

A Sustainable Design that Enhance the Quality of Life and Human Behavior's

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Abstract—Public parks are placed high on the research agenda, with many studies addressing their social, economic and environment influences in different countries around the world. They have been recognized as contributors to the physical quality of urban environments. Recently, a broader view of public parks has emerged. This view goes well beyond the traditional value of parks as places for more recreation and visual delight, to depict them as valuable contributors to broader strategic objectives, such as property values, place attractiveness, job opportunities, social belonging, public health, tourist development, and improving the overall quality of life. This research examines the role of public parks in enhancing the quality of human life in Egyptian environment. It measures 'quality of life' in terms of 'human needs' and 'well-being'. This should open ways for policymakers, practitioners, researchers and the public to realize the potentials of public parks towards improving the quality of life.

Keywords—Elements of Parks, Human Needs, Quality of Life (QOL), Subjective Well-Being.

I. INTRODUCTION

A. Quality of Life

A large number of scales and tests have been devised to measure the QOL. QOL measures vary widely in concept, construction and content; therefore, they cannot always be compared directly with each other [1].

Most studies suffer from giving weighting schemes for some aspects or some variables more than others. In most studies, the weighting process (either equal weights or not) is based on the researcher's judgment.

The above table views different frameworks of QOL that have been used through history. The table shows repetition for Environmental, Economic and Social aspects. From year 1988 to 2005 the QOL frameworks have been more detailed than before. It starts to presents the aspects in new forms that manly considered the human as an important aspect. While since 2005 the theorists have disagreed in the form of QOL framework, some theorists have returned to view environmental, Social, Economic aspects as the most important aspects in life in order to improve the human life quality. While others continued the pass of 19th century theorists and start to describe the aspects as much as they can, to prevent conflict and overlapping of information.

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TABLE I
THE PARAMETERS OR FACTORS THAT AFFECT THE QUALITY OF LIFE (QOL)
SOURCE: THIS TABLE HAS BEEN ADAPTED FROM QOL ASPECTS IN
LITERATURE

| Source | Aspects |
|----------|--|
| [2] | (1)Economic, (2)Political, (3)Environmental, (4)Social and (5) health & educational. |
| [3] | (1)Climate, (2)Housing, (3)Health care & environment, (4)Crime, (5)Transportation, (6)Education, (7)Arts, (8)Recreation, (9)Economics |
| [4], [5] | (1)Precipitation, (2)humidity, (3)heating degree days, (4)cooling degree days, (5)wind speed, (6)sunshine, (7)coast, (8)violent crime, (9)teacher pupil ratio, (10)visibility, (11)total suspended particulates, (12)NPDES effluent discharges, (13) landfill waste, (14)superfund sites, (15)treatment, storage and disposal sites, (16)central city. |
| [6] | (1)Public safety, (2)food cost, (3)living space, (4)housing standard, (5)communication, (6)education, (7)public health, (8)peace and quiet, (9)traffic flow, (10)clean air |
| [7] | (1)Quality of physical environment, (2)Quality of social environment, (3)Quality of economic environment, (4)Quality of transportation & communication. |
| [8] | (1)Transportation factor, (2)Noise in the urban space, (3)Air pollution in the urban space, (4)built density, open space and environmental quality in residential neighborhoods, (5)Environmental evaluation system for buildings and spaces, (6)Esthetics and the environment, (7)Public participation and the urban environment. |
| [9] | (1) Environmental, (2) Economic, (3) Social. |

Both objective and subjective indicators are used as measures of the QOL. Objective measures have the advantage of not being subject to observer error, but they are insensitive to the feelings of the subject [10]. These measures have been expressed regarding the reliability of some measures, for example: crime rates, housing density and income [11].

Subjective parameters, such as job satisfaction, happiness, utility, welfare for individuals or group and perceptions of health and morale involve subjects being asked to make judgments about their lives; this is the strength of subjective measures. As reference [12] has stated, "people's perceptions, however uninformed they may be, are real and people act on the basis of them".

In this research, reference [13] framework of the QOL has been adopted because it is the most suitable framework to this research, it considers the human needs and well-being as the most important contributors in human QOL and that is the one of the objectives of this research. Reference [13] defined QOL as measuring human needs with subjective well-being. QOL is proposed as a multi-scale, multi-dimensional concept that contains interacting objective and subjective elements. They relate QOL to the opportunities that are provided to meet human needs in the forms of built, human, social and natural capital as shown in fig. 1.

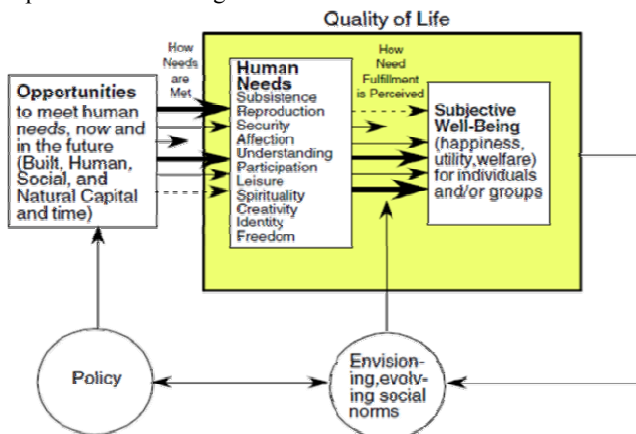


Fig. 1 Quality of Life (QOL) as the interaction of human needs and the subjective perception of their fulfillment, as mediated by the opportunities available to meet the needs [13]

The adapted framework of reference [13] defined QOL as 'objective human needs in relation to personal or group perceptions of subjective well-being'. It can be measured in terms of 'human needs' and 'subjective well-being'.

Since reference [13] were studying the relation between QOL and opportunity, which is out of the scope of this research, an adaptation has been made where only the framework of QOL has been used as shown in fig. 2.

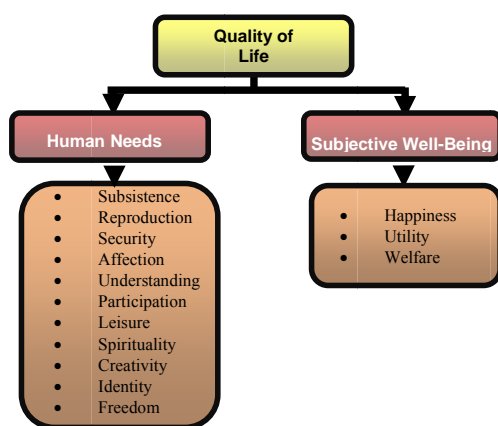


Fig. 2 The adapted model for studying Quality of Life (QOL)

B. Elements of Parks

In this study, the parks design is not the primary scope, we use the elements of parks to measure the relations between parks and the QOL elements of parks are discussed in detail in [14], [15], [16], [17], [18], [19], [20], [21], [22] and others.

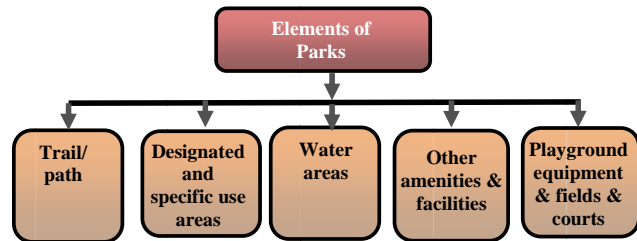


Fig. 3 Elements of parks [20]

The framework of the elements of parks (shown in fig. 3) used in this study. It was adapted from reference [20] framework, which has divided the elements of parks into five categories as follows:

1. Trail/Path

Trails, path, or footpath networks are important elements in the landscape, allowing people to enjoy the landscape, whether this landscape was a natural one such as mountains, forests, coastal or inland waterways or artificial such as parks and farms. Landscapes can be destroyed by poorly constructed paths, while well designed pathways and trails can add a great value to the landscape and allow people to experience it [14], [16].

2. Designated and Specific Use Areas

These areas include: open space, meadow, wooded area, picnic area, camping site, shelter/pavilion/gazebo, entertainment venue/stage, area surrounding park, wildlife or pet area and parking lot.

Public parks and open spaces helped people to transform from passive spectators to active participants. Specific use areas such as parks have a major role in accomplishing three main objectives: provide health, pleasure, art, and a powerful influence to the city.

Urban green spaces and specific use areas, especially in parks increase the quality of life by presenting several recreational experiences. Benefits and performances of green spaces are measured by the user's level of satisfaction [17], [22].

3. Water Areas

Water features in parks includes lakes, ponds, and fountains, fishing area, stream/creek, wetland, reflective pools and waterfall.

Water provides visual enjoyment, improves the micro-climate, creates focal points, irrigation reservoirs and native habitats and creates recreational opportunities [15], [21].

4. Other Amenities and Facilities

Site amenities and facilities have a positive effect on the performance of the site; they include benches, trash receptacles, tables, vending machines, flag poles, telephone booths, bus shelters, kiosks, mail boxes, sculptures, walls, fences, monuments, memorials, gazebos, drinking fountains, bike racks and picnic shelters.

Arts and sculptures play a prominent role in landscape architecture of public spaces and their usual job is the representation of different expressions of a cultural relationship between man and site as well as man and nature [20].

5. Playground Equipment and Fields and Courts

Playgrounds, fields and courts include: play-set, imaginary play structure, ground surface, things to swing/hang from, things to climb on/up/through, things to stand or walk on, swings and things to slide down, etc.

They are to get people out from behind glass and walls. They provide a place where children are able to play in shaded, bigger and safe places. Playgrounds, fields and courts help neighbors in knowing each other, coming together, creating relationships and building a sense of community [19].

II. PROCEDURE

A. Study Area

Al-Azhar Park has been chosen to be the study area of this research according to some criteria and these criteria were as the following:

Has been constructed in the last 10 years to serve the quality of life of this generation and to fill their needs. The park is located in a low income area in order to study the effect of this park on the residents' QOL. The park serves different economic levels.

Al-Azhar Park is one of the largest parks in Egypt. It is one of the largest parks in Cairo and it is surrounded by several historical places as shown in fig. 4. The aim of the designers of Al-Azhar Park was to revitalise this heritage in a manner which makes it a stimulus for social and economic development.

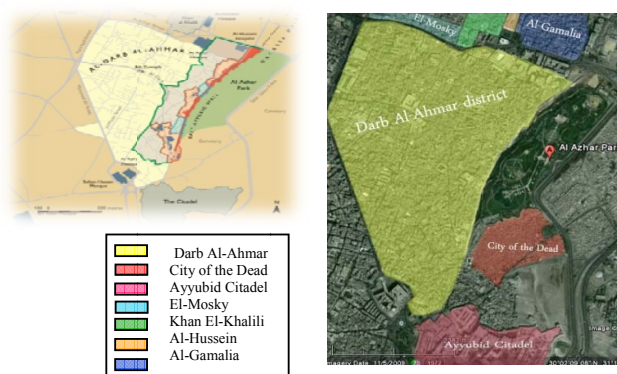


Fig. 4 The setting of the Al-Azhar Park in relation to the surrounding districts

Al-Azhar Park is located in Darb Al-Ahmar district in the core of Fatimid Cairo which was established in the 10th century AD. It is surrounded by the most significant historic districts of Islamic Cairo as shown in fig. 4. From the north, it is surrounded by significant historic districts of Islamic Cairo as Al-Hussein, El-Mosky, Khan El-Khalili, El-Darasa and Al-Gamalia. To the east, are the Mamluk "City of the Dead", Salah Salem Street (one of the main streets of Cairo), and Manshiyat Naser district. To the south, there are the Sultan Hassan Mosque and its surroundings, as well as the Ayyubid Citadel. Finally, to the west there is the Fatimid city and its extension to Bab El-Wazeer and Darb Al-Ahmar district with their wealth of mosques, madrasas and mausolea.

The coordinates of Al-Azhar Park are 30°2'27"N and 31°15'53"E. The total area of the Al-Azhar Park is 30 hectare (74 acre) [23].

The district of Darb Al-Ahmar is well known as an impoverished residential/commercial district. On the other hand, it features one of the richest concentrations of Islamic art and architecture in Cairo. The current urban character of the district is an organic tissue of narrow alleys, lined with shacks, strewn with garbage, and prowled by drug dealers. Darb Al-Ahmar was until recently one of this city's most disreputable slums with about 30 square centimeters of green space per resident [9].

B. Components of Al-Azhar Park

The Park is held together by a formal axis or spine which is tied together along its entire length with a water channel providing an additional and traditional theme from Islamic gardens. Water fountains and pools are dispersed and lead ultimately to the most free form of the lake in the south meadow. Gardens and pavilions in the classical Islamic tradition, surrounded by geometrically planted orchards which enhance the arrival point on the edge of a lake. The central pathway accompany's alleyways and series of formal gardens and anchored at each end by the hilltop restaurant and lakeside cafe, which act as internal landmarks. A network of informal pathways surrounds the more formal areas and leads through all levels and corners of the site [24]. All these components of the park are shown in fig. 5.

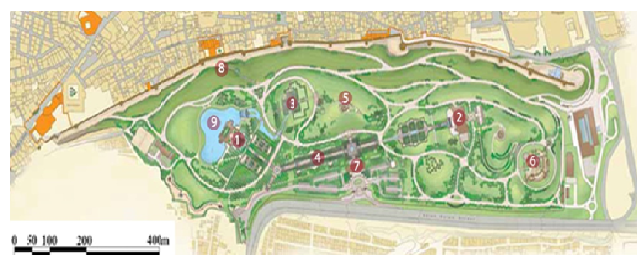


Fig. 5 Master Plan of the Al-Azhar Park and its components [23]

1. Lakeside Cafe
2. Hilltop Restaurant
3. Ayyubid Cafe
4. Royal Palm Promenade
5. The Mountain and telescope
6. Children's Play Area
7. Park Entrance
8. Ayyubid Historical Wall
9. Lake

C. Procedures

The survey was conducted between September and November 2012. Part of the survey was made inside Al-Azhar Park while the other part was done in Darb Al-Ahmar district. A total of 415 participants were voluntary willing to participate in the survey. 315 participants participated through the survey in Al-Azhar Park while 100 participants participated during the survey in Darb Al-Ahmar district.

The distribution of the participant's social and demographic characteristics, such as gender, age, marital status and education level are shown in Table II.

TABLE II
SOCIAL AND DEMOGRAPHIC CHARACTERISTICS OF PARTICIPANTS IN THE STUDY

| GENDER | | AGE | | EDUCATION | |
|--------|------------|----------|------------|---------------------|------------|
| Type | Percentage | Range | Percentage | Education level | Percentage |
| Male | 53% | Below 20 | 12.12% | Uneducated | 36.36% |
| Female | 47% | 20-29 | 27.27% | Basic | 30.30% |
| | | 30-39 | 12.12% | Secondary | 3.030% |
| | | 40-49 | 15.16% | Technical Education | 12.13% |
| | | Above 50 | 33.33% | Higher Education | 18.18% |

People were approached in the park and were informed about the survey's objective and the procedures to answer the questions. Those willing to participate voluntarily were given the questions and were invited to fill it in during their stay in the area, so that the answers would reflect their immediate experiences. Each question was described to them before starting to answer the question in order to guarantee that they understood each question. The questionnaire were distributed on both weekdays and weekends, in different hours of the day and in different parts of the parks relevant to the parts that fit the elements of parks.

Statistical software SPSS 17.0 was used to conduct statistical analysis on each data subset to extract the major factors of the corresponding scale by employing the Mean value, standard deviation and the ANOVA table. After that, all the data were statistically analyzed using SPSS program in order to measure the effect of elements of parks on the 'quality of life' in terms of 'human needs' and 'subjective well-being'.

III. RESULTS

The questionnaire was a self-report which measures behaviours, background information and psychological trails concerning their life satisfaction toward public parks. The data of all 415 participants was used in the analysis. The whole data set was divided into 65 data subsets, corresponding to 65 variables that have been occurred from observing the relation between each elements of the park with the aspects of quality of life.

Statistical software SPSS 17 was used in one-way analysis of variance (One-Way ANOVA), Standard Deviation and the

Mean value to be tested on the collected data. The following Tables and charts summarize the results of this test.

The following charts revealed the relation between each element of the park concerning all the QOL aspects. In order to understand the significance of the elements on the QOL aspects it was decided to choose the aspect that the participants have stated it more than 5 to be the highest satisfaction aspects which satisfy park visitors the. The total number of responses was 7 and 4 is the moderate response, so 5 responses were chosen which was more than the moderate to prove that this aspect satisfied the park visitors in this specific places. 4 to 4.9 were chosen to be the moderate value, while less than 4 responses were the lowest satisfaction aspects which satisfied the visitors. In the figures below the significant aspects are above the thick blue line, while the non-significant aspects are below the thin blue line.

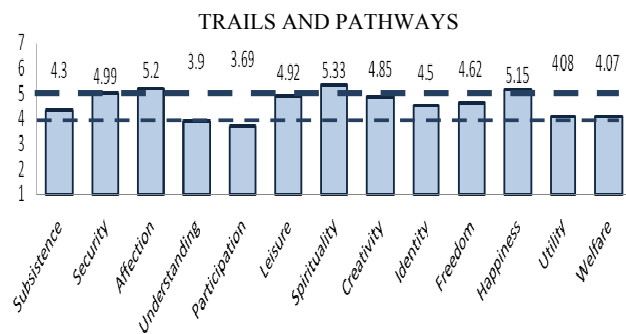


Fig. 6 The mean value of trails and pathways on QOL aspects

- Above 5 :High satisfaction
- Between 5 & 4 :Moderate satisfaction
- Below 4 :Low satisfaction

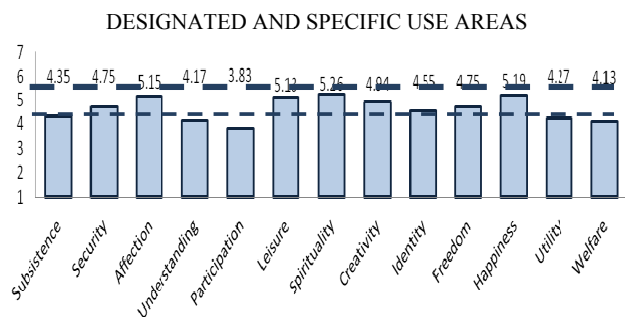


Fig. 7 The mean value of designated and specific use areas on QOL aspects

- Above 5 :High satisfaction
- Between 5 & 4 :Moderate satisfaction
- Below 4 :Low satisfaction

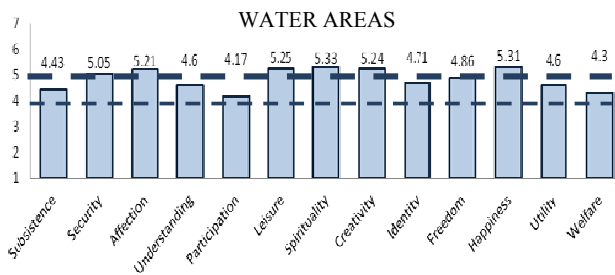


Fig. 8 The mean value of water areas on QOL aspects

- Above 5 :High satisfaction
- Between 5 & 4 :Moderate satisfaction
- Below 4 :Low satisfaction

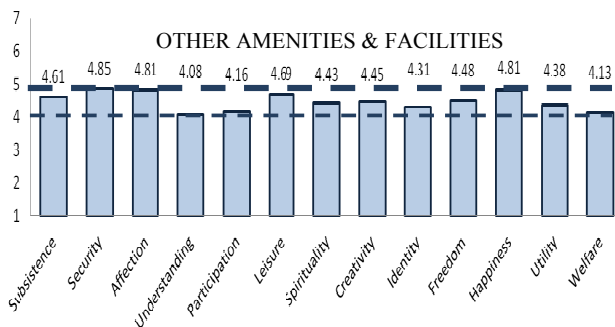


Fig. 9 The mean value of other amenities & facilities on QOL aspects

- Above 5 :High satisfaction
- Between 5 & 4 :Moderate satisfaction
- Below 4 :Low satisfaction

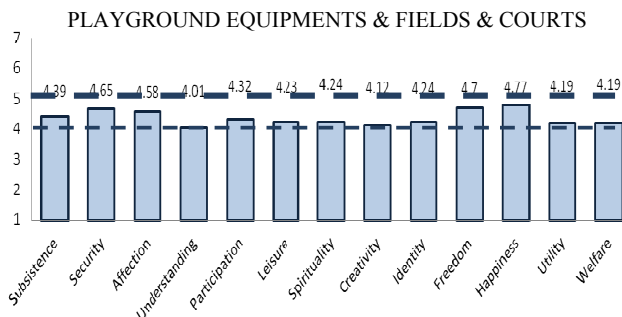


Fig. 10 The mean value of playground equipments & fields & courts on QOL aspects

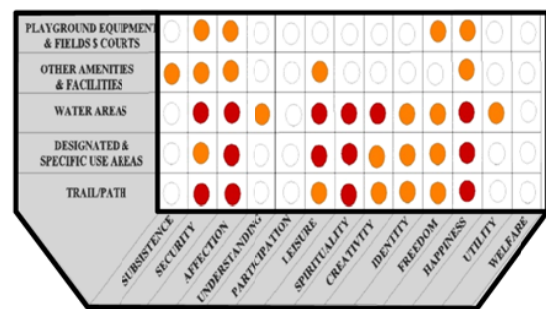
- Above 5 :High satisfaction
- Between 5 & 4 :Moderate satisfaction
- Below 4 :Low satisfaction

The results of the mean value revealed that the water areas were the places which satisfying most numbers of QOL aspects of the visitors. The second places were the open green spaces and trials/ pathways which are surrounded by green views and green spaces as shown in above figures.

IV. DISCUSSION & CONCLUSION

The findings revealed that the water areas are the place that satisfy most numbers of QOL aspects of the park visitors. The second places are the open green spaces and trials/pathways which are surrounded by green views and green spaces. This may indicate that architects, landscape architects and urban planners should make more water areas and design more open spaces in Egyptian urban districts in order to satisfy the public needs and to improve their quality of life. Water plays an important role in human settlements and it is a basic need for human survival [25].

The findings of this research revealed that most landscape elements of the park have contributed significantly to human needs and subjective well-being (SWB). This finding was presented on several figures as is shown. These figures represent the effect of the elements of Al-Azhar Park which represent different places in Al-Azhar Park on each QOL aspect. Since that the total answers value is 7 and 1 is the lowest value while 4 is the moderate one, it was decided to take the value of 5 or more as a significant value and a range between 4.5 to 5 to be the moderate significant value in order to make sure that the aspect is really valid.



● Strong relation ● Moderate relation ○ Weak relation

Fig. 11 Effect of Elements of parks on QOL aspects as found in Al-Azhar Park through the survey analysis

From fig. 11 it was noticed that Al-Azhar Park does not satisfy all the visitor's basic needs that were stated in QOL framework such as Participation and welfare but it satisfies their needs for the rest of QOL aspects but with different level of satisfaction as shown.

Analysis of the results showed that most park elements may contribute to human needs and SWB. It also revealed that the elements of parks have a significant effect in satisfying the QOL aspects especially the need of 'Happiness' and 'Affection'.

The case study survey shows that people enjoy visiting Al-Azhar Park and that is why the level of happiness is very high in all the elements of parks which represent different places in Al-Azhar Park. On the other hand, visitors do not feel that there is a relation to welfare and they don't feel that there are a lot of places or activities which helps them to participate in or to help them to be introduced to new people except in the

'Playgrounds Equipments & Fields & Courts' which represent the children's area in the park. Some people see that the water areas such as the fountains and the lake provide an opportunity to learn new things.

The substantive conclusion of this study is that respondent's perception, on average, of QOL of their district was enhanced due to the advent of Al-Azhar Park. This project provides a high opportunity for finding satisfactory jobs, adequate infrastructure and municipal services; and increase commercial values which contribute to their income (interview with Al-Azhar park manager). Thus, the city planners and municipal authorities should place the most emphasis on such projects in similar areas.

This finding is consistent with the research hypothesis. Of course, some of the QOL aspects cannot easily be manipulated, but this study indicates the priorities to allocate resources to improve the QOL in similar districts of the old core of Cairo.

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