Assessing Park Qualities of Public Parks in Cairo, Egypt

Abstract

Purpose: This article presents an evaluation tool that is designed to assess 12 spatial and managerial qualities of public parks. The tool is applied in evaluating public parks in Cairo to reveal common management practice issues.

Design/Methodology/Approach: Features and factors of the qualities were defined and evaluated. The tool was then tested by conducting an evaluation of 48 public parks in Cairo and consulting local experts regarding the assessment criteria. Both contributed to enhancing the tool, making it more comprehensive and contextualised to Cairo.

Findings: Application of the tool confirms that it has the capacity to provide a comprehensive evaluation of a variety of features and can detect key differences between evaluated parks. Analysis highlights that parks in Cairo are not maintained at optimum level, and many exhibit serious deterioration that can have negative influences beyond the boundaries of the parks themselves. The majority of these parks also share problems of heavy commercialisation, wasted potentials, fragmentation and separation of uses.

Originality: The evaluation tool provides a new and alternative perspective for the evaluation of the built environment. It considers the relationships between the different factors of evaluation, rather than reducing them to simple checklists. Managers and other practitioners can use the tool to evaluate existing parks or when designing proposals to achieve better standards in their qualities.

Keywords:

Quality, Evaluation, The public park system, Cairo public parks, Management, Operation

1. Introduction

Public parks are important resources for cities as they can have many positive short-term and long-term impacts on the lives of residents. In addition to providing places for recreation, exploration, contact with nature and socialising, public parks can also provide a range of other cultural, environmental and economic benefits. They are created using both physical and natural elements that are configured and maintained to achieve certain desirable *Park Qualities.* Park Qualities refer to 12 spatial and managerial characteristics that are translated into further benefits and positive impacts (Aly and Dimitrijevic, 2021).

For residents of Cairo, most of these positive influences are not realised. Many residents do

not have access to public parks in the districts where they live as the city has an unequal distribution of very low quantity green spaces that are mostly small in area (Aly and Dimitrijevic, 2022). In addition, the poor standard of qualities in the existing parks undermines the realisation of their potential benefits and positive impacts. This research used the 12 park qualities as the basis for the design of an evaluation tool to be used to assess public parks in Cairo. The 12 qualities were operationalised into sets of evaluation factors, as explained in the methods section below. The tool helped to determine common problems in Cairo parks and relate them to management practice.

2. Methods

This section explains the process of design of the evaluation tool and provides an outline of the public parks included within the research scope. A total of 48 public parks in Cairo were examined using site observations to determine the parks condition and identify common issues. Parks were visited between December 2020 and March 2021. Observation is a qualitative data collection method that should be carried out systematically (Creswell and Creswell, 2013). Systematic observations were achieved by using the designed tool to record evaluations for predetermined factors in each of the observed parks. Site observations also contributed to the adjustment and improvement of the evaluation tool, for instance, adding clutter to cleanliness evaluation factors after noticing its effect in the parks.

The evaluation tool was designed to quantify the qualitative observations made so that an efficient comparison could be made between parks. Utilising the tool, scores were allocated for each observed evaluation factor. The use of a standardised scoring system allowed for the use of descriptive statistics to analyse the condition of a park. The evaluation factors were determined deductively depending on the components of the public park system. Factors were also inductively selected as they emerged from the data collected during observations and consultations. The existing situation was documented by taking photographs of all elements and spaces in each park. This provided support and justification for the evaluation and for later referrals.

The use of the tool to observe and evaluate the parks formed part of the design and validation process. Observation using the tool highlighted a number of evaluation factors to be added and the need for modifications to be made in the structure. As a result, the tool became more accurate, comprehensive and better contextualised to parks in Cairo. A comparison of results between the observed parks served to highlight that the tool has the capacity to provide objective measurements, detect differences between park qualities and enable a comprehensive

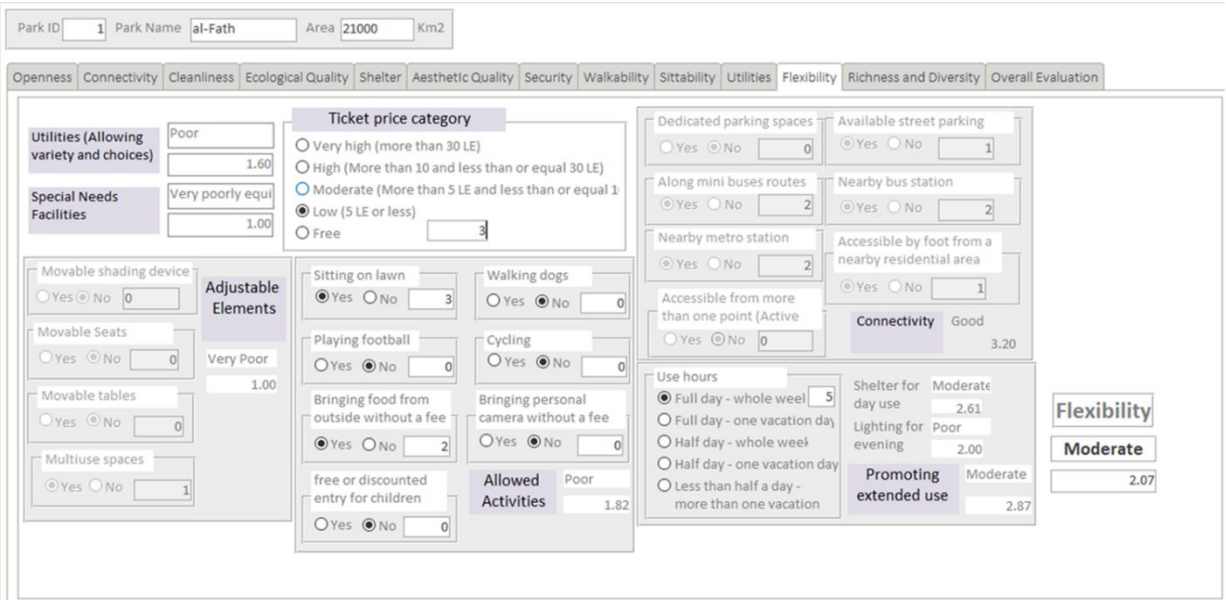

Figure 1 – Example of the forms used for data entry in Access

evaluation. Microsoft Access was used to create the forms that were used to record the evaluation for each park (Figure 1). Consultations with experts, practitioners and academics were used to validate the evaluation tool. Consultations were conducted with 6 management practitioners from Cairo parks: 1) al-Azhar Park (managed by the Agha Khan Trust for Culture (AKTC)), 2) Merryland Park (managed by Facilities), 3) two representatives from the Specialised Gardens Administrations (SGA), and 4) two representatives from the Distinctive Gardens Administration (DGA). In addition, two professors from the Urban Planning and Design Department at Ain Shams University, Cairo provided their feedback.

During consultations, each evaluation factor, and its degree of influence, was discussed in detail in order to reach agreement on its value. Whenever there was majority agreement, scores were modified. The consultees also made recommendations for modifications, suggested new points for consideration, arranged the qualities based on their degree of influence and provided their opinion about the usefulness of the tool.

2.1. Research Scope

This research focuses on public parks in Cairo City only, and it does not include parks in the new communities on its outskirts. However, initial analysis of a users' survey highlighted a public park in one of the new communities that was mentioned several times as being a park that participants liked to visit. As a result, the decision was taken to include the park in this study. In addition to being a popular park, it served as an example of a park managed with a market orientation which could not be investigated in the other selected parks as a result of their closure (al-Merryland) or demolition (al-Fardous).

A total of 48 public parks were visited and evaluated, of which 47 were in Cairo City and one was in New Cairo (Figure 2). The majority of the parks included in the study are managed by governmental bodies:

- A total of 17 parks are managed by Cairo Cleanliness and Beautification Agency (CCBA)
  - 16 of these are managed by the DGA; the DGA manage a category of parks called the Distinctive Gardens (DGs)
  - One park - al-Fustat Park - is managed by the Central Administration for Beautification (CAB)
- 25 parks are managed by the SGA; the SGA manage a category of parks called Specialised Gardens (SGs)
- 2 parks are managed by the Ministry of Agriculture (MA)
  - The Aquarium Grotto, which is under the management of the General Administration of Zoos and Aquariums (GAZA)
  - Al-Zohriya park, which is under the management of the Horticulture Research Institute (HRI)
- The Cultural Park for Children (CPC) is managed by the National Centre for Child Culture (NCCC)
- Family Park outside Cairo City is managed by the Ministry of Defence Hotels and Clubs Administration (MD HCA)

Two parks in the study are managed by international and community organisations. These included:

- Al-Azhar Park, which is managed by the AKTC, an international organisation
- The Child Centre of Civilization and Creativity (CCCC), which is managed by the Heliopolis Association (HA) - a local community organisation

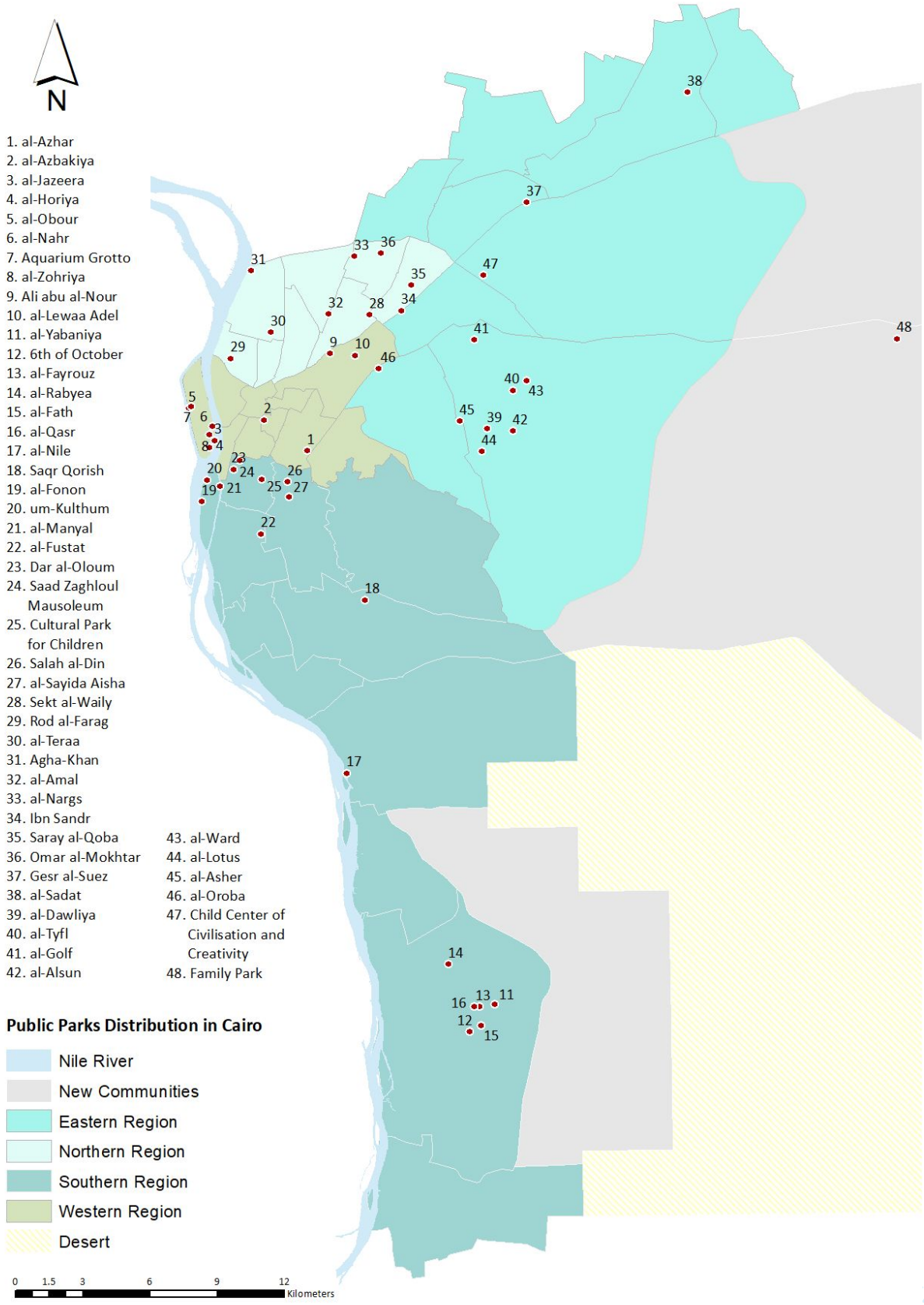

Figure 2 – Locations of the parks that were evaluated in Cairo, modified from Aly and Dimitrijevic (2022)

2.2. The Evaluation Tool

The design of the evaluation tool was based on the public park system outlined by Aly and Dimitrijevic (2021), which defined two complementary systems - natural and man-made - and identified the interrelations between all their components. The components of the public park system were synthesised from existing theoretical and empirical research in the field of ecology, landscape ecology, environmental psychology, urban design and landscape architecture (Aly and Dimitrijevic, 2021). In the public park system, park elements are configured to perform certain functions and processes, resulting in outputs in the form of 12 park qualities that have benefits and positive impacts on humans and the natural environment. Cairo parks were evaluated using these 12 qualities operationalised into detailed sets of evaluation factors. The 12 park qualities can be summarised as follows:

1. Openness: refers to the park's spaciousness. The degree of openness depends on the park area, the open views available, the effect of visual barriers, the level of structure domination and the crowding of activities inside the park
2. Connectivity: refers to the interlinkages between the internal areas of the park and external links that support accessibility, in addition to community ties
3. Cleanliness: refers to the level of upkeep which is related to tidiness, being clear of waste and other contaminations
4. Utilities: relates to the presence of services and functionality elements, and their condition
5. Ecological/landscape quality: this is an overarching quality that is determined by the performance of the park natural systems. It cannot be evaluated using only the tool in this study, which depends on observations. As such, the presence of natural elements and their observed health are evaluated and referred to as 'landscape quality'
6. Shelter: refers to the presence and condition of elements that protect from weather and host activities
7. Aesthetic quality: refers to the application of visual design principles, including variety in vegetation colours and composition, and factors that would undermine the aesthetics of any park regardless of visual attributes (such as cleanliness and the elements' condition)
8. Security: relates to the level of safety of the park that is achieved using formal and informal supervision, internal connectivity, and the presence of functional security utilities and lighting. This is also concerned with the degree of internal safety hazards

and threats from surroundings

9. Walkability: refers to how well the park can accommodate walking activity through the presence of utilities, their condition and the support of other qualities such as shelter and security
10. Sittability: refers to opportunities for sitting alone or in groups in the park and focuses on the availability of utilities to enable this, their condition and the support of other qualities such as openness and shelter
11. Flexibility: relates to the level of choice the park provides in accommodating a variety of users through diverse utilities, adjustable elements, lesser restrictions on desirable activities, affordability, and the promotion of extended use
12. Richness and Diversity: determined by the influence of openness, landscape quality, aesthetic quality, utilities and flexibility and relates to the features of uniqueness that give a park its character

A key concern that informed the design of the evaluation tool was to avoid the creation of checklists with individual evaluation factors that did not relate to each other. As such, the tool was designed to consider park elements (e.g. vegetation and flooring), the configuration functions (e.g. space and directionality definition) and operation functions (e.g. cleaning, maintenance and managing activities) required for each park quality, in addition to including the influence of the park qualities on each other. All qualities are complementary and important for the overall experience in a park. However, their degree of influence varies. Some qualities do not only influence a park individually, but they can also affect several other qualities which make any change in their value more crucial. Figure 3 illustrates the qualities' influence on each other, and highlights that 'utilities' is the quality with the highest effect on the other qualities. Utilities and other qualities like openness, shelter, landscape quality and security, support the realisation of walkability and sittability.

During the consultation interviews, the six park managers agreed that all 12 qualities were important for a park, and that some qualities were more influential than others. One of the managers commented that the qualities provide "a complete picture, nothing is unimportant; if you fulfil everything and there is no security or cleanliness, for example, then the park will not be well used". Another one commented that "there are some qualities that are essential for a park regardless of its characteristics, and it will not function without them. The importance of others will depend on the park's characteristics and the goals of its management".

In general, park managers mentioned utilities, cleanliness (both are the qualities with the

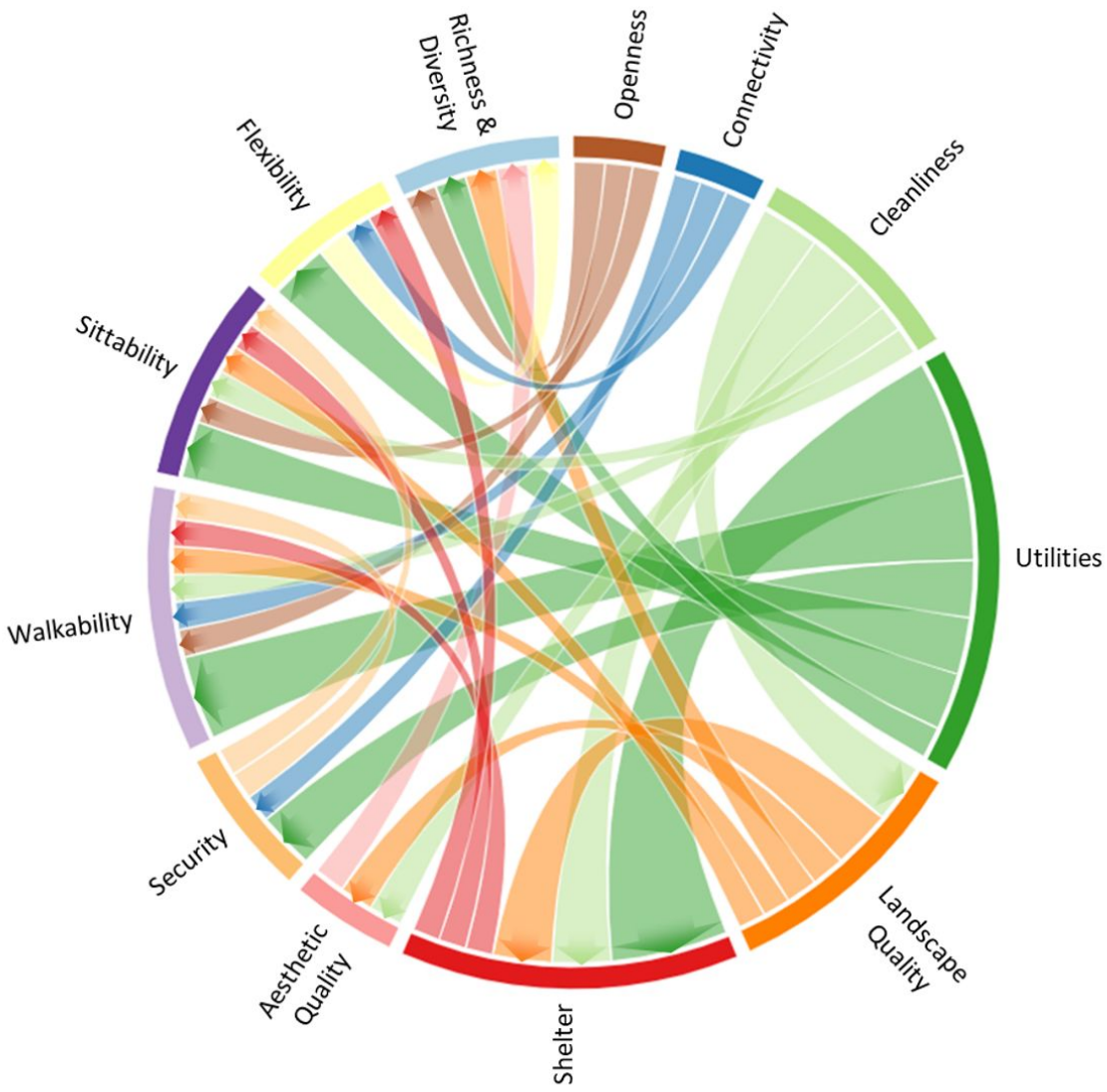

Figure 3 - Qualities mutual influences

highest influence on other qualities), security and connectivity as being the qualities with the highest influence on a park. Despite security directly affecting only two other qualities; walkability and sittability, low security can completely diminish the use of any park - regardless of the level of any of its other qualities. Connectivity can also be highly influential and affects three other qualities; walkability, security and flexibility.

The idea of the 'degree of influence' was considered when creating the evaluation tool by including some qualities as features or factors of evaluation for other qualities. In addition, varied scores were given for some evaluation factors to express their higher degree of influence. The weighing of each of the qualities to calculate the overall evaluation of each park is not needed because the weight of each quality is already considered in the calculations. However, it is possible to give connectivity and security a higher weight in the calculation of the overall evaluation to reflect their higher influence that is not expressed in their direct influence on other

qualities. It was decided not to further complicate the calculation at this stage of the tool development, so additional weighing in the final calculation was not used.

Table I shows an example of the calculations used to determine the value for each feature, the qualities and the overall evaluation of the park[1]. The number of features under each quality vary, as do the number of evaluation factors under some of the features. This results in different totals. A common range was required for all factors to allow for the calculation of averages, so a unified scale was selected to allow for a proper comparison. The value for each quality (quality X, Y, Z) was set on a scale between 0 and 4 (a range between -ve and +ve evaluation), This value is calculated as an average of its relevant features (feature XA, XB, XC). The features are either evaluated directly using a scale (feature XC) or they have a calculated average (features XA, XB) that results from several factors (features XA1, XA2', XA3).

Table I - The method used for calculating the numerical values of the evaluation

The previous table showed an example using 3 qualities. A total of 12 qualities were evaluated using the evaluation tool in this research. The observation and evaluation of public parks in Cairo helped to enhance the evaluation features and factors under each quality. The tool was created in phases: before, during and after completing the observations. Each stage resulted in some modifications in response to points observed in the parks or changes to make the evaluation more accurate. Modifications were made (1) after testing the output of applying the tool on some of Cairo parks, (2) after evaluating all the visited parks, and (3) after the consultations with experts.

The goal of creating this tool was to use it to evaluate public parks in Cairo and to identify their common issues. The easier identification of common issues supports park management agencies to identify both problems and potentials in the parks they manage, and it also provides clear evidence to support decision-making. The management team, a supervisory committee or an external evaluation committee can use the tool – either fully or partially – to evaluate public parks. Alternatively, they can adjust the evaluation tool by adding additional evaluation factors or altering the scores to make it more suitable for the parks they intend to evaluate. One important feature of the tool is that it evaluates a park in a way that considers the mutual influences of all its components, not only the specific evaluation factors proposed in this

[1] More explanation of how the evaluation factors for each quality are structured is provided in the appendix.

research. Designers and planners can use the tool to assess their proposals for the design of new public parks, and it can also be used for planning for potential improvements to existing parks. The complex task of evaluating a public park can be made easy to conduct using a tool that is simple to administer, yet provide a detailed and comprehensive assessment.

3. Results

The research examined 48 parks in Cairo, all of which were visited and evaluated. Presenting detailed results of site visits and evaluations was found to be impractical within the limitations of this article. To facilitate an examination of the evaluation results, collected data were grouped according to park size. This allowed for a comparison of parks with broadly similar features. Under each area category, an average was calculated for parks that were managed by the same administration[2]. The following section details one example of the evaluation that covers one of the area categories. Afterwards, a summary of the overall results for the 48 parks is provided, grouped by the administrations responsible for their management.

3.1. Public Parks with Areas of more than 145,000 m²

In this area category, five parks are evaluated and compared. These parks include al-Azhar Park, Family Park, al-Fustat Park, al-Dawliya and 6th of October Parks (managed by the SGA) that were compared together as an average value with other individual parks, and shown separately (Figure 4 and Figure 5). Al-Dawliya and 6th of October parks, despite being managed by the same administration, provide an example of management on opposite sides of attention and neglect. Al-Dawliya was the first park the SGA were responsible for managing, and their administrative offices are sited in that park. The park has a large area that allows them to keep adding new activities and, as a result, it is one of the most visited SGs. The high number of visitors, and the number of activities in the park, attracts significant revenue to the administration. Accordingly, the SGA considers al-Dawliya Park to be one of the most important parks that they manage.

Figure 4 highlights the substantial gap between al-Azhar Park and Family Park, and other parks under governmental management, especially in relation to the qualities that are most influenced by the condition of the parks' elements. However, al-Dawliya and al-Fustat Parks are kept in acceptable condition despite some noticeable maintenance problems, while 6th of

[2] Tables of the detailed evaluation of the 48 public parks can be provided by the authors upon request

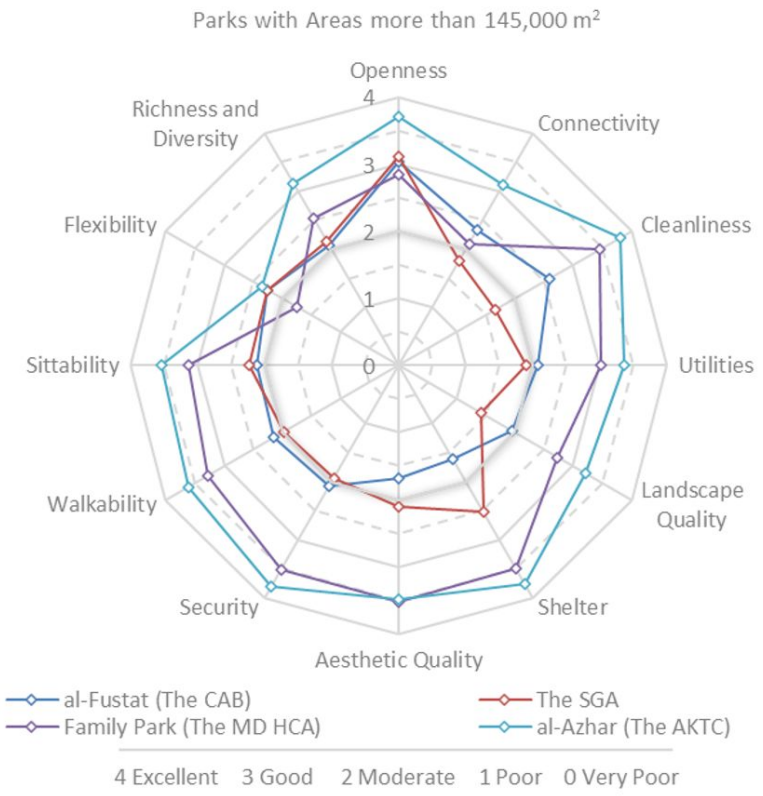

Figure 4 - Evaluation of parks with areas more than 145,000 m²

October Park exhibits serious deterioration. Both al-Dawliya and 6th of October parks have major problems with all of their water features.

Moreover, the SGA has continued to offer areas inside al-Dawliya park to investors to create new structures for activities inside the park. This has been common practice in Cairo parks and with other governmental administrations too, and it could result in an increase in the variety of activities. However, it may also raise other issues. Al-Dawliya park was originally designed to be divided into different zones and each of them was intended to have a landscape theme from a different country. Although the park still mostly keeps that theme, new structures have not been designed with the themes in mind, or to make use of that special character. Some of the themed zones have receded in the background as a result of the new structures, while others have been kept in better condition, and especially those that have had recent contributions for renovations made from the embassies of their respective countries.

On the other hand, 6th of October Park has many wasted potentials and is completely neglected. The park is known as 'Tokyo Park' because it has areas that were designed and built by Tokyo Municipality (Cairo Governorate, 2008). The Asian features and vegetation, in addition to the artificial lake and the park's extended area, can make it a destination with a unique character. Nevertheless, it was noted that all these potentials are unutilised, and it is in very poor condition. The park received an overall evaluation value of 1.61, mainly because of

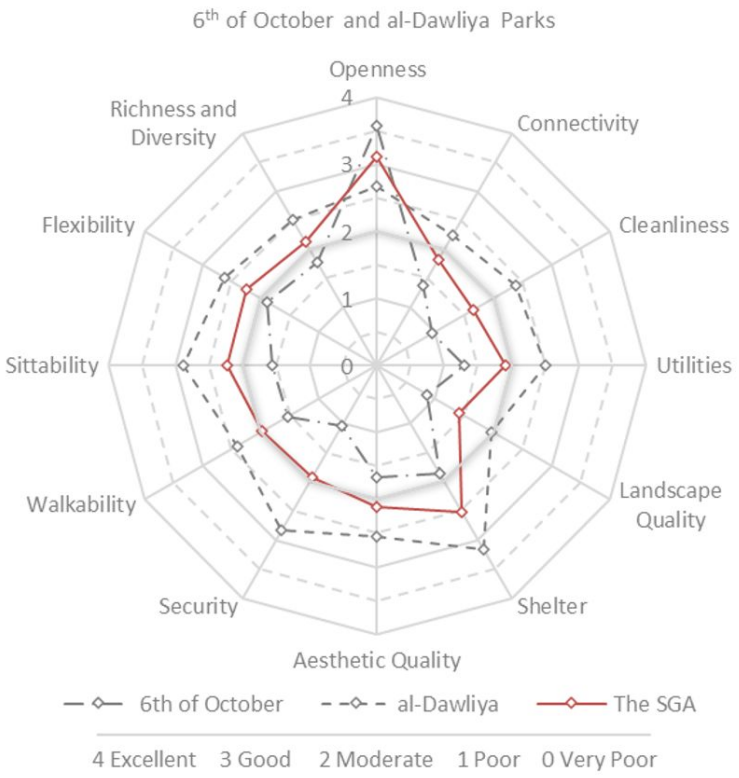

Figure 5 - Evaluation of al-Dawliya and 6th of October Parks

the deterioration of its elements and not because of its design features. The SGA has complained that some residents from the surrounding neighbourhood cause problems, especially those related to the theft of several elements from the park (The SGA personal communication, 2021). However, rather than attempting to extend ties with the community and work with residents, the SGA started to neglect the park as their limited resources have been directed to parks that generate more revenue.

The multiple buildings and crowding of activities in al-Dawliya's Park only affected its openness score slightly. This was as a result of its vast area and the different levels inside the park. However, the effects of crowding did decrease the openness of the park to a level lower than all other parks under this area category, and it was close to al-Fustat and Family Parks which also have multiple buildings and activities. Moreover, all these activities require additional spending from the users. For example, at al-Dawliya Park the fee for the use of the children's playground is 20 Egyptian Pounds, and parents must pay for a ticket if they want to accompany their children. On the other hand, the children's playground at al-Fustat has a cheaper ticket (5 Egyptian Pounds), and the playground is free to use at both al-Azhar Park and Family Park.

Family Park, despite having a free children's playground, has the most expensive entry ticket and the highest cost for services and activities. It charges visitors an entry fee with their

own food and drinks or if they bring in food deliveries. In addition to its high cost of use, the park is not externally well-connected and so its flexibility to accommodate different user groups is significantly reduced. The management practice of the SGs and al-Fustat is different in that respect; their entrance ticket and cost of services and activities are lower, and they do not charge visitors to bring food into the park from the outside.

In al-Azhar Park, despite a high price entrance ticket, the children's playground is free, and it offers other free children's activities. There is a variety in the price ranges of the food and drinks the park offers, and visitors are permitted to bring their own food without a fee. Al-Azhar Park has the strongest community ties to its surrounding district, and its influence extends to the whole city.

3.2. Overall evaluation

The earlier part outlined the evaluation of 5 of the observed parks in Cairo. The evaluation found that parks under governmental management, except Family Park, are in less good condition (Table II and Figure 6). The SGA manages the highest number of public parks under one administration in Cairo; 25 out of the 48 that were visited and evaluated. Unfortunately, around half of the parks they manage are in poor condition, while the DGA has only two out of 16 parks under their management that are in poor condition. Other governmentally managed parks are at a varied scale of moderate evaluation level. Family Park and the CCCC are at a moderate level but with values closer to the good evaluation. Al-Azhar Park is the only evaluated park in Cairo that is included in the 'good' category of the evaluation.

Table II - Comparison between the evaluation of public parks in Cairo

Data shows that the DGA keeps its parks in a more consistent condition than the SGA managed parks (Figure 6). The evaluation of qualities in DGs has a significantly lower range than the SGs. For example, the interquartile range for security at the SGs is 1.21, while for the DGs it is 0.47. Similarly, for the overall evaluation of the SGs, the interquartile range is 0.79 and the range is 1.59, while the interquartile range for the DGs is 0.18 and the range is 0.72. In contrast, the range for openness for SGs is higher than for DGs, as SGs have more variety in their areas and configuration (openness range for the SGs equals 3.24 and for the DGs it is 1.89) (Figure 6).

However, despite scoring lower for park condition, utilities and shelter evaluation in the upper 25% of the SGs is significantly higher than the DGs (Figure 6). The maximum value for

the SGs utilities evaluation is 2.91 and the lowest value for the top 25% is 2.17, while for DGs they are 2.35 and 2.11. The highest evaluation for shelter at the SGs is 3.39 and its upper quartile is 3.14, and at the DGs they are 3.18 and 2.88 respectively. For the overall evaluation, the top 25% of SGA parks are in a slightly better condition than the upper 25% of the DGs. 25% of the SGs have an evaluation higher than 2.48 and a maximum value of 2.84, while the upper 25% of the DGs vary between 2.45 and 2.70 (Figure 6).

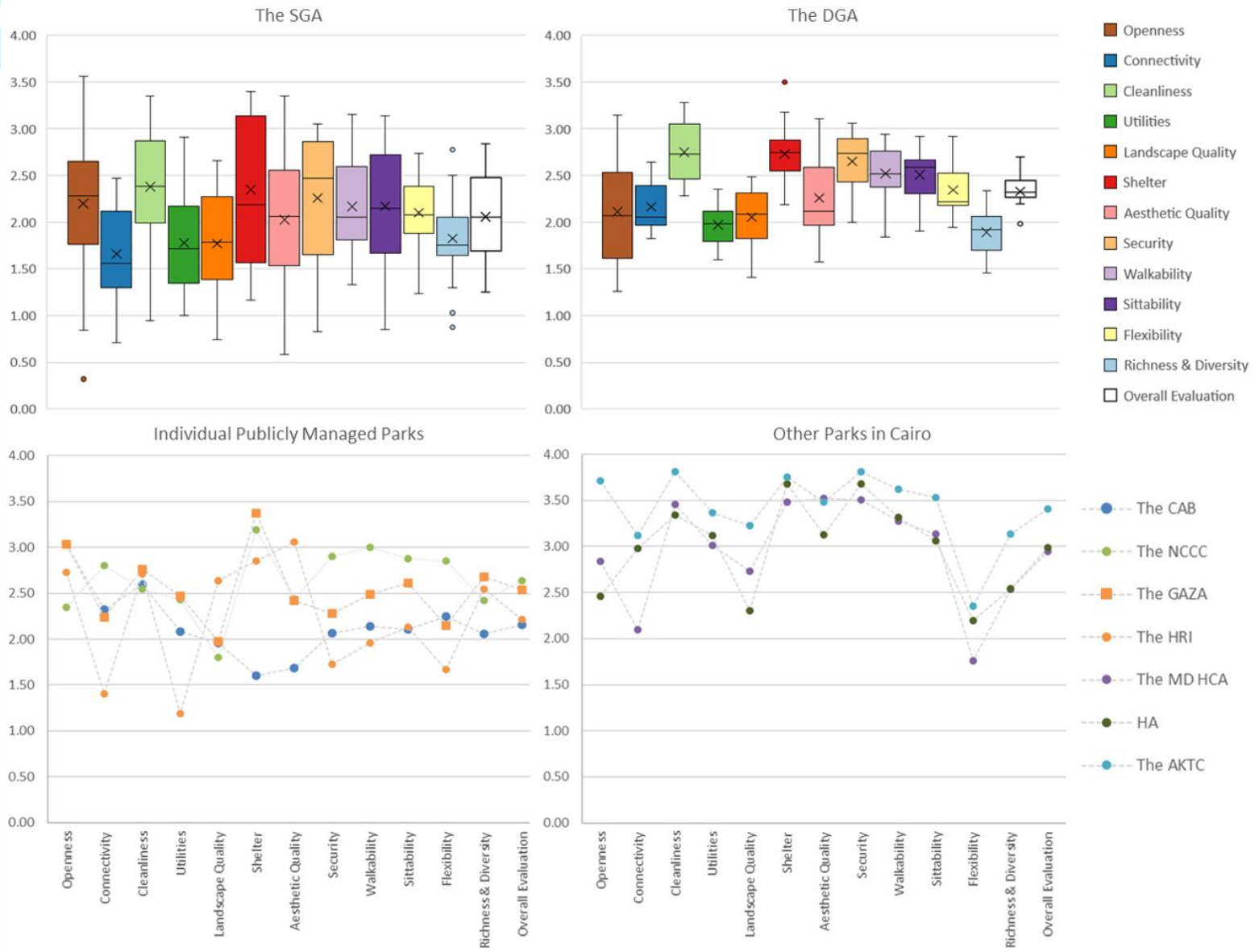

Figure 6 - Comparison between the evaluation of public parks in Cairo

4. Discussion: Common Themes in Cairo Public Parks

4.1. The decline in Cairo's public parks conditions

The parks evaluated in this study all have active management. Compared with other green space types that do not have assigned management, these parks are mostly kept in acceptable condition. However, the parks under governmental management are in a worse condition when compared to those managed by other management entities. Most of the elements in these parks have a degree of damage that, in most cases, does not hinder usage. However, it does reflect a negative image of the parks and their upkeep.

The operation practice in Cairo public parks has a clear reflection on their condition. The differences in the condition of elements in a park like al-Azhar that has regular, scheduled and preventative maintenance is noticeable when it is compared to other governmentally managed parks where maintenance is reactive, unscheduled and only a response to critical issues. The condition of elements also affects several qualities in a park. As such, the drop in utilities value for several parks also affects other qualities like walkability, sittability and flexibility. Deterioration in the condition of elements also affected the aesthetic quality of many parks.

In relation to grounds maintenance, no serious issues can be noticed in the health of vegetation in the majority of parks. This may result from the managers of the SGs, DGs and al-Fustat all being agriculture engineers. Grounds maintenance is the only operation function that is carried out on a regular basis. The SGs and CCBA nurseries meet the parks' needs in terms of replacing plants or adding seasonal ones. However, grounds maintenance, despite being regular, is still largely random and based on personal experience. There are no specific standards set, and water consumption is a major issue. Standards are required to guide the process, for example, in determining the most adaptive vegetation to use, how to group vegetation types with similar care needs, and how to reconsider the design of lawn areas and their mix with other groundcovers (Ahern, 2005; Beck, 2013; Lovell and Johnston, 2009; Makhzoumi, 2000).

In relation to park cleanliness, there are fewer problems at the DGs and al-Fustat when compared to other governmentally managed parks. The connection with CCBA helps as these parks have more regular trash clearing, while in other parks the piles of trash and other waste are noticeable. Water features problems are a common issue in all the parks that have them. They are all either dry, or stagnant and very unclean. Toilets in most of the governmentally

managed parks are very unclean, unhygienic and have many malfunctioning fixtures. Some of the toilets were found to have no water.

Clutter in public parks conveys an image of untidiness. In several parks in Cairo, traces of maintenance were more noticeable than the effect of the function itself. For example, it is common to see irrigation hoses extended inside the parks together with piles of construction waste or vegetation waste, tools and equipment all in noticeable locations. Installation of elements like bins, lighting posts, children's play equipment and seats are not carried out properly. This often means that they are surrounded by paint stains, or they are tilted, unstable or have bulky concrete at their base. These issues all contribute to giving the parks an unpleasant atmosphere and they indicate a management practice that is not well coordinated.

4.2. The Commodification of Cairo Public Parks and Their Wasted Potentials

Public parks in many countries are pushed towards becoming more self-sustaining and to generate revenue (Davidson, 2013; Smith, 2018). Parks are affected by overall changes in public services provision and the shift away from the state-centred model of management (Carmona *et al.*, 2008; Smith, 2018). However, the extent of the effect of commercialisation on public parks is argued to be lesser than for other public services, due to their nature and the view of them as being public goods. However, although parks have largely kept their public status, the effects of commodification are noticeably increasing. Revenues are created through the provision of concessions for activities inside parks, in addition to sponsorships and occasional ticketed events. However, parks largely remain publicly accessible and free except during the times of these ticketed events (Smith, 2018). In Cairo, this approach has taken an extreme form that has overtaken any other value that public parks could hold.

The urgency of creating more activities is a common practice between CCBA, the DGA and the SGA. Increasing the revenues from the parks is the top priority for these administrations. Green areas inside the parks are commonly offered to investors to build structures to accommodate their activities, even in parks with relatively small areas. Recently, the DGA handed over a whole park to a private investor (Figure 7). During the site visits, all DGs had advertisements at their gates to announce the auctioning of spaces within the parks for activities. These activities do not form part of the original park designs, and parks are not reconfigured to accommodate them. As a result, the additional structures and activities often result in a disruption of connectivity and a decrease in openness - especially in smaller parks.

Activities are important for public parks because they contribute to giving each park its

Figure 7 - Changes in Saray al-Qoba Park and a nearby plants nursery - Map data © 2022 Google – Photos by Diaa El-Shorbagy - the satellite images and photos show the replacement of green areas with other activities in a relatively small park, the 2022 images shows almost the complete removal of the park's vegetation

character and encourage people to visit (Carmona *et al.*, 2008). However, the decision on the appropriate type of activities requires careful examination. For instance, it is important to think about how suitable activities are for the particular parks where they are introduced, and it is important to decide if activities should be very similar in all the parks. In Cairo, activities tend to be repetitive even in parks with close proximity. This results in the parks losing their individual character and starting to look similar. In addition, the lack of variety reflects a lack of vision and coordination between the parks and the needs of their surrounding communities. In addition, green spaces start to recede into the background as the domination of these activities in the parks increases.

By focusing only on activities that provide financial gains, the administrations are ignoring several other potentials. Although many public parks in Cairo have a rich history, cultural significance and other elements that have the capacity to provide each of them with a unique

character, they are treated in a similar way and the governmental administrations do not try to utilise these potentials. Their management approach is very limited and based on previous practices which aim to generate revenue without considering other ideas that can enhance the parks and benefit users. Some of these parks are even in a very deteriorated condition, yet entry fees are required. Examples of these wasted potentials are parks like the Aquarium Grotto, al-Zohriya, al-Dawliya, 6th of October and many others. The uniqueness of each park should be utilised and highlighted to diversify what the parks could offer. For example, al-Zohriya Park and the Aquarium Grotto have opportunities for expressing identity, culture and education that should be the focus of their management approach.

4.3. Fragmentation and Separation of Uses

All public parks, and most other green space types in Cairo, are fenced. Fences and tickets are the key ways in which the administrations protect the parks' elements. These measures also serve to decrease the number of visitors, although they generate revenue and provide a level of control over users' behaviours inside the parks. In the context of Cairo, the presence of fences can be important for security. However, their design requires to be reconsidered in many parks to make best use of the positive aspects and to avoid any negative effects.

Fences around many parks in Cairo visually separate them from their surroundings and, as such, it becomes sometimes difficult to recognise the presence of a park in some locations. In addition, most public parks in Cairo only have one active gate, while a second gate may be available but closed as a result of not having enough security personnel to control an additional open gate. The quality of connectivity is affected by both fences and gates, and by the way in which the fences and gates are designed. Parks in Cairo are separated from surrounding activities which could otherwise be complementary. Uses that could be integrated within the parks, such as libraries, are isolated with fences as a result of being managed by a different governmental agency (Aly and Dimitrijevic, 2022).

Internal fragmentation between areas of a single park is common for several reasons. New structures that were not part of the original design are often added to parks and their location is selected without proper reconfiguration. They often cause interruptions in the parks' connectivity and separate their spaces. Several parks have closed areas that visitors are discouraged from using. Al-Jazeera Park, for example, has only a quarter of its area open for visitors. Similarly, al-Manyal, al-Fonon, um-Kulthum, and al-Fustat parks all have closed areas.

Park management close these areas to reduce the pressure of usage and the need for maintenance, as they do not have enough workers to cover these areas. Security is another concern that causes some areas inside the parks to be closed. It is often claimed that the closed parts are isolated and far from the main gates, so they do not have proper supervision or enough security personnel to cover them. Al-Fustat Park has a considerable extent of its area closed due to such security concerns. The closed areas represent more than half of the park's total area.

4.4. Extended Influences Beyond Park Qualities

The evaluation of public parks in Cairo in this study used 12 qualities that are part of the public park system. The public park system components extend to the influence of these qualities on human beings. Park qualities are further translated into the set of benefits and positive impacts (Aly and Dimitrijevic, 2021). The deterioration of many parks in Cairo, together with the keen focus on economic benefits, serve to weaken the potential for parks to offer other benefits and positive impacts. For example, poor cleanliness and poor condition of park elements, which affect qualities like walkability and sittability, have a negative impact on user comfort. Poor landscape quality and the continuous reduction of green areas inside parks, in favour of activities, can affect opportunities for users to benefit from having contact with nature. Disengagement from nature can have a negative long-term impact on people's health and wellbeing. People have the right to use and benefit from green spaces. However, low flexibility as a result of not accommodating all types of users undermines that right and decreases public accessibility to green spaces. Overall, the decline in park qualities affects the total shared experience that the parks offer, decreases social interactions and impacts engagement both inside and with the parks.

5. Conclusion

The criteria for evaluating any type of built environment are often reduced to sets of checklists that assess several components in isolation from one another. On the contrary, this research proposed an evaluation tool that considers the elements, configuration functions and operation functions required for different park qualities, and the influence of these qualities on each other. This evaluation tool could be developed further by the use of an extended study to collect additional expert and user opinions. Detailed surveys for each quality could be conducted individually to obtain better generalised values for the scores. The tool can also be applied by other researchers and managers to test the accuracy and precision of the results it

produces.

This tool was applied to evaluate several parks in Cairo, revealing a number of common issues among them. Cairo parks are managed as isolated islands without proper integration or coordination. The management approach used takes a very limited view of the potential value of each park. As a result, the parks are not well utilised and have many wasted potentials. On the level of day-to-day operation, the majority of Cairo parks were found to suffer from a degree of degradation. Public parks can provide many benefits and positive impacts for users. Their retreating role and degraded condition mean that these influences are not realised. For example, equal access to affordable recreation is not achieved in Cairo, and the dominance of consumerist types of leisure mean that opportunities for lower-income groups diminish even more.

Al-Azhar Park provided a clear example of how the management approach can result in significant variations in the values of all park qualities, demonstrating that a change is needed in how other parks in Cairo are managed. To begin with, a shift is required in how governmental administrations and other decision-makers perceive parks, as this view influences and guides their entire practice of park management and development. Common visions, strategies and goals are required for all the parks to realise their full potential. Instead of managing them separately, the parks need to be managed as a network that includes other green spaces and introduces better coordination and integration. Finally, the current operation does not keep the parks in good condition. A more sustainable operation will need action plans, regulations, standards and continuous evaluation to make necessary adjustments for moving forward. The tool provided in this research can be a starting point for park administrations to adapt and change according to an agreed set of goals and standards.

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Appendix

Each of the 12 park qualities is evaluated with a set of features. The features are highlighted with a common colour, for example, features for openness are highlighted in dark orange while those utilities are highlighted with a dark green colour (check no. 1 in Figure A). They are highlighted in this way to be able to easily recognise the qualities when they reappear as evaluation factors for other qualities.

At the top header of each table, a note is made about how many features are used to evaluate the quality (check no. 2 in Figure A). Whenever the features are consisting of further sub-features these sub-features are highlighted in light grey colour (check no. 3 in Figure A). Factors of evaluation are provided for each feature which is sometimes a direct scale of

evaluation between 0 to 4 or a set of yes/no questions that are further calculated to transform them to the same scale (check no. 4 in Figure A). The 0 to 4 scale generally represents a spectrum between a negative and positive evaluation. The last row after each feature indicates whether this feature has a calculated value from a set of factors or if it has a directly selected value from a scale (check no. 5 in Figure A).

In some cases, the calculation for the quality has several features and each feature is not only divided into sub-features but also the sub-features are further divided (check no. 6 in Figure A). For example, evaluating the condition of structures is evaluated using 6 sub evaluations, condition of structures is a sub-feature in evaluating structures which in return is a feature in evaluating utilities. This is repeated in the evaluation of the condition of many other elements.

To reduce the length of the tables, repetition was avoided as much as it was possible. For example, if two features have the same evaluation factors and they appear consecutively, the factors are not repeated, for example, in the cleanliness table, the evaluation of the Nile River cleanliness is similar to that of water features, and toilets cleanliness and other elements in a park (food venues, playgrounds, etc) are all evaluated similarly on a scale from very dirty to very clean, etc. Moreover, if the evaluation scale or factors are repeated for a different feature that appears later in the same table or another one, the scale of evaluation or the factors are not repeated as well. Common names can help in identifying these factors, for example, the percentage of broken elements or material appearance (check no. 7 in Figure A).

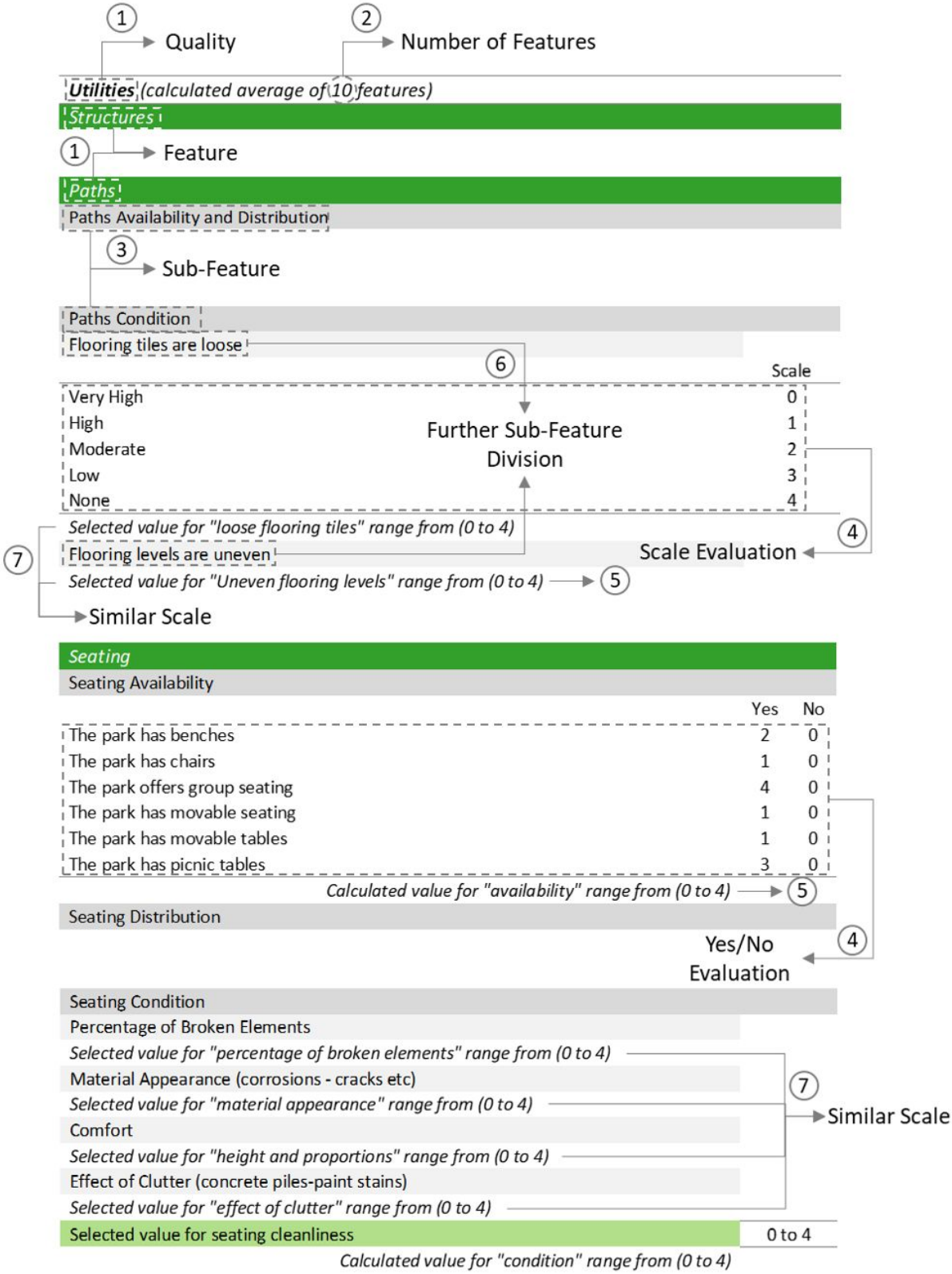
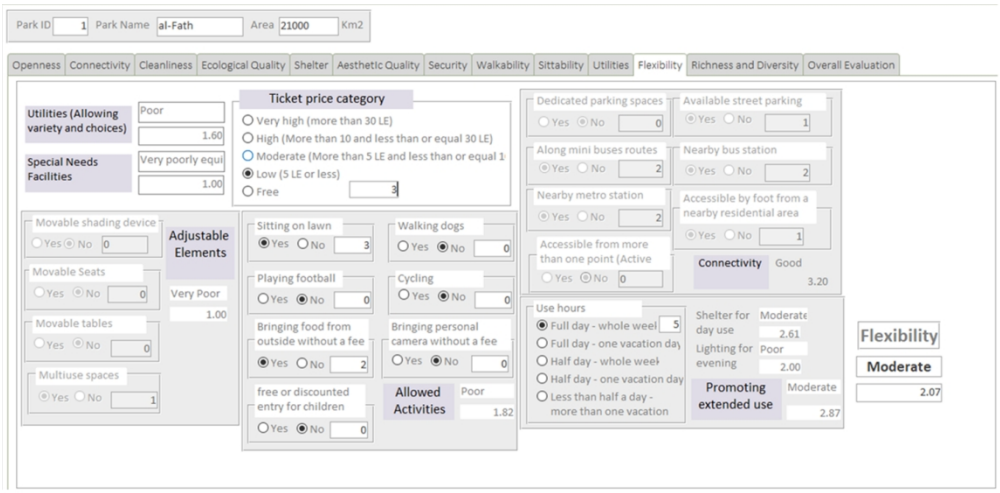
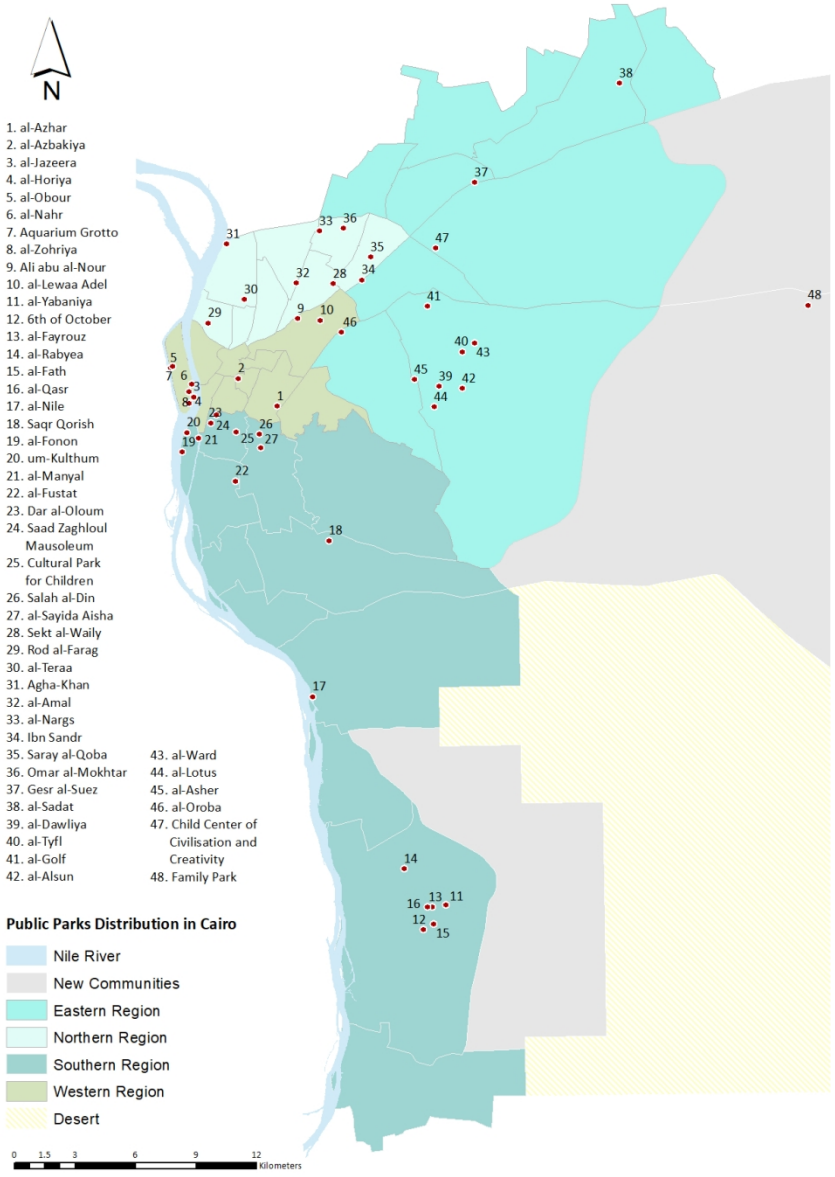


Figure A – Example of the qualities table structure



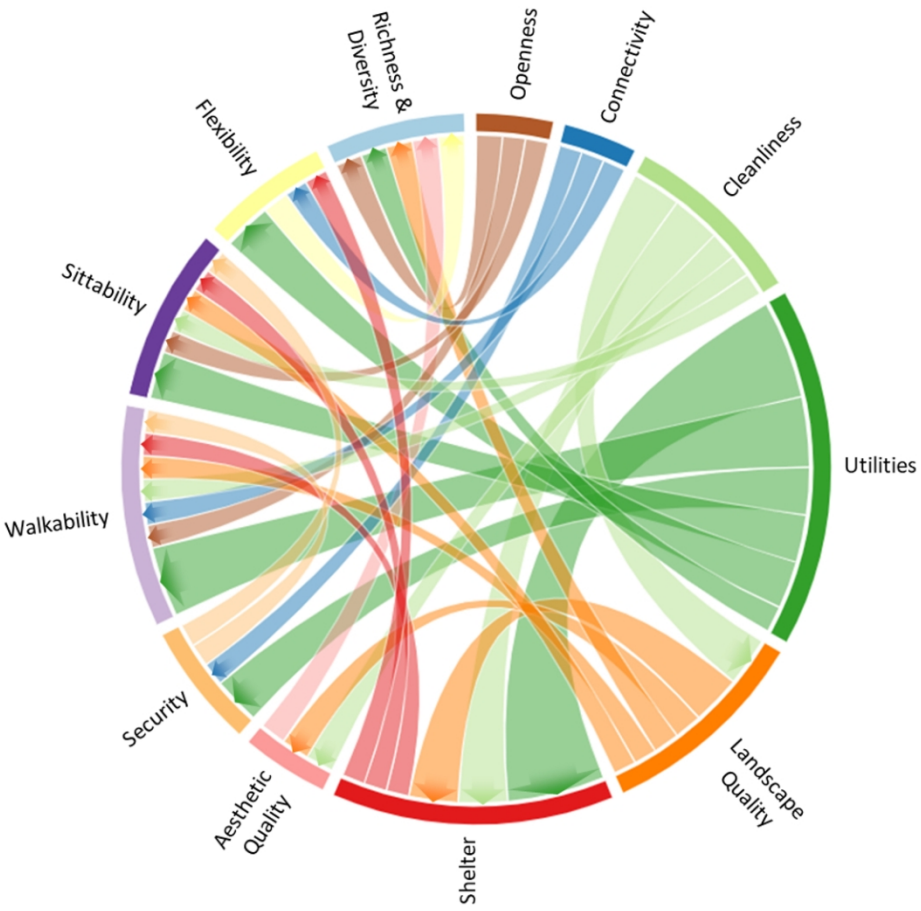
Example of the forms used for data entry in Access

256x125mm (149 x 149 DPI)



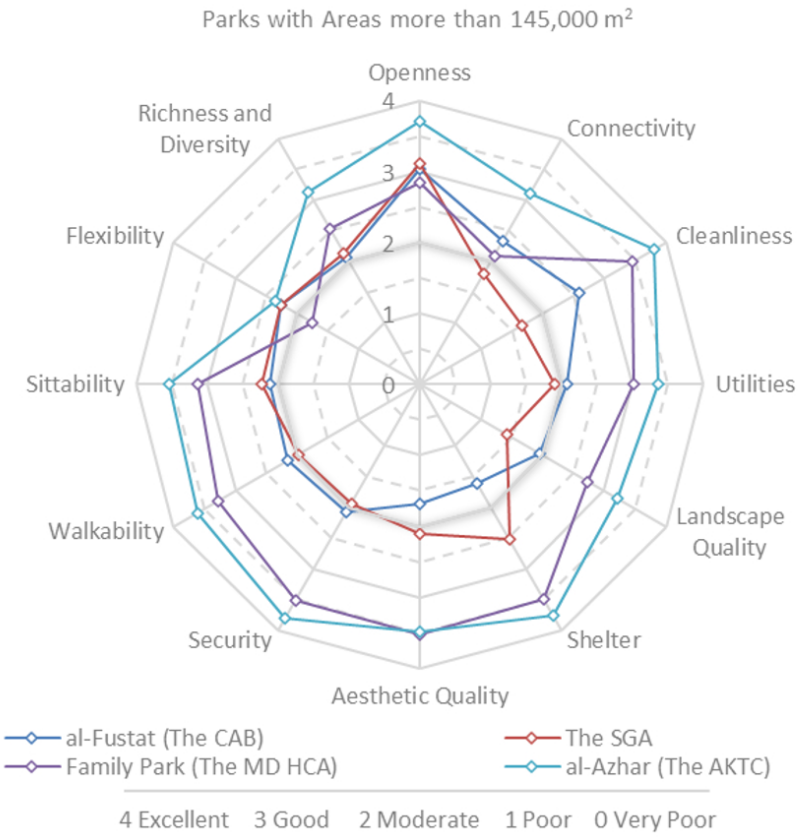
Locations of the parks that were evaluated in Cairo, modified from Aly and Dimitrijevic (2022)

210x297mm (150 x 150 DPI)



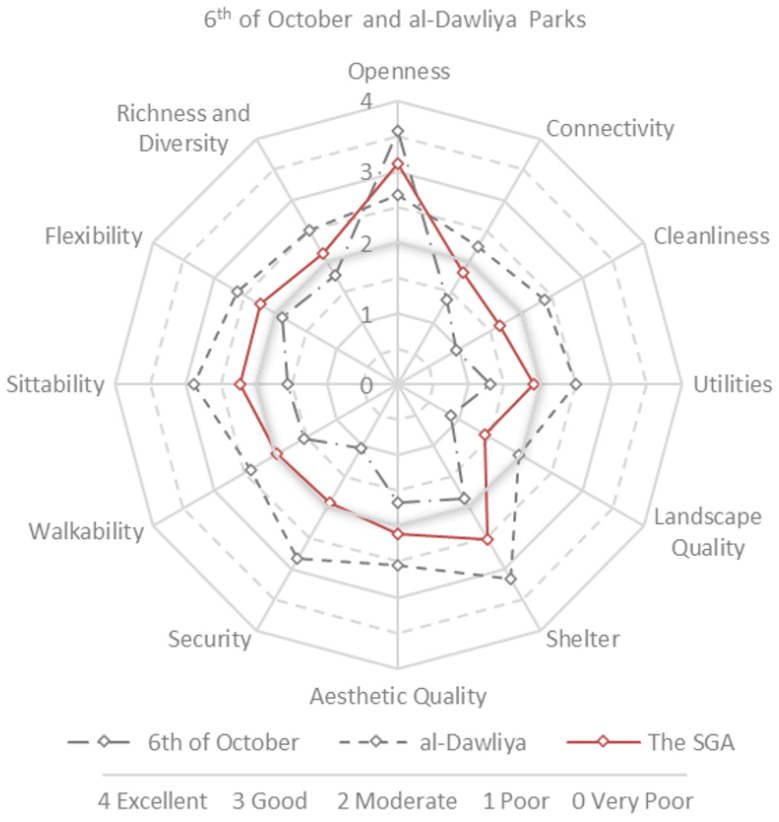
Qualities mutual influences

202x198mm (150 x 150 DPI)



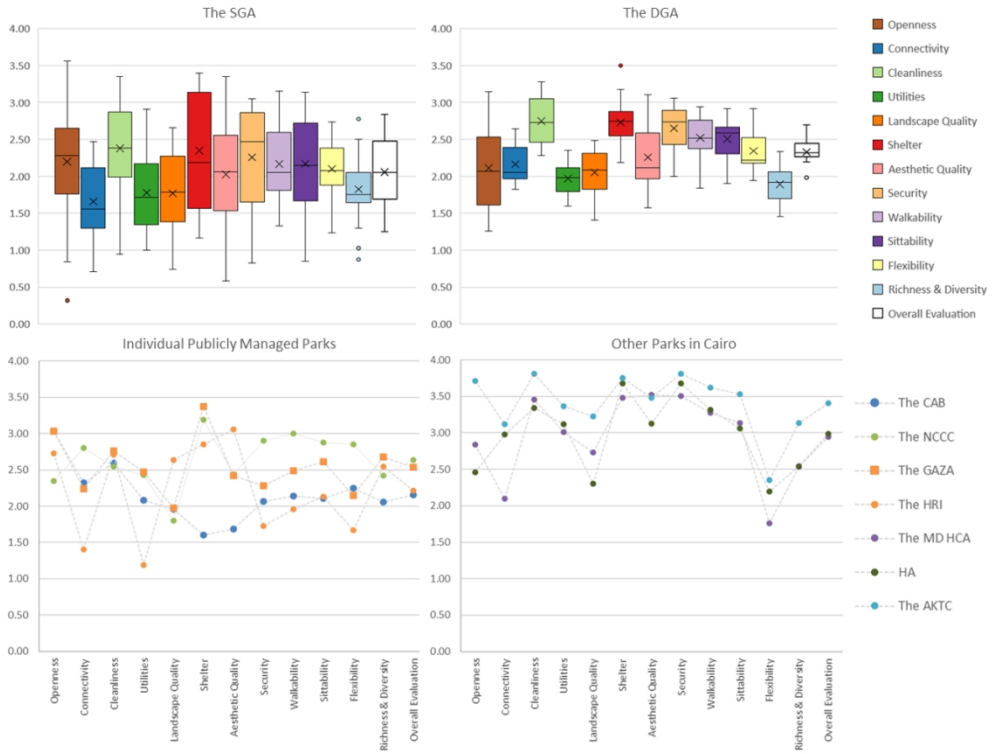
Evaluation of parks with areas more than 145,000 m2

173x149mm (149 x 149 DPI)



Evaluation of al-Dawliya and 6th of October Parks

172x146mm (149 x 149 DPI)

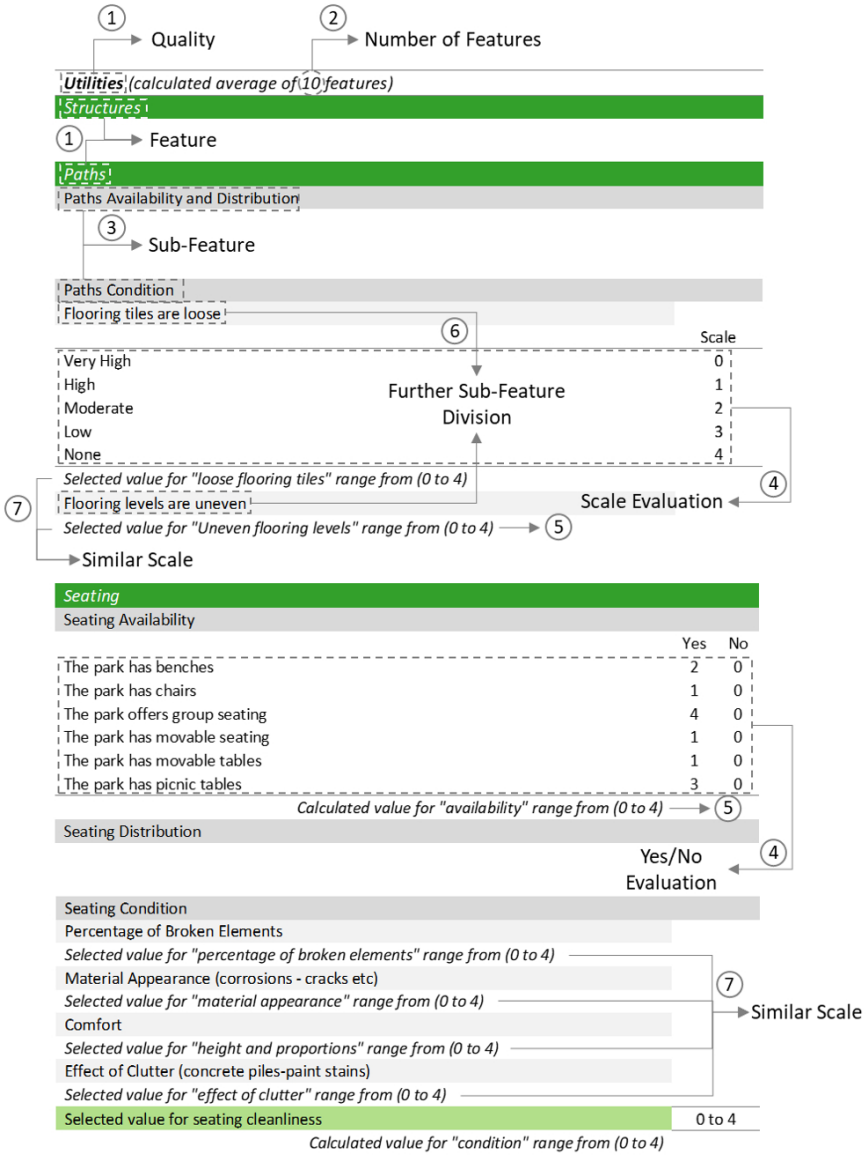


Comparison between the evaluation of public parks in Cairo

227x174mm (149 x 149 DPI)

Changes in Saray al-Qoba Park and a nearby plants nursery - Map data © 2022 Google – Photos by Diaa El-Shorbagy - the satellite images and photos show the replacement of green areas with other activities in a relatively small park, the 2022 images shows almost the complete removal of the park's vegetation

124x129mm (150 x 150 DPI)



Example of the qualities table structure

169x232mm (149 x 149 DPI)

Table I - The method used for calculating the numerical values of the evaluation

Quality X

Feature XA			
	Score for Yes	Score for No	Value of selected Yes or No
Point XA1	XA1	XA1'	XA1
Point XA2	XA2	XA2'	XA2’
Point XA3	XA3	XA3'	XA3
		Total	XA1+XA2’+XA3

The calculated value for feature XA (to have a maximum unified value of 4 regardless of the number of evaluation points or the total resulting from variation in scores) =

$$\frac{\text{Total } * \ 4}{XA1 + XA1' + XA2 + XA2' + XA3 + XA3'}$$

Feature XB			
	Score for Yes	Score for No	Value of selected Yes or No
Point XB1	XB1	XB1'	XB1’
Point XB2	XB2	XB2'	XB2’
Point XB3	XB3	XB3'	XB3
Point XB4	XB4	XB4'	XB4
		Total	XB1’+XB2’+XB3+XB4

The calculated value for feature XB =

$$\frac{\text{Total } * \ 4}{\text{XB1} + \text{XB1'} + \text{XB2} + \text{XB2'} + \text{XB3} + \text{XB3'} + \text{XB4} + \text{XB4'}}$$

Feature XC

Selection of a direct value from 0 to4 (to keep a unified maximum of 4)

Selected Value for feature XC from 0 to 4

Quality X =

$$\frac{Feature\ XA + Feature\ XB + Feature\ XC}{Total\ number\ of\ features\ which\ is\ 3\ in\ this\ example}$$

Quality Y

Quality Z

The overall Evaluation of the Park (average of the park qualities) =

$$\frac{Quality\ X + Quality\ Y + Quality\ Z}{Total\ number\ of\ qualities\ which\ is\ 3\ in\ this\ example\ and\ 12\ for\ the\ tool}$$

Table II - Comparison between the evaluation of public parks in Cairo

	Actual/Average evaluation	Frequency			Total
		Poor	Moderate	Good	
The SGA	2.06	12	13	0	25
		48%	52%		
The CAB	2.16		1		1
The HRI	2.22		1		1
The DGA	2.33	2	14	0	16
		13%	88%		
The GAZA	2.54		1		1
The NCCC	2.63		1		1
The MD HCA	2.95		1		1
HA	2.98		1		1
The AKTC	3.41			1	1