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ANALYTICAL HIERARCHY PROCESS (AHP) BASED PRIORITY EVALUATION OF QUALITY CRITERIA FOR URBAN PARKS: KONYA CITY SAMPLE

Kent Parkları Kalite Kriterleri Önceliklerinin Analitik Hiyerarşi Süreci (AHP) Tabanlı Değerlendirilmesi: Konya Kenti Örneği

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ABSTRACT

Urban parks, which are the most important elements of urban open green areas, are indispensable. They take people away from the dense, stressful, and noisy environment of cities and provide them with various active and passive recreational opportunities. It is of great importance that urban parks are planned correctly for being qualified as preferable areas. And they have a strong functional and aesthetic design so that they remain preferred. Therefore, prioritizing the quality criteria affecting the public satisfaction of urban parks is crucial in the planning and design stages.

This study employed a questionnaire to determine the priority ranking among four quality criteria for urban parks in three regions of Konya (Turkey) with different socio-demographic characteristics. These criteria are comfort and image, sociability, uses and activity, and accessibility. The main research goal was to create a base for planning, design, and revision processes of urban parks by preferences of park users. The results were evaluated with the help of Analytical Hierarchy Process (AHP), a pairwise comparison technique. The results show that comfort and image take the first place in the quality criteria ranking with a weight of 0.550 weight. This was followed by sociability with a weight of 0.246, uses and activity with a weight of 0.147 and accessibility with a weight of 0.057. It is suggested that the density of young and old population and levels of income of the public effect priority of an urban park in any locality.

Key Words: Analytical Hierarchy Process, Quality criteria, Urban parks

ÖZET

İnsanı kentin yoğun, stresli, kalabalık ve gürültülü ortamından uzaklaştıran, çeşitli aktif ve pasif rekreasyon olanakları sağlayan, toplum için vazgeçilmez bir alan olan kent parkları, kentsel açık yeşil alanların en önemli unsurudur. Bu bağlamda kent parklarının nitelikli ve tercih edilebilir alanlar olması için doğru planlanması, sürekliliğinin sağlanması için fonksiyonel ve estetik açıdan güçlü bir tasarıma sahip olması büyük önem taşımaktadır. Kent parklarının halk memnuniyetini ve tercih edilebilirliğini etkileyen kalite kriterlerinin önceliklendirilmesi, planlama ve tasarımın belirlenmesinde öncelikli konu olmaktadır.

Bu çalışmada, Konya'nın (Türkiye) farklı sosyo-demografik özelliklere sahip üç bölgesindeki kentsel parklar için dört kalite kriteri arasında öncelik sıralamasını belirlemek için bir anket kullanılmıştır. Bu kriterler konfor ve imaj, sosyallik, kullanımlar ve aktiviteler ile erişilebilirliktir. Araştırmanın temel amacı, park kullanıcılarının tercihlerine göre kent parklarının planlama, tasarım ve revizyon süreçlerine bir altlık oluşturmaktır. Sonuçlar, ikili karşılaştırma tekniği olan Analitik Hiyerarşi Süreci (AHP) yardımıyla değerlendirildi. Sonuçlar, kalite kriterleri sıralamasında 0.550 ağırlık ile konfor ve imaj ilk sırada yer aldığını göstermektedir. Bunu sırası ile 0.246 ağırlıkla sosyallik, 0.147 ağırlıkla kullanımlar ve aktivite ve 0.057 ağırlıkla erişilebilirlik izlemiştir. Genç ve yaşlı nüfus yoğunluğunun ve halkın gelir düzeylerinin herhangi bir yöredeki bir kent parkının önceliğini etkilediği görülmektedir.

Anahtar Kelimeler: Analitik Hiyerarşi Süreci, Kalite kriterleri, Kent parkları.

1. INTRODUCTION

People living in the dense, noisy, congested, polluted, concretized and stressful urban fabric today are continuously looking for spaces where they can come together with nature. Therefore, the efforts to create more contemporary and livable urban environments are steadily picking up. Incidentally, urban parks have emerged as some of the most important elements of urban aesthetics shaped by humankind, providing for various active and passive recreational and socializing opportunities (Kart, 2002).

The configuration of public spaces, their material arrangements, and their functional and symbolic interpretations provide opportunities for encouraging or preventing urban life (Skjeveland, 2001). As per the standard practices in urban planning and development, the criteria established to evaluate the development and use of successful public spaces are grouped under four headings, such as comfort and image, uses and activity, access and linkage, and sociability (Spaces, 2000). As urban parks are some of the most accessible urban public spaces, these four criteria should be considered in the study of urban park quality criteria as well.

Comfort and image are key to whether a park shall be used or not. The attractiveness and character of space are created in people's minds in terms of its safety, cleanliness, maintenance and the use of the surrounding buildings (Yücel, 2007).

The availability of activities is yet another main factor that attracts people to parks. The variety of activities allows and inspires a large gamut of people to make use of space (Spaces, 2000).

A park with a variety of activities and large enough to serve a good number of patrons will still not have enough users if it is not positioned correctly. Parks should be in such a locality that tightly connects with schools, youth centers, playgrounds and housing areas (Corbusier & Yörükan, 2009). To work on this criterion, the socio-demographic structures and the needs and tastes of the park users should be taken into consideration. When evaluating a park in terms of accessibility and linkage, it is important to consider its connections with the rest of the city and also its inter-spatial connections. While examining the linkages to the city, the location, the land uses around the park and the conditions of the roads that provide access to the park should be considered. To evaluate the inter-spacial connections, the important aspects of consideration would be the entrances and exits, the roads within the park and how these inner roads interlink the various spaces within.

Degree of a society's existing social ties are affected their social integration (Can, 2016). The sociability of a park can be its most difficult but indispensable feature and is affected by the existence of three other criteria (uses and activity; access and linkage; image and comfort). Since the emergence of the concept, urban parks have been looked upon as community spaces to establish a mechanism for social integration (Yorulmaz, 2006). Today, parks bring together different social groups physically and intellectually (Swanwick, Dunnett, & Woolley, 2003) and offer them an opportunity to be with other people in a relaxing and undemanding way. Being among others and seeing and hearing them imply positive experiences and offer alternatives to being alone (Gehl, 2011).

Numerous studies have used public preferences to evaluate public satisfaction about urban parks (An, Tian, & Gan, 2014; Çetinkaya, Erman, & Uzun, 2015; Gürer & Uğurlar, 2017; Jaafar & Tudin, 2010; Riki, Rezazade, & Miri, 2016; Rouhi, Monfared, & Forsat, 2017). This study investigates the general public preferences regarding urban parks to prioritize the quality criteria and to create a base by considering these preferences in the planning, design and revision processes. The Analytical Hierarchy Process (AHP) method, a multiple criteria analysis technique, is used for ranking the criteria in terms of importance.

2. RESEARCH METHODOLOGY

The main materials of the study are the quality criteria for urban parks and a questionnaire on these criteria to be answered by park users with different socio-demographic characteristics in three different regions (Ecdat, Kültür, and Karaaslan Hadimi park) of Konya (Turkey). The quality criteria for successful urban parks as gathered from the literature review (Corbusier & Yörükan, 2009; Spaces, 2000; Ter, 2011; Yorulmaz, 2006; Yücel, 2007) were put forward first. Then, a simple, understandable questionnaire was prepared to enable park users to make a pairwise comparison of these quality criteria.

The descriptive study was done using a questionnaire. Respondents were requested to rank the quality criteria for urban parks. The outcomes were analyzed using the AHP technique and used to determine the

priority levels of the criteria by comparing the alternatives in pairs.

AHP is an easy, convenient and preferred quantitative method for decision-makers to rank and select the best of the alternatives; it develops a numerical score for each decision alternative based on comparisons of each under different criteria reflecting decision makers' preferences and on how well the decision-maker meets the criteria (Russell & Taylor, 2003; Saaty & Vargas, 2012). The technique is based on pairwise comparison, a natural process people use while evaluating an object in terms of preference, importance, and probability. A scale of numbers is used to show how many times an element is dominant over the others in terms of the criterion or property being compared (Forman & Selly, 2001; Saaty, 2008b).

While making comparisons among the criteria, the basic comparison scale as presented in Table 1 and containing values from 1 to 9 was used. The priorities were established after pairwise comparisons. Priorities are relative numbers, numerical rankings, or the result of numerical measurements, derived from binary comparisons based on dominance and measured on the ratio scale.

Table 1. Importance Levels Used in Comparison (Saaty, 2008a)

Importance	Definition
1	Equal importance
3	Weak importance
5	Essential importance
7	Demonstrated importance
9	Extreme importance
2,4,6,8	Intermediate values

The steps included in AHP are the formation of the problem, establishment of a hierarchical structure, pairwise comparisons, synthesis, evaluation and the reporting of results (Forman & Selly, 2001; Saaty, 2005).

The questionnaire on “determining the priority criteria for successful urban parks” was prepared and 120 people surveyed to see their preference for quality of urban park among four criteria. The four criteria included in the questionnaire were:

- ✓ ‘Comfort and image’ covering several qualities such as security, cleanliness, greenery, charm, the availability of facilities to walk around, the adequacy of recreational areas and units, historical features and environmental factors (Carmona, Heath, Oc, & Tiesdell, 2003; İnceoğlu & Aytuğ, 2009).
- ✓ ‘Uses and activities’ reflecting the various activities available, including recreational ones, suitable for different socio-demographic criteria, needs and tastes.
- ✓ 'Accessibility’ signifying how easily accessible the parks are for pedestrians or through public transportation and how well connected they are to the other parts of the city (Uslu, 2016; Wang, Brown, Liu, & Mateo-Babiano, 2015)
- ✓ 'Sociability' referring to how the parks could attract people of different ages and cultures, increase user diversity and thus aim to create a cross-section of diversity and cohesion within their spaces (Uslu, 2016)

The questions were framed verbally so that the respondent could understand and answer easily; for example, a question was framed as “comfort and image are .....more important than sociability” and the respondent filled in the blanks with appropriate numbers from 1 to 9 in the scoring system developed by Saaty. The scores were then converted into a matrix. The pairwise comparison matrix of the four criteria is given in Table 2.

Table 2. Pairwise Comparison Matrix of Alternatives According to Quality Criteria

Quality criteria	Comfort and Image	Sociability	Accessibility	Uses and Activities
Comfort and Image	1			
Sociability		1		
Accessibility			1	
Uses and Activities				1

3. RESULTS AND DISCUSSION

Briefly, a quality urban park must be safe, well-maintained and attractive, and have sufficient space and facilities for relaxation (comfort and image). It should give its patrons the opportunity to be together and spend time with other people (sociability). It should also provide a variety of activities for the use of people with different demographic and cultural structures and needs (uses and activities). Access to the park should be easy and its positioning should be related to the surrounding spaces (accessibility).

Out of the 120 participants in the survey, most were female graduates and students in the age group of 21–40 (as detailed in Table 3). The responses show that while young people preferred sociability, the older ones valued accessibility. While sociability remained a priority at the lower income level, comfort and image were of importance for those in the upper income level. Therefore, when planning for an urban park in any locality, the most appropriate of these two criteria could be prioritized according to the density of young and old population in the region and also the levels of income of the public.

Table 3. Demographic Characteristics of The Respondents

Respondent profile		Percent
Gender	Female	59,2
	Male	40,8
Age	Below 20 yrs	11,7
	21-40 yrs	71,7
	41-60 yrs	13,3
	Above 60 yrs	3,3
Education	Elementary school	13,32
	High school	8,59
	University	78,09
Occupation	Public employees	26,7
	Private sector employees	24,1
	Retired	3,3
	Unemployed	15
	Student	30,8
Income level	0-2000	28,3
	2001-3500	28,3
	3501-5000	16,7
	Above 5001	26,7

The results of the AHP analysis of the pairwise comparisons demonstrate that the highest ratio is obtained for the comfort and image parameter with a value of 55%, compared to the other three parameters; and the lowest ratio is for the accessibility parameter with a value of 5.7%. Thus, the priorities of urban park quality criteria as recommended from the survey start with comfort and image having the highest weight of 0.550, followed by sociability with a weight of 0.246, uses and activity with a weight of 0.147 and lastly, accessibility with a weight of 0.057. The normalizations obtained by weighing each alternative are as given in Table 4.

Table 4. Priority Values of Urban Parks Quality Criteria

Quality criteria	Weights	Priority
Comfort and Image	0,550	1
Sociability	0,246	2
Accessibility	0,057	4
Uses and Activities	0,147	3

It is also noted that while speaking of the most important criterion, the comfort and image parameter, people weighed the aspects of charm, safety, the facilities to sit and relax and walk around, and cleanliness. Meticulous planning of structural and vegetative elements in park areas, proper site selection and regular maintenance positively influence the shaping of this parameter. The maintenance activity should provide enough thrust on the repair or renewal of park structures and equipment, removal of waste and the periodical maintenance of vegetative landscapes. In short, the charm of a park and the associated high utilization rate are directly proportional to user satisfaction.

In terms of accessibility, people considered the aspects of proximity, continuity, connection and the ability

to reach the park by walk. It is also noted that accessibility was not an obstacle for patrons to come to a park once their preferences were set.

4. CONCLUSION

Urban parks that can be described as successful are open green areas in the right locations, are functional and aesthetically appealing, can meet the needs of the various socio-demographic groups, host active and passive recreational activities, and can contribute to the city life on social, cultural, and economic aspects.

While planning and designing or renovating such spaces, it is crucial to consult the expectations, requests, and opinions of the park users alongside the necessary criteria involved in the design, planning, and management stages. AHP analysis can be a useful method for determining the priorities of urban park quality criteria for analyzing the survey results. The results reflect that urban park users highly prioritize the aspects of comfort and image. Also, the spatial quality of an area is very relevant to the comfort and image parameter, and this is related to the design and management of urban parks. It can also be concluded that while the accessibility criterion is considered important during the planning stage, it takes the last place in the preference importance level.

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