EFFECT OF THE CULTURAL AND NATURAL ENVIRONMENT ON THE DESIGN OF GREEN URBAN SPACES FOR THE SALHIA COMPLEX

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ABSTRACT

This study was aimed to identify the basic principles and design considerations (cultural and natural) that can be relied upon in the urban landscape design for vertical residential complexes in Baghdad city. The descriptive and analytical approach was followed to collect and extract the data for urban green spaces of Al-Salhia residential complex within Baghdad city that based on six tools for data collection and analysis which were: field survey, climatic factors analysis, urban fabric analysis, personal interviews, cultural factors analysis, and questionnaire. The questionnaire was distributed to a random sample of the people and specialists from Al-Salhia complex residents. After collecting the forms, the data was gathered by the "Excel Office Microsoft" software, and the " System Analysis Statistical" program was used to download the data and the differences between the means were compared with the least significant difference "LSD" test. The results revealed that the decrement in the green space's percent of the complex and their efficien. And the shades created by the residential buildings were not taken into consideration by designing the green spaces and their impact.

Key words: System Statistical Analysis, urban fabric , vertical residential complex, design considerations, sustainable cities, climate action
***Part of Ph.D. dissertation of the 1st . author.**

تأثير البيئة الثقافية والطبيعية على تصميم الفضاءات الحضرية الخضراء لمجمع الصالحية

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المستخلص

هدفت الدراسة الى ايجاد مبادئ اساسية واعتبارات تصميمية (ثقافية وطبيعية) يمكن الاعتماد عليها في تصميم الفضاءات الحضرية الخضراء للمجمعات السكنية العمودية في مدينة بغداد. وقد اتبع البحث منهجا وصفيا تحليليا في جمع البيانات واستخلاص المفردات للفضاءات الخضراء الحضرية لمجمع الصالحية السكني ضمن مدينة بغداد وتحليل المعلومات, في ضوء ستة أدوات لجمع المعلومات وتحليلها :المسح الميداني وتحليل العوامل المناخية وتحليل النسيج الحضري والمقابلات الشخصية وتحليل العوامل الثقافية وأخيرا الاستبيان. كما تم اعتماد استمارة الاستبيان التي وزعت على عينة عشوائية من ألاهالي والمختصين من سكنة المنطقة. وبعد جمع الاستمارات تم تفريغ البيانات باستخدام برنامج Microsoft " "Excel Office واستعمل البرنامج االحصائي SAS " System Analysis Statistical" في تحميل البيانات، وقورنت الفروقات المعنوية بين المتوسطات باختبار اقل فرق معنوي " LSD " . أظهرت الدراسة انخفاض نسبة الفضاءات الخضراء في المجمع وكفائتها إلى دون المعايير المحلية والعالمية المطلوبة والمتناسبة مع الكثافة السكانية المتزايدة .ولم يتم مراعات الظل والظلال التي تخلقها العمارات السكنية تصميميا على الفضاءات الخضراء واثرها على ذلك.

كلمات مفتاحية: نظام التحليل الاحصائي، النسيج الحضري ، مجمع السكني العمودي* ، الاعتبارات التصميمية، مدن مستدامة، العمل المناخي

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INTRODUCTION

The vertical housing has become an urgent need to control the population increment in terms of creating a natural, cultural, social, and economic environment that is stable and suitable for people. Therefore, most countries of the world have begun to establish vertical housing complexes on a large scale, due to the advantages of this style in quickly meeting the housing needs, and necessities, including Iraq, which is suffering from a stifling housing crisis(10). Al-Mansoori and Al-Mousawi (7,8) defined green areas as the areas that can be planted and that provide a natural beauty to residential neighborhoods; green areas are usually penetrated by a number of pedestrian walkways for residents, whether for transportation, walking or spending leisure time in cities to provide a safe, comfortable, and stable quality of lifestyle and achieve thermal comfort for humans. Muhammad and others (17) defined thermal comfort as the state of thermal balance between the body and the surrounding environment, and maintaining the body's internal temperature, humidity, and ventilation. The air temperature must be around 20 and 28 °C, and the relative humidity between 20%-80%. The air temperature that the human body can tolerate ranges from 15 to 34 °C. Microclimatic landscape design be effective in ameliorating extreme conditions caused by global climate change and urban heat island intensification, providing people with thermally comfortable and heat-safe environ (15). Abdel Wahhab (3) concluded the importance of providing green spaces that meet the society needs as an essential element of housing to be capable of living, working, learning, and creativity. Considering the natural, cultural, social, and economic environment that belongs to the people occupied these spaces to be a constant social focus at the level of the region, this is what concerns our research and here comes the importance of green areas. Al-Subaihawi (9) emphasized the importance of the natural environment as the main factor in the emergence and development of civilizations, and the sons of Mesopotamia on this generous land had extensive interest in studying the natural environment and trying to harness God's gifts to serve humankind, and to be adapted to the conditions of the natural environment to create spaces for the life continuance and development. Al-Jumaily and Tahseen (6) mentioned that the area decrement and encroachment on green spaces in Baghdad city has a negative effects and multiple problems, including the environmental ones, that loses the biodiversity, ecological balance, and microclimate; moreover, it occurs a cultural and social problems, which affects the entertainment activities, relaxation, and Urban imbalance, in addition to legal problems that are difficult to solve in the future. Semeraro and others (21) emphasized that urban green spaces are an effective part of the regional urban fabric design by enhancing the ecosystem and regulating the microclimate, and reduce the noise and pollution, filtering pollutants, increasing biodiversity, cultural and educational values, enhancing people's interaction with green spaces and being more attractive. Abdullah (4) noted in a field study that the green areas percent in Khartoum city is 0.54% and the population share of green spaces equals 0.42 m^2; which is not appropriate for the population according to the international standards. The results also revealed the importance of providing green spaces according to international standards and requirements, and the criterion for the per capita share of green spaces ranged around 10-20 m^2/ Person . Mahal &et al. and Qubaa & et al. (16, 20) pointed out the importance of applying the modern technology and adopting geospatial techniques in managing green spaces and climatic conditions, as it allows collecting and analyzing the data easily and quickly. The green areas are considered as an integral part of the planning of the urban environment as they are an integral part of the city and include several important functional, aesthetic and environmental dimensions. It is achieved through the adoption of a coordinated and systematic approach and planning and is also influenced by a range of planning, technical and managerial factors (22) **.** Abbas (1) emphasized in a study on the effect of the urban heat island phenomenon in Al-Karkh area of Baghdad, for the historically areas that were crowded by housing projects in order to achieve thermal comfort for the population and the level of satisfaction, the study reached to

solve environmental and cultural problems by improving the local climate of green urban spaces, by increasing the vegetation cover percent and the application of while pavements, taking into account the buildings height to the street width to control the average radiation and temperature **.** Abu-Ali and others (5) focused on enhancing the local climate of urban residential areas for the neighborhoods of Abu Dhabi, by evaluating and using local nature-based solutions such as street landscaping, urban spaces, distinctive landscape types, and design strategies for space typ **.** Abdel Latif (2) emphasized that urban heat islands are the main influential of the current climate change; accordingly, there are increasing calls from the international community to employ strategies that can support both adaptation and mitigation to climate change of the cities to limit the spread of the climate change effects in the world, especially in Baghdad, including the application of the smart adaptation to climate change approach, as well as the green urban injection approach. Increasing the proportion and efficiency of urban green space as a more appropriate strategy for urban green infrastructure planning for residential complexes is greening the walls of buildings with various forms of green plants that crawl on the outer walls of buildings as structural support, grow on dirt, stone and water on the walls as growth medium, and take a long time to become Large enough to cover an entire wall (19). Balcony greening from residents' contact with plants by growing plants in indoor and outdoor containers on balconies. This describes a wide variety of urban gardening practice that can alleviate symptoms of depression, reduce anxiety, increase life satisfaction and quality of life, and strengthen participation among neighborhood residents (14). The uses of the water element in green spaces give it a lively character, in addition to the great importance of the environment in cooling and soothing the environment (12).

MATERIALS AND METHODS

Study Site: Al-Salhiya complex was chosen as one of the leading vertical housing projects in the country, that is characterized by a unique visual organization, location, level of implementation, social, and technical services, which was implemented in 1983 AD. It is located along Haifa Street - Salhiya on the Karkh side, about 3 km from the city center, in a flat level and has soil with less salinity. about (621 * 580) AD. The complex area (Sector 222) is 36 ha, which is about (580 * 621 m), and the open spaces are about 67.7% of the total area (16 m^2 per person) and was built using the structural system. The complex was designed in the form of a residential neighborhood consisting of four main residential sectors , each of which was called a sector, which is the northern, southern, eastern, and western districts, consisted of children's playgrounds, green areas, and pedestrian pathways that do not intersect with motorways to ensure the safety of residents and children during their movement within the residential complex (11), and thus the complex constitutes a residential neighborhood, each part of which is designed according to the principle of the residential neighborhood (the neighborhood unit). The field study took the period from 1/1/2020 to 1/1/2022. The field study included five tools for collecting information.

First :the fild survey

The selected study sites that were surveyed and analyzed through field visits and observations depending on the area, cultural, and environmental characteristics of each site. it was revealed that the distribution of green spaces in the residential district based on a hierarchy into three levels, the smallest of which represents very small green spaces that belongs to the residential units on the ground floor of each residential building and intended for use by the residents of these units only. The second level is the space of the residential building itself, while the third level is the green open space at the sector level, where it is located in the middle of each group of residential buildings.The distribution of green spaces considered separating them and not intersecting the pedestrian walkways with vehicles to ensure the safety of the children while they play and the safety of the occupants during their movement within the project.

Field survey

Through continuous visits, observations, and photographs of the urban green spaces of Al-

Salhia residential complex, which ind three axes:

Spatial determinants which included several points, namely:

The open spaces area around the buildings ranges from 87.38 - 687.38 m^2 per building, and thus the share of one family of green space ranges between 2.3 - 9.9 m^2 at the level of one residential building, given what each building contains as an average of 64 housing units (apartment). The share of one family of green space at the level of one sector ranges from 1.3-1.8 m². This is in relation to the area of the common green space for each sector, which amounts to 900 m^2; this percent whether at the level of residential building or the sector, is very small and does not meet the resident's needs. Most of the green spaces in the complex are square, and the least are rectangular. Most of the green spaces land of the complex are irregular in practice due to neglect and poor maintenance. The neighborhoods of the open spaces at the level of buildings are a service area from the north, and housing units from the south, east and west, that is, open on one side, which is the north-west. As for the green spaces at the sector level, they are open from all sides, surrounded by pedestrian pathways. The complex planner tried to take the advantage of the optimal orientation of the buildings in hot and dry areas, as the best orientation of the buildings in this area is the northwest from the four directions to allow the desired seasonal winds to blow on the buildings. However, the impact of shadows created by the residential buildings were not taken into account by design on the green spaces (Fig. 2). As a result, the designers of the spaces did not succeed in choosing the appropriate plants for the shaded places, despite the fact that the direction of the green spaces to the northwest in terms of wind and the lack of solar radiation in summer is very desirable.The green space's location for the residential area is very suitable and easy to reach by the residents of the complex, which is a good indicator. The spaces are visible to people and are not fenced, open to everyone and not separated from buildings, as they are an integrated and connected urban fabric.

Planning criteria: Through the first paragraph, the research concluded that the per capita share of green spaces employed for use as places of recreation required and satisfactory for the residents needs at precent was not achieved. Considering that when the complex was established in 1983, open spaces constituted 67.7% of the total area (16 square meters per person). This decrement in the level of per capita share of green spaces is due to the change in the green spaces use into garages for parking due to their need to secure their vehicles. Which decreases these spaces, and negatively affected the area from the environmental point of view.

Components of green spaces: which included two types of components:

***Plant content:** where the content of the green spaces was trees, shrubs, and grass only, and this shows that there is no diversity in the plant content.

***Complementary components** this type of content is very slight, as they contain only a few lighting elements, and a small percent of walkways, which explains the poor design diversity of these components.

The level of maintenance of green spaces

The field observation revealed that the outdoor spaces are neglected and there is a lack of maintenance operations, which distorted their appearance, and caused the reluctance of the people to use and exploit these spaces and lack of interest in them.

Second: Analysis of the Climatic Factors of Green Urban Spaces

Table 1 revealed the difference between the measurement of climate factors for the weather station of Baghdad and the personal station *(Vantage Pro2) and the personal automatic weather station in Al-Salhiya complex in the summer season on 3.8.2020 and on 4.8.2020 from 2-4 pm, when the station was installed in the middle of the outdoor space to be measured

***The station is imported from Michigan/USA. It measures weather and provides accurate environmental data to meteorologists, farmers, research scientists and gardeners all over the world.**

The max temperatures decreased from the normal rate in Baghdad by 1-4 °C, and the relative humidity increased by 1-8%, while the

wind speed was less than the daily rates by 1-13 km. h^{-1}. The wind direction is unstable, and this explains the approach of the microclimate measurements of the complex's spaces to the general climate of Baghdad. This is due to the lack of outdoor space, efficiency, and quality of green spaces and their role performance and neglect, and this negatively affected the natural environment of the complex and the residents to spend enjoyable leisure time.

Table 1. shows Measuring the climatic factors of the spaces of the Salhiya complex in summer

Climatic factors	Baghdad weather station in 3.8.2020	Your Personal weather station Space					Baghdad weather station in 4.8.2020	Your Personal weather station Space				
		1	2	3	4	5		6	7	8	9	10
Mximum temperatureC^0	51	50	47	48	49	49	52	50	52	48	49	50
Relative humidity%	10	11	18	15	13	12	9	10	8	12	12	10
Wind speed(k/h	20	19	8	10	11	13	22	18	21	20	18	20
Prevailing Wind	NW	NW	SW	N	NE	NW	NW	NW	W	S	N	NW
Plant Density Ratio %		20	80	65	40	50		40	5	60	6	35

Data in Table 2 shows the difference between the measurement of climate indicators by Iraqi meteorological organization and seismology and the personal automatic weather station for the spaces of the Salhiya complex in the winter season on 27.12.2020 and 7.1.2021 in the morning. The increment in relative humidity, wind speed and low temperatures, in addition to changing the direction from the daily rates for the city of Baghdad by a small percent, due to the low plant density, which ranges between 30-50%, and the lack of efficiency and the green spaces area.

Table2. shows Measuring the climatic factors of the spaces of the Salhiya complex in winter

Climatic factors	Baghdad weather station in 27.12.2020	Your Personal weather station Space					Baghdad weather station in 7.1. 2021	Your Personal weather station Space				
		1	2	3	4	5		6	7	8	9	10
Morning time(h)	5 7 8	7	7	8	8	8	5 7 8	7	7	7	8	8
Minimum TemperaturC^0	2 5 7	4	2	4	6	4	3 6 8	4	7	2	5	7
Relative humidity%	64	65	74	79	67	72	54	59	52	66	60	55
Wind speed(k/h)	10	5	14	3	16	9	3	8	10	7	5	9
Prevailing Wind	SE	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW
Plant Density Ratio%		20	80	65	40	50		40	5	60	60	35

This confirms the weak environmental awareness of the design, implementation and development of green urban spaces, and the lack of consideration in the percent of plant density and the general climate factors of the city and its impact on the micro-climate of the green spaces.

Third: urban fabric analysis

The urban fabric of the complex followed the assemblage method of residential buildings around the central courtyards, which is the best solution in forming spaces bearing communicative features, where spatial proximity plays a role in encouraging social relations with the presence of a hierarchical hierarchy in the levels of these spaces as mentioned above. As this trend is based on the ideas adopted by the urban fabric of the traditional environment, and that the complex is somehow close to this original trend in housing planning, However, due to the deterioration of the formation and design of green spaces, their decline and neglect, the urban fabric has become distorted and does not rise to the controls of the urban locality.

Fourth: analysis of the elements of the cultural environment

The results of the information related to the family and the respondent to the questionnaire (Table 3) in terms of the family's cultural level and income, revealed that most of the residents were educated people with a bachelor's degree, and the level of family income was mostly middle-income. Taking the cultural and economic level of the region's population in consideration has an important impact on increasing or decreasing the demand for green spaces for recreation and entertainment. Knowing the educational level of space occupiers has an important and impactful effect on increasing or decreasing the demand for green spaces, maintaining, 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 and demand on public places for recreation and entertainment**.** Nawrath and other researchers (18) confirmed through a study that doubling the efforts to increase the quantity, quality, and accessibility of urban green spaces supports the health status of the occupiers of these spaces in low and middle-income areas. As it became clear through the field study that the social relations in the complex are strong and continuity among the residents, Additionally, the lack of the mosque and its religious and social role from the main central space of the housing complex was one of the most important negatives that the residential complex suffers from despite the presence of a mosque near the complex.

Table 3. The cultural level and the family income level of the respondent to the questionnaire

population sample size	260
1- The cultural level of the head of the family.	
Uneducated	6
Reads and writes	10
Elementary Certificate	20
prep school degree	35
College degree	120
Master's Degree	69
Chi-Square (χ^2)	10.92**
2-amily income level	
Poor	40
Medium	137
Affordable	83
Chi-Square (χ^2)	**10.92
(P≤0.01) **	

Fifthiy: 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 gather the data that we were presented, and then the nature of the questionnaire form and design was presented to the specialists to obtain credibility in the final results to prove that the tables and results were not spontaneous, after conducting a quick session test experiment with the families participating in the questionnaire. After collecting the information and opinions of the specialists, the final form of the questionnaire was obtained to be submitted to the residents from the people and specialists to evaluate their opinions and desires.

Sixthly: the questionnaire

The questionnaire form was presented in two ways, where a quick session test 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 obtain credibility in the results to prove that the tables and results were not spontaneous. It was tested through 260 questionnaires (the sample was chosen according to the opinion of the residents and the observations of the visitors' percent of the site) consisting of 16 questions using the Triangular Likert scale distributed among the residents of the complex Table **4** . And 15 questionnaires consisting of 16 questions, distributed among specialists from the complex residents as in Table **5** , to study the required relationships according to the objectives of the study for independent factors and items within the axes included in the questionnaire. The Statistical Analysis System for Kazem and others (13) was applied to analyze the data obtained from the questionnaire tables, and the significant differences of means were compared with the LSD test, T, and F tests. The significant differences between percent (calculated by dividing the part by the total 150 and multiplying by 100) were compared using the Chi-square -χ2 test.

Table 4. Data of opinions and desires of families who use green spaces For Salhiya Residential Complex

Question	Sample size 260			Significant	mean ± standard deviation	Weight	Rank
	No	Somewhat	Yes				
1-Do you think the importance of green spaces in residential areas?	198	13	49	**	2.57 ±0.34	111.50	3
2-Is the green space sufficient to meet the families' desires?	56	160	44	**	2.04 ±0.27	88.67	13
3-Are the municipal green space services running well?	36	173	51	**	1.94 ±.08	84.16	15
4-Is the green space easily accessible from the housing unit?	179	0	81	**	2.37 ±0.37	103.00	7
5- Do you feel safe and comfortable with your family during your roaming in the green space?	105	94	61	**	2.16 ±0.41	94.00	11
6- Do you think cultivating green space with local plants suitable for the environment is better than imported plants?	73	115	72	**	2.01 ±0.27	86.83	14
7- If campaigns were set up to develop green space, would you contribute?	175	33	52	**	2.47 ±0.51	107.16	5
8- Do you think it is necessary to plant trees to reduce noise and dust and as windbreaks?	103	104	53	**	2.19 ±0.28	95.00	10
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?	91	119	50	**	2.15 ±0.29	93.50	12
10-Do you prefer evergreen trees and shrubs over deciduous trees?	196	26	38	**	2.60 ±0.46	113.00	1
11-Do you prefer warm colors (red, orange, and yellow) when choosing flowers over cool colors (white, blue, violet and pink)?	141	47	72	**	2.26 ±0.31	98.16	9
12-Do you like to plant all kinds of rose bushes?	156	33	71	**	2.32 ±0.53	100.83	8
13-Do you prefer diversification when choosing the plants that you prefer to grow in the green space?	166	38	56	**	2.42 ±0.38	105.00	6
14-Did you participate in the design of the green space to enrich it?	0	0	260	**	1.00 ±0.05	43.33	16
15-Do you prefer the presence of one of the water elements in the green space?	184	24	52	**	2.51 ±0.33	108.67	4
16-Do you prefer having complementary components (garden furniture)?	198	13	49	**	2.57 ±0.53	111.50	2
LSD value	--	--	--	--	1.065 *		--

.(P≤0.01) ** ،(P≤0.05) *

Table 5. Data of opinions and desires of specialists who use green spaces For Salhiya Residential Complex

Question	Sample size 260			Significant	mean ± 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	5
3-Are the municipal green space services running well?	0	4	11	**	1.26 ±0.37	3.16	4
4-Is the green space easily accessible from the housing unit?	15	0	0	**	3.00 ±0.29	7.50	1
5- Do you feel safe and comfortable with your family during your roaming in the green space?	15	0	0	**	3.00 ±0.29	7.50	1
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?	7	8	0	**	2.46 ±0.38	6.16	2
10-Do you prefer evergreen trees and shrubs over deciduous trees?	3	12	0	**	2.20 ±0.25	5.50	3
11-Do you prefer warm colors (red, orange, and yellow) when choosing flowers over cool colors (white, blue, violet and pink)?	7	8	0	**	2.46 ±0.38	6.16	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	5
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	--	--	--	--	1.278 *		--

.(P≤0.01) ** ،(P≤0.05) *

RESULTS AND DISCUSSION

Results in Tables **4** and **5**, represent the opinions and desires of the people and specialists that occupies Al-Salhia Complex, as following:

Green spaces are of great importance in meeting the needs of society as an essential component of housing and complementing it to be habitable, and this is confirmed by specialists and residents of the region and this is due to the cultural level of specialists with their awareness of the importance of these spaces and their functions.The lack of green spaces and their decline negatively affects the residents of the complex, because there are insufficient spaces for people to gather for the purposes of social communication and entertainment, and this is confirmed by the residents and specialists of the residents of the complex. Municipal services suffer from neglect in perpetuating these spaces, which led to their deterioration and lack of use by the people of the area, and this was confirmed by the respondents from the residents and

specialists from the residents of the complex. The green spaces are easy to access because they are very close to the housing units at the level of residential architecture and at the level of the sector, and this is what the specialists and the people support. The majority of families and specialists agreed on the availability of safety and comfort inside the complex as it is fenced and protected from vehicles on the main street and protected from strangers, which made the complex safe and desirable to live in. The people showed their love for the strange and unfamiliar types of plants, while the specialists preferred the local plants that are suitable for the local environment, and this explains the lack of environmental awareness among families about the plants and their suitability to the local environment and the damage and losses that they incur in the event that they are not suitable for the local environment. The majority of the people and specialists in the area showed their strong willingness to contribute to the campaigns to develop these spaces, by donating the purchase of plants as well as working in agriculture and maintenance, and this explains the people's desire for social cohesion and strengthening the spatial affiliation of their urgent need for these spaces.The trees cultivation reduces noise and as windbreaks and reduces the intensity of solar radiation, and this is confirmed by specialists from the area's residents, and the majority of the people from the area agree with this, while a high percentage of the people hesitated about the necessity and not of the necessity of planting these trees due to their lack of awareness of the functions of afforestation and its environmental role of the site. All the specialists agreed on the importance of using plants in separating the parts of the garden and defining the walkways, in order to increase the green element in the space because of its benefits and importance. This explains the lack of awareness of the importance of plants and their benefits. The specialists from the residents of the complex confirmed their preference for evergreen and deciduous trees and shrubs, according to their experience of the importance of these two types, each one has its reasons and conditions for its use, while the majority of the residents confirmed their preference for evergreen trees and shrubs, because they suffered from the deterioration of spaces, dust and unwanted winds in summer and winter And their lack of preference for fallen trees because of the leaves they leave during the winter, and they did not realize the amount of their benefits when the sun's rays penetrated them and their need for radiation in winter. When it comes to the colors of hot or cold flowers, the majority of the residents of the complex preferred the warm colors because of their power of attraction and deeply loved by the people, while most of the specialists from the residents of the complex combined warm and cold colors because of their features that differ among themselves, where each color has its reasons All the residents and the specialists of the complex's residents expressed their strong desire to plant rose bushes in the green spaces, because of the rose's status throughout history and among the people, as Iraqi families cherish the cultivation of roses in their gardens since ancient times, and its cultivation is the basis of the gardens. Based on the common sense of the human beings, they prefers ts 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, and this is confirmed by the people of the complex, especially the specialists of its inhabitants. They assured the residents and specialists of the complex residents not to give them the opportunity to participate in the design of the spaces, and this weakens the sense of belonging to the place and to these spaces and their preservation. Water features have many applications, great importance, and a popular site for everyone throughout history, because of the visual, sensory and aesthetic effects of water as a central attraction, and this is confirmed by the majority of the people and all the specialists in the complex. Any green space cannot be without complementary components 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, and this is what the people's opinions are unanimous on. All given above; we note that the answers of the families

and specialists from the residents of Al-Salhia complex were significant, which means the presence of statistical indications among their answers is real and not regular, meaning that they respond with conviction about the importance of these questions. This is proved by the reliability and validity coefficient of the axes according to the questionnaire as in (Table 6), which is 78% for families and 81% for specialists from the residents, and that the general trend of the answers was positive according to the triple Likert scale

Table 6. The reliability and validity coefficient of the axes according to the questionnaire form

Region and hubs		Consistency and honesty
Al Salhiya Residential Complex	Residential families	0.78
	Specialists	0.81

CONCLUSION

The decrement in the green space's percent of the complex and their efficiency below the required local and international standards and commensurate with the increasing population density, which is due to the change of land uses, neglect or insufficient design . The shades created by the residential buildings were not taken into consideration by designing the green spaces and their impact . Although the direction of the green spaces to the northwest in terms of wind and the lack of solar radiation in summer is very desirable . and The lack of community participation, which negatively affected the social relations among the residents, and undermined trust between the citizen and government institutions.

RECOMMENDATIONS

Increasing the green space's efficiency by applying an appropriate strategy to increase the density and quality of afforestation. And we suggest applying the shade and semi-shade plants that suitable for the local environment in Baghdad, especially for the shady green spaces and to be considered in the designed. And Integrating parks with society to link trust between citizens and government institutions.

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