Characteristics of visiting urban open spaces in Sana'a city in Yemen

A A Q Alwah1,2, W Li1* and A N M Al-Attar3

1 College of landscape Architecture, Northeast Forestry University, Harbin 150040, China
2 Faculty of Engineering and Architecture, IBB University, Ibb, Yemen.
3 College of Geography, South China Normal University, Guangzhou, China
*Corresponding author’s e-mail: Liwen0451@sina.com

Abstract. Knowledge of the characteristics of visiting and using urban open spaces is the key to the effective design, development, and management of these spaces. Although research has conducted many studies related to the use and importance of urban environments in Europe, America, Australia, China, and some East Asian countries, there is a lack in such studies in the Middle East, especially in Yemen. This study covers a part of the knowledge gap by verifying the characteristics of visiting and using three selected open spaces in Sana'a city in Yemen through self-reporting of the users of these spaces. The study shows that Yemenis go to open spaces for recreation, family seating, playing with children, and walking. Furthermore, users prefer spaces that provide appropriate and adequate seating areas, various and modern entertainment facilities, a high level of hygiene and maintenance, and safe spaces that are free from intruders. This knowledge benefits the urban designers and developers in Yemen to rehabilitate degraded open areas and design new public spaces.

1. Introduction
A public open space is one of the most critical elements of sustainable urban design and planning worldwide. The public open space provides ecosystem services to the population, which include recreational, sporting, leisure, and recreational activities, increasing air quality, improving climate, controlling stormwater, and promoting social justice by fostering social interactions[1-5].

The effects of technological developments bring out anxiety, which grows day by day to the extent that those effects have changed people's lives to further isolation and privatization. Therefore, the role of public places in social life becomes more important and significant[6, 7].

One of the vital roles played by public open spaces is to support personal and cultural diversity, which expresses democracy in access to public open spaces[8]. Interaction between multicultural individuals within public open spaces helps to promote tolerance and understanding among others, rather than isolation in monoculture environments[9]. Public open spaces can provide health benefits, improve health and fitness when used in physical activities, or when people just go outdoors to create a sense of well-being, which is very important with the increasing diseases of the age, such as heart diseases and obesity as a result of new lifestyles [10]. Public open spaces are also places of informal learning by interviewing other people with different customs and traditions [11].

Creating vital and dynamic urban open environments that contribute to the well-being and enhancement of the quality of life are linked to the design, planning, and management of these open
spaces, which must meet users' needs and requirements through the awareness of their experiences and preferences [12]. People may tend to have different perceptions about urban environments based on different cultural contexts [13, 14]. Therefore, separate studies to cover the knowledge gap must be conducted in different cultural contexts.

With regard to the use of open spaces, research has presented many studies in the US, Australia, Europe, Turkey, and China [5, 13-22], and few studies in the Middle East [23-26]. Although there is a study of the relationship between physical settings and the use of public spaces in Sana'a city, the direct observation was used only to verify users' behavior [25]. Therefore, the present study attempts to understand the characteristics of visiting and using open spaces in Sana'a city through perceptions of users themselves.

The study provides knowledge for urban planners and developers about the characteristics of visiting public spaces in Sana'a city by examining three selected spaces, namely Al-Tahrir Square, Al-Thawra Park, and Al-Sabean Park.

2. Materials and Methods

2.1. Study area
Sana'a City is the political capital of the Republic of Yemen. It is the most important cultural center in Yemen and was once appointed as the Arab world's Capital of Culture in 2004 [11, 27]. The political as well as the administrative status of Sana'a City has a long history of economic growth and rapid development. Multifaceted transformations in the city have arisen through social, political, historical, and environmental factors that have caused changes in people's lifestyles [28].

The urban form of Sana'a City includes many types of urban open spaces such as natural fields, roads and paths, recreation areas and outdoor spaces, public spaces, stadiums, and unused open regions. We have selected three of the most essential spaces in the city as case studies, namely Al-Tahrir Square, Al-Thawra Park, and Al-Sabean Park. See figure 1.
2.2. The questionnaires

Questionnaires are the most common way to know what people want and need from open spaces, despite many problems that may result from involving people in predicting the future [29]. Therefore, we tried to simplify the idea of the questionnaire, and structure it sequentially to be easy for all segments of society.

The questionnaire contains demographic information and questions about the characteristics of visiting open spaces. Visiting characteristics include arrival distance, way to go, length of stay, companions of visit, and purpose of visit. In addition, two open questions were asked in order to find out the factors that encourage and discourage the visit of public open spaces in Sana'a city.

To validate the questionnaire and determine the extent to which it achieves the study aims, we presented the questionnaire to five professors in the field of urban environment in Yemen, Canada, and Egypt. The questionnaire was modified and developed based on the comments and suggestions of those experts.

We distributed the final questionnaire in July, August, and September 2019 to visitors and users of the three selected spaces. We existed in the three selected spaces during working days and at weekends. In each space, we distributed 250 copies of the paper questionnaire. We could get 696 valid questionnaires, Al-Tahrir Square (235), Al-Thawra Park (239), and Al-Sabean park (222). Simple random samples were adopted, attempting to make them broad and varied in terms of age, gender, and educational level. Paper questionnaires data were collected, coded, and analyzed using SPSS and Microsoft Excel software.

2.3. In-depth interviews

Eight experts, six of whom were Yemeni university professors, participated in the in-depth interviews held in September 2019. The interviews aimed to identify the views of the experts on the priorities of users of public open spaces in Sana'a and to identify ways to achieve them. Some of the interview questions were about academic qualifications and academic titles. The main items were: What are the characteristics of visiting open spaces in Sana'a city? What are the priorities of open space users in Sana'a city? And how can they be met?

The interviews were conducted in a friendly, smooth, and stress-free atmosphere. Four of the interviews were in-person and recorded after receiving the respondents' approval. The remaining four interviews were carried out online.

3. Results

3.1. Demographic characteristics

The participants' demographic characteristics can be seen in figure 2. The demography of the respondents is roughly equal in Al-Thawra Park (54% male, 46% female) and Al-Sabean Park (53% male, 47% female), while the male percentage in Al-Tahrir Square is more than the ratio of the female (53% per for men, 47% for women). Respondents were categorized into five age classes. The highest respondents' rates in all of the selected open spaces are the second and third categories. The majority of respondents are graduates, while the lowest proportion in all spaces is uneducated people and post-graduates.

3.2. Visit characteristics

Visit characteristics were checked in many aspects by surveying participants. These aspects are: purpose of the visit, duration of stay, distance to the place, and companions of the visit.

Most respondents in all the selected spaces see leisure and recreation as their main purpose to enter the spaces, except for Al-Tahrir Square, respondents' primary goal is to go to other facilities and services. Furthermore, there are different essential aims, such as playing with children in Al-Tahrir Square, and
Figure 2. Demographic characteristics

Figure 3. The purpose of the visit the selected spaces
enjoying family time, playing with kids, and taking a walk in both Al-Sabean and Al-Thawra parks (see figure 3). Most of the respondents go alone to Al-Tahrir Square. However, they go with family or friends to both Al-Thawra and Al-Sabean Parks (see figure 4). Most respondents travel less than 2 km to access Al-Tahrir Square and 2-5 km to access Al-Thawra Park, while the vast majority move 6-9 km to access Al-Sabean Park (see figure 5). In both parks, more than half of the respondents remain in spaces for 3 to 4 hours. The largest proportion of respondents remain in Al-Tahrir square for less than an hour (see figure 6).

Figure 4. Companions of visit of the selected spaces

Figure 5. Distance of arrival to the selected spaces
Most respondents pointed out that diversity of facilities of different leisure activities, availability of appropriate sitting places, modernity of play equipment, well-maintenance, and safety issues are the most important factors and features that encourage visiting open spaces. On the other hand, they listed some discourage factors such as lack of suitable sitting areas for families, lousy condition of play amenities, lack of cleanliness and maintenance, and presence of intruders and annoying people in open spaces.

3.3. Priorities of public open spaces users

Users' priorities of public open spaces in Sana'a city were discussed in interviews with eight experts and professors in Yemeni universities. Experts agree that recreation is the primary need of users of public open spaces in Sana'a city specifically and in Yemen in general. Most of them also emphasize that meeting the social needs in the revival of public open spaces in Sana'a city is important, including commercial revitalization. An associate professor of architecture and architectural design in Aden University pointed out that the spiritual relationship between the user and space is important, especially in Sana'a city, which contains the old city of Sana'a, which has been inscribed on the World Heritage List. An Assistant professor of housing in Hadhramaut University added the need for safety and privacy.

A professor of urban and regional planning in Sana'a University and director-general of Sana'a city parks stated that most of the users of public open spaces in Sana'a city - especially parks - are women and children. Men go to parks often to chew Qat and use shisha. Therefore, attention should be paid to the priorities of actual users of the spaces. A professor of architectural design and theories of architecture in Ibb University also emphasized that space users seek to spend family time. An assistant professor of built environment architecture emphasized that the role of urban rehabilitation is significant in the success of public open spaces in Sana'a city, which suffers from neglect and deterioration, especially Al-Tahrir Square and Bab Al-Yemen, which are close to the historic Old City of Sana'a.

The most important thing that the experts pointed out about the practical mechanism to activate the public open spaces in Sana'a city is to encourage the involvement of the private sector in investment, and the opportunity to invest with some restrictions to ensure the benefit of all society classes. Furthermore, the creation of urban awareness of all players related to public open spaces include urban designers, users, competent authorities, owners, and others.

4. Discussion

For effective planning, design, and management of urban open spaces, we must know what is happening within these spaces, how and why people go to them, how people behave within these spaces, and how
they perceive the characteristics of space. We design and manage places from people. Therefore, knowledge of the characteristics of people’s visits and the perception of their behavior within open spaces are the main key to providing vital public spaces that contribute to the well-being and enhancement of the quality of life.

People's perceptions and experiences about open spaces may differ within different cultural contexts [14, 30], thus, the separate studies in each different cultural contexts must investigate the characteristics of people's visits to open spaces. In this study, we investigate the characteristics of visiting open spaces in Sana'a city, which are consistent and different from the characteristics of visiting open areas in other cultural contexts. For example, recreation is the primary purpose of visiting the selected public open spaces in Sana’a city, except for Al- Tahrir Square. Likewise, many studies conducted in different cultural contexts indicated that people regard recreation as the main goal of visiting open spaces, for example in the UK [31] and Turkey [13] [32]. However, another group of studies emphasized that relaxation is the main purpose of people visiting parks and public open spaces like in European countries [33] [5] [16], China [17] [20] [34], Turkey [32, 35], Malaysia [18], and Korea [36]. Yemeni society appears to be culturally and behaviorally closer to the Turkish society than the Western society.

Results generally indicate that people go to public parks as families, which is consistent with the results of a study conducted in Turkey[13], and different from some studies in other countries [14, 17, 19]. This indicates that presence of individuals is more than families in parks and urban open areas.

Results of the questionnaires and interviews indicated that Yemenis also go to parks and squares to eat. Mostly, the intent of eating there is chewing Qat and using shisha. Qat is a common social habit in Yemen. About 60% of males and 30% of females chew Qat daily for a long times[37]. Although laws and regulations prohibit chewing Qat in official government institutions during working hours, chewing Qat cannot be prevented in public open spaces. Competent authorities and urban designers can allocate specific places for chewing Qat and smoking shisha and can provide facilities that help maintain the cleanliness of such places.

In the sun, the main propose of visiting the open spaces in Sana'a city is recreation, as Yemenis go to outdoor environments as families, and they prefer the places that provide a variety of recreation facilities. Alwah, et, al. (2020) reported that the diversity of facilities that support active and passive recreation activities for different users' segments might increase the density of the use of public spaces in Sana'a city[25].

5. Conclusion
The study tried to verify the characteristics of visiting open spaces in Sana'a city through self-reporting of the users of three selected open spaces. Results of the study indicated that Yemenis go to open spaces for entertainment, family seating, playing with children as well as for walking. Yemenis prefer public spaces that provide adequate seating areas, adequate and modern play equipment, and a high level of hygiene and maintenance. This knowledge can help urban planners, developers, and designers to identify people's behavior, experiences, and requirements when designing new public spaces or developing existing public spaces. The study also emphasizes the need to reconsider the urban status of Sana'a city in general, and to rehabilitate and develop the public open spaces in the city. Private sector can also be involved in the management of public open spaces in Sana'a according to experts' opinions. This is in line with what Nasution et al. (2012) pointed out that private sector has a higher capacity than public sector in managing public spaces [38].

Acknowledgment
The study was carried out with the help of College of landscape Architecture, Northeast Forestry University, Harbin, China, and Faculty of Engineering and Architecture, IBB University, Ibb, Yemen.

References
[1] Fan, P., et al., Accessibility of public urban green space in an urban periphery: The case of Shanghai. Landscape and Urban Planning, 2017. 165: p. 177-192.
[2] Niemelä, J., *Ecology of urban green spaces: The way forward in answering major research questions*. Landscape and urban planning, 2014. 125: p. 298-303.

[3] Wolch, J.R., J. Byrne, and J.P. Newell, *Urban green space, public health, and environmental justice: The challenge of making cities ‘just green enough’*. Landscape and urban planning, 2014. 125: p. 234-244.

[4] De Ridder, K., et al., *An integrated methodology to assess the benefits of urban green space*. Science of the total environment, 2004. 334: p. 489-497.

[5] Chiesura, A., *The role of urban parks for the sustainable city*. Landscape and urban planning, 2004. 68(1): p. 129-138.

[6] Abbasian, A., *Importance of Urban Squares as Public Space in Social Life A New Design of Fisktorget in Karlskrona City*. 2016, Blekinge Institute of Technology: Karlskrona, Sweden.

[7] Mehmet İNCEOĞLU, A.A., *The Concept of Urban Space Quality. MAKALE / ARTICLE*, 2009. 4(3).

[8] Thompson, C.W., *Urban open space in the 21st century*. Landscape and urban planning, 2002. 60(2): p. 59-72.

[9] Salama, A.M. and R.Y. Gharib, *A perceptual approach for investigating urban space diversity in the city of Doha*. House International, 2012. 37(2): p. 24.

[10] Salama, A. and S. Azzali, *Examining attributes of urban open spaces in Doha*. Proceedings of the ICE-Urban Design and Planning, 2015. 168(2): p. 75-87.

[11] Elshehstawy, Y., *Informal Encounters: Mapping Abu Dhabi’s Urban Public Spaces*. Built environment, 2011. 37(1): p. 92-113.

[12] Abdul fattah.A.Q. Alwah, et al., *Developing a Quantitative Tool to Measure the Meeting of Public Spaces for the Needs and Requirements of Users; Applying in Sana’a City in Yemen*. Emotion, Space and Society, 2020.

[13] Özgüner, H., *Cultural differences in attitudes towards urban parks and green spaces*. Landscape Research, 2011. 36(5): p. 599-620.

[14] Loukaitou-Sideris, A., *Urban form and social context: Cultural differentiation in the uses of urban parks*. Journal of Planning Education and Research, 1995. 14(2): p. 89-102.

[15] Gobster, P.H., *Visions of nature: conflict and compatibility in urban park restoration*. Landscape and urban planning, 2001. 56(1-2): p. 35-51.

[16] Peters, K., B. Elands, and A. Buijs, *Social interactions in urban parks: stimulating social cohesion? Urban forestry & Urban greening*, 2010. 9(2): p. 93-100.

[17] Jim, C.Y. and W.Y. Chen, *Recreation–amenity use and contingent valuation of urban greenspaces in Guangzhou, China*. Landscape and urban planning, 2006. 75(1-2): p. 81-96.

[18] Ramlee, M., et al., *Successful Attractions of Public Space through Users Perception*. Environment-Behaviour Proceedings Journal, 2016. 1(2): p. 188-196.

[19] Tinsley, H.E., D.J. Tinsley, and C.E. Croskeys, *Park usage, social milieu, and psychosocial benefits of park use reported by older urban park users from four ethnic groups*. Leisure sciences, 2002. 24(2): p. 199-218.

[20] Marafa, L.M., et al., *Perceived tranquility in green urban open spaces*. World Leisure Journal, 2018. 60(3): p. 221-234.

[21] Evenson, K.R., et al., *Measurement properties of a park use questionnaire*. Environment and behavior, 2013. 45(4): p. 526-547.

[22] Ayala-Azcárraga, C., D. Diaz, and L. Zambrano, *Characteristics of urban parks and their relation to user well-being*. Landscape and urban planning, 2019. 189: p. 27-35.

[23] Shurbaji, M. and R. Furlan, *The Sheraton Park and Users’ Human Behaviour: Strategies for Implementation of the Public Realm in Doha*. 2017.

[24] Abdelhamid, M.M. and M.M. Elbakharany, *Improving urban park usability in developing countries: Case study of Al-Shalalat Park in Alexandria*. Alexandria Engineering Journal, 2020.
[25] Abdulfattah.A.Q. Alwah, et al., Relationship between physical elements and density of use of public spaces in Sana’a City. Proceedings of the Institution of Civil Engineers; journal Urban Design and Planning, 2020.

[26] Rostami, R., et al., Successful public places: A case study of historical Persian gardens. Urban Forestry & Urban Greening, 2016. 15: p. 211-224.

[27] Al-Abed, A., Sana’a urban transformation: From walled to fragmented city. Journal of Engineering Sciences, Assiut University, 2011. 39: p. 897-918.

[28] Ali, H.H., I.A. Al-Hashimi, and F.a. Al-Samman, INVESTIGATING THE APPLICABILITY OF SUSTAINABLE URBAN FORM AND DESIGN TO TRADITIONAL CITIES, CASE STUDY: THE OLD CITY OF SANA’A. ArchNet-IJAR, 2018. 12(2).

[29] Beer, A. and C. Higgins, Environmental planning for site development: a manual for sustainable local planning and design. 2004: Routledge.

[30] Alwah, A.A.Q., et al. Difficulty and Complexity in Dealing with Visual Pollution in Historical Cities: The Historical City of Ibb, Yemen as a Case Study. in IOP Conference Series: Earth and Environmental Science. 2020. IOP Publishing.

[31] Tzoulas, K. and P. James, Peoples’ use of, and concerns about, green space networks: A case study of Birchwood, Warrington New Town, UK. Urban Forestry & Urban Greening, 2010. 9(2): p. 121-128.

[32] Oguz, D., User surveys of Ankara’s urban parks. Landscape and urban planning, 2000. 52(2-3): p. 165-171.

[33] Roovers, P., M. Hermy, and H. Gulinck, Visitor profile, perceptions and expectations in forests from a gradient of increasing urbanisation in central Belgium. Landscape and Urban Planning, 2002. 59(3): p. 129-145.

[34] Chen, B., O.A. Adimo, and Z. Bao, Assessment of aesthetic quality and multiple functions of urban green space from the users’ perspective: The case of Hangzhou Flower Garden, China. Landscape and Urban Planning, 2009. 93(1): p. 76-82.

[35] Akpinar, A., Factors influencing the use of urban greenways: A case study of Aydin, Turkey. Urban forestry & urban greening, 2016. 16: p. 123-131.

[36] Lee, Y.-C. and K.-H. Kim, Attitudes of citizens towards urban parks and green spaces for urban sustainability: The case of Gyeongsan city, Republic of Korea. Sustainability, 2015. 7(7): p. 8240-8254.

[37] Balint, E.E., G. Falkay, and G.A. Balint, Khat–a controversial plant. Wiener Klinische Wochenschrift, 2009. 121(19-20): p. 604.

[38] Nasution, A.D. and W. Zahrah, Public open space privatization and quality of life, case study Merdeka Square Medan. Procedia-Social and Behavioral Sciences, 2012. 36: p. 466-475.