
Impact of urban green space attribute on visitors' satisfaction in Putrajaya: Malaysia

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Abstract: Systematic distribution and management strategy of urban green spaces has proved to have positive impact (positively influenced) on aesthetic features of urban environment. This translated into greater neighbourhood and visitors' improved overall satisfaction. However, on the contrary, this manifests to affect the natural features of the urban environment, leading to non-negligible dissatisfaction. Careful consideration of green space is judged based on their particular necessity in terms of quality and service provision towards the desirable development of Putrajaya. In this study, 386 samples are considered based on Krejcie and Morgan 1970 sample size formula. The results obtained indicated a strong positive relationship between urban green space attributes and satisfaction. Whereas, results of regression analysis shows that the entire predicting variables have significant unique contribution in determining satisfaction to urban green spaces visitors' in Putrajaya.

Keywords: urban green space; quality; quantity; accessibility; satisfaction; Putrajaya; Malaysia.

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1 Introduction

According to Town and Country Planning Act of 1976 and amended in 2006 (Act 172) open space is any land either enclosed or not which is design wholly or partly as public gardens, parks, sport and recreation ground, or leisure ground, walks or as a public place. Park and recreational spaces also presents positive as well as negative impact on the environment, depending on how optimally they are used. This suggests that conscious effort directed towards maintenance of the provided open spaces would make a positive contribution in enhancing the aesthetic quality of the urban environment. The quality of the built environment has a positive connection with resulting neighbourhood

satisfaction. This assertion is in line with Lee et al. (2008), the study shown respondents were more satisfied if they had a good place to live. The systematic distribution of urban green spaces and the management strategy adopted in maintaining the aesthetic quality of public open spaces makes a significant contribution to the overall satisfaction of the urban residents. The Commission for Architecture and the Built Environment (CABE) (2010) relates urban green space satisfaction to subsequent neighbourhood satisfaction. This implies that urban green spaces enhance the overall built environment quality and hence promote residents' satisfaction with their neighbourhood.

Despite the significance contributions of provision of urban green space to urban residence satisfaction as highlighted, there is no study conducted in Malaysian context to validate these findings. This gap of literature stimulates this research, many researchers have acknowledged the importance of urban green spaces to urban community quality of life (Marans and Stimson, 2011; Gómez-Baggethun and Barton, 2013). These benefits include promotion of air quality and purification of water (Smith et al., 2013). Urban green spaces also help in creating place attachment (López-Mosquera and Sánchez, 2013; Lee and Shen, 2013) which is manifested through provision of recreational services and enhancing the aesthetic quality of urban areas, which in turn promotes the satisfaction of urban residents. However, before urban green spaces can provide social services to their immediate urban society, they must satisfy certain criteria.

This study examines three attributes of urban green spaces: its quality, quantity and accessibility. These are adjudged as stimulants of visitors' satisfaction. This study will highlight the attributes that have influence on visitors' satisfaction of urban green space in Putrajaya. Therefore, studying visitors' satisfaction within urban green spaces is essential in determining the realisation of the set objective in creating the city. The aim of moving the capital territory away from congested Kuala Lumpur was to harmonise city development with nature, which is believed to enhance the satisfaction of residents and thereby motivate the workforce to achieve excellence in their respective fields.

2 Methodology

Putrajaya is located 25 km south of Kuala Lumpur, 20 km to the north of Kuala Lumpur International Airport, KLIA and within 50 km of the Malaysian Super Corridor (MSC). The city lies on latitude N 2°55'34.8996" and on longitude E 101°41'47.202". The city of Putrajaya is meant to house 350,000 residents when completed. At present the population is 72,413 (Department of Statistics Malaysia, 2010).

Putrajaya, the administrative centre of Malaysia displays functional and efficient designs from nature (Moser, 2010). A city with about 36% open spaces and 20 separate precincts which are well connected and integrated with green corridors; are seen to attract various local and international tourists to explore natural scenery (Aris-Anuar et al., 2011). The open spaces provide the city dwellers with both passive recreational facilities in the form of walking, jogging and watching birds as well as the active recreational facilities. The city was developed using green garden concepts rooted from the work of Ebenezer Howard *Garden City of Tomorrow* (Siong, 2006).

Purposeful sampling which is part of non-random sampling strategy that fall within the context of qualitative research place responsibility of selecting subjects or participants on the researcher base on some certain pre-designed characteristics as opined by Cohen

et al. (2007). A purposeful technique is a method of selecting location of survey based on function and specific unique characteristics of the site (Suri, 2012). Purposeful selection strategy was employed in this study where urban green spaces were selected based on their individual quality and the services they provide for harmonious development of Putrajaya. This method is the most viable option, because Putrajaya is a city designed according to the neighbourhood concept and consists of 20 different precincts with a park in every individual precinct. The arrangement of the precincts does not conform to any systematic categorisation that would validate random sampling technique. Lake Putrajaya, Taman Putra Perdana, Taman Saujana Hijau and Taman Botani were the four urban green spaces selected for this study.

A quantitative research technique was employed in analysing the data collected in this research. The study uses a sampling strategy to identify the desired respondents. Sampling techniques are a way of collecting data from small samples of the population in order to make generalisations in respect of the whole population (Creswell, 2009). The study uses cross-sectional data in determining the satisfaction of the visitors' of urban green spaces in Putrajaya. This indicated possibility to determine satisfaction index of visiting respondents' once; without repeating administration of the questionnaire. The questionnaire was administered between 5:00 PM and 7:25 PM when all workers and students were free from their daily obligations and had some spare time to engage in recreational activities. Data collection was conducted within the four selected urban green spaces in Putrajaya on both weekdays and at weekends; the study targeted only visitors to the selected urban green spaces. 386 respondents participated in this study and 371 valid questionnaires that are properly filled by the respondents' are entered into the software for analysis, while 368 were used for the analysis after removal of questionnaires that have some missing values. The method used for determining the sample size was Krejcie and Morgan's (1970) formula:

$$s = \frac{X^2 NP(1-P)}{d^2(N-1) + X^2 P(1-P)} \quad (1)$$

Confidence level = 99%

where s denotes the required sample size, X^2 represents the table value of chi-square for one degree (1%) of freedom at the desired confidence level (3.841). The confidence level is 1%, which indicates that 99% of the sample selected is a true representation of the population of Putrajaya. N denotes the population size of the study area, P represents the population proportion, Putra Jaya is a heterogeneous society where the residents include Malay, Chinese and Indian (assumed to be 0.50 since this would provide the maximum sample size) and d represents the degree of accuracy or level of precision of the population $\pm 5\%$ or can be expressed as a proportion (0.05) (Krejcie and Morgan, 1970). The value of d (the degree of accuracy expressed as a proportion, (0.05) signifies the level of precision or sample error. The value used in calculating the sample size is 0.05, which implies that true sample sizes of the population in Putrajaya are between 95% and 105%. The last criterion necessary for an unbiased sample size is the degree of variability in the attributes measured; since Putrajaya is not inhabited by a homogenous population as explained earlier, the selection of 0.50 indicates a greater level of variability in the sample selected for the study (Israel, 2013).

The questionnaire was specifically designed for this study and was administered with the help of trained enumerators who are familiar with the protocol of administering

questionnaires. Self-administered questionnaire aids the rapid turn-around of the responses which is equivalent to 96%. Expert validation process was observed in ascertaining the suitability of the question asked in the questionnaire before the instrument was subjected to a pilot survey. Reliability of internal consistency was performed with Cronbach's alpha value as follows (*quality* = 0.856, *quantity* = 0.835, *accessibility* = 0.846 and satisfaction = 0.836). Bryman and Cramer (1990, p.71) suggest that the reliability level is accepted at 0.80. Therefore, the entire results of Cronbach's alpha generated are acceptable, as they are more than 0.80. The Cronbach's alpha provides reliability of inter-item correlation, which implies; the correlation of each item with the sum of all other relevant items measured on the same construct and is useful for multi-item scales.

Five questions were asked to determine the perceived satisfaction of visitors to the selected urban green spaces in Putrajaya as a dependent variable. The independent variable of the study was 'urban green spaces' in Putrajaya; the variable were designed to be predicted by three attributes, quality, quantity and accessibility. The quality construct was measured by nine items, quantity of urban green spaces by five items and accessibility to urban green spaces also by five items. All the named constructs (quality, quantity and accessibility) were designed on five Likert scales. Likert scale fall within interval scale, whereby all the choices have equal intervals; that is, strongly disagree represent one, through to strongly agree representing five. These dependents and independent variable are measured using interval scale, this has been used in order to permits the respondents to select among the five Likert scale option that ranges from strongly disagree which is donated by one to strongly agree that is donated by five. The advantage of using interval scale is to permit the researcher to perform inferential statistics. Pearson moment correlation analysis was performed to examine the relationship between each attributes of urban green spaces against satisfaction. Multiple regression analysis was also conducted to examine the attributes of urban green spaces that made a unique statistical contribution to visitors' satisfaction.

The result produced by SPSS Software version 21 revealed that about 45% of variance in satisfaction was explained by all the predictor variables entered in the regression model. Where by the remaining 55% was explained by other factors that are not considered in this work. The analysis showed that quality of open space makes a unique and significant contribution to satisfaction ($\beta_1 = 0.215$, $t = 6.477$, $p = 0.000$), quantity ($\beta_2 = 0.237$, $t = 5.217$, $p = 0.000$), accessibility ($\beta_3 = 0.150$, $t = 2.999$, $p = 0.003$).

2.1 Background of the respondents

This section was designed to present a descriptive analysis of the respondents for the study. The aim was to visualise the characteristics of the individual respondents participated in the study. The components used for the description of the socio-demographic data of the respondents are: residential address, age, gender, marital status, educational qualification, race and occupation. These are the variables that are considered to be important for describing the characteristics of the respondents, as presented in Table 1.

Table 1 Respondents background ($n = 371$)

| <i>Variables</i> | <i>Frequency</i> | <i>Percentage</i> | <i>Mean</i> | <i>SD</i> | <i>Min.</i> | <i>Max.</i> |
|-------------------|------------------|-------------------|-------------|-----------|-------------|-------------|
| Residential group | | | | | | |
| Insiders | 277 | 74.7 | | | | |
| Outsiders | 62 | 16.7 | | | | |
| International | 32 | 8.6 | | | | |
| Missing val. | 0 | 0 | | | | |
| Age | | | 27.925 | 7.4402 | 13 | 60 |
| Age group | | | | | | |
| 13–28 years | 247 | 66.6 | | | | |
| 29–44 years | 107 | 28.8 | | | | |
| 45–60 years | 17 | 4.6 | | | | |
| Gender | | | | | | |
| Male | 178 | 48 | | | | |
| Female | 193 | 52 | | | | |
| Marital stat. | | | | | | |
| Single | 242 | 65.2 | | | | |
| Married | 128 | 34.5 | | | | |
| Missing | 3 | .3 | | | | |
| Education | | | | | | |
| Primary | 1 | .3 | | | | |
| Secondary | 77 | 20.8 | | | | |
| Bachelor | 211 | 56.9 | | | | |
| Master | 74 | 19.9 | | | | |
| PhD | 6 | 1.6 | | | | |
| Missing | 2 | .5 | | | | |
| Race | | | | | | |
| Malay | 279 | 75.2 | | | | |
| Chinese | 40 | 10.78 | | | | |
| Indians | 20 | 5.39 | | | | |
| Others | 32 | 8.63 | | | | |
| Occupation | | | | | | |
| Unemployed | 18 | 4.9 | | | | |
| Students | 150 | 40.4 | | | | |
| Self-employed | 26 | 7.0 | | | | |
| Employed | 177 | 47.7 | | | | |

Source: Survey (2014)

2.2 Residence

Table 1 shows the demographic variables of the respondents. A total of 371 valid questionnaires were returned from a sample size of 386, as explained earlier. The sample of the study consists of 74.7% residents of Putrajaya, 16.7% non-residents of Putrajaya and 8.6% persons who are international tourists who visited the green open spaces in Putrajaya.

2.3 Age of the respondents

The age of the respondents ranges from 13 to 60 years (mean = 27.9245, SD = 7.44019). The age group of 13–28 constitutes the largest group that visits green open spaces in Putrajaya, with about 66.6% of the total respondents. This group of respondents mostly consists of students. The moderate score for this category is from people aged 29–44 years with responses of about 28.8% of the total respondents. This group of respondents is mainly employed people. The smallest category of these respondents is people aged 45–60 years, with a total response of about 4.6% of the total respondents.

The picture portrayed by the ages of the respondents in this survey shows that urban green space users are mostly young men and women, who are the future of Malaysia. Therefore, their aspirations are of paramount importance in planning the way and manner in which Malaysian urban areas are to be designed, developed and maintained.

2.4 Gender

The number of males is 178, which constitutes 48% of the respondents, while the number of female respondents is 193, which amounts to 52% of the sample size. The respondents' gender is well represented, as contained in the report of the Department of Statistics Malaysia (2014). The composition of males in Putrajaya was found to be smaller than the female population, with females constituting about 55.5%, while males account for only 44.5%. This indicates a difference margin of about 11%; therefore, the responses in this study are evenly distributed with a population of females higher than that of males by 4%. A study by Wan Omar et al. (2012) shows a similar trend of visitation to green open spaces by gender. Their findings show the composition of males to be 236 visitors (49.4%), while the female composition is 242 (50.6%).

2.5 Marital status

The number of single respondents in the study was found to be 242, constituting more than 65% of the total responses obtained from the study. This category of urban green space users was found to be the highest among the visitors. Married people constitute about 34% of the urban green space users in Putrajaya.

2.6 *Level of education*

There are 0.3% respondents with the primary school certificate as their highest qualification. The number of respondents whose highest educational qualification is secondary was found to be 20.8%. The numbers of responses that account for the highest number of visitors to urban green spaces in Putrajaya are bachelor degree holders, representing more than 56%. The green open spaces users who obtained a master's degree as their highest educational qualification constitute about 20%, while the respondents whose educational qualification is a PhD represent less than 2%.

The finding of Mani et al. (2012) reveals a different result from the finding of this research; however, the result for education uses a different scale from the one used for this research: PMR 8 (4.7%), SPM 37 (21.6%), STPM 5 (2.9%), diploma 43 (25.2%), degree 65 (38%), postgraduate 13 (7.6%). Though these two studies were both conducted in Malaysia, but in different geographical locations, they share some similar characteristics. The group composition of degree holders achieved the highest score in the two studies, but, considering the fact that Putrajaya is the capital administration city of Malaysia, it is not surprising to find many postgraduate degree holders in its enclaves.

2.7 *Race*

Race means the ethnic affiliation of a given respondent who visited the urban green spaces for any reason. Malay received the highest number of responses in the study, with a total number of 279, which constitutes about 75.2% of the total. Chinese has a moderate score of 40, which amounts to 10.78%. Indians have the lowest score amongst the indigenous Malaysians, with a total response of 20, which constitutes about 5.39% of the total survey respondents. There are 32 respondents representing 8.6% of the total respondents that are classified as others, because they are not affiliated to any ethnicity in indigenous Malaysian society. This implies that, there is international tourist that visited urban green spaces provided in Putrajaya. Enhancing the quality of the available urban green space in Putrajaya would increase their potentiality toward attracting international tourist.

The respondents' characteristics do not give a true picture of the Malaysian ethnic composition according to the data of the Department of Statistics Malaysia (2014), which indicated Malay to be about 67.4%. However, the finding of the study is in parallel with the composition of ethnicity in Putrajaya, which shows the population of Malays to be 94.8%, Chinese 1.8% and Indians 2.7%. In order to reconcile the racial differences in this study, the effort was centred on reducing the disparity of racial variation between Putrajaya and that of the national ethnic composition. The Chinese are under-represented in this research as their population composition is 24.6% when considering the national composition, but over-represented when considering the Putrajaya ethnic composition alone. The Indians are equally under-represented in this research, as their population composition stands at 7.3% when considering the national composition, but could be found to be equally over-represented when considering their actual ethnic composition in the Putrajaya context with the estimation up to 2010.

A study conducted by Wan Omar et al. (2012) reveals a similar trend of variation in national ethnic composition data. Their study examined the promotion of green walks on urban trails in Kuala Lumpur. The ethnic composition of their study reveals 169 (35.4%) Malay, 164 (34.3%) Chinese and 145 (30.3%) Indians; this picture shows similar inconsistency with the national ethnic composition data.

2.8 Occupation

Occupation could be seen in this research as the formal or informal job in which the respondent was engaged at the time of conducting the study. The respondents who at the time of collecting this data were not employed in either the civil service or public service or self-employed are found to constitute 4.9% of the total respondents of this research. The category of users of green open spaces whose status at the time of collecting these data were student constitutes about 40.4%. The green open space users in Putrajaya who were self-employed represent about 7% of the total responses in the study. The number of persons whose status at the time of collecting these data was employed form more than 47%; this category of users of green open spaces in Putrajaya has the highest score.

3 Result and discussion

3.1 *Relationship of green open space attributes (quality, quantity and accessibility) and satisfaction with facilities provided in Putrajaya*

Pearson correlation analysis was performed to examine the relationship between the quality of open spaces and visitors' satisfaction with urban green spaces in Putrajaya. As shown In Table 2, preliminary analyses were performed to ensure compliance with all assumptions of normality, linearity and homoscedasticity. All the urban green space attributes have strong and positive relationship with satisfaction and between the individual attributes entered into correlation analysis. There was a strong positive relationship between quality of open spaces in Putrajaya and satisfaction ($r = 0.576$, $p = 0.000$). This indicates that quality of urban green space visited would have strong statistical significance to the satisfaction of the visitor. Quantity and satisfaction showed a strong positive relationship between the quantity of open spaces in Putrajaya and satisfaction ($r = 0.509$, $p = 0.000$). Quantity of urban green supply in Putrajaya has strong statistical significance to the satisfaction of the visitors in terms of their ability to accommodate the visitors. There was a strong positive relationship between the quantity and quality of open spaces in Putrajaya ($r = 0.506$, $p = 0.000$). This indicated that, the available urban green spaces supplied in Putrajaya are of good quality and in big size, whilst accommodate the visitors as well as sufficiently provided to cater the needs of categories of their users. There was a strong positive relationship between accessibility of open spaces in Putrajaya and satisfaction ($r = 0.533$, $p = 0.000$). Accessibility plays a vital role toward visitation of the available urban green space supplied in Putrajaya. The easier the provided urban green spaces are to the urban dwellers, the more likely is it for the people to visit the urban green spaces. Therefore, promoting visitors satisfaction has direct bearing with the accessibility of the provided urban green space. There was a strong positive relationship between accessibility to open spaces and their quality in Putrajaya ($r = 0.643$, $p = 0.000$) as indicated by the correlation analysis performed. There was also a strong positive relationship between accessibility to open spaces in Putrajaya and their quantity ($r = 0.594$, $p = 0.000$) as observed from the correlation analysis between the two attributes of urban green space.

Table 2 Correlation matrixes

| <i>Variables</i> | <i>Y</i> | <i>x₁</i> | <i>x₂</i> | <i>x₃</i> |
|--|----------|----------------------|----------------------|----------------------|
| Y (satisfaction) | 1 | | | |
| <i>x₁</i> (quality of open space) | .576 | 1 | | |
| <i>x₂</i> (quantity of open space) | .509 | .506 | 1 | |
| <i>x₃</i> (accessibility of open space) | .533 | .643 | .594 | 1 |

Note: Sig. (2-tailed).000.000.000.

3.2 Multiple linear regression analysis

H_0 1 All the independent variables are not significant when regressed against satisfaction.

The following hypothesis was used in testing which of the predicting attributes entered in the regression model made a unique and statistical significant contribution toward satisfying visitors of urban green space in Putrajaya. The factors that contributed to satisfaction in this study were quality, quantity and accessibility of open spaces. Therefore, the model consisted of three predicting variables: quality (x_1), quantity (x_2) and accessibility (x_3). The prediction equation was as follows:

$$Y_i = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \beta_3 X_{3i} + \varepsilon_i \quad (2)$$

where

Y satisfaction

X_1 quality

X_2 quantity

X_3 accessibility

ε random error.

The proposed hypothesis test of the validity of the model was expressed as follows:

$$H_01: \beta_0 = \beta_1 = \beta_2 = \beta_3 = 0 \quad (3)$$

$$H_11: \beta_0 \neq \beta_1 \neq \beta_2 \neq \beta_3 \neq 0 \quad (4)$$

Table 3 ANOVA of multiple linear regression analysis of urban green space attributes and satisfaction

| <i>Model</i> | <i>Sum of squares</i> | <i>df</i> | <i>Mean square</i> | <i>F</i> | <i>Sig.</i> |
|--------------|-----------------------|-----------|--------------------|----------|-------------------|
| 1 Regression | 1,417.409 | 3 | 472.470 | 97.686 | .000 ^b |
| Residual | 1,760.523 | 364 | 4.837 | | |
| Total | 3,177.932 | 367 | | | |

Notes: ^bPredictors: (constant), accessibility, quantity, quality.

Table 3 illustrates that the multiple linear regression model of satisfaction results as a whole (which includes quality, quantity and accessibility) was statistically significant

($F(1417.409) = 97.686, P = 0.000$). This result indicates that the slope of the estimated linear regression model line was not equal to zero. Hence, H_01 was rejected, which indicated that all the independent variables are not significant when regressed against satisfaction.

The regression model shows that satisfaction would increase on average by 0.215 for each increase of one unit in the quality of urban green spaces, net of the effects changes due to the quantity and accessibility of the urban green spaces. Similarly, satisfaction would increase on average by 0.237 and 0.150 for an increase of one unit of quantity and accessibility, respectively, of open space in Putrajaya net of the effects changes by quality and accessibility in the case of quantity and quality and quantity in the case of accessibility.

Table 4 Coefficients of regression analysis on urban green space attributes (quality, quantity and accessibility) and satisfaction

| Models | Unstandardised coefficient | | Standardised coefficients | <i>t</i> | Sig. |
|---------------------|----------------------------|-------------------|---------------------------|----------|------|
| | <i>B</i> | <i>Std. error</i> | <i>Beta</i> | | |
| (Constant) | 4.854 | .906 | | 5.356 | .000 |
| Total quality | .215 | .033 | .342 | 6.477 | .000 |
| Total quantity | .237 | .046 | .266 | 5.217 | .000 |
| Total accessibility | .150 | .050 | .169 | 2.999 | .003 |

Note: Defendant variable: satisfaction.

Given the satisfaction with green open space in Putrajaya, the quality and quantity of open spaces were statistically significant contributors to satisfaction; accessibility contributed least to satisfaction in this study. Therefore, the mathematical derivative of the regression equation for the satisfaction of visits to urban green space model is as follows:

$$Y = 4.854 + (.215)x_1 + (.237)x_2 + (.150)x_3 + \text{Error} \quad (5)$$

Table 5 Model summary of regression analysis on urban green space attributes (quality, quantity and accessibility) and satisfaction

| | <i>R</i> | <i>R square</i> | <i>Adjusted R square</i> | <i>Std. error of the estimate</i> |
|---|-------------------|-----------------|--------------------------|-----------------------------------|
| 1 | .668 ^a | .446 | .441 | 2.19923 |

Note: ^aDefendant variable: satisfaction.

This means that the quality of urban green spaces in Putrajaya helps in determining satisfaction with urban green spaces in particular and satisfaction with the urban environment in general, as the quality of green spaces determined the aesthetic quality of the urban area hence enhancing the appearance of the place.

The quantity of urban green spaces ensures even distribution of open spaces that helps to reduce effects of segregation and disparity amongst various classes of urban dwellers. This would facilitate a sense of place in all urban green space visitors and hence promote their overall satisfaction with the urban area at large and urban green spaces specifically. Similarly, accessibility plays a vital role in enhancing the satisfaction of urban green space visitors.

Considering ($R^2 = .446$, adjusted $R^2 = .441$), this can give visitors to urban green spaces to view and appreciate the aesthetic component of their green spaces and hence enhances their place attachment (Budruk et al., 2009). These positive feelings would promote the attitudes of the residents to engage in voluntary management of the green spaces to ensure continued preservation of the quality of their neighbourhood which are consider as communal assets (White et al., 2013).

4 Discussion

The satisfaction index of urban green space visitors in Putrajaya indicate unanimous satisfaction with the urban green spaces in terms of their quality, quantity and accessibility. This result signifies the successful design and creation of Putrajaya as a garden in the city, where workplaces, residential areas and recreational facilities are well connected to promote sustainable human development. Landscape management promotes the aesthetic quality of urban green spaces and conservation of biodiversity. Similarly, the management of the landscape should continue to satisfy the aspirations and recreational needs of urban green space visitors. Parking space provides convenience for visitors as more than 67% of the respondents indicated their satisfaction to parking space provided in the urban green space. Majority of urban green space users use their own cars to visit green spaces, if there is congestion or no suitable parking space many of the visitors would avoid visiting such places.

The result obtained from this study suggests that the quality of urban green spaces contributed more to the satisfaction of the respondents than accessibility while quantity of the provided urban green space has the highest contribution to visitors' satisfaction. The visual quality of urban green space helps in promoting pleasantness of the urban green spaces and satisfying the emotional feeling of urban green space users. The choice of destination image and perceived quality was based on research conducted by Hankinson (2005). Pearson correlation analysis was conducted whereby the study indicated strong positive relationship between perceived quality of recreational commercial venue with customer satisfaction and choice of place. The finding is in line with the result of this study which recognised the importance of the quality of urban green spaces in enhancing satisfaction of urban green space users. A study conducted by Muslim et al. (2013) indicated a significant relationship between green open spaces in good condition and city satisfaction, with a loading factor of 0.878. The study of Muslim et al. (2013) uses factor analysis in selecting the variables that have significant relationship with neighbourhood environment. Factor analysis is used when there are too many items on the constructs in the questionnaire and the researcher wanted to segregates the items into different construct (factors) for easy analysis. A loading factor of more than 0.5 with eigenvalue of 1.00 indicates present of significant relationship in the item under consideration. Therefore, obtaining loading factor of 0.878 indicates strong relationship between quality and neighbourhood satisfaction. The result supports the present research findings as both the two researches were conducted in Malaysia. The qualities of urban green spaces add aesthetic quality to the built environment and hence result in enhancing the satisfaction of urban residents. Therefore, satisfaction with urban green spaces is higher as regards to resident who have an adequate quantity of green spaces in their area ($r = 0.51$; $p < .01$), whereas the quality of neighbourhood green spaces is not in line with the finding of this

work; the finding indicated low statistical significance between the quality of green spaces and neighbourhood satisfaction ($r = 0.12$; $p < 0.01$).

The finding of this research is in agreement with Sanesi et al. (2006) study of green open spaces in two cities in Italy (Rome and Bari). The study show greater positive feeling in areas with both a high quality and a high quantity of green spaces, or area with very little composition of quality and quantity of green open spaces than other areas ($r = 0.58$; $p < .02$). The residents of areas with sufficient quality and quantity of green spaces tend to be more satisfied with their areas; thereby the residents with a low supply of quality and quantity of green spaces indicate the need to be provided with green spaces.

Qin et al. (2013) also revealed that colourful urban green spaces ranked higher in terms of satisfying visitors of open spaces. Diversity of colour in urban green spaces indicates quality of plant species which together add aesthetic quality and scenic beauty to the urban environment, thus enhancing the attractiveness of green spaces. The quantity of urban green spaces ensures spatial distribution which helps in providing space to the visitors of the urban green space thus, satisfying the space requirement of the users. Its distribution is not limited to the number of urban green space provided, but extends to the size of a given urban green spaces supplied within the context of urban fabric that are essential in satisfying visitors' needs. When the green open space provided is not spacious enough to meet the expectations of visitors, it is bound to generate less satisfaction regardless of its quality. Hur et al. (2010) examined resident satisfaction with the amount of open space within residential neighbourhoods in Franklin County in central Ohio. Pearson correlation indicated a positive strong relationship between the amount of open space in residential areas and residents' satisfaction with their neighbourhood ($r = 0.55$, $p = 0.005$). As demonstrated by the findings of the above study and the result of this work, there is a strong, positive relationship between the quantity of urban green space and visitors' satisfaction with urban green spaces in particular and to the subsequent neighbourhood satisfaction. Also, even distribution of urban green space is essential in promoting neighbourhood satisfaction that can add to the aesthetic quality in the urban area and thereby eliminating dissatisfaction.

Green open spaces also provide the urban population with an opportunity to socialise and engage in physical activities and were found to promote place attachment. A study by Sullivan (2004), investigated the relationship between a neighbourhood with green areas and a barren neighbourhood. The finding revealed that those urban residents with sufficient urban green space are found to use urban green spaces more often than their counterparts in barren open spaces. This indicated relationship between neighbourhood satisfactions with accessibility to the provided urban green space. Thus, social interaction is equally found to be more frequent than in barren open spaces. This finding indicates that urban residents appreciate urban green spaces, which promote outdoor recreation and hence promote social cohesion and subsequent place attachment. Meanwhile, Sullivan's work has considered only places with adequate provision of urban green space and neighbourhood with limited supply of urban green spaces. Therefore, quality and accessibility are not factors that they consider in their study, which are included in the present work.

Integration of quality urban green spaces within densely populated urban areas is understood to increase housing values in such neighbourhoods, whereas urban areas with

scattered populations are recognised to attract insignificant economic value (Nilsson, 2014). Therefore, green open spaces are required mostly in urban areas that are recognised to attract a high volume of population accommodated within limited urban spaces; thus, green spaces add aesthetic quality to densely populated urban centres. With regard to provision of urban green spaces, effort must be directed toward satisfying urban needs and the expectations of their users. This indicated that supplying urban green spaces within densely populated urban area add beauty to the entire neighbourhood as well as providing cooling effect that would motivate the urban residents to visit the provided urban green space.

This argument was exemplified by the rapid growth of Shah Alam city in Malaysia that witnessed significant changes in land use and land cover patterns, resulting in an increase of urban heat island and thermal radiant of build areas which significantly increased the radiant temperature (Buyadi et al., 2013). Therefore, systematic supply of green spaces within Shah Alam city would reduce the heat stress experience by the city dwellers. Urban heat stress is more prevalent in heavily populated residential areas, causing urban residents to recognise the importance of green open spaces within their build environment.

The increasing awareness and desire to enrich urban fabric with green spaces is a phenomenal strategy in planning and development of urban areas. Such growing demand in urban green spaces is epitomised by the desire to actualise sustainable urban development that promote high quality of life in cities (Tan et al., 2013). Green open space promotes the physical quality of urban areas and hence increases their economic value. The desire of urban residents to live in close proximity with nature was demonstrated by residents of Tokyo in their willingness to pay additional rental charges if green space could be reinstated (Kumagai and Yamada, 2008). This portrays how a green space enhances the satisfaction of urban residents.

When urban green spaces are of good quality and easily accessible to urban residents, there is a high likelihood that people will visit the provided urban green spaces, as demonstrated in this study. A well-designed urban green space with adequate accessibility is equally proven to attract more patronage by urban residents. Accessibility of green open spaces is a vital criterion in promotion of visitors' satisfaction, as indicated in this study where satisfaction has a strong positive relationship with accessibility of urban green spaces. The more accessible is the urban green space provided, the greater its attractiveness to urban visitors. However, in a situation where distribution of urban green space is concentrated in specific urban areas, without cognisance of the need of other parts of urban areas to share the benefit of the provided urban green spaces, the growing expectation will not meet the target benefit of enhancing urban green space usage. Therefore, conscious effort must be centred on effective and even distribution of green open spaces to achieve the necessary benefit attached to their provision.

The relationship between accessibility and satisfaction of urban green space visitation was also in line with Kearney (2006), the study examined several attributes of neighbourhood satisfaction among which was satisfaction with shared outdoor spaces and satisfaction with nearby nature. These two variables were simply attributed to accessibility of urban green spaces. The findings of the study indicated that there was a moderate positive relationship between shared outdoor spaces and satisfaction ($r = 0.45$, $p = 0.005$) and a moderate positive relationship between accessibility to nearby nature

and satisfaction ($r = 0.42$, $p = 0.005$). The result supports the finding of this work as the two studies were undertaken in different geographical locations with varied respondents, yet they found a similar answer regarding the accessibility of urban green spaces and satisfaction. The slight difference in the two studies can be attributed to segregation of the factors examined by Kearney (2006).

5 Implications for landscape design, planning and management

The findings of this study can provide new insights for landscape designers in designing, planning and maintaining urban green space to promote visitor's satisfaction. The study has explicitly shown which attributes of urban green space have greater influence in determining the satisfaction of visitors to urban green spaces. Urban green spaces that are capable of enhancing the satisfaction of visitors must be of good quality in terms of its design and facilities provision to add to the scenic beauty of the provided urban green space that can automatically stimulate higher rate of visits. If the quality of the provided green spaces can be promoted, there is probability of increase of .215 for each increase of one unit in the quality of urban green spaces, net of the effects changes due to the quantity and accessibility of the urban green spaces. The quantity of urban green space provision assists in promoting spatial distribution of urban green spaces that can enhance the overall scenic beauty of the urban environment. Quantity of urban green space is the highest predictor of satisfaction to the visitors in Putrajaya. Therefore, increasing the individual urban green space size and number would generate greater satisfaction. Accessibility of urban green space ensures ease of access without any restriction or barrier that could limit visits to urban green spaces. As indicated from the respondents' background, there are 32 international tourists that visited the available green spaces provided in Putrajaya.

6 Conclusions

The correlation analysis revealed a significant strong positive relationship between the three urban green space attributes and satisfaction. Similarly, the multiple regression analysis models indicated the entire predicting variables (quality, quantity and accessibility) make a unique and significant contribution to the satisfaction of urban green space visitors.

Therefore, it can be concluded that when designing urban green spaces for promotion of visitor satisfaction or satisfying the aesthetic aspiration of the neighbouring residents, focus must be made on enhancing the quality of urban green space in sufficient quantity and with easier accessibility channels to meet the growing need of urban green space users.

Similarly, the vision of creating Putrajaya as a garden in a city has had tremendous success as indicated by the finding of this work, which showed integrating green open spaces within urban fabric uniquely promotes the satisfaction of the residents, thus facilitating the creation of an efficient workforce that stimulates the economy and sustainable development.

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