



Visitors' Preferences for Malaysian Botanical Gardens' Landscapes

Noriah Othman, Mohd Hisham Ariffin,
Noralizawati Mohamed, Mohd Ali Waliyuddin A. Razak

Faculty of Architecture, Planning & Surveying
Universiti Teknologi MARA, 40450 Shah Alam, Malaysia

mhisham238@salam.uitm.edu.my

Abstract

Botanical gardens are bio-diverse flora-based natural attractions. Visitors to two prominent Malaysian botanical gardens were surveyed about their preferences for human oriented gardens' landscape designs. There were significant differences in the preferences for garden landscapes with poorly maintained man-made structures and jungle-like garden landscapes (National Botanical Gardens), and the Japanese garden landscape (Penang Botanical Gardens) among Malays, Chinese and Indians ($p < 0.10$). There were significant differences in preferences between males and females ($p < 0.10$) for garden landscapes with man-made structures (National Botanical Gardens) and landscapes having open spaces (Penang Botanical Gardens).

Keywords: Landscape, Human Oriented, Botanical Gardens, Preferences

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1.0 Introduction

Malaysia is undergoing rapid urbanization (World Bank Malaysia is undergoing rapid urbanization (World Bank 2015). This urbanization is threatening the sustainability of Malaysia's botanic gardens, arable lands and jungles bordering the existing urban areas. Botanic gardens normally function as repositories of a nation's plant diversity. The sustainability of Malaysia's botanic gardens depends on their relevance to the urban populace. This relevance can be generated by the populace's increased use of the botanic gardens albeit in the man-made landscape parts of the botanic gardens whilst leaving the natural parts untouched. According to Hopper (2007), landscape professionals play important roles in protecting the living environment in collaboration with other professions such as architecture, municipal planning, and civil engineering. Landscape designs should consider the provision and satisfy of the humans' and living environment's needs without sacrificing the natural environment.

Botanical gardens are included in the National Landscape Policy of Malaysia. These gardens offer green spaces for urbanites. They contain collections of various plants in their original natural forms. The plants are recorded, exhibited and studied to learn about their uniqueness (National Landscape Department Malaysia, 2013). According to Oldfield (2008), Ballantyne et al. (2008), and Chavez and Sharrock (2013), botanical gardens must connect ecologically with the surrounding localities. Galbraith et al., (2011) emphasized that botanical gardens have to be living museums that serve communities while promoting public understanding of the relationship between plant, humanity and the rest of nature. This paper reports two objectives of this larger research on botanical gardens. These objectives are (1) the ethnicity-influenced preferences to selected designed landscapes in both botanical gardens and 2) the gender influenced preferences to selected designed landscapes in both botanical gardens.

2.0 Literature Review

Past research shows that environmentally friendly human oriented designs make the city and green spaces more liveable and create togetherness and pride among the inhabitants (Vuchic, 1999). Such designs provide opportunities for people to engage actively in green spaces and enhance community social interaction (Middle et al., 2014; Rashidi, Jamirsah and Said., 2012), educating people the importance of taking responsibility of their environment (Mahdavinejad and Abedi, 2011), and potentially protecting the green spaces and habitat from any harm due to uncontrolled landscape planning and work (Buta et al., 2014).

The Human Oriented Design approach has three concepts that influences garden visitors' perceptions of the landscape setting of the overall landscape design. Firstly, the concept of Needs Motivation is used to identify the level of landscape preference and visits among park users (Noralizawati et al., 2012; Noriah et al., 2014; and Nordh et al., 2011). According to this concept, people are motivated to action due to the desires to satisfy their needs. Thus, the personal preferences towards landscape visuals reflect the person's potential actions due to the desire to satisfy their needs. The second concept is the Landscape Visual Preferences

of landscape visitors. This is important in the assessments of the quality of existing landscape design both in natural and man-made areas (Noralizawati et al., 2012; Noriah et al., 2014; Oguz 2000; and Ozguner and Kendle, 2006). For example, positive landscape assessments could be obtained through incorporation of natural elements such as waterfall, vegetation, land-form and well-maintained landscape. Lastly, the human-oriented design incorporates the Concept of Flow. This guides the developing of the landscape site that fully engage with people and give meaningful landscape-based experiences (Clements and Dorminey, 2011). Elements of coherence, legibility and connectivity-accessibility are crucial to creating flow. Coherence results from the organization of the landscape components into a meaningful whole. Legibility refers to surrounding that is easy to understand and to remember. The combination between proper connectivity and clear accessibility to the spaces in the gardens influenced visitors to explore the landscape

3.0 Methodology

3.1 The Sites

The NBGSA was initially known as Taman Pertanian Bukit Cerakah (Bukit Cerakah Agricultural Park) and was opened on 24 April 1986. In year 2007, the park adopted its current name. The main objective of NBGSA is to be a centre of education, scientific research and development of botany, horticulture, agriculture and other related fields. The attractions at NBGSA include the four-season temperature house, animal garden, herbs and spices garden, and paddy fields

The Penang Botanic Garden (PBG), Penang. It was established in 1884 by the British curator, Charles Curtis from the old granite quarry site and is more popular known as Waterfall Gardens at that time. Visitors generally engage in jogging, sightseeing and picnicking. PBG offers visually appealing vistas for photography. The main area of PBG had undergone refurbishment to upgrade the environment and physical services for the visitors.

3.2 Data Collection

This research used qualitative-quantitative methodology. A field survey using questionnaires was administered on the visitors to both sites. The first section of the questionnaire investigated the attributes and variables related to the respondents' motivation towards visiting botanical gardens. It required the respondents to rate photographs of the respective site using a five-point Likert scale where 1= strongly dislike, 2=dislike, 3=moderate, 4=like, 5=strongly like. The survey was administered at the exit of the botanic gardens to avoid disturbing the activities of the visitors in the park. The surveys were carried out during weekends where the numbers of visitors were at their peak. The respondents each took 15 minutes maximum to complete the questionnaires. The Botanic Gardens Agriculture Officer was also interviewed for information on the sites and the usage of the spaces.

4.0 Results And Discussions

There were 182 survey respondents at the NBGSA site. The highest number of respondents were Malays (61%) followed by Chinese (27.5%) and Indians (11.5%). The males constituted 47.8% of the respondents

The total number of the respondents in the PBG survey was 281 peoples. Malays constituted 41.6% of the respondents, followed by Chinese 39.9%, and Indians 18.5%. The males represented 53% of the respondents.

4.1 NBGSA Photographic Preferences Mean Scores

Table 1 shows the mean score results for photograph-based human oriented design assessment according to ethnicity. Generally, the Chinese rated lower for all the photograph scenes than the Malays and the Indians. There are significant differences in rating scores ($p < 0.10$) for photograph 2. The mean scores for photograph 2 are above moderate levels: Malays (mean=3.59), Chinese (mean=3.08) and Indian (mean=3.24). Maintenance of the amenities is a crucial factor that influences the preference of the users. Photograph 2 shows poorly maintained man-made structures. The relatively moderate mean scores for the photograph may be due to a relatively small amount of decay despite the overall impression of poor maintenance of the structures in the photograph.

Table 1. Mean rating of photographs of National Botanical Gardens Shah Alam based on ethnic group.

| Ethnic group Photo | Malay (N=111) | Chinese (N=50) | Indian (N=21) | Total mean | F | Sig. |
|-----------------------|------------------|-------------------|------------------|---------------|------|-------|
| 1 | 4.06 | 3.78 | 3.95 | 3.97 | 2.64 | 0.07* |
| 2 | 3.59 | 3.08 | 3.24 | 3.41 | 4.94 | 0.01* |
| 3 | 3.74 | 3.58 | 3.90 | 3.71 | 1.11 | 0.33 |
| 4 | 4.07 | 3.84 | 4.05 | 4.01 | 1.34 | 0.27 |
| 5 | 4.55 | 4.46 | 4.62 | 4.53 | 0.62 | 0.54 |

1. Preference rating scale is 1= strongly dislike, 2=dislike, 3=moderate, 4=like, 5=strongly like

2. * Significant differences at $p < 0.10$



Photograph 1 of NBGSA



Photograph 2 of NBGSA



Photograph 3 of NBGSA



Photograph 4 of NBGSA



Photograph 5 of NBGSA

Source: Authors

The rating scores for photograph 1 had differences across ethnic groups. The mean scores for photograph 1 are high across all the three ethnic groups (Malay =4.06; Chinese =3.78 and Indians =3.97). The higher scores among the Malays and Indian respondents may reflect both ethnic groups upbringing in mostly non-urban residences in the second half of the 20th century. At that time, the Chinese mostly lived in the urban areas (Stenson, 1980). Thus, the Malays and Indians are more comfortable with photograph 1 showing the natural landscape vista with a road.

Table 2 shows the T-test analysis according to gender. The mean scores for photograph 2 show that the females (mean = 3.61) scored higher than the males (mean=3.20). The mean scores for photograph 4 indicate that females (mean = 4.11) scored higher than the males (mean =3.90, $p<0.10$). These two results give contradictory results. Photograph 2 seems to

indicate that the females are more tolerant of poorly maintained man-made landscapes than the males. Photograph 4 shows well-maintained pathways among natural landscape elements. The scores for Photograph 4 may indicate that females have higher preference for man-made structure than males. This may reflect females feeling safer where there are structures and open areas in the landscapes. Structured landscapes may be less frightening than natural landscapes (Ozguner and Kendel, 2006).

Table 2. Mean rating of photographs of National Botanical Gardens Shah Alam based on gender.

| Ethnic group Photo | Male (N=87) | Female (N=95) | T-value | Sig. (2 tailed) |
|-----------------------|----------------|------------------|---------|-----------------|
| 1 | 3.91 | 4.03 | -1.14 | 0.26 |
| 2 | 3.20 | 3.61 | -2.80 | 0.01* |
| 3 | 3.77 | 3.66 | 0.815 | 0.42 |
| 4 | 3.90 | 4.11 | -1.67 | 0.10 |
| 5 | 4.56 | 4.51 | 0.65 | 0.52 |

1. Preference rating scale is 1= strongly dislike, 2=dislike, 3=moderate, 4=like, 5=strongly like

2. * Significant differences at $p < 0.10$

4.2 PBG Photographic Preferences Mean Scores

Table 3 shows the mean results for landscape photograph assessment at PBG. Only photograph 3 achieved significant differences ($p < 0.10$). Photograph 3 shows a Japanese garden design landscape. Malays (mean=4.38) scored the highest while Chinese (mean=4.13) and Indian (3.16). The Indians possibly scored the lowest because the Chinese culture did not influenced the Indian culture as much as Malay culture in the historical past (Milner, 2008). The Chinese scores possibly reflect similarities between Chinese and Japanese culture. According to Varley (2000), a substantial portion of Japanese culture is based on Chinese culture. When asked about the reasons for scoring the photographs in the study, the respondents indicated a preference for clear access, having continuity directions and legible directions. In addition, views of ornamental trees and landscape are important attributes Japanese gardens. These findings are congruent with Nurul Nazzyddah and Noriah (2014).

Table 3. Mean rating of photograph of Penang Botanical Garden based on ethnic group.

| Ethnic group Photo | Malay (N=117) | Chinese (N=112) | Indian (N=52) | Total mean | F | Sig. |
|-----------------------|------------------|--------------------|------------------|------------|------|-------|
| 1 | 4.15 | 4.17 | 4.21 | 4.17 | 0.11 | 0.90 |
| 2 | 4.21 | 3.96 | 4.10 | 4.09 | 1.81 | 0.17 |
| 3 | 4.38 | 4.13 | 3.96 | 4.20 | 1.83 | 0.03* |

| | | | | | | |
|---|------|------|------|------|------|------|
| 4 | 3.50 | 3.45 | 3.73 | 3.52 | 0.99 | 0.37 |
| 5 | 3.73 | 3.37 | 3.87 | 3.75 | 0.34 | 0.72 |

1. Preference rating scale is 1= strongly dislike, 2=dislike, 3=moderate, 4=like, 5=strongly like

2. * Significant differences at $p < 0.10$



Photograph 1 of PBG



Photograph 2 of of PBG



Photograph 3 of of PBG



Photograph 4 of of PBG



Photograph 5 of Penang Botanical Gardens

Source: Authors

Table 4 shows the t-test analysis results. Only photograph 2 had differences between the gender groups ($p < 0.10$). Photograph 2 shows a distanced view of an open area with a courtyard surrounded by grassy areas and some trees. The scores were generally high. The female respondents (mean=4.19) scored Photograph 2 higher than the male respondents (mean=4.00). This may indicate that females preferred landscape perceived to give clearer access. This finding implies that women have more safety needs than men. The Malay, Chinese and Indian cultures are relatively patriarchal where provision of safety and security is the cultural responsibility of males (Gupta, 2006). According to Alderfer ERG Theory (George and Jones, 2012), safety is part of the Existence needs that can motivate an action by a person.

The three main ethnic groups in Malaysia are Malays, Chinese and Indians. These three ethnic groups represent the largest proportion of visitors to the gardens. These findings support Nassauer (1995) that culture changes landscapes and culture are embodied by landscapes. The sustainability of the gardens is dependent on their relevance to visitors' needs. A high degree of relevance would motivate a person to visit the gardens. Thus, landscape designs of botanic gardens have to consider the ethnic preferences of the visitors. The findings also imply that not enough attention is given to safety needs. This shows in the lower scores for scenes of poorly maintained man-made structures and the higher scores for open spaces. Poorly maintained structures are potential safety hazards. Malaysia naturally has thick jungle vegetation. Thus, the botanic garden should have distinct man-made landscape areas and natural jungle areas.

Table 4. Mean rating of photographs of Penang Botanical Gardens based on gender.

| Ethnic group Photo | Male (N=149) | Female (N=132) | T-value | Sig. (2 tailed) |
|-----------------------|-----------------|-------------------|---------|-----------------|
| 1 | 4.13 | 4.20 | -0.69 | 0.49 |
| 2 | 4.00 | 4.19 | -1.65 | 0.10** |
| 3 | 4.21 | 4.58 | 0.09 | 0.92 |
| 4 | 3.48 | 3.58 | -0.68 | 0.50 |
| 5 | 3.75 | 3.76 | -0.05 | 0.96 |

1. Preference rating scale is 1= strongly dislike, 2=dislike, 3=moderate, 4=like, 5=strongly like

2. * Significant differences at $p < 0.10$

5.0 Conclusions

There were significant differences in the preferences for garden landscapes with poorly maintained man-made structures and jungle-like garden landscapes (National Botanical Gardens), and the Japanese garden landscape (Penang Botanical Gardens) among Malays, Chinese and Indians ($p < 0.10$). There were significant differences in preferences between

males and females ($p < 0.10$) for garden landscapes with man-made structures (National Botanical Gardens) and landscapes having open spaces (Penang Botanical Gardens). The findings imply that ethnic culture and gender needs influences visual perception preferences of landscapes.

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