

Study of the plant distribution and green spaces in public parks Abu Tayara Park - Case Study

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Abstract:

Abu Tayara Park was designed on an area of 24198 m², and it is located at latitude 33°25'76.2"N and longitude 44°40'32.0"E. The Dora area is located south of Baghdad, one of the oldest areas of Baghdad, which overlooks the western shore of the Tigris River and includes a group One of the important residential and commercial neighborhoods and complexes in the city of Baghdad, the most important of which is the Abu Tayara neighborhood, so the designed park was called Abu Tayara Park. And the temperature rises (50 °C) during the summer months and vice versa during the winter months (-8 °C). Part of the population was also surveyed in the area, so that 100% of the respondents see the need for a park in their area, and that the preferred time for their visits is the afternoon. 50%, and the most preferred recreational activities in the park are children's play areas at 50%, places to sit, relax, read, or a place to practice sports 25%, and take the opinions of specialists in the municipality and visitors in this field into consideration in the design process so that the visitor feels that he is participating in the process Design even with his voice

Key words: Public Parks, Green Spaces, Sustainable Environment, Recreational Needs

1.Introduction

Public parks are a form of green space that contributes to entertainment, beautifying the city and enjoying its beautiful landscapes [1] Parks, like many other green spaces, provide multiple benefits to the residents of an area where recreation activities are practiced, peace and tranquility, hiking and walking activities are practiced, as well as mitigation of environmental challenges such as air quality and temperature by the presence of plant groups in the parks where temperatures are low in Air compared to the built environment and tree canopies reduce solar radiation which greatly affects the average radiant temperature and thus a thermally comfortable park [2] [3]As the awareness of applying green design has become a focus of attention for most developed countries, the use of natural elements such as deciduous trees and plants can maintain environmental quality [4] [5]Nowadays, urban green spaces and parks are known as Vitamin G, where G stands for the green space around us [6]The environment at the present time, especially the natural environment, faces a series of challenges that appear in (increasing urbanization, the dangers of pollution and overpopulation), all of which are intertwined factors that require concerted efforts to confront the phenomena of the modern era and to get rid of the negative effects of the environment and its preservation. It is exacerbated with the development of human life, as this development is directly proportional to this development. [7] [8]

The first place to start when developing a new park is to ask and listen to the needs of the community it will serve. It helps make every member of the community feel that they are a stakeholder in the success of the project. It is their park; ask them questions to help define what matters most[9]. For the purpose of taking the opinions of residents of the city and

knowing their recreational need inside the park, there are several means of communication and its easiest is to follow the questionnaire process, The questionnaire is a direct communication method and an important tool in design studies, as it ensures clarity in answering the questions asked ; The most popular method was chosen

-Face to Face: Interviews usually involve selecting a carefully controlled sample and randomly

1.1 Research problem:

Lack of interest in the design of these green spaces as a result of looking at the reality of many parks in Baghdad, which suffer from environmental pollution and severe neglect by municipal departments, specifically Abu Tayara Park, the study area

1.2 Research Objectives:

The study aimed to create parks with designs that adopt modern trends to create an ideal environment and to identify the importance of parks as recreational tourist sites and preserve the environment.

2. Case Study:

The study area is related to Abu Tayyara Park located in Baghdad / Al-Karkh in the Dora area south of Baghdad, for the year 2022-2023. Figure No. (1) shows a satellite image of the study area and the center surrounding the park, with an area of 1251 m², located at latitude 33°25'76.2" north and longitude 44°40'32.0" east. The Dora area is located south of Baghdad, and it is one of the oldest areas of Baghdad. When planning and designing parks, the matter always begins with determining the location, and the main factor is the possibility of accessing the site so that the public can reach it easily.

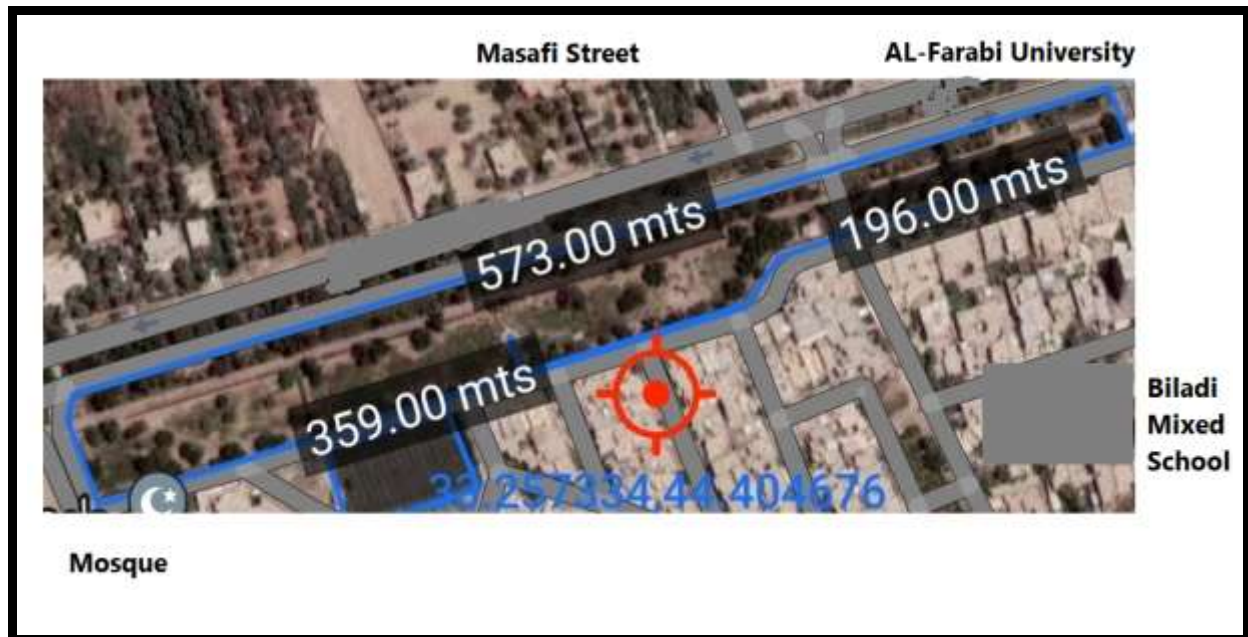


Fig. (1) Satellite image of the study area according to the Mapulator program

The park was selected for the study on the basis of:

2.1 Location — the park is located in the southern part of Baghdad / Al-Dora Al-Masafi Street, with an area of 23995 m²

2.2 Accessibility - The park is used daily all year round and is open to everyone

2.3 Source of noise - The park was chosen for analysis assuming that the main source of noise is generated by transportation and because it is located at the entrance to two areas (Al-Shorta Street, Abu Tayara Street), in addition to the railway crossing the park from the eastern part to the western part

2.4 Functional program - There is a diverse functional program in the park, the leading function of which is sports, recreation activities, seeking rest, calm, hiking, and places designated for children's play, in addition to the aesthetic importance of the park

Collecting information about the research sample based on:

-Architectural plans

The plans were drawn for the external spaces of the park as a proposed reality and to

achieve the educational as well as the aesthetic goal, as the AutoCAD 2019 - English program was used in developing these plans, based on the on-site observation during the field visit and the theoretical aspect, and based on a questionnaire, and the suggestions of the visitors in the park were taken into account, the proposed design as Follow contemporary trends in distributing these units necessary for this type of space, as shown in Figure (4) (5)

-Field visits: A researcher visits the site of the park, which was chosen as a research sample, in an attempt to study its reality in terms of the following aspects:

- The size of the open spaces and their distribution in the park
- Natural and material components of these gardens.

Divide the park into three gardens

The first garden with an area of 12349 m², The most important thing that was noticed in it is that it has a comfortable space to look at It was defined by a line of dudenia plants at equal distances, as it isolated it from the main street, and on the right side of the entrance to the garden, there is a line of bushes of Betsborm as determinants of the garden. In

addition to the presence of green spaces and distributed albizia trees, palm trees and eucalyptus trees randomly to provide shade and distribute the seats below, in addition to the presence of seats in the form of side lines, The corridors are fully paved and used for sports lovers, such as the footpath, and lighting poles and water faucets are provided, as in Table (1-1) and Figure (4).

As for the second garden, its area was shown 7049 m², through observation, where children's games are concentrated From a slide, a swing, an exploration group, and seating seats, in addition to the presence of green spaces, there are some areas that need

patching for the appearance of the soil surface, and with the presence of plant complexes that soften the atmosphere and provide shade in hot days As shown in Figure (4) and Table (1-1), a malfunction was observed in the lighting poles and water taps in this garden and they need maintenance.

While the area of the third garden is 4800 m², considered the last part of a park, and it is noted that there are many plant complexes and benches for sitting, relaxing, playing sports, and as a foot path, but it needs lighting columns and more water faucets, in addition to providing the necessary boxes inside this garden , as in Table (1-1) and Figure (4).

Table 1: The most important natural and man-made components in the park

the information	Service and maintenance operations	synthetic elements	natural elements	space
Garden1	middle	benches light Waste basket Water faucets	Lwans Albizia , palm Dodonaea	
Garden2	middle	Kids Games benches light Waste basket Water faucets	Lwans palm , Dodonaea , Albizia	
Garden3	middle	benches light Waste basket Water faucets	Lwans Eucalyptus Albizia Dodonaea	

- Personal interviews: Through a personal interview with relevant people who are present in the park, inquiries are made, questionnaire forms are distributed, and certain aspects that the researcher finds necessary to supplement the data obtained are as they are the most interactive elements with that environment,

and the most aware of its negative and positive aspects, and they were chosen randomly to show the most. The visitors are from the age group 20-35, and their percentage reached 40%, while the rest of the groups were distributed as 15%, 37.5%, and 7.5%, respectively, as in Figure(2)

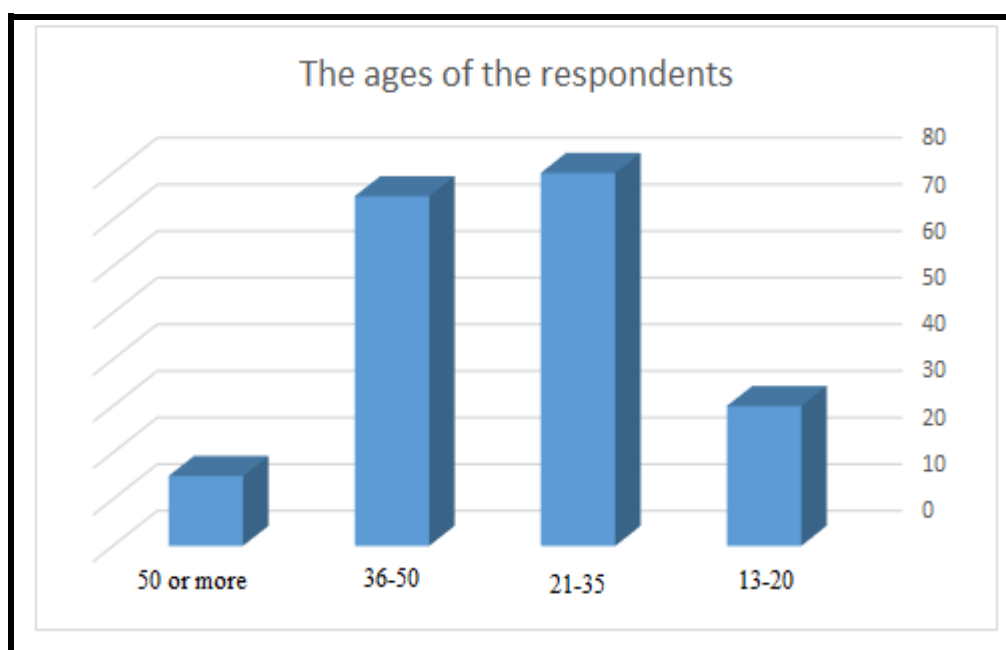


Fig. (2) The ages of the respondents

Questionnaire

To measure the accuracy of the information collected from the sources of information collection and for the purpose of the study, the questionnaire was designed with a set of various questions that are related to each other and evaluated scientifically and linguistically by specialists to appear in a way that achieves its objective. The questionnaire was distributed to a random sample of 200 people and it was filled out manually. Using the Microsoft Office Excel program, a dimension analysis was conducted on the results obtained from the questionnaire using the complete linkage method, which is one of the most important hierarchical agglomerative methods to simplify the data by grouping the axes into clusters according to the similarity of the response

pattern and based on of the Pythagorean equation using the computer according to the statistical program SPSS version 23. Appendix (1)

Results and discussion

It was found through the complete linkage method cluster analysis scheme, Figure (3) and Table (2), based on the results of the questionnaire, that the axes were distributed in two main groups (X and Y), and the cluster (X) was divided into two secondary clusters (X1 and X2). The first cluster (X1) included 3 axes, as we find that the axes (v7, v11, v6) are the closest to each other with a distance ranging between (0.997, 0.992, 0.990), which the visitors expressed their admiration for the children's fun areas in the park and considered it a basic axis, and this is consistent with [10] Where children's fun areas affect positively and

effectively in all body systems, they develop the functional ability of the internal organs such as the breathing and circulation system, as well as the development of muscular and physical ability and moderate stature. As for the second branch (X2), it included one axis (V8), which got a percentage of 62.5%, which was praised by the visitors for the availability of appropriate lighting and signs distributed inside the park, but some of them need maintenance, while the second cluster (Y) is from close The axes (V9, V10, V5) with a distance of (0.945) (0.976), in which the visitors indicated their desire for the availability of such green spaces and gardens in their areas and their connection to the cleanliness of open spaces and landscapes inside the park with the abundance of the necessary funds in the park Especially after recent years have witnessed the emergence of simultaneous concepts, namely ecology, environmentally friendly design, and sustainability, although each of them is considered an area in itself to understand natural processes, manage environmental resources, and achieve sustainable development, especially after the environmental association and the global environmental movement declared towards the seventh decade of the century Twenty years about the existence of this science, and introduced it to the design profession as an aid in understanding the process of sustainability [11] [12]. Where the adoption of the principle of design with nature is a successful strategy in minimizing the harmful effects resulting from the formation of cities, by providing various levels of pre-health conditions for the site. Natural environment is a goal for designers interested in preserving a healthy environment, and this means minimizing negative environmental impacts as much as possible and using renewable energies that raise the level of

quality of the place [13] [14]. And its isolation from the axis (V1) with a distance of (0.431) in which they emphasized the importance of the presence of green spaces at a rate of 100%, and this reinforces the results of [15] that people who have greater contact with nature in green spaces with sustainable landscapes tend to be less anxiety and dissatisfaction, and their feelings of self-esteem were positively affected. As for the axis (v3), between what time of day the park is preferred to be used by visitors, the highest percentage was in the afternoon, amounting to 50%, while the evening percentage reached 34% & 16% in the morning, while the isolation of the axis (V2) from the previous axes, with a distance of -0.235). [16] With a percentage of 12.5%, which noted the desire of visitors for the most important activities that they would like to do, such as places to sit, relax, read, or a place to exercise and fitness equipment, by 25%, while playing in the open air, by 12.5%, while the point got the most important activities that visitors want to do as a space for children on 50% These results are evidence of the desire of visitors to have these activities and parts within their garden, and they must take into account the design process. Finally, the axis is isolated in which season the park is preferred to be used by visitors (v4) from all previous axes with a distance of -0.626.) [17] and obtained the following percentages (50%) in their preference to visit all seasons of the year, while each of the summer, autumn and winter seasons obtained equal percentages of 10%, while the spring percentage reached 20%. because it is the most season in which visitors visit the park, as shown in the proposed scheme No. (5) so that the visitor feels that he is participating in the design process even with his voice

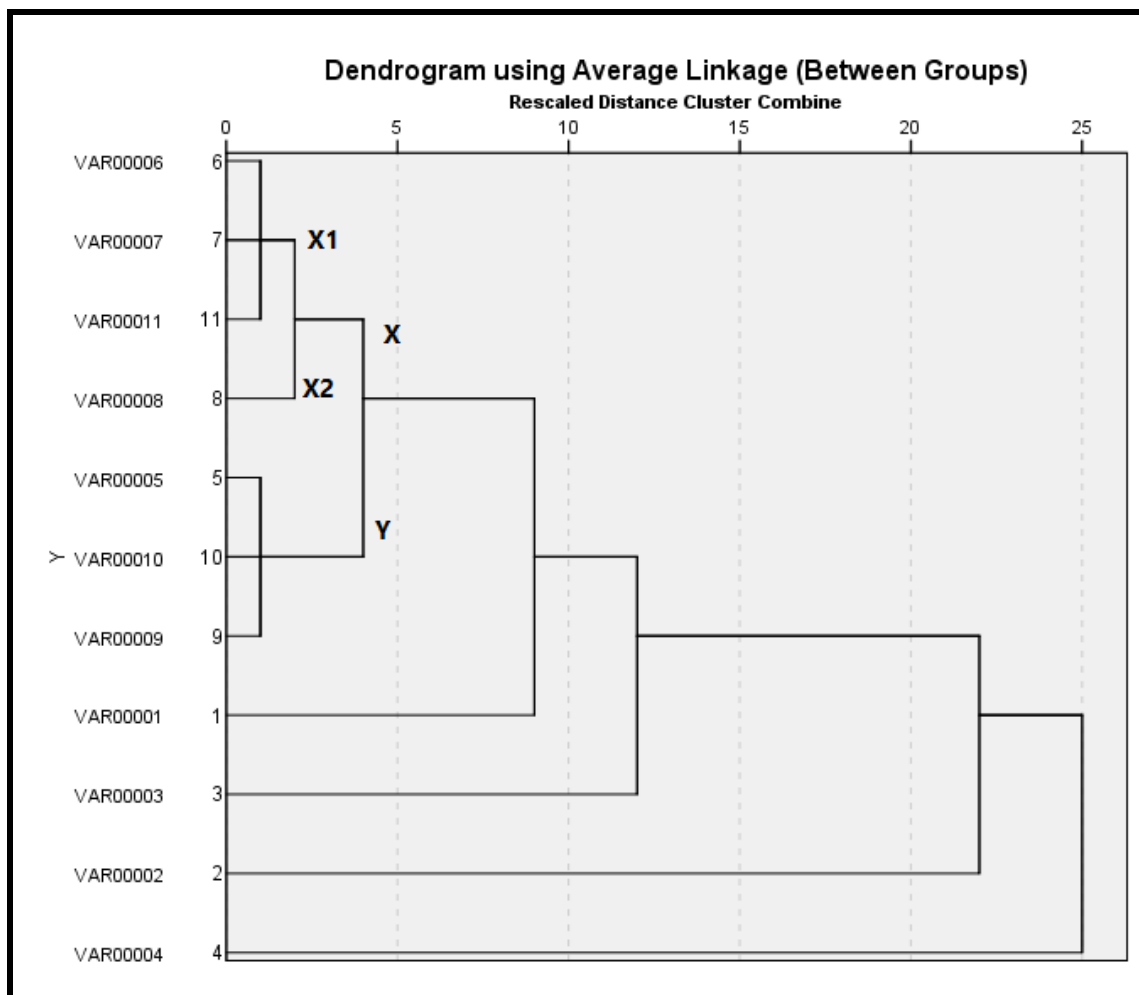


Fig. (3) Cluster analysis chart

Table2: Proximity Matrix

Matrix File Input											Case
VA R0 001 1	VA R0 001 0	VA R0 000 9	VA R0 000 8	VA R0 000 7	VA R0 000 6	VA R0 000 5	VA R0 000 4	VA R0 000 3	VA R0 000 2	VA R0 000 1	
.66 3	.26 4	.43 1	.91 7	.76 0	.73 9	.11 3	0.0 00	- .10 2	.00 0	1.0 00	VAR 0000 1
- .21 2	- .27 1	- .24 2	- .11 4	- .18 4	- .18 6	- .26 7	- .62 6	- .23 5	1.0 00	.00 0	VAR 0000 2
.46 3	.63 6	.46 6	.21 0	.38 3	.35 2	.55 0	- .55 5	1.0 00	- .23 5	- .10 2	VAR 0000 3
- .37 6	- .47 6	- .39 7	- .20 9	- .32 7	- .31 8	- .43 7	1.0 00	- .55 5	- .62 6	0.0 00	VAR 0000 4
.80 6	.97 6	.94 5	.48 7	.72 1	.75 1	1.0 00	- .43 7	.55 0	- .26 7	.11 3	VAR 0000 5
.99 2	.84 3	.92 4	.94 2	.99 7	1.0 00	.75 1	- .31 8	.35 2	- .18 6	.73 9	VAR 0000 6
.99 0	.82 7	.90 4	.95 6	1.0 00	.99 7	.72 1	- .32 7	.38 3	- .18 4	.76 0	VAR 0000 7
.90 6	.62 5	.74 3	1.0 00	.95 6	.94 2	.48 7	- .20 9	.21 0	- .11 4	.91 7	VAR 0000 8
.94 9	.97 3	1.0 00	.74 3	.90 4	.92 4	.94 5	- .39 7	.46 6	- .24 2	.43 1	VAR 0000 9
.89 7	1.0 00	.97 3	.62 5	.82 7	.84 3	.97 6	- .47 6	.63 6	- .27 1	.26 4	VAR 0001 0
1.0 00	.89 7	.94 9	.90 6	.99 0	.99 2	.80 6	- .37 6	.46 3	- .21 2	.66 3	VAR 0001 1

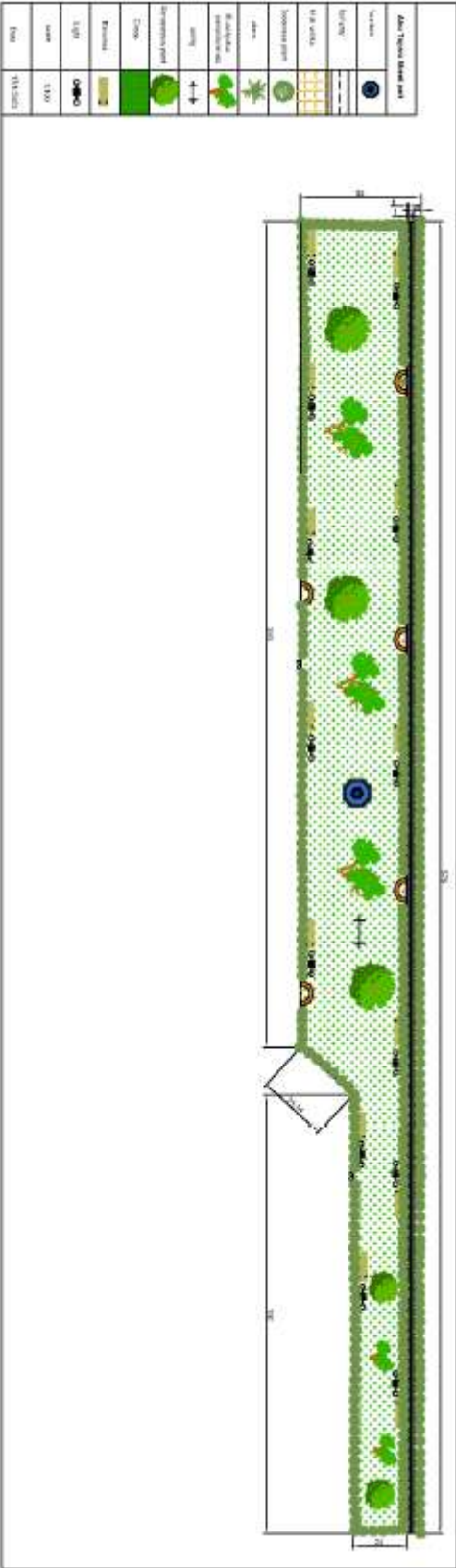


Fig. (4) reality Abu Tayara Park

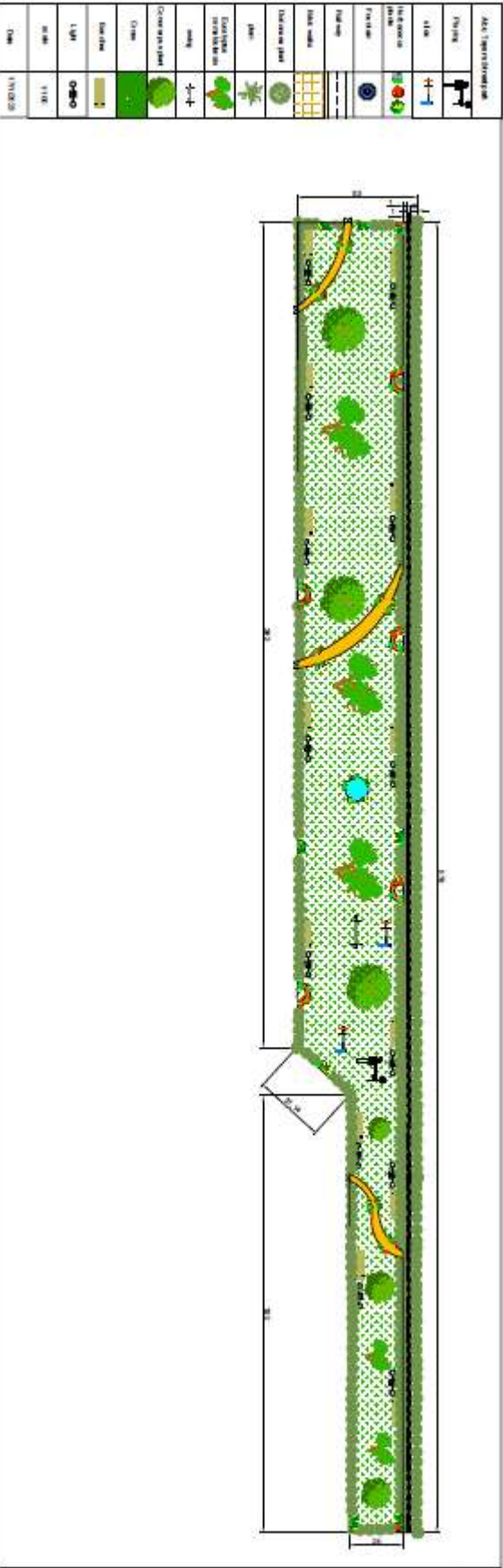


Fig. (5) Suggestion Abu Tayara Park

Conclusions

-Parks take their developments from the needs and activities of their users

-Parks play as lungs for cities and medicine for many diseases such as psychological, physical and social

-The factors that are taken into consideration when designing parks are the impacts of the site and its surroundings, environmental factors, recreational residents' needs, region traditions and customs, and construction costs

-The necessity of studying the harsh environment of the country and its problems and interest in choosing national plants in designs, as well as interest in using water a lot in designing parks for their cooling effect in order to achieve the comfort zone that people are always searching for in parks

Recommendations

-These conclusions emphasize the importance of thoughtful planning and scientific research in establishing and developing gardens, with the aim of enhancing environmental sustainability and the well-being of the population.

-There is a need to study the harsh environmental conditions in the country and address the problems related to them, in addition to the importance of introducing local plants into garden designs and paying attention to the intensive use of water in designs due to its cooling effect, which contributes to creating a comfortable environment that visitors seek in gardens.

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