ROLE OF COMMUNITY FOR IMPROVEMENT OF ECOSYSTEM SERVICES IN URBAN PARKS

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Urban parks are considered as the most valuable component of green structure in cities. They are providers of ecosystem services (provisional, regulation, support, and cultural) in urban areas. They perform various functions to improve the well-being of citizens. Due to rapid urbanization, the quantity and quality of parks, both are adversely affected. Several studies depict that urban parks play a significant role in the sustainability of a city and improvement in the quality of life of citizens. It is obvious that to improve the health of urban parks, the community involvement through their suggestion cannot be ignored. In this perspective, many research studies have been done to identify the people's preferences relevant to urban green spaces. This approach leads to a better understanding of the needs of people as they are the targeted audience, who got direct or indirect benefits from parks. In this context, a questionnaire-based field survey was conducted in fifteen selected parks of Lahore from which 300 respondents were interviewed. The aim of the study was to assess the suggestions proposed by the visitors to maintain and improve the ecosystem services in parks. Further, the question about the quality of parks was asked to know their needs. It was also necessary to determine their interest regarding the willingness to pay entrance-fee assumed to use for the improvement of parks. Although all the public parks in Lahore have no entry fee. Moreover, a change in the frequency of visits was measured due to hypothetically implemented entrance fee. Cleanliness was a highly recommended suggestion by the people and the most famous quality of the park was to improve the physical and mental health. The findings are useful in planning, designing, and managing urban parks to fulfill the needs of people and improving the quality of citizens' life.
Keywords: Ecosystem services, urbanization, sustainability, quality of life, parks.

INTRODUCTION

Public urban green spaces like urban parks are generally considered as the key element of urban green structures. Government institutes for the public welfare in cities usually maintain them. The characteristics of urban green spaces preferred by citizens and investigated the similarities and differences among the three cities of Portuguese (Madureira *et al.,* 2015). In the evaluation of cities globally based on competitiveness, the presence of public facilities like urban parks is considered as one of the important aspects. The presence of parks near the residential areas is primarily important for their services e.g. to provide recreation to citizens, space to gather, and social connection. They also contribute to upgrading the areas aesthetically (Oh and Jeong, 2007). In another study, seven different ecosystems in cities have been identified, which are close to nature although managed by human beings. Parks/lawns are one of the managed green spaces which are a mixture of grass, trees, and other plants (Bolund and Hunhammar, 1999).

Urban green spaces are the fundamental part of the sustainable urban development. As it has been identified and they contribute to mitigate the diverse impacts of urbanization and improve the quality of life of urban dwellers by supporting biodiversity and providing ecosystem services (Xu *et al.,* 2018). The urban population of the world is projected to rise by 84% from 3.4 billion in 2009 to 6.3 billion in 2050. It is experienced that the number of megacities has increased significantly since 1970 and mostly the newest cities are emerging in developing countries. According to studies urban green spaces are considered as the last remnant of nature in cities (Molla *et al.,* 2018).

The regulation services provided by green spaces are air purification, temperature moderation, noise reduction, carbon storage, and flood control. The cultural benefits include the provision of entertainment opportunities, physical and mental health improvement, connecting the people by providing meeting places, social safety, and alike. To understand the relation between green spaces and the well-being of people, two critical aspects of a healthy lifestyle are considered as the provision of ecosystem services and access to green spaces. Green places are unevenly distributed in the cities; so, to get maximum benefits for the urban residents, it is important to make a wise decision regarding land use (Xu *et al.,* 2018).

Urban population growth increase in urban land use and socioeconomic activities continuously threaten urban ecosystems. They ultimately reduce the ecosystem services value (ESV) and affect the sustainability process in cities.

Researchers are paying more attention to the accurate assessment of ecosystem values due to its vital role in urban planning. They are trying their best to evolve strategies to improve and restore ecosystem services (Yang *et al.,* 2018). Urban ecosystem services do not only contribute in improving the quality of life of the dwellers in cities. But they also play a significant role in adaptation and mitigation of climatic challenges (Cortinovis and Geneletti, 2018). Due to the detachment of urban society from the natural environment, pressure on the provision of ecosystem services in urban parks may be increased as urban green spaces contribute to improve the well-being of people in cities. So, they provide a great opportunity to study human perception about the physical environment. Research shows that People's perception of the physical environment varies from individual to individual, so the interpretation of benefits depends upon human attitude. Therefore, to study human perception is always being a challenge for the researchers (Kothencz and Blaschke, 2017). Some researchers conducted studies on people's perception and their willingness to pay for improvement in ecosystem services among three cities of China (Tian *et al.,* 2020). Baur *et al.,* (2014) explained an understanding of visitor's perceptions about Oregon's urban parks in his study. It highlighted the importance of people's contribution in designing and managing the urban park. The study revealed that by improving the services regarding the visitors' needs, parks can be more responsive publicly.

The societal behavior and quality of life in the cities are generally reflected by the urban green spaces which ultimately highlights the health of the city's environment. A city without adequate quantity and quality of urban green spaces becomes a concrete jungle or a polluted city. Thus, it becomes susceptible to vulnerabilities, social vices, and low livability index. Urban green places not only help to cope with these types of negative effects but also provide healthy recreation facilities, shelter to wildlife, and essential livable city stuff (M'Ikiugu *et al.,* 2012). Chinese researchers also highlighted people's perception, knowledge, and attitude towards urban green spaces in Guangzhou, China for better designing and planning (Jim and Chen, 2006).

MATERIALS AND METHODS

The study area Lahore, known as the cultural heart of Pakistan, is the largest city and provincial capital of Punjab province in Pakistan. It has a history of more than 2000 years. The city of Lahore reflects a large number of worth seeing sites like architectural buildings, masjids, churches, mausoleums, shrines, parks, and gardens (Rana and Bhatti, 2017).

It is a fact that in Pakistan the research on understanding the role of ecosystem services is at its initial phase. However, the process of urbanization is adversely affecting the ecological environment. Research on urban ecosystem services in

Pakistan started during the last decade. It is encompassing the studies related to the perception of people, designing green spaces according to the needs of people, impacts of green spaces on social life, and challenges about urban green spaces (Bokhari *et al.,* 2018). In this paper, the term urban park is used as part of urban green spaces that provide various ecosystem services, e.g. recreation, meditation, tourism, aesthetics, social connectivity, etc. (Razak *et al.,* 2016). In this context, a study was conducted in fifteen selected parks of Lahore to understand the community's role in improving and maintenance of ecosystem services in parks. The purpose of the study is to assess the perception of people through their suggestion and interest shown towards the improvement and betterment of ecosystem services in urban parks. This will be helpful in planning and designing of urban parks in the context of people's needs which ultimately leads to enhance the quality of life. The study area comprises of fifteen parks of Lahore administered by the Parks and Horticulture Authority (PHA). The institute of PHA is responsible to develop and maintain the green areas in Lahore under the umbrella of the Punjab Government.
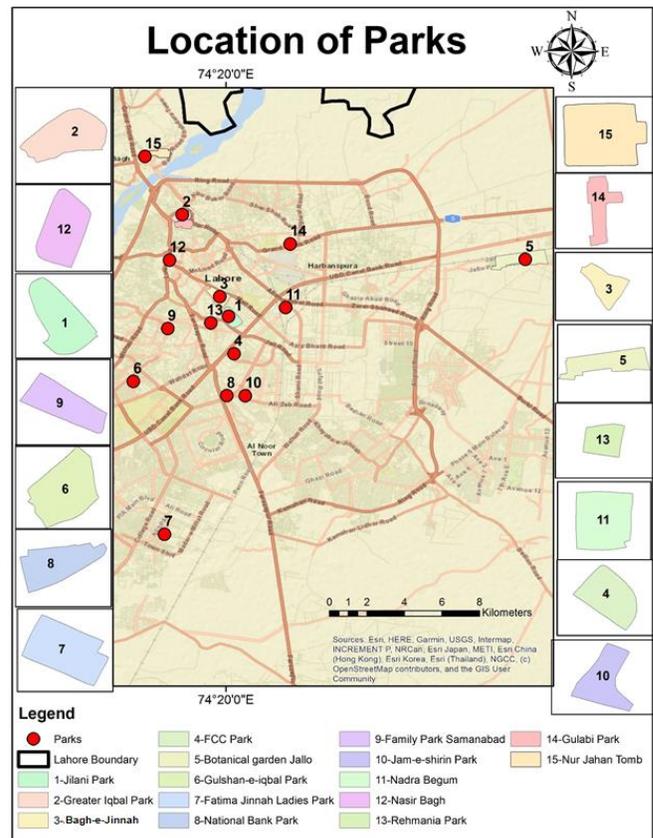

Figure 1. Map of the study area.

Observation, quantitative and qualitative surveys are useful methods to collect data. A qualitative survey usually includes users and experts. While the quantitative survey primarily

focuses on the data from visitors (Razak *et al.,* 2016). In this research, primary data collection was done through a questionnaire-based survey in selected parks of Lahore as shown in Figure 1. The questionnaire was designed to assess the perception of people in improving the ecosystem services in parks. It consisted of demographic and socio-economic data of respondents, open-ended, and close-ended questions. The questionnaire was comprised of characteristics that reflect the people's knowledge about the particular quality of the park, suggestions to improve the parks, and their willingness to pay an entrance fee for the betterment of parks. It was translated into the Urdu language for the convenience of the respondents. Questionnaires were only given to those visitors who were willing to fill the survey form. Social Packages on Statistical Systems (SPSS version 25.0) was used to analyze the collected data. The total number of respondents was three hundred from fifteen selected parks of Lahore. Similarly, education and employment status also contribute to understanding the attributes regarding the quality of life (Riaz *et al.,* 2002).

RESULTS AND DISCUSSION

This study reveals that 49% were male and 51% were female respondents (Table 1). It also depicts that most respondents (48.3%) were in the 18-30 age group. As much as education level is concerned, the result showed that 28% of respondents belong to the intermediate level and 27.7% were graduated. Similarly, when job status was observed, 36.7% were employed and 33% were the students who visited parks.

Many suggestions were given by the respondents to improve the ecosystem services in parks. An open-ended question was included in the questionnaire to write the response. This method was adapted to know the needs of people and suggestions for the betterment of parks. There is a long list of suggestions given by the respondents. However, in this study, a list of only the top 10 suggestions is mentioned to observe the most demanding need of the people in selected parks (Table 2). According to the result, 18% of suggestions were about the cleanliness of parks. While 17.3% of respondents suggested for plantation of trees in the parks. However, 15.7% gave their suggestion to improve the maintenance of parks. Further, 6.3% of people gave their opinions about the provision of recreation facilities for the public. Result also delineated that 4.3% of people are concerned about the security of parks while 3.3% wanted swings for kids in parks. Besides, 3% of people also wanted to improve the parking facility. Moreover, 1.7% of people suggested keeping silence in parks and the same percentage wanted to avoid political activities in the parks. A similar study was conducted in Malaysia that enlisted the top ten suggestions given by visitors for the maintenance and improvement of urban parks (Razak *et al.,* 2016). Thus, the identification of suggestions in the current study also revealed that the park's services can be improved and maintained by incorporating the feedback of visitors. Details are given in table 2.

Table 1. Socio-demographic profile of the respondents.

	Frequency	Percent
Gender		
Female	153	51
Male	147	49
Total	300	100
Age groups		
Less than 17	35	11.7
18 to 30	145	48.3
31 to 45	82	27.3
46 to 60	35	11.7
Above 60	3	1
Total	300	100
Education level		
Below Matric	13	4.3
Matric	31	10.3
Inter	84	28
Graduate	83	27.7
Post Graduate	74	24.7
Others	15	5
Total	300	100
Employment status		
Employed	110	36.7
Self-Employed	43	14.3
Student	100	33.3
Retired	4	1.3
Job Less	43	14.3
Total	300	100

Table 2. List of top 10 suggestions to improve the park.

Description	Frequency	Percent
Cleanliness	54	18.0
Tree plantation	52	17.3
Improve maintenance	47	15.7
Null	40	13.3
Recreation facilities may be provided	19	6.3
Security	13	4.3
Swings for kids	10	3.3
Parking facility	9	3.0
Avoid political activities in the park	5	1.7
Silence may be kept	5	1.7

As for as the quality of the park is concerned, data showed that the p-value (0.34) was larger than the alpha value (0.05) means that gender doesn't depend on the quality of parks (Table 3). Because parks improve physical and mental health and provide the natural silence zone which is important for both genders. However, the p-value (0.04) was found less than the alpha value (0.05) means that there is an association between age group and quality of the park as if the park has swings for kids, big playing area then less than 17 years kids

mostly come (Table 3). Moreover, if parks have more recreation facilities then the adult group (18-30 years) mostly visit. Mostly adults to aged age-group have a concern about the quality of parks as they enjoy the natural environment and have an idea about the maintenance of parks. Because parks as a source of aesthetic appreciation and inspiration, provide a green and peaceful environment so aged group preferred to visit parks.

Data also depicted that for sr. 3, p-value (0.04) was found less than the alpha value (0.05) (Table 3). There was an association between education level and quality of park as most students come in parks for educational purposes or research work. On the other side, educated persons know the quality or advantages of parks as parks provide a natural environment, improve the mental and physical health, park's importance for mitigating the impacts of climate change etc. Table 3, (Sr. 4) shows that p-value 0.01 that is less than alpha value 0.05. Jobholders prefer to go to those parks, where they find, desired activities, and other services. Students, housewives, and retired persons also preferred to go park to enjoy the natural environment and make themselves fresh. In another study, it has been concluded by chi-square test that age and education were statistically associated with the perceived ecosystem services (Jim and Chen, 2006). In this study, age, education, and employment status also showed a strong association with the particular quality of the park perceived by visitors.

Table 3. Quality of park for which it is famous.

Sr.	Description	Chi-square value	Significance
1	Gender	10.085	0.34
2	Age-group	51.322	0.04
3	Education-Level	59.815	0.04
4	Employment status	56.602	0.01

Source: primary data computed by crosstab.

Figure 2 shows most of the respondents (31.7%) marked that the parks are famous for the quality to improve the physical and mental health. This shows that they knew green spaces play a vital role in improving the physical and mental health of human beings. After that, most people (25%) came to parks to enjoy the natural environment. Further, 10.3% of respondents also knew that the famous quality of parks is to improve the local environment.

Although there is no entry fee in all public parks of Lahore under PHA, however, the data was also evaluated to observe the willingness of respondents to pay the entrance fee (Table 4). It was therefore supposed either they will agree to pay or not if it is assumed that the fee will be utilized for the betterment of parks. But surprisingly only 2.3% of people agreed to pay while 97.7% did not agree. When the change in visit due to the implementation of the supposed entrance fee was observed as shown in Table 5, it came to know that 50%

of people do not know about the change in the visit. While 29% stated that due to the entry fee, visits would be decreased.
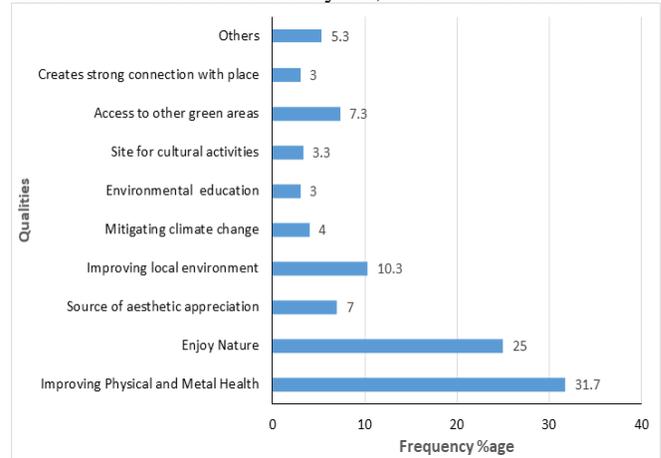

Figure 2. Frequency %age of the famous qualities of parks

Table 4. Willingness to pay an entrance fee

Description	Frequency	Percent
Yes	7	2.3
No	293	97.7
Total	300	100.0

Table 5. Impacts of entrance fee on the visit to the park.

Description	Frequency	Percent
No, it would remain the same	52	17.3
Yes, it would decrease	87	29.0
Yes, it would increase	11	3.7
I don't know	150	50.0
Total	300	100.0

Table 6 shows the Pearson correlation among selected parameters. The result showed the negative weak correlation ($r = -0.133$) between the quality of the park for which it is famous and people's willingness to pay an entrance fee for improvement of park. p value = 0.011 showed significance between them while alpha (α) value is 0.05. It is assumed that if the quality of the park is up to the mark of people's need, they will be interested to pay for the betterment of park. The negative weak correlation ($r = -.008$) between quality of park for which it is famous and the impacts of entrance fee on the change in visits exists. However, p value between them is 0.447, which is interpreted as no significance. Similarly, there is weak positive correlation between willingness to pay entrance fee and impacts of entrance fee on change in visit with $r = 0.019$. Result also shows that there is no significance between them ($p = 0.371$). Pearson correlation was used in study of public parks and well-being in United states of America to highlight the association between independent variables of parks and indicators of wellbeing (Larson *et al.,* 2016). Likewise, a study was conducted in Turkey with the help of Pearson correlation analysis to find the association

Table 6. Pearson's correlation.

		Quality of park for which it is famous	Willingness to pay an entrance fee	Impacts of entrance fee on the visit in the park
Quality of park for which it is famous	Pearson correlation	1.000		
	Sig. (1-tailed)			
Willingness to pay entrance fee	Pearson correlation	-0.133*	1.000	
	Sig. (1-tailed)	0.011		
Impacts of entrance fee on the visit in the park	Pearson correlation	-0.008	0.019	1.000
	Sig. (1-tailed)	0.447	0.371	

*Correlation is significant at the 0.05 level (1-tailed); Source: primary data computed by Pearson's correlation.

between preferences and perceptions of visitors. This study highlighted the significance of visitor's role in park management. Results showed a strong positive association between preferences and perceptions (Arslan and Kaymaz, 2020). It is observed in current study that visitors will show their willingness for the improvement and conservation of parks, if they are satisfied with the services of parks. Moreover, the visit frequency will not be affected, if their needs are fulfilled. Otherwise they will not be interested in payment.

Conclusion: Study concludes that urban parks play a significant role in improving the quality of citizens' life. Therefore, the involvement of people is unavoidable in designing and improving the ecosystem services in urban parks. The outcome of the study focuses that during framing the policies and strategies for urban planning, it's important to consider the community suggestions because they reflect the real needs of people. It also portrays the perception of people about the quality of parks that they consider, is important, and their willingness to pay for the improvement of urban parks. This also leads a way to understand their needs and interest in maintaining ecosystem services in urban parks. Ultimately, the result will be helpful for the cities and town planners to design and manage urban parks according to people's demands and needs.

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