low and middle-income areas.

Table 2. The cultural and the family income level of the users of the green royal cemetery spaces

population sample size spaces of the royal cemetery development 100					
1-The cultural level of the head of the family.	befor		after		2- family income level.
Uneducated	0	0	poor	10	
Reads and writes	4	6	11		
Elementary Certificate	6	9	Medium	54	
prep school degree	20	19	60		
College degree	48	40	Affordable	36	
Master's Degree	22	26	29		
Chi-Square (χ^2)	**11.873	**604			
				Chi-Square (χ^2)	**14.026 **14.867
(P≤0.01) **					

Table 3-1. Data of opinions and desires of families who use spaces about the royal cemetery before its developmen

Question	Sample size 100			Signifi- cant	Average ± standard deviation	Weight	Rank
	No	Some what	Yes				
1-Do you think the importance of green spaces in residential areas?	58	30	12	**	2.46 ±0.32	41.00	7
2-Is the green space sufficient to meet the families' desires?	22	24	54	**	1.68 ±0.27	28.00	12
3-Are the municipal green space services running well?	0	9	91	**	1.09 ±0.23	18.16	15
4-Is the green space easily accessible from the housing unit?	28	22	50	**	1.78 ±0.34	29.66	10
5- Do you feel safe and comfortable with your family during your roaming in the green space?	3	16	81	**	1.22 ±0.26	20.33	14
6- Do you think cultivating green space with local plants suitable for the environment is better than imported plants?	28	38	34	**	1.94 ±0.32	32.33	8
7- If campaigns were set up to develop green space, would you contribute?	72	17	11	**	2.61 ±0.37	43.50	4
8- Do you think it is necessary to plant trees to reduce noise and dust and as windbreaks?	30	31	39	**	1.91 ±0.28	31.83	9
9- Do you prefer separating the parts of the garden and defining the paths and the green surface by means of natural rather than artificial determinants ?	16	29	55	**	1.61 ±0.33	26.83	13
10-Do you prefer evergreen trees and shrubs over deciduous trees?	21	29	50	**	1.71 ±0.32	28.50	11
11-Do you prefer warm colors (red, orange, and yellow) when choosing flowers over cool colors (white, blue, violet and pink)?	61	31	8	**	2.53 ±0.41	42.16	6
12-Do you like to plant all kinds of rose bushes?	81	13	6	**	2.75 ±0.47	45.83	1
13-Do you prefer diversification when choosing the plants that you prefer to grow in the green space?	74	21	5	**	2.69 ±0.42	45.83	3
14-Did you participate in the design of the green space to enrich it ?	0	0	100	**	1.00 ±0.05	16.66	16
15-Do you prefer the presence of one of the water elements in the green space?	75	20	5	**	2.70 ±0.35	45.00	2
16-Do you prefer having complementary components (garden furniture)?	72	16	12	**	2.60 ±0.30	43.33	5
LSD value	--	--	--	--	1.287 *	--	--

* (P≤0.05) ,** (P≤0.01)

Table 3-2. Data of opinions and desires of specialists who use spaces about the royal cemetery before its development

Question	Sample size 15			Signi- ficant	Average ± standard deviation	Weight	Rank
	No	Some what	Yes				
1-Do you think the importance of green spaces in residential areas?	15	0	0	**	3.00 ±0.29	7.50	1
2-Is the green space sufficient to meet the families' desires?	0	0	15	**	1.00 ±0.05	2.50	7
3-Are the municipal green space services running well?	0	12	3	**	1.80 ±0.23	4.50	5
4-Is the green space easily accessible from the housing unit?	3	4	8	**	1.66 ±0.25	4.16	6
5-Do you feel safe and comfortable with your family during your roaming in the green space?	0	0	15	**	1.00 ±0.05	2.50	7
6-Do you think cultivating green space with local plants suitable for the environment is better than imported plants?	15	0	0	**	3.00 ±0.29	7.50	1
7-If campaigns were set up to develop green space, would you contribute?	15	0	0	**	3.00 ±0.29	7.50	1
8-Do you think it is necessary to plant trees to reduce noise and dust and as windbreaks?	15	0	0	**	3.00 ±0.29	7.50	1
9-Do you prefer separating the parts of the garden and defining the paths and the green surface by means of natural rather than artificial determinants?	11	4	0	**	2.73 ±0.26	6.83	2
10-Do you prefer evergreen trees and shrubs over deciduous trees?	0	15	0	**	2.00 ±0.19	5.00	4
11-Do you prefer warm colors (red, orange, and yellow) when choosing flowers over cool colors (white, blue, violet and pink)?	9	6	0	**	2.60 ±0.25	6.50	3
12-Do you like to plant all kinds of rose bushes?	15	0	0	**	3.00 ±0.29	7.50	1
13-Do you prefer diversification when choosing the plants that you prefer to grow in the green space?	15	0	0	**	3.00 ±0.29	7.50	1
14-Did you participate in the design of the green space to enrich it?	0	0	15	**	1.00 ±0.05	2.50	7
15-Do you prefer the presence of one of the water elements in the green space?	15	0	0	**	3.00 ±0.29	7.50	1
16-Do you prefer having complementary components (garden furniture)?	15	0	0	**	3.00 ±0.29	7.50	1
LSD value	--	--	--	--	1.207 *	--	--

* (P≤0.05) ,** (P≤0.01)

4-1. Data of opinions and desires of families who use spaces about the royal cemetery after its development

Question	Sample size 100			Significant	Average \pm standard deviation	Weight	Rank
	No	Some what	Yes				
1-Do you think the importance of green spaces in residential areas?	91	9	0	**	2.91 \pm 0.34	48.50	2
2-Is the green space sufficient to meet the families' desires?	18	20	62	**	1.56 \pm 0.27	26.00	16
3-Are the municipal green space services running well?	72	20	8	**	2.64 \pm 0.40	44.00	3
4-Is the green space easily accessible from the housing unit?	33	26	41	**	1.92 \pm 0.29	32.00	15
5-Do you feel safe and comfortable with your family during your roaming in the green space?	58	10	32	**	2.26 \pm 0.32	37.66	11
6-Do you think cultivating green space with local plants suitable for the environment is better than imported plants?	39	33	28	**	2.11 \pm 0.24	35.16	13
7- If campaigns were set up to develop green space, would you contribute?	49	31	20	**	2.29 \pm 0.30	38.16	10
8- Do you think it is necessary to plant trees to reduce noise and dust and as windbreaks?	69	11	20	**	2.49 \pm 0.35	41.50	7
9-Do you prefer separating the parts of the garden and defining the paths and the green surface by means of natural rather than artificial determinants?	42	38	20	**	2.22 \pm 0.26	37.00	12
10-Do you prefer evergreen trees and shrubs over deciduous trees?	66	14	20	**	2.46 \pm 0.37	41.00	9
11-Do you prefer warm colors (red, orange, and yellow) when choosing flowers over cool colors (white, blue, violet and pink)?	58	31	11	**	2.47 \pm 0.41	41.16	8
12-Do you like to plant all kinds of rose bushes?	70	20	10	**	2.60 \pm 0.39	43.33	5
13-Do you prefer diversification when choosing the plants that you prefer to grow in the green space?	68	22	10	**	2.58 \pm 0.31	43.00	6
14-Did you participate in the design of the green space to enrich it?	0	0	100	**	1.00 \pm 0.05	16.66	17
15-Do you prefer the presence of one of the water elements in the green space?	81	9	0	**	2.61 \pm 0.32	43.50	4
16-Do you prefer having complementary components (garden furniture)?	92	8	0	**	2.92 \pm 0.37	48.66	1
17-Do you think the old space design is better than the current design?	18	60	22	--	1.96 \pm 0.25	32.66	14
LSD value					1.355*	--	

* (P \leq 0.05) , ** (P \leq 0.01)

Table 4-2. Data of opinions and desires of specialists who use spaces about the royal cemetery after its development

Question	Sample size 15			Signi- ficant	Average ± standard deviation	Weight	Rank
	No	Some what	Yes				
1-Do you think the importance of green spaces in residential areas?	15	0	0	**	3.00 ±0.29	7.50	1
2-Is the green space sufficient to meet the families' desires?	0	0	15	**	1.00 ±0.05	2.50	6
3-Are the municipal green space services running well?	15	0	0	**	3.00 ±0.29	7.50	1
4-Is the green space easily accessible from the housing unit?	3	6	6	**	1.80 ±0.27	4.50	4
5-Do you feel safe and comfortable with your family during your roaming in the green space?	0	6	9	**	1.40 ±0.19	3.50	5
6-Do you think cultivating green space with local plants suitable for the environment is better than imported plants?	15	0	0	**	3.00 ±0.29	7.50	1
7-If campaigns were set up to develop green space, would you contribute?	15	0	0	**	3.00 ±0.29	7.50	1
8-Do you think it is necessary to plant trees to reduce noise and dust and as windbreaks?	15	0	0	**	3.00 ±0.29	7.50	1
9- Do you prefer separating the parts of the garden and defining the paths and the green surface by means of natural rather than artificial determinants?	12	3	0	**	2.80 ±0.34	7.50	1
10-Do you prefer evergreen trees and shrubs over deciduous trees?	3	12	0	**	2.20 ±0.27	5.50	3
11-Do you prefer warm colors (red, orange, and yellow) when choosing flowers over cool colors (white, blue, violet and pink)?	4	11	0	**	2.26 ±0.28	5.66	2
12-Do you like to plant all kinds of rose bushes?	15	0	0	**	3.00 ±0.29	7.50	1
13-Do you prefer diversification when choosing the plants that you prefer to grow in the green space?	15	0	0	**	3.00 ±0.29	7.50	1
14-Did you participate in the design of the green space to enrich it?	0	0	15	**	1.00 ±0.05	2.50	6
15-Do you prefer the presence of one of the water elements in the green space?	15	0	0	**	3.00 ±0.29	7.50	1
16-Do you prefer having complementary components (garden furniture)?	15	0	0	**	3.00 ±0.29	7.50	1
17-Do you think the old space design is better than the current design?	0	15	0	**	2.00 ±0.19	5.00	4
LSD value	--	--	--	--	1.297 *	--	--

* (P≤0.05) ,** (P≤0.01)

Tables 4-1, 4-2, 5-1 and 5-2, shows the opinions and desires of the people and specialists living in the area before and after the development of green spaces, show the following results:

Green spaces are of great importance for their environmental, aesthetic, social, health,

economic, urban and cultural benefits. This confirms the opinion of the people and specialists inhabiting the area, and the reason is due to the cultural level of specialists who are aware of the importance of green spaces and their functions.as for the people, the reason is due to the human instinct for his love

of nature, which he likens to God's paradise on earth. The social communication of the residents of residential areas is achieved through gathering and meetings in the green spaces within these residential areas, and the people and specialists emphasized the neighborhood's lack of green spaces that meet their desires and needs. The maintenance and service operations are among the main matters for the success and sustainability of green spaces, which was carried out by the Adhamiya Municipality, and this was confirmed by the residents of the area and the specialists after the development, which encouraged the attraction of the people to hesitate and enjoy, unlike the spaces before the development were neglected, so the people did not hesitate to them. The answer to this question was different, each according to the distance of the housing unit from these spaces, but most of them were far from their homes and could only reach by vehicles, only the units that surrounded the royal cemetery were close to the site and easy to access, and this explains the lack of justice in the distribution of Green spaces within the shops to ensure easy access for all members of the residential neighborhood. The level of individual and community security was not taken into consideration when planning and signing the spaces, by dividing the green space through streets for the movement of vehicles that penetrate the spaces, and the mixing of pedestrian traffic with cars, and the lack of spaces for pedestrian movement paths, which makes it difficult for the people of the area to feel safe, despite the presence of a rescue unit in charge of the area. Man by nature loves everything new, so the majority of the people show their preference for imported plants, and this explains the lack of awareness among families about plants and the lack of environmental awareness about their suitability to the local environment and the extent of the damage and losses they incur in the event that they are not suitable for the local environment, while specialists confirmed the opposite. Community participation has a great impact in strengthening social relations between the residents of the neighborhood, developing the spirit of cooperation and taking

care of these spaces. 8- Planting trees reduces noise and as a windbreak, and provides shade from the scorching sun in summer and protection from cold winds in winter. The appearance of these trees is ugly in the eyes of the people due to their lack of awareness of the importance of afforestation and its benefits. Plants have many uses and benefits, including separating the garden parts and defining the walkways, in order to increase the green element in the space, and this is according to the desire and conviction of specialists, while the majority of the people preferred industrial determinants because of their attractive colors and shapes, and this explains the lack of awareness of the importance of plants and their benefits. The evergreen and deciduous trees and shrubs for each type of them have reasons and conditions for their use, as the majority of the people stressed before the development that they did not prefer evergreen trees and shrubs, as a result of the dense afforestation in the green spaces, and its neglect without perpetuation and pruning, and the blocking of the warm sun rays in winter. This led to the distortion of the view in front of the people aesthetically and functionally, while the people explained after development their preference for evergreen trees and shrubs, because they suffered from cutting and removing a large percentage of trees and shrubs after development. The colors of flowers in green spaces are popular and attractive, and they are of importance in achieving the element of diversity, contrast and aesthetics for plants, and each color has reasons to use it according to design principles. Rose bushes have great status throughout history and in the hearts of the people, as Iraqi families have been proud of the cultivation of roses in their gardens since ancient times, and its cultivation is considered the basis of gardens, and this is confirmed by the people and the specialists. Man by nature loves nature with its different colors, shapes, sizes, and types, because of its important psychological impact on man, as he quickly gets bored when watching a space devoid of the element of diversity and surprise. This is what was confirmed by the people of the area and the specialists of its inhabitants before and

after the development. The response was categorical, painful, and heartbreaking, for not participating in the area's residents and specialists in designing the spaces before and after the development, which explains why the residents of the area were not allowed to feel the importance of green spaces for entertainment and social importance, this weakens the sense of belonging to these spaces and preserving them. Aquatic elements have many uses, great importance and a popular location for everyone throughout history, because of the visual, sensory, and aesthetic effects of water as a central attraction. This is confirmed by all the people and specialists living in the area. Any green space cannot be without supplementary ingredients that raise its aesthetic value and increase its functional efficiency, so there are many accessories that are points of attraction and interest in the space. This is what was agreed upon by the opinions of the people and the specialists living in the area. Residents and pioneer specialists were reluctant to answer about

which design is better before or after development, because they find pros and cons in each design, and complete dissatisfaction with any one of them, because they want development, but they want afforestation with it, as the specialists from the residents of the area agreed with the people of the area. The opinions and desires of the residents of the area open the door towards providing many recommendations and advice to those in charge of managing these vital spaces, by devoting environmental awareness and taking note of the importance of afforestation in public life and individual and community behavior, by popularizing the environmental culture through visual, audio and print media, and involving the people of the area in the process of designing, implementing and maintaining spaces, to enhance social relations and a sense of responsibility, and taking into account the principles of safety and security when planning the site, while staying away from vehicle routes.

Table 5. The reliability and validity coefficient of the axes according to the questionnaire form

Hubs	Consistency and honesty
Static Families - Before Tatter	72%
Static Families - After Tatter	77%
Professionals - Before Embroidery	82%
Professionals - Before Embroidery	83%
Total	80%

From the foregoing, we note that the answers of the people and specialists from the residents of the area were moral, that is, the presence of statistical indications between their answers is real and is not subject to chance, meaning that they respond with conviction about the importance of these questions, and this is proven by the reliability and honesty coefficient of the axes according to the questionnaire form as in (Table 6), which amounts to 80%.

CONCLUSIONS

1- Increasing environmental awareness and strategic planning among the designers of urban green spaces and decision-makers in the design and implementation of these spaces increases their efficiency and job performance.
2- The importance of strategic afforestation in reducing temperatures for the micro-climate of urban green spaces, increasing relative

humidity, and reducing wind speed and change of direction.

RECOMMENDATIONS

1- Achieving increased environmental awareness and strategic planning for designers and occupants of urban green spaces through audio, visual and print media.
2- Paying attention to urban green spaces and planting them according to a strategy that is commensurate with the environmental and climatic data of the site.

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Source: Baghdad Municipality, GIS Division

Contributions of authors

S.N.J.: Suggestion the proposal of the article, revised the manuscript

Sundus A. AL-Rahman: field survey, data collection and questioner

CONFLICT OF INTEREST

The authors declare that they have no conflicts of interest.

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دراسة تحليلية للفضاءات الحضرية الخضراء المحيطة بالمقبرة الملكية

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المستخلص

حيث اختيرت الفضاءات المحيطة بالمقبرة الملكية لأغراض الدراسة العملية كونها معلم تاريخي وثقافي وعمراني مهم لحي الاعظمية فحسب بل على مستوى محافظة بغداد، وهدف البحث الى زيادة الوعي البيئي والتخطيط الاستراتيجي لدى مصممي الفضاءات الحضرية الخضراء وأصحاب القرار في تصميم وتنفيذ هذه الفضاءات لزيادة كفاءتها وادائها الوظيفي، وقد اتبع البحث منهج المقارن الوصفي التحليلي لاستخلاص البيانات لهذه الفضاءات، والتي مرت بمرحلتين قبل التطوير في عام 2020 وبعد التطوير عام 2021 في ضوء خمسة أدوات لجمع المعلومات وتحليلها: المسح الميداني وتحليل العوامل المناخية و تحليل النسيج الحضري و المقابلات الشخصية والاستبيان، وقورنت الفروقات المعنوية بين المتوسطات باختبار اقل فرق معنوي كما أكدت نتائج الدراسة على أهمية التشجير في خفض درجات الحرارة للمناخ الموقعي المصغر للفضاءات، وزيادة الرطوبة النسبية، وتقليل سرعة الرياح وتغيير اتجاهها.

الكلمات مفتاحية: المقبرة الملكية، النسيج الحضري، حي الاعظمية، التخطيط الاستراتيجي.