

Evaluation of Residents Perception about Socioeconomic and Environmental Impacts of Urban Green Spaces of Lahore, Pakistan

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Abstract: In a country like Pakistan, the presence of urban greening and parks are very essential for the well-being of its citizens. The resident's awareness about urban green spaces (UGSs) is essential as it would not only help towards a healthier environment, but prepare residents to manage these spaces efficiently through local resources. This formulates the rationale behind current research work. This research is aimed at studying about the resident's perception for UGS's attributes like environmental, negative and positive. Another major focus of this research is to analyze the socioeconomic differentials and its consequent impacts on resident's perception about urban green spaces, which has been probed with the help of MANOVA (Multivariate Analysis of Variance). In this regard the primary data of 223 visitors were collected by random sampling method from eight major parks of Lahore, Pakistan. The findings of this survey of resident's perception have shown that mostly male, single, low and middle class, and educated people visit the urban green spaces and they are highly indebted by their environmental and health benefits. For the selected characteristics of urban green areas, the resident's perception has revealed that there exists an insignificant relationship with age and marital status of the respondents while the most significant relation was shown by the residents who visited the UGSs regularly as 'p' value is less than the set significance level of 0.05. This study has highlighted a dire need of such UGSs in the city of Lahore which is known to be the "City of Gardens". This could raise the spirits of administrators, city managers and planners to take immediate action in this regard.

Keywords: Attributes; perception; socioeconomic differentials; random sampling; significance level.

Introduction

Today as cities have become more and more urbanized, a change in the natural environment is unavoidable. In this change, the loss of urban greening and its likely benefits; social, economic, physical and ecological are evident. Generally, urban green space meant that all the greenery of any area, whether it is a schoolyard, playground, vacant lots and a public plaza. Similarly Maruani and Amit-Cohen (2007) referred the urban green space are small and large parks in urban neighborhood fringes. According to the EEA (European Environmental Agency) the parks and urban green space are required to be well within the reach of local residents walking distance of 15 minutes or in close proximity to enjoy the UGS's wide-ranging benefits (Stanners and Bourdeau, 1995).

The presence of UGSs are indicators of urban sustainability and quality life in fast developing urban world (De la Barrera et al., 2016). For city's well-being the check on urban greening and its presence is necessary as green spaces recharge the ground water, reduce air pollutants, and minimize the noise as well as atmospheric temperature along with many other social and ecological benefits. Whereas the changes in LCLU (land cover and land use) leave its imprints on terrestrial, physical, biological, and climatological conditions (Lehmann et al., 2014) and to overcome these problems the study of vegetation cover changes,

preservation and resident's perception is very important (Latifovic et al., 2005, Fisher et al., 2006).

According to resident's perception, the most important benefits of UGSs are so many ; mainly increase in decision power of an individual and to reduce stress of all sorts (Hartig et al., 1991), improvement in mental health of children living nearby (Cornell et al., 2001) and an enhanced social interaction among communities (Kuo et al., 1998). However, the heterogeneity of socioeconomic and demographic background, culture and the environment also influences the resident's perception about the use and potential of urban green areas (Erkip, 1997).

Keeping this in view, the research objective focusing on the UGS visitor's socioeconomic and demographic differentials in Lahore and their impacts upon different attributes of urban greening, the present research has been conducted. In addition to this, another objective is to study and analyze the perception of Lahore's residents about urban green area's characteristics. In order to achieve these objectives, the current study hypothesized that H_0 of all the socioeconomic and demographic variables have no impact on UGS's characteristics and attributes.

Previous researches related to UGSs in different localities show that urban greening is important for human's health and the nearby residents experience less stress as they live near healthy environment

because of good quality green space area (Francis et al., 2012). Van den Berg et al. (2010) highlighted an analysis indicating that after the World Trade Centre attack on 9th September, 2001 the number of park visitors increased many folds to reduce the mental stress. In 2004, the people of Netherland enjoyed so many benefits of the green areas in cities and considered as the place of relaxation, scenic beauty, freedom and peace of mind (Chiesura, 2004). While with reference to the environmental benefits of green spaces, Hussain et al. (2010) described that 86% of park visitors in Faisalabad considered vegetation cover as a source of reducing air pollution.

Table 1 Urban green spaces in Lahore.

Urban green space or park name	Location	Area (acres/ Km ²)
Hazuri Bagh	31°35' N 74°18' E	5.12 / 0.020
Shalimar Garden	31°35' N 74°22' E	39.53 / 0.15
Gulshan-e-Iqbal	31°30' N 74°17' E	67 / 0.27
Jilani Park	31°32' N 74°20' E	84.5 / 0.34
Botanical Park (Jallo Park)	31°34' N 74°29' E	100 / 0.404
Bagh-e-Jinnah	31°33' N 74°19' E	121 / 0.489
Model Town Park	31°29' N 74°19' E	125 / 0.51
Greater Iqbal Park	31°35' N 74°18' E	328.90 / 1.33

Source: Google Earth, Parks and Horticulture Authority (PHA) Lahore.

In earlier studies, the variation in socio-demographics has clearly shown that for the aged citizens scenic beauty is main attraction, while they visited urban green spaces. However, for younger people it is the sports which attracted them the most (Matsuoka and Kaplan, 2008). Similarly socialization, social interaction and relaxation is one of the major attractions for females, when they visit urban green spaces (Lee et al., 2002).

However, in some studies, the negative impacts (vandalism and insecurity) of green areas were also encountered by residents due to mismanagement and imbalanced availability of UGS and without a proper park administration (Australia, 1983). But the multifunctional benefits of urban green areas had always stood out against the negative attributes. Even in a comparative analysis carried out for Vietnam and Pakistan, the urban green spaces have been considered as places of social interactions and communications (Schetke et al., 2016). The UGS's main benefits observed in the city of gardens-Lahore are related to health, environment and social interaction, while these attributes were analyzed with ANOVA and chi-square test (Alam, 2013, Shirazi and Kazmi, 2016).

Therefore; in this study a significant level of dependent variables is probed within the groups of independent variables with the help of a MANOVA test.

Table 2 Socioeconomic profile of the visitors.

Demographics	Participants	No. of respondents	Percentage of respondents
Gender	Male	143	64.1
	Female	80	35.9
Age	15 - 24	87	39.0
	25 - 29	65	29.1
	30 - 34	32	14.3
	35 - 49	20	9.0
	50 - 54	8	3.6
	55 - 59	5	2.2
Marital Status	60 and above	6	2.7
	Single	130	58.3
	Married	83	37.2
Education	Divorced / Widow	10	4.5
	Uneducated	3	1.3
	Primary / Middle	16	7.2
	Matric	25	11.2
	Inter	46	20.6
	Graduate/Postgraduate	100	44.8
	Professional Degree	27	12.1
Occupation	Other	6	2.7
	Unemployed	12	5.4
	Student	65	29.1
	Govt. Employ	25	11.2
	Private Employ	73	32.7
	Self-Employed	18	8.1
	Pensioner / Retired	6	2.7
	House Wife	17	7.6
	Business	6	2.7
	Man/Woman	1	.4
Household's monthly income	Others	1	.4
	Less Than 50,000	101	45.3
	50,001 - 75,000	62	27.8
	75,001 - 1,00,000	33	14.8
	1,00,001 - 1,50,000	12	5.4
Total	1,50,001 - above	15	6.7
		223	100

Materials and Methods

Study Area and Selected Sites

Lahore-the city of gardens has been selected as the study area for this research (located at Lat. 31° 15' and 31° 43'N and Long. 74° 10' and 74° 39' E) and is the capital of the Punjab province. Lahore is the second largest city of Pakistan after Karachi in terms of its population size. According to the Government of Pakistan Census, 1998, the population of Lahore was 7 million, with a density of population of 3,566 person per sq.km. However, in 2018 its population became 11.07 million people. On a global scale, Lahore ranked 31st amongst the most populated cities with the density of 12,400 people per sq.km. (Cox, 2018). Lahore's geographical extent is 1,772 sq. km (684 sq. miles) with low-latitude semi-arid hot climate/ subtropical steppe. The hottest month in Lahore is June with 40°C average temperature and January is the coolest month with dense fog. The monsoon season starts in July and lasts up to September (Government of Pakistan, 2000).

According to Parks and Horticulture Authority Lahore (2018) there are 276 green belts and 828 parks in Lahore. The literature has shown that researchers primarily focus the parks as the indicator of urban green space studies (Bedimo-Rung et al., 2005). Similarly, as all the green areas or parks of Lahore

cannot be covered in research therefore only eight main parks of Lahore have been chosen as representative of the urban green space in this research work. Figure 1 shows the selected study area Lahore, whereas Figure 2 portrays the selected green areas. The areas and location of selected urban green spaces are shown in Table 1, which indicates that the Hazuri Bagh is smallest while the greater Iqbal Park is highest by area/size.

Table 3 Ranking of urban green space attributes.

Urban Green Space Attributes	Mean	Rank
Important in an area	1.49	1
Promote Health	1.58	2
Promote children physical and mental development	1.64	4
Reduce stress	1.81	7
Property value increase	2.00	10
Increase duration of living	2.27	13
Important in daily life	1.87	9
A place of social interaction	2.31	15
Promote incivility and vandalism	3.47	19
Commercial encroachment	3.17	17
Insect or bug attack	2.57	16
Unsafe or insecure place	3.39	18
A place for whiling away time	3.74	20
Enhance the scenic beauty	1.71	5
Reduce the air pollutants and improve the air quality	1.61	3
Protect from adverse environmental conditions	2.17	11
Preserve biodiversity (birds, animals, and plants)	1.64	4
Minimize noise pollution	2.22	12
Maintain the climate	1.84	8
Source of rainfall	2.52	14
Moderate the temperature	1.72	6

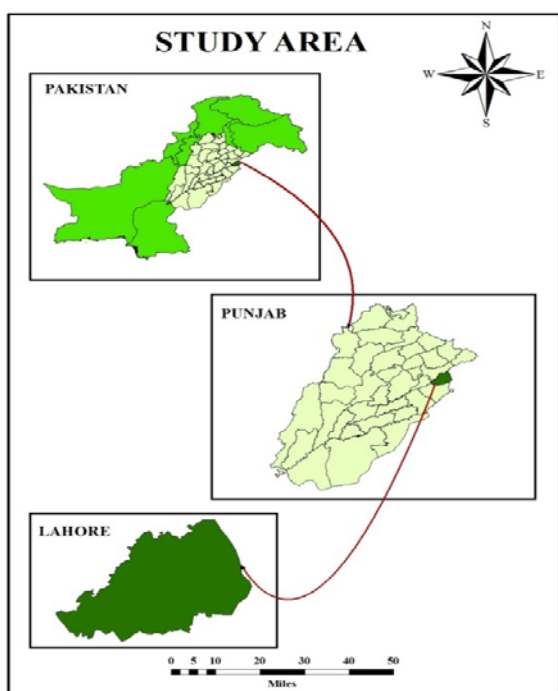


Fig. 1 Study area Lahore.

Table 4 Resident’s perception for urban green space attributes.

UGS attributes	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Positive Attributes					
Important in an area	59.2%	34.5%	4.9%	0.9%	0.4%
Promote Health	53.4%	36.3%	9.4%	0.4%	0.4%
Promote children physical and mental development	49.8%	39.0%	9.4%	1.3%	0.4%
Reduce stress	40.8%	41.7%	13.5%	3.6%	0.4%
Property value increase	32.3%	41.3%	20.6%	5.4%	0.4%
Increase duration of living	21.5%	42.6%	24.7%	9.4%	1.8%
Important in daily life	34.5%	45.7%	17.5%	2.2%	0.0%
A place of social interaction	19.7%	47.1%	21.1%	6.7%	5.4%
Negative Attributes					
Promote incivility and vandalism	1.8%	18.4%	25.1%	40.8%	13.9%
Commercial encroachment	1.8%	26.0%	34.5%	29.1%	8.5%
Insect or bug attack	13.5%	41.3%	23.3%	18.4%	3.6%
Unsafe or insecure place	4.0%	15.2%	30.5%	38.6%	11.7%
A place for whiling away time	2.2%	9.9%	18.4%	50.7%	18.8%
Environmental Attributes					
Enhance the scenic beauty	39.5%	52.0%	6.7%	1.8%	0.0%
Reduce the air pollutants and improve the air quality	52.9%	36.8%	7.2%	2.7%	0.4%
Protect from adverse environmental conditions	26.5%	43.9%	17.0%	10.8%	1.8%
Preserve biodiversity (birds, animals and plants)	47.5%	43.0%	7.2%	2.2%	0.0%
Minimize noise pollution	22.9%	43.0%	25.1%	6.7%	2.2%
Maintain the climate	32.3%	52.9%	13.5%	0.9%	0.4%
Source of rainfall	18.4%	35.4%	27.8%	12.1%	6.3%
Moderate the temperature	41.3%	47.1%	10.3%	0.9%	0.4%

Questionnaire Survey, Sampling and Data Analysis

In previous studies a questionnaire was used as a survey tool to study about resident’s perception (Garrad and Willis, 1999, Lorenzo et al., 2000, Lewan and Söderqvist, 2002) while in this study the same instrument and technique have been used to study resident’s perception about Lahore. For field survey a pre-designed questionnaire with close-ended questions is used with Likert Scale, “strongly agree” to “strongly disagree”, coded from ‘1’ to ‘5’ respectively.

The data for this study were collected during the months of June to August 2018 between 400 pm to 700 pm (evening time) on all weekdays as well as at weekends. At first the pilot test was conducted in Jilani Park by random sampling and afterwards based on visitor’s understanding and response the irrelevant questions and errors were removed from the questionnaire to make it more convenient and accurate. The final questionnaire after the removal of all errors and ambiguities was used for the field survey and in total 226 visitor’s data were collected as representative of a sizeable population. At an average minimum twenty-five questionnaires were filled from each UGS/park. Out of these 226 filled questionnaires 223

were selected for analysis as 3 of them were excluded because of incomplete and missing information.

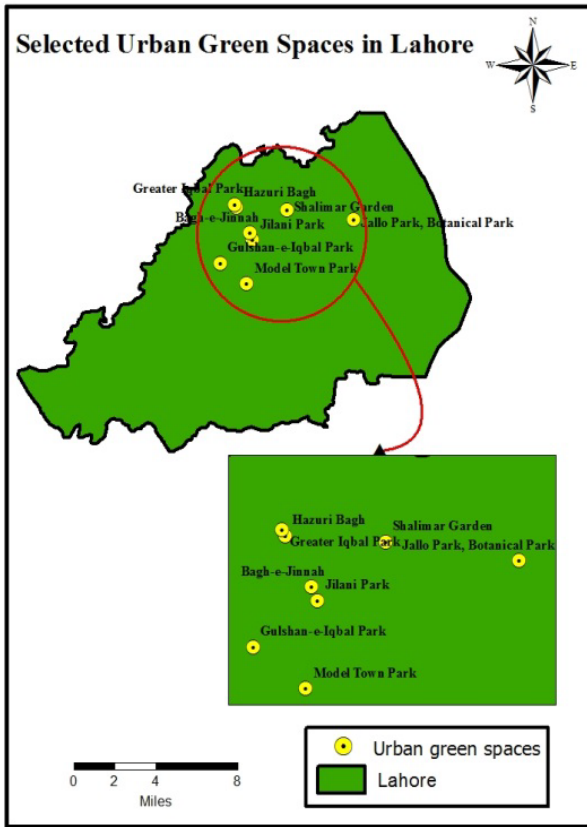


Fig. 2 Selected urban green spaces in Lahore.

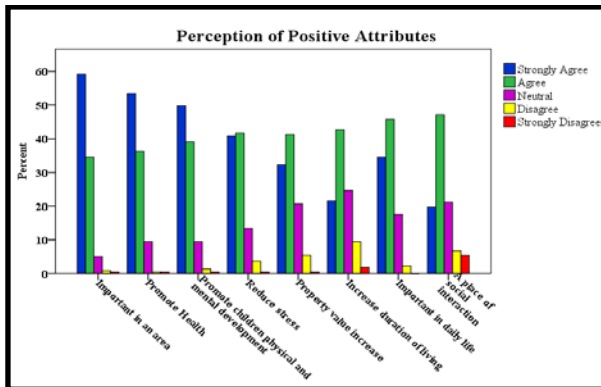


Fig. 3 Urban green space positive attributes perception.

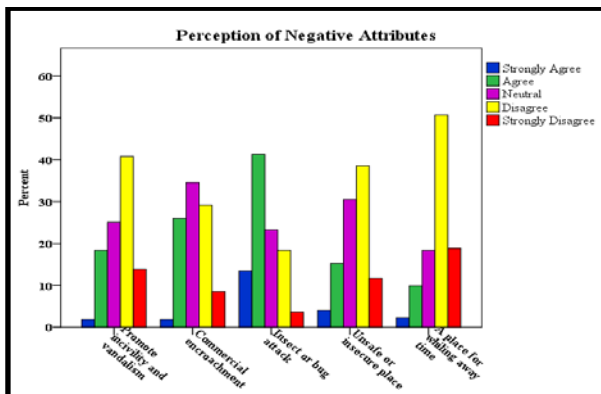


Fig. 4 Urban green space negative attributes perception.

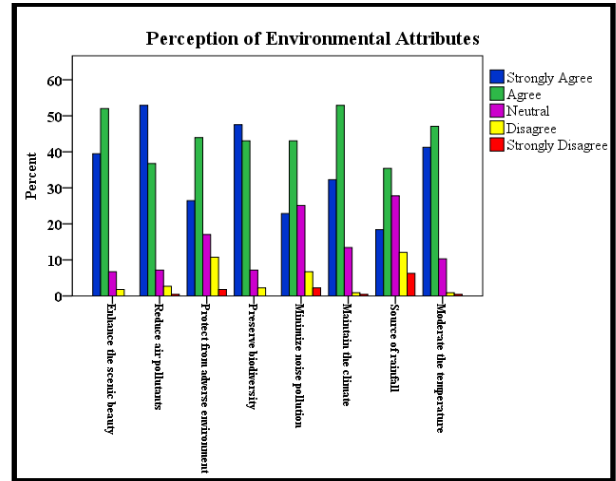


Fig. 5 Urban green space environmental attributes perception.

Table 5 Gender implications for urban green space attributes based on MANOVA test

UGS Attributes	Gender (Pillai's Trace=0.098; $\rho = 0.411$)			
	Male	Female	F Value	ρ
Positive Attributes				
Important in an area	1.49	1.68	0.427	0.514
Promote Health	1.56	1.71	1.287	0.258
Promote children physical and mental development	1.59	1.98	2.323	0.129
Reduce stress	1.75	2.16	4.005	0.047
Property value increase	1.92	2.29	0.026	0.872
Increase duration of living	2.27	1.98	2.125	0.146
Important in daily life	1.82	2.39	0.710	0.400
A place of social interaction	2.27			
Negative Attributes				
Promote incivility and vandalism	3.54	3.34	2.068	0.152
Commercial encroachment	3.22	3.08	1.097	0.296
Insect or bug attack	2.74	2.28	10.561	0.001
Unsafe or insecure place	3.49	3.20	4.270	0.040
A place for whiling away time	3.81	3.61	2.250	0.135
Environmental Attributes				
Enhance the scenic beauty	1.69	1.75	0.475	0.491
Reduce the air pollutants and improve the air quality	1.56	1.70	1.696	0.194
Protect from adverse environmental conditions	2.10	2.30	1.960	0.163
Preserve biodiversity (birds, animals and plants)	1.59	1.74	2.277	0.133
Minimize noise pollution	2.17	2.33	1.404	0.237
Maintain the climate	1.79	1.94	2.188	0.140
Source of rainfall	2.51	2.55	0.064	0.800
Moderate the temperature	1.64	1.88	5.773	0.017

To fulfil the objective of this research the SPSS version 20 was used to test and analyze the data with the descriptive and inferential statistics. In inferential statistics to test the independent variables' statistical significance, with the extent of variance of dependent variables the MANOVA (Multivariate Analysis of Variance) has been used.

Table 6 Age implications for urban green space attributes based on MANOVA test.

UGS Attributes	*Age (Pillai's Trace=0.485; $\rho = 0.891$)							F Value (df=6)	p	ρ in the Scheffe comparison
	1	2	3	4	5	6	7			
Positive Attributes										
Important in an area	1.53	1.43	1.69	1.25	1.38	1.40	1.50	1.058	0.389	
Promote Health	1.59	1.57	1.84	1.40	1.25	1.60	1.33	1.348	0.237	
Promote children physical and mental development	1.61	1.65	1.75	1.45	1.75	1.80	1.67	0.419	0.866	
Reduce stress	1.82	1.88	1.94	1.60	1.25	1.60	2.00	1.118	0.353	
Property value increase	2.10	2.11	1.81	1.80	1.63	1.40	2.17	1.433	0.203	
Increase duration of living	2.25	2.38	2.37	2.25	1.75	2.20	1.67	1.006	0.422	
Important in daily life	1.87	1.72	2.19	2.05	1.63	2.00	1.50	1.905	0.081	
A place of social interaction	2.20	2.34	2.66	2.40	1.88	2.00	2.33	1.123	0.350	
Negative Attributes										
Promote incivility and vandalism	3.39	3.46	3.25	3.75	3.87	3.60	4.17	1.332	0.244	
Commercial encroachment	3.09	3.20	3.09	3.20	3.38	3.60	3.50	0.472	0.829	
Insect or bug attack	2.55	2.60	2.44	2.80	2.75	2.40	2.50	0.317	0.927	
Unsafe or insecure place	3.40	3.35	3.09	3.60	3.75	3.40	3.83	0.978	0.441	
A place for whiling away time	3.60	3.86	3.59	3.85	4.13	4.20	4.00	1.165	0.326	
Environmental Attributes										
Enhance the scenic beauty	1.75	1.69	1.91	1.50	1.50	1.40	1.50	1.248	0.283	
Reduce the air pollutants and improve the air quality	1.69	1.58	1.72	1.45	1.25	1.40	1.33	0.887	0.505	
Protect from adverse environmental conditions	2.14	2.31	2.34	2.10	1.63	2.00	1.50	1.274	0.270	
Preserve biodiversity (birds, animals and plants)	1.74	1.69	1.62	1.45	1.38	1.20	1.17	1.515	0.174	
Minimize noise pollution	2.22	2.37	2.12	2.30	1.88	1.60	2.00	0.924	0.478	
Maintain the climate	1.87	1.88	2.00	1.50	1.63	1.80	1.67	1.272	0.271	
Source of rainfall	2.48	2.60	2.75	2.40	2.13	2.00	2.50	0.681	0.665	
Moderate the temperature	1.82	1.69	1.72	1.60	1.38	1.80	1.50	0.774	0.591	

* 15-24=1, 25-29=2, 30-34=3, 35-49=4, 50-54=5, 55-59=6, 60 and above=7

Results and Discussion

Demographic Characteristics

The resident's demographic characteristics are shown in Table 2 which shows that out of 223 visitors, males and females are 64.1% and 35.9% respectively. Based on age group, the share of young visitors of 15-29 age groups is highest with 68.1% whereas the old and middle-aged group visitors were few. In China the same trend is found with more young visitors (Shan, 2014). In rest of the age group, 30-34, 35-49, 50-54, 55-59, and 60 and above the visitors reported are 14.3%, 9%, 3.6%, 2.2%, and 2.7% respectively.

An analysis of marital statuses showed that the single men and women visiting UGSs ratio is highest (58.3%), married (37.2%), and divorced or widows/widowers (4.5%) is less. The education profile in Table 2 also shows that the visitors were well educated as the uneducated respondent's share is only 1.3%. Residents who had attended primary or middle school were 7.2%, who had acquired a Matriculation certificate were 11.2%, who had passed high school were 20.6%, graduates and postgraduates were the maximum with 44.8%, professional degree holders were 12.1%, and 2.7% of visitors belonged to others categories. For occupation mixed respondents were found, but privately employed were highest with 32.7% and with 2.7% retired. The businessman/woman were lowest apart, from 0.4% belonged to another category. Collectively students and private employees make the share more than fifty percent at 61.8%. In this study it is found that

residents from lower class and middle-class visit the green spaces more as 45.3% visitors were from the income group of less than 50,000 rupees. The rest 27.8% were from income group 50,001 - 75,000, 14.8% from 75,001 - 1,00,000, 5.4% from 1,00,001 - 1,50,000 and 6.7% were from 1,50,001 - above income group.

Resident's Perception

The ranking in Table 3 shows that the residents of Lahore are well aware of the green space advantages. To rank the attributes based on resident's perception, the mean value is used. For 'strongly agree' the mean value recorded is lowest and for 'strongly disagree' the mean value recorded is highest. Urban green spaces are important in an area and promote the visitor's health, because of which it is highest in ranking at 1 and 2 respectively. The other ranks of green space attributes are: 'reduces air pollutants' at 3, 'preserves biodiversity' and 'promotes children's physical and mental development' at 4, 'enhances scenic beauty' at 5, 'moderates the temperature' at 6, 'reduces stress' at 7, 'maintains the climate' at 8, 'important in daily life' at 9, and 'increases property value' at 10. Whiling away of time was ranked the highest at 20 with the most disagreed response. One positive attribute of social interaction and the rest of the negative attributes are ranked above 10.

Positive Attributes

For positive attributes of UGS most visitors reported 'strongly agree' response (Fig 3, Table 4). With

Table 7. Marital status implications for urban green space attributes based on MANOVA test.

UGS Attributes	Marital Status (Pillai's Trace=0.149; p=0.848)					
	Single	Married	Divorced/ Widow	F Value (df=2)	p	p in the Scheffe comparison
Positive Attributes						
Important in an area	1.49	1.47	1.60	0.168	0.846	
Promote Health	1.55	1.61	1.70	0.318	0.728	
Promote children physical and mental development	1.65	1.57	2.10	2.336	0.099	
Reduce stress	1.85	1.71	2.20	1.819	0.165	
Property value increase	2.04	1.94	2.10	0.372	0.690	
Increase duration of living	2.29	2.24	2.30	0.075	0.928	
Important in daily life	1.81	1.95	2.10	1.332	0.266	
A place of social interaction	2.26	2.40	2.20	0.494	0.611	
Negative Attributes						
Promote incivility and vandalism	3.42	3.52	3.70	0.547	0.580	
Commercial encroachment	3.21	3.11	3.10	0.288	0.750	
Insect or bug attack	2.60	2.55	2.40	0.191	0.827	
Unsafe or insecure place	3.44	3.33	3.20	0.492	0.612	
A place for whiling away time	3.72	3.77	3.70	0.073	0.930	
Environmental Attributes						
Enhance the scenic beauty	1.72	1.70	1.60	0.169	0.845	
Reduce the air pollutants and improve the air quality	1.64	1.59	1.40	0.480	0.619	
Protect from adverse environmental conditions	2.22	2.08	2.30	0.567	0.568	
Preserve biodiversity (birds, animals and plants)	1.67	1.60	1.60	0.237	0.789	
Minimize noise pollution	2.24	2.17	2.50	0.574	0.564	
Maintain the climate	1.84	1.86	1.80	0.033	0.968	
Source of rainfall	2.52	2.54	2.50	0.017	0.983	
Moderate the temperature	1.76	1.66	1.70	0.482	0.618	

59.2%, the highest 'strongly agree' response is recorded that Green areas are important in an area. 'Promotes health' and 'children's physical and mental development' also showed the 'strongly agree' response at 53.4% and 49.8% respectively. In Los Angeles, 89% of respondents agreed to the same statement that green areas are important in an area (Pincetl and Gearin, 2005). The agreed response was recorded highest for 'a place for social interaction' at 47.1%, and for rest it was 'important in daily life' at 45.7%, 'increases the duration of living' at 42.6%, 'reduces stress' at 41.7%, and 'property value increases' at 41.3%. In Mandeville city, New Orleans the same results were found for increase in property value (Lorenzo et al., 2000) and good mental health (Sherer, 2003). Among other positive attributes for 'social interaction' there was 5.4% response to 'strongly disagree' which was the highest for this response. The same perception of residents was observed in Guangzhou (Jim and Shan, 2013) and Singapore (Yuen et al., 1999).

Negative Attributes

For negative attributes mixed response of residents was recorded as shown in the multiple bar graphs, (Fig 4 Table 4). For insect or bug attack the highest agreed response of residents was recorded with 41.3% and same result was found in Singapore with 58% (Yuen et al., 1999). For 'whiling away time' residents showed the highest disagreed response with 50.7%. The same disagreed response of visitors was observed for green space as an 'unsafe place' at 38.6% and 'promotes incivility and vandalism' at 40.8%. The highest neutral

response of 34.5% was recorded for green space a source of 'commercial encroachment'.

Environmental Attributes

Figure 5 and Table 4 show that residents highly appreciate the environmental benefits of green spaces in Lahore as 52.9% visitors reported strongly agree response to 'reduce air pollutants' and 'maintain the climate of an area'. Greenery enhances the scenic beauty also received more than a fifty percent response of residents with 'agree' at 52%. The same 'agree' response was observed for the 'protection of an adverse environment' at 43.9%, and at 43% for both 'preservation of biodiversity' and 'reduction of noise pollution'. For green spaces to enhance the scenic beauty and perseveration of biodiversity no negative response was recorded, but 12.1% and 10.8% of the visitor's response showed the disagreed response for source of protection against the adverse environmental conditions and enhanced rainfall due to the presence of urban green spaces. These results in Figure 5 revealed that for some environmental attributes the residents are not aware and neutral about green space benefits. As for 'source of rainfall' the response is more neutral with 27.8%, and for the rest of the environmental attributes there was 'disagree' and 'strongly disagree' response with less than 10%.

Socioeconomic Differentials

Table 5 depicts the gender relation with attributes of green space and it is very much clear that out of twenty- one attributes gender is significant to four

Table 8. Education implications of urban green space attributes based on MANOVA test.

UGS Attributes	^b Education (Pillai's Trace=0.651; p=0.114)								F Value (df=6)	P	ρ in the Scheffe comparison
	1	2	3	4	5	6	7				
Positive Attributes											
Important in an area	1.67	2.00	1.64	1.54	1.37	1.41	1.33	2.547	0.021	ρ(2,5)=0.05	
Promote Health	2.00	1.87	1.76	1.65	1.48	1.52	1.33	1.455	0.195		
Promote children physical and mental development	2.00	2.19	1.64	1.70	1.49	1.67	1.83	2.431	0.027	ρ(2,5)=0.05	
Reduce stress	2.00	2.00	1.88	1.96	1.67	1.89	1.83	.941	0.466		
Property value increase	1.33	2.25	1.84	2.09	2.01	2.00	1.67	.841	0.540		
Increase duration of living	2.00	2.50	2.56	2.22	2.24	2.26	1.67	.999	0.427		
Important in daily life	1.33	2.13	2.00	2.02	1.76	1.89	1.67	1.368	0.229		
A place of social interaction	3.33	2.63	2.44	2.17	2.15	2.67	2.50	1.951	0.074		
Negative Attributes											
Promote incivility and vandalism	2.33	3.56	3.52	3.28	3.54	3.44	3.83	1.162	0.328		
Commercial encroachment	2.33	3.06	3.48	2.93	3.23	3.11	3.50	1.497	0.181		
Insect or bug attack	2.67	2.56	2.36	2.22	2.68	2.89	3.00	1.844	0.092		
Unsafe or insecure place	3.33	3.06	3.52	3.13	3.43	3.56	4.17	1.619	0.143		
A place for whiling away time	4.00	3.31	4.08	3.50	3.75	3.89	4.33	2.163	0.048		
Environmental Attributes											
Enhance the scenic beauty	2.00	1.62	1.56	1.83	1.75	1.59	1.33	1.087	0.371		
Reduce the air pollutants and improve the air quality	2.00	1.75	1.60	1.61	1.58	1.74	1.00	.989	0.434		
Protect from adverse environmental conditions	3.33	2.44	2.24	2.13	2.12	2.11	2.17	.954	0.457		
Preserve biodiversity (birds, animals and plants)	1.67	1.50	1.60	1.83	1.61	1.63	1.33	.847	0.535		
Minimize noise pollution	2.67	2.19	2.36	2.17	2.16	2.37	2.33	.407	0.874		
Maintain the climate	2.33	1.94	1.84	1.98	1.82	1.67	1.50	1.079	0.376		
Source of rainfall	3.33	2.69	2.68	2.46	2.42	2.59	3.00	.771	0.594		
Moderate the temperature	2.33	2.06	1.52	1.70	1.72	1.74	1.50	1.413	0.211		

^b Uneducated=1, Primary / Middle=2, Matric=3, Inter=4, Graduate/ Postgraduate=5, Professional Degree=6, Other=7

Table 9. Occupation implications for urban green space attributes based on MANOVA test.

UGS Attributes	^c Occupation (Pillai's Trace= 0.808; P= 0.251)									F Value (df=8)	P	P in the Scheffe comparison ¹
	1	2	3	4	5	6	7	8	9			
Positive Attributes												
Important in an area	1.58	1.55	1.40	1.44	1.61	1.17	1.41	1.67	2.00	0.594	0.782	
Promote Health	1.58	1.66	1.64	1.42	1.56	1.17	1.88	2.17	1.00	1.819	0.075	
Promote children physical and mental development	1.67	1.74	1.76	1.55	1.44	1.17	1.71	1.83	2.00	0.912	0.507	
Reduce stress	1.67	1.91	2.04	1.70	1.67	1.33	1.82	2.17	3.00	1.275	0.258	
Property value increase	2.00	2.08	2.16	1.89	2.11	1.67	1.82	2.33	3.00	0.784	0.617	
Increase duration of living	2.25	2.25	2.44	2.22	2.44	1.50	2.18	2.83	4.00	1.377	0.208	
Important in daily life	2.00	1.88	2.00	1.74	2.06	1.50	2.06	2.17	1.00	1.092	0.370	
A place of social interaction	2.00	2.26	2.40	2.27	2.56	1.33	2.41	3.33	3.00	1.847	0.070	
Negative Attributes												
Promote incivility and vandalism	3.58	3.31	3.24	3.62	3.83	4.33	3.35	2.50	3.00	2.301	0.022	
Commercial encroachment	3.42	3.06	3.08	3.08	3.39	4.33	3.29	3.00	3.00	1.588	0.130	
Insect or bug attack	2.67	2.51	2.56	2.59	2.67	3.83	2.12	2.67	3.00	1.607	0.124	
Unsafe or insecure place	3.58	3.29	3.04	3.60	3.61	4.33	2.94	2.67	2.00	2.894	0.004	
A place for whiling away time	3.67	3.66	3.88	3.78	3.50	4.33	4.00	3.00	4.00	1.215	0.291	
Environmental Attributes												
Enhance the scenic beauty	1.92	1.83	1.80	1.60	1.50	1.67	1.65	1.83	1.00	1.105	0.361	
Reduce the air pollutants and improve the air quality	1.75	1.74	1.60	1.47	1.72	1.17	1.71	1.67	1.00	0.997	0.439	
Protect from adverse environmental conditions	2.00	2.20	2.24	2.15	2.17	1.17	2.41	2.67	2.00	1.141	0.337	
Preserve biodiversity (birds, animals and plants)	1.67	1.83	1.48	1.51	1.67	1.33	1.76	1.67	2.00	1.308	0.241	
Minimize noise pollution	2.25	2.31	2.20	2.19	2.39	1.83	2.06	2.17	2.00	0.336	0.951	
Maintain the climate	1.83	2.00	1.88	1.62	1.89	1.67	2.06	2.17	2.00	1.773	0.084	
Source of rainfall	2.83	2.48	2.64	2.49	2.61	1.83	2.76	2.17	2.00	0.669	0.719	
Moderate the temperature	1.75	1.86	1.84	1.60	1.67	1.17	1.76	1.83	1.00	1.268	0.262	

^c Unemployed=1, Student=2, Govt. Employ=3, Private Employ=4, Self -Employed =5, Pensioner / Retired=6, House Wife=7, Business Man / Woman=8, Others=9

Table 10. Household's monthly income implications for urban green space attributes based on MANOVA test.

UGS Attributes	^d Household's Monthly Income (Pillai's Trace=0.406; ρ =0.301)						
	1	2	3	4	5	F Value (df=4)	ρ in the Scheffe comparison
Positive Attributes							
Important in an area	1.44	1.61	1.42	1.33	1.60	1.011	0.402
Promote Health	1.50	1.69	1.55	1.75	1.60	.852	0.494
Promote children physical and mental development	1.50	1.82	1.76	1.50	1.60	2.118	0.080
Reduce stress	1.74	2.02	1.67	1.83	1.73	1.402	0.234
Property value increase	2.00	1.98	2.30	1.92	1.53	2.066	0.086
Increase duration of living	2.16	2.47	2.30	2.25	2.20	1.021	0.397
Important in daily life	1.74	2.06	2.00	1.92	1.67	2.220	0.068
A place of social interaction	2.05	2.52	2.58	3.00	2.07	4.579	ρ (1,4)=0.05
Negative Attributes							
Promote incivility and vandalism	3.52	3.42	3.30	3.42	3.67	0.490	0.743
Commercial encroachment	3.24	3.06	3.00	3.42	3.27	0.787	0.535
Insect or bug attack	2.59	2.50	2.55	2.58	2.80	0.263	0.901
Unsafe or insecure place	3.46	3.31	3.39	3.50	3.13	0.484	0.748
A place for whiling away time	3.82	3.74	3.48	4.17	3.40	1.893	0.113
Environmental Attributes							
Enhance the scenic beauty	1.59	1.84	1.82	1.75	1.67	1.579	0.181
Reduce the air pollutants and improve the air quality	1.64	1.63	1.55	1.42	1.60	0.298	0.879
Protect from adverse environmental conditions	2.07	2.35	2.24	2.25	1.93	1.057	0.379
Preserve biodiversity (birds, animals and plants)	1.64	1.71	1.48	1.50	1.80	0.838	0.502
Minimize noise pollution	2.11	2.42	2.24	2.33	2.07	1.173	0.324
Maintain the climate	1.80	1.94	1.79	1.75	1.93	0.497	0.738
Source of rainfall	2.34	2.68	2.76	2.67	2.53	1.431	0.225
Moderate the temperature	1.70	1.71	1.73	1.67	1.93	0.360	0.837

^d Less than 50,000=1, 50,001 - 75,000=2, 75,001 – 100,000=3, 100,001 - 150,000=4, 150,001 and above=5

Table 11. Park visit implications for urban green space attributes based on MANOVA test.

UGS Attributes	^e Park Visit (Pillai's Trace=0.341; ρ =0.121)						
	1	2	3	4	F Value (df=3)	P	P in the Scheffe comparison
Positive Attributes							
Important in an area	1.26	1.54	1.52	1.52	1.486	0.219	
Promote Health	1.32	1.54	1.70	1.64	2.307	0.078	
Promote children physical and mental development	1.41	1.56	1.72	1.74	1.962	0.121	
Reduce stress	1.62	1.78	1.98	1.78	1.549	0.203	
Property value increase	1.71	2.07	2.05	2.06	1.528	0.208	
Increase duration of living	1.94	2.14	2.38	2.46	2.956	0.033	
Important in daily life	1.50	1.81	2.07	1.94	4.399	0.005	ρ (1,3)= 0.008; ρ (1,4)= 0.053
A place of social interaction	1.79	2.15	2.46	2.57	5.397	0.001	ρ (1,3)= 0.025; ρ (1,4)= 0.005
Negative Attributes							
Promote incivility and vandalism	3.74	3.53	3.41	3.33	1.358	0.257	
Commercial encroachment	3.44	3.20	3.03	3.12	1.394	0.246	
Insect or bug attack	2.65	2.92	2.41	2.39	3.438	0.018	ρ (2,4)= 0.045
Unsafe or insecure place	3.59	3.63	3.28	3.17	2.886	0.037	
A place for whiling away time	3.88	3.68	3.67	3.78	0.484	0.694	
Environmental Attributes							
Enhance the scenic beauty	1.53	1.76	1.69	1.77	1.136	0.335	
Reduce the air pollutants and improve the air quality	1.38	1.64	1.70	1.61	1.330	0.266	
Protect from adverse environmental conditions	1.68	2.02	2.51	2.26	6.127	0.001	ρ (1,3)= 0.001; ρ (1,4)= 0.043; ρ (2,3)= 0.055
Preserve biodiversity (birds, animals and plants)	1.56	1.59	1.74	1.64	0.608	0.611	
Minimize noise pollution	2.12	2.20	2.34	2.19	0.505	0.679	
Maintain the climate	1.71	1.78	1.97	1.86	1.194	0.313	
Source of rainfall	2.21	2.46	2.79	2.51	2.164	0.093	
Moderate the temperature	1.32	1.68	1.84	1.86	5.125	0.002	ρ (1,3)= 0.010; ρ (1,4)= 0.005

^e Daily=1, 1 to 2 times a week=2, 1 to 2 times a month=3, occasionally=4

attributes only. As the 'p' value is less than 0.05 only for increase in property value, insect or bug attack, safety concerns, and moderation of temperature. The insect or bug attack showed the most significant relation with gender and the mean of females, 2.28 shows that females are more concerned about it. But for increase in property value male agreed more that green space increases the property value. Whereas for green areas as an unsafe place, insecure female showed more neutral response than the male. In some similar studies the same behavior of women was seen for green space security issue (Burgess et al., 1988, Sanesi and Chiarello, 2006). In the end, the maintenance of surrounding temperature is more acknowledged by the male respondents than female with the low mean value.

With 'p' value more than α , 0.05 age shows the insignificant result for all the green space attributes as shown in Table 6. Whereas in China the significant relation of age was found with green space attributes as the old age residents appreciated the green space benefits more (Jim and Shan, 2013). The same results related to age significance level were found in Lahore also (Shirazi and Kazmi, 2016).

In Table 7 marital status also shows the insignificant results for all the independent variables with the 'p' value greater than 0.05.

With education and green space attributes, a delicate relation of significance is observed (Table 8). There are only two attributes in analyzed data which shows the 'p' value less than ' α ', 0.05. The attributes of green areas are important in an area and a source of children's physical and mental development. For both the attributes graduate/postgraduate residents were more significantly related than primary/ middle.

For occupation Table 9 shows a weak relation, as only two negative attributes of urban green areas are significant with occupation. For incivility and vandalism, the value of 'p' is 0.022, and for an unsafe place it is 0.004 which shows that green space as an unsafe place shows more significant relation with occupation than incivility and vandalism.

Household monthly income and green space attributes shows a feeble relation (Table -10). The only attribute which shows the significant relation with household's monthly income is social interaction. This relation is found significant with two income groups and it has been noticed that low income group (less than 50,000) is more significant to this statement with mean value 2.05 than the income group of 100,001 - 150,000 with neutral response of 3.

Table 11 represents the Park visit's relation and it revealed a significant level for the five attributes of UGS as the value of 'p' is less than α . For social interaction and protection from adverse environmental conditions the 'p' is significant at 0.001. For the

moderation of temperature 'p' is 0.002, for importance in daily life, 0.005 and for bug or insect attacks with significant value of 0.018 respectively. For almost all the attributes, the significant relationship is strong with the residents who visited the green space regularly than the residents who visited occasionally or 1 to 2 times in a month. This assures the visitors of daily basis acknowledgement and they cherish green space benefits and the functionality more than others.

Conclusion

This research showed that residents of Lahore – in the study area, have been well aware of the benefits of various attributes of urban green spaces regardless of the age group they belonged to or their respective marital status. The response of residents showed a high awareness level for vegetated areas as they highly appreciated the presence of green areas in their vicinity. Residents were neutral and less fearful about the green area's negative attributes, whereas they acknowledged the environmental and health benefits a lot. This study concludes that residents need more green areas and resident's positive perception also supports the preservation of urban green space. This research has highlighted the resident's problem related to urban green space like safety issues or insect or bug attack, but with safety measures and planning this issue can be resolved. The perception of residents can also help city managers and planners to design and develop more urban green spaces for citizen's benefits.

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