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## Value of Nature in Life: Landscape Visual Quality Assessment at Rainforest Trail, Penang

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### Abstract

Interest in recreational activities such as visiting the trail, observe nature and meditation has increased in the Rainforest Trail of Penang Botanical Garden recently. Previous research found that the landscape visual quality is the main reason why people visit the place. A survey was undertaken on visitors to the Rainforest Trail for this purpose. The data was analysed using descriptive statistics, correlations and significant differences tests. This study found that the man-made landscape can be considered contrary to the intended natural characteristic of the Rainforest Trail even despite, attempts to blend in the man made changes with original natural appearance.

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### 1. Introduction

Over the years, Penang has lost a great deal of its natural heritage and landscape visual quality. Nevertheless, there are still pockets of undisturbed natural beauty in the island such as the Rainforest Trail. Previously, the Penang Botanical Garden was established by the British in 1884. Under the

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leadership of the Garden's first superintendent, Charles Curtis, a granite quarry was transformed into a great botanical and horticulture garden. The diverse objectives of the garden included conservation, recreation, education, research, tourism and services (Department of Penang Botanical Garden, 2010). Interest in recreational activities such as visiting the rainforest trail, observe nature and meditation has increased in the Rainforest Trail of Penang Botanical Garden recently. Statistics show that over two thousand visitors annually visited the trail (Statistics and Information Department of Penang Botanical Garden, 2010). The trail is about 1.6 kilometers long and may take 30-45 minutes to complete (Devy, 2009). Research done by Park et al. (2011) indicated that landscape visual quality at particular area is the main reason why people visit the place. Noralizawati (2011) in her rainforest trail research found that landscape visual quality play an important role in enhancing the attractiveness along the trail.

Visual quality is very important. The term landscape visual used in this paper is restricted to an outdoor environment, natural or built, which can be directly visualized and perceived by a person visiting or using the space. According to Matsuoka and Kaplan (2007), the study of visual quality had been explored by many researchers over the decades using the case study approach. Among the studies were at the botanical gardens and parks (Noralizawati, 2011; Park et al., 2011; Oguz, 2000), streetscapes (Noriah, 2004; Todorova et al., 2004) and neighborhoods (Crow et al., 2006; Kaplan and Austin, 2004; Zhang, 2011). These studies conclude that people gave highly aesthetic responses to landscape that is associated with natural elements. Yet some findings stated that people responded very well to urban and suburban environment that had unique, beautiful and well maintained landscape.

Over the years, studies on visual quality have formulated a different approach whereby the relationship between human nature and visual quality is taken into consideration. Demographic variables have been shown to be related with people's preferences and perceptions towards the visual quality. These demographic variables include gender (Cohen et al., 2007; Todorova et al., 2004), age (Noralizawati, 2009), ethnic (Noriah, 2004), previous experience (Noralizawati, 2009; Ozguner and Kendle, 2006), familiarity (Noriah, 2004; Park et al., 2011) and public opinions versus professional bodies' opinions (Noralizawati, 2009; Ozguner and Kendle, 2007). Those studies investigated the landscape visual quality that ranged from personal space to public space and indicated the various human behaviors when dealing with nature along rainforest trail. It is in line with recent research finding by Smith et al., (2012) where the visual simulation has an increasingly important role in communicating landscape change and the visual images are easily readable and understood by the public.

This research attempted to achieve several objectives; to identify the motivational factors for visiting the Rainforest Trail; to analyze the high and low preferred visual quality among respondents along the trail and to investigate the reasons for respondents in preferring their selected types of visual quality. Some related theories in Landscape Preference and Visual Quality Assessment was adopted in this study to prove the relationship of the study. Motivations for the visiting the Garden was also investigated in this study to assess the correlation on the visual quality selections. It involves three influencing factors (instrumental, social and intrinsic motivation factor). The combination of quantitative and qualitative approaches was utilized to enhance the trustworthiness of the research findings.

## 2. Literature Review

Forest and natural trails have received much attention in visual quality research. According to Mohd Kher (2006), visual quality is associated with positive or negative preferences and it is also defined as the condition, character and quality of scenic landscape and the way it is perceived, preferred and valued by the professionals or the public. Preliminary research findings by Tsunetsugu et al. (2010) reported that the forest natural settings could affect humans preference through five human senses; visual, olfactory, auditory, tactile and taste. The eyes explore the visual field and abstract from certain objects, points of

focus and perspectives (Noralizawati, 2009). In many natural setting research studies, respondents gave high ratings and reacted positively to scenes that they liked to see such as native vegetations, mountains and streams while they rated low and reacted negatively to scenes that they disliked to see such as bushes and scenes that appeared frightening (Noralizawati, 2009; Todorova et al., 2004). Smell is closely related to human's emotion thus give impact to their preference scenes too.

A few research studies found that the forest trails produced an olfactory result. The smell of wood and fresh grass by the respondents was found to be their reason to like those natural settings (Noralizawati, 2009; Sekuler and Blake, 2002). The human assessments on visual quality were also greatly associated with the auditory senses. The sounds that coming out from the running stream, the rustle of leaves and the singing of birds and insects can offer tranquility and reduce mental fatigue (Noralizawati, 2009). According to Tuan (1974) people have a highly developed sense of touch, which enables them to identify and manipulate objects. The tactile senses are also important to access visual quality among respondents. Any object that touched by the humans could increase their sensitivity towards what they see. For example, a person feeling the surface of leaves, flowers, grasses and tree bark enhanced their visual understanding about these objects (Noralizawati, 2009). The importance of aesthetic (texture, form and color) and psychological components (expression) in predicting visual preference is also important to define the level of visual quality in forest settings.

The visual preferences of users can also be accessed through the categorization of landscape character. Research by Ozguner and Kendle (2006) and Noralizawati (2009) found that human preferences towards landscape can be determined by comparing between the man made and natural elements that exists in the forest settings. Previous research findings on rainforest trail showed that the public is able to distinguish and at the same time appreciate both types of elements and the landscape must be able to affect the human's visual in a positive way (Noralizawati, 2011).

Research conducted by Zang (2009) suggested that the motivational theory could derive the understanding of public or tourist needs. He categorized the motivational factors into two perspectives of study; push and pull perspectives. According to him, the push factors refer to the public as a subject and deal with those factors driving him or her to visit certain place. Meanwhile the pull factors are those which attract the tourist to a given place. Oku and Fukamachi (2006) underlined that the relationship between visitors' characteristic and their choice of activities are related from one to another. Hisham (2008) reviewed the research literature on peoples' participation in activities and concluded that there were several participation motivation factors which are instrumental factor (to get result that give benefit to work, study and oneself), social factor (to socialize with family and friend or to accompany on their request) and intrinsic factor (curious, interest and like the activity). The approach was based on the motivational orientations of Houle (1993).

Visitors to the recreational places were driven by categories of reasons and deterrents (Tsunetsugu et al., 2010). They suggested that although people may have similar reason for visiting the rainforest trail, they may have different preferences depending on their motivational factors. Some respondents in their study reported that they had a passion for physical activities. However, the quality of facilities would determine their degree of passion towards the place. Need theories by Maslow (1970) proposed that one of the fundamental needs of people that affect their motivation is belongingness. Park et al., (2011) stated in their study that the strong relationship among the trail users would bond them as a social group. Oku and Fukamachi (2006) found that the differences of landscape visual quality and perception can be determined from the types of activities engaged in, size of groups and publics' familiarity with the area.

It can be concluded that the motivation play as a central role to determine human's reason on something that they like and they preferred to. Realizing the importance of those findings, further investigation on the relationship between motivational factors and publics' choice of landscape visual quality along the Rainforest Trail should be carried out.

### 3. Methodology

The study used structured designed questionnaires to collect the response from the visitors of Rainforest Trail. Field observations and a pilot test of the survey questionnaire were done to obtain information on the improvement of the questionnaire. A face-to-face administration of the survey was done at the Rainforest Trail. In Section A of the questionnaire, the questions for the visitors were on their reasons (instrumental, social and dispositional factors) for visiting the Garden and thus could help the researcher to correlate their motivations with their visual quality ratings. Section B contained demographic background questions. The demographic variables that are inquired about are gender, age, ethnic, level of education, occupation and monthly income. These variables are needed to test the relationship between visitors demographics and their visual quality ratings. In Section C, the visitors were asked to rate the visual quality of 20 pictures. These questions are utilized to examine the level of visual quality assessment of the respondents towards the existing elements along the trail. A five point Likert scale was used where 1 represents very high visual quality, 2 is high visual quality, 3 is moderate visual quality, 4 is low visual quality and 5 is very low visual quality. The collected data were analysed statistically using the Statistical Packaging for Social Sciences (SPSS) Version 16.0. The tests used were descriptive statistics, Cronbach alpha test of internal consistency, correlation and significant differences. As the distribution was not normal, non-parametric tests were used to determine significant differences (Mann Whitney test) and correlation (Spearman rho test, Kruskal Walis test).

### 4. Results and Discussion

The value for the the Cronbach's alpha coefficients for the survey questionnaire is 0.70. According to Pallant (2005), the results less than 0.60 reflects poor reliability, 0.70 – 0.80 shows an acceptable reliability and greater than 0.80 reveal as a good reliability level of the instrument thus this study confirmed that the questionnaires distributed to the respondents were reliable to measure the dimension of the variables.

#### 4.1. Demographic Characteristics of the Respondents

Results from the survey shows that there are 52.3% of respondents were male and 44.6% were female. Malay ethnic represents 30.8%, followed by 26.2% for both Chinese and Indians and 15.4% were from Sweden, China and Japan. The average respondents were from 18 to 50 years old. Among all age groups, the highest percentage is between 18-30 years old (29.2%) and the lowest is from 51 years old and above (12.3%). Workers from private sectors (38.5%) were the largest group in the distribution of respondents, followed by government servant (29.9%), students (10.0%) and retirees (15.8%).

#### 4.2. Reason for Visiting the Rainforest Trail

Table 1, 2 and 3 provides the output of the reason for visiting the study area. The results generated 'a very strong' reason for every factors for instrumental, social and intrinsic motivations. A 'very strong reason' (44.6%) is found under Instrumental Reason (to get a result that give benefit to work study/oneself) and Social Reason (to socialise with family/ friend or to accompany friend). The same answer was also given by the respondents (63.1%) under Dispositional Reason (to explore the curiosity feeling/ interested with the place/like this type of activity).

Table 1. Instrumental (to get a result that give benefit to work study/ own self)

		Frequency	Percent (%)
Answers	not a reason	2	3.1
	very weak reason	2	3.1
	weak reason	10	15.4
	strong reason	22	33.8
	very strong reason	29	44.6
Total		65	100.0

Table 2. Social (to socialize with family/ friend or to accompany friend)

		Frequency	Percent (%)
Answers	not a reason	2	3.1
	very weak reason	3	4.6
	weak reason	5	7.7
	strong reason	26	40.0
	very strong reason	29	44.6
Total		65	100.0

Table 3. Dispositional (to explore the curiosity feeling/ interested with the place/like this type of activity)

		Frequency	Percent (%)
Valid	not a reason	0	0.0
	very weak reason	0	0.0
	weak reason	7	10.8
	strong reason	17	26.2
	very strong reason	41	63.1
Total		65	100.0

#### 4.3. Reasons for Rating the Man Made and Natural Landscape Visual Quality

The results found that Photograph 5 (interpretative signage) had a ‘very high visual quality’. The respondents stated that a good condition of interpretative signage can help them to travel along the Trail with confidence and help them to plan their trek. The ‘very low visual quality’ result under this category is shown at Photograph 3 (exposed construction wiring). According to respondents, they dislike the photo because it felt dangerous and had low visual quality when they enter the trail entrance. Some of the respondents suggested that the landscaping ground work should be properly scheduled to avoid the uncomfortable feelings among users. The natural photograph that captured high mean value by respondents is as shown under Photograph 2 (natural pond). The respondents expressed their feelings of calm and being soothed while viewing and visiting this place. According to them, the water elements, plants and aquatic animals around the pond create a balance ecosystem and relax their mind. The ‘very low visual quality’ under this category is shown at Photograph 3 (drainage system). According to them, the condition of the drainage system is unclean and showed poor maintenance by the management. The

respondents also wished to see the design of the place to blend with nature and thus preserving the surroundings.

#### *4.4. Association Between Rating For Landscape Visual Quality And Reasons For Visiting The Rainforest Trail*

There was a significant low inverse correlation ( $r = -0.206$ ,  $p < 0.10$ ) between man made visual quality assessment and Social reason for visiting the Rainforest trail. This indicates that the rating for man made visual quality increases (note that 1 is highest rating and 5 is lowest rating) when the Social reason for visiting the Rainforest Trail is stronger but this association is weak. There were no significant correlations ( $p < 0.10$ ) between rating for natural visual quality and reasons (social, instrumental and dispositional) for visiting the Rainforest Trail.

#### *4.5. Correlation Between Ratings For Landscape Visual Quality And Demographic Variables*

There were no significant correlation ( $p < 0.10$ ) between the rating for man made and natural landscape visual quality with demographic variables (age, income).

#### *4.6. Significant Differences Between Ratings For Man Made Visual Quality And Demographic Variables (Education Qualification, Gender, Ethnicity and Work Status)*

Both Kruskal Wallis test and ANOVA test indicated a significant difference between ratings for manmade visual quality and ethnicity ( $p < 0.05$ ). Post hoc Tukey HSD test indicated that Malays rated man made visual quality more than Chinese ( $p < 0.10$ ). T-tests were used to determine significant differences between man made visual quality rating and demographic variables (education, gender and work status). A significant difference ( $p < 0.10$ ) was found between the rating for manmade visual quality and work status. It indicated that unemployed visitors rated man made visual quality less than the employed visitors ( $p < 0.10$ ).

#### *4.7. Significant Differences Between Ratings For Natural Visual Quality And Demographic Variables (Age, Income, Education Qualification, Gender, Ethnicity And Work Status)*

Both Kruskal Wallis test and ANOVA test indicated a significant difference between ratings for natural visual quality and ethnicity ( $p < 0.05$ ). Post hoc Tukey HSD test indicated that Malays rated natural visual quality less than Chinese ( $p < 0.10$ ). T-tests were used to determine significant differences between natural visual quality rating and demographic variables (education, gender and work status). A significant difference ( $p < 0.10$ ) was found between ratings for natural visual quality and work status. It indicated that employed visitors rated natural visual quality less than the unemployed visitors ( $p < 0.10$ ).

## **5. Conclusion and Recommendation**

Results of the study revealed that respondents reported a very strong reasons answer for instrumental, social and dispositional factors for visiting the Rainforest Trail. In particular, they gave high visual quality ratings to photographs perceived as 'having good facilities design', 'proper guideline', 'safety design', green and natural setting' and 'awake their five senses'. 'Feeling unsafe', 'inappropriate landscape design' and 'low maintenance' were amongst the reasons for low visual quality rated photographs by the respondents. There was a significant low inverse correlation ( $r = -0.206$ ,  $p < 0.10$ )



between man made visual quality rating and social reason for visiting the Rainforest Trail. Chinese preferred man made visual quality less than Malays ( $p < 0.10$ ). Unemployed visitors rated man made visual quality less than the employed visitors ( $p < 0.10$ ). Malays rated natural visual quality less than Chinese ( $p < 0.10$ ). Employed visitors rated natural visual quality less than the unemployed visitors ( $p < 0.10$ ). The results of this study are consistent with those of previous documenting people's visual assessment to scenes in forest landscape (Burn et al., 2011; Matsuoka and Kaplan, 2007; Tsunetsugu et al., 2010). It is recommended that the park authorities improve the visual quality of the trail by improving the safety aspects, maintenance work and landscape. However, man-made landscape can be considered contrary to the intended natural characteristic of the Rainforest Trail, even despite attempts to blend in the man made changes with original natural appearance. Improving safety aspects and regular maintenance are man-made interventions that may decrease the natural visual quality of the trail if done improperly. This dilemma may be alleviated if man-made visual quality is rated less and if there is increased appreciation for natural visual quality among the visitors. Thus, the Malays and employed persons (ie adults) who highly rated man made visual quality may indicate that campaigns towards appreciation of nature and its aesthetics should be targeted at these groups of people. Campaigns among the young who are mostly unemployed should be one that further nurtures their appreciation of nature and its aesthetics.

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