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VISUAL PERCEPTION TOWARDS LANDSCAPE ELEMENTS IN PROMOTING RESTORATIVE ENVIRONMENTS: A CASE OF GAMUDA GARDEN, RAWANG

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Abstract:

Rapid urbanisation led to decreasing rate of physical and mental health due to the hectic lifestyle living in a city. However, being in natural environment setting does provide a restorative experience for the visitors especially among urban community. It is very important to identify the landscape elements that stimulate brains and deliver relaxing situation to park visitors. This study employed a Q methodology to identify the landscape elements that successfully provide restorative environment setting for visitors in Gamuda Garden, Rawang, Malaysia. Photographs of five landscape elements that believed to provide restorative experience were captured and respondents were asked to rank order the photos according to its importance in providing restorative environment settings. The data collected were analysed using PQMethod software where factors were flagged, rotated and factor analysis were constructed. Four themes were generated which are tension relief, social value, natural value and comfort value. This study highlights the identification of landscape elements that provide restorative settings that should be taken into consideration in urban park planning and management.

Keywords:

Restorative Experience, Landscape, Urban Park, Q Methodology

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Introduction

The interest in examining the relationship between nature and human health are increasing recently with the aim to enhance the development of a healthy urban population. There is a growing rise in the allocation of political interests in promoting natural settings to advance public health and create a sustainable city (World Health Organization, 2016). With 75% of the world's population predicted to live in cities by 2050 alongside the world's population expected to exceed 10 billion, city planning is increasingly acknowledged as a critical component in a comprehensive strategy to address negative health effects (UNFPA, 2011). It is critically important to make sure the natural settings provided in the city could be able to provide a restorative environment for the continuous well-being of urban community while they are facing numerous pressures from the hectic lifestyle in the city.

Previous studies have investigated the advantages of being indulged in nature setting for the physical and mental health of urban communities including mortality rates have been decreased and there has been advancement in reducing healing times (Donovan et. al., 2013). Being exposed to natural environments results in a decreasing number of recorded respiratory illness and allergies, while also enhancing mental and cognitive abilities (Hanski et. al., 2012; Dallimer et. al., 2012; Berman et. al., 2008). Additionally, recent studies discovered that urban nature can be a cost-effective remedy strategy for numbers of health problems (Keniger et. al., 2013; Hough, 2014). However, as indicated by other studies, not all natural environment settings provide an equally restorative environment to human beings (Herzog et. al., 2003). Experts have raised awareness of the significance of landscape settings, features and spatial qualities in improving physical health (Liu, 2016; White et. al., 2010; Peschardt et. al., 2013) and it is mentioned that parks and gardens are effective in providing relaxation spots and refreshing surroundings (Kimbell et. al., 2009).

Researchers have conducted more scientific investigation about the effects of landscape characteristics and the categories of urban landscape elements in promoting aesthetic value preferences and the perception towards restoratives environment settings (Wang et. al., 2019; Hoyle et. al., 2017). Furthermore, Wang et. al. (2016) found out that several natural elements do contribute to the restoration process of mind among stressed people. Nevertheless, the study on the natural environment as a crucial part of urban setting is undoubtedly an evolving area of research especially in the field of human psychology, public health and built environments. Therefore, this study primarily aims to assess the visual perception of landscape elements that contribute to visitors' restorative experiences, specifically at Gamuda Garden, Rawang, Malaysia.

Gamuda Gardens is an 810-acre community land that integrate an active lifestyle within the nature harmoniously. Five beautiful lakes lead to the 50-acre Central Park, which is pet-friendly and surrounded by undulating terrain and rolling hills. This municipality features a Waterfront Village that provides a unique retail experience with specially curated retail and food and beverage options. The 68-acre Gamuda Gardens City Centre, an adventure-entertainment centre, will bolster the township's vitality so that it can become the heart of Klang Valley North. Gamuda Gardens is a mixed-use development located in the Gombak district of Selangor, Malaysia, in the village of Rawang. Rawang is located about 30 kilometers north of Kuala Lumpur and is readily accessible via major highways such as the North-South Motorway and the Guthrie Corridor Motorway. Due to its strategic location, the parks are receiving popularity among urban community for types of recreational activities. In addition, the park represents

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extraordinary landscape elements with aesthetic appeal and exceptional qualities that distinguish the ares from other urban parks in Malaysia.

Restorative Environment for Human Well-Being

It is proven that being indulged in certain landscape elements might stimulate individual's brain thus promoting a restoration state for the whole body. The identification of landscape elements that contribute to the restorative environment is needed to make sure that the planning aligns with the sustainable development goals of the area for the sake of urban community. However, as the world are progressing in its urban development, there is also a growing concern towards the planning and managing of landscape element in urban park. Issues such as poorly maintained parks and public spaces contradict the findings on the importance of preserving natural environments (Daniel, 2001).

Landscape Elements in Park

This study started with an identification of landscape elements that visually promoting the restorative experiences at urban park. Secondary data collection was conducted to find out all the relevant elements and five elements were chosen for the purpose of this study. Five elements that are believed to contribute to the restorative environment in the urban park are the plants, water feature, landscape construction, road and pavements and garden facilities. The theoretical framework used in this study is shown in figure 1 below.

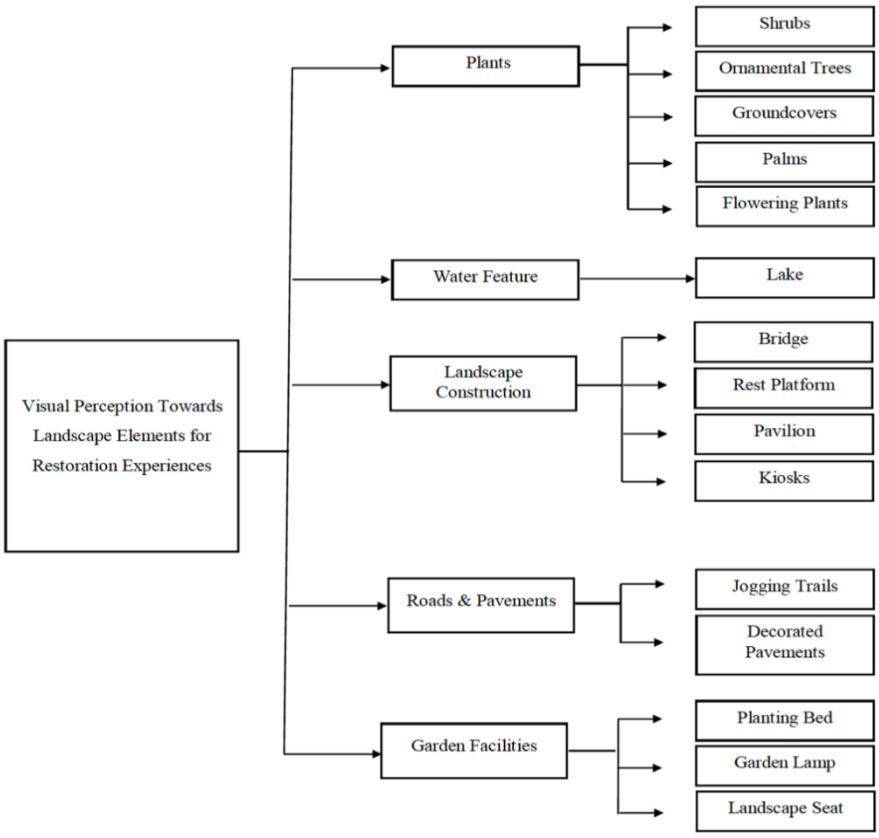

Figure 1: Theoretical Framework for Assessing Visual Perception Towards Landscape Elements for Restoration Experiences

Adapted from: Li Deng et. al. (2020)

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Q Methodology for Assessing Visual Perception

This study used Q methodology to capture photographs of different landscape elements available in Gamuda Garden and asked respondents to rank order their preferences of the elements that contribute to the restorative experience in the park. Q methodology is widely used in the field of recreation and leisure purposely in assessing people's opinions, beliefs and attitudes (Ward, 2009). The application of Q methodology was introduced by William Stephenson and acts as a bridge that combining the qualitative and quantitative research. The application of Q method used in this study were described as follows:

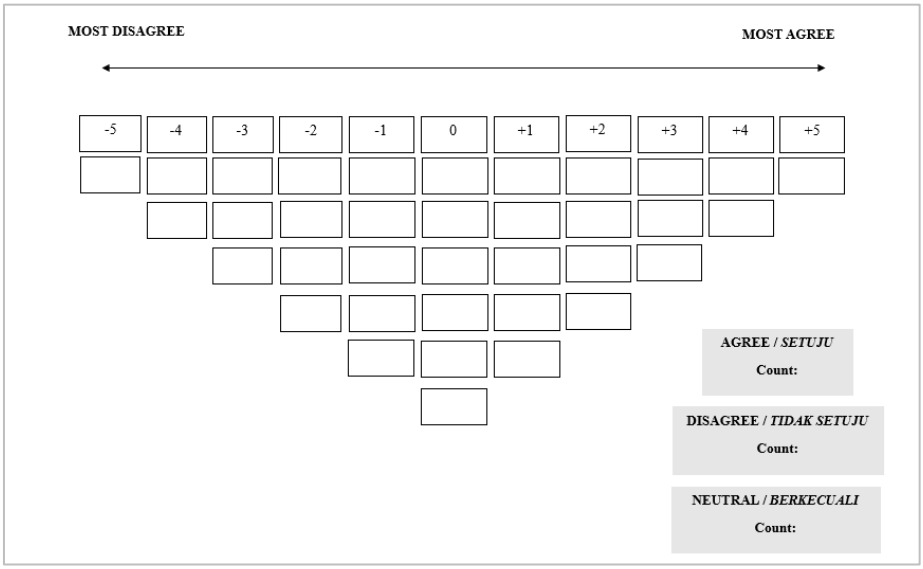

Figure 2: Q Methodology Sort

The Development of Concourse

According to the Exel and Graf (2005), concourse in Q methodology should be a collection or sets of items either photos, statements or objects associated with a particular topic of the research. Therefore, photographs illustrating landscape elements that believed to portray restorative environment setting in Gamuda Garden were used as a concourse for this study. Initially, a total of 157 photographs were captured.

Q Sample Establishment

The Q sample, also known as the representative sample, is derived from the concourse's collection. Pilot test was done to help in producing a Q sample in selecting the most relevant photos that accurately depicting the natural settings of the park, thereby facilitating the study's goals. As a result, a total of 36 images were chosen and designated as the Q sample, which was then distributed to the respondents for data collection process.

Selection of Respondents (P Set)

The main purpose of Q method is to assess the diversity of perspectives among respondents. Therefore, only limited sample size is required for the purpose of the study. A ratio of four to five respondents are relevant to describe two or four components (Exel, 2005). Moreover, it is suggested that the P set is smaller number than the Q set. A total of 40 respondents were involved in this study and consist of the visitors of Gamuda Garden.

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Q Sorting / Data Collection Process

Q sorting process were conducted on-site, and respondents were approached carefully after obtaining their permission for participating in the study. Respondents were then required to distribute the photographs using the provided ranking sheets in response to a single question. Respondents were asked to rank order the photo based on its significance in relation to their restoration experiences in Gamuda Gardens, Rawang. This survey sought to encourage individuals to disseminate photos based on the Likert scale. After the distribution, respondents were given the opportunity to revise their responses, and interviews were conducted to aid in the data interpretation process.

Data Analysis and Interpretation

PQMethod software was utilized for the analysis data process. Each respondent's Q sort data was recorded, and the factor was subsequently constructed. Factors were rotated and flagged to assure the optimal factor loading to achieve the purpose of the study. Each factor was interpreted based on the observations made during the sifting procedure and interviews with respondents. The interpretation of the data yielded four primary themes: tension relief, social value, natural value, and comfort value.

Demographic Profile of Respondents

The Q sorting procedure required participants to provide their demographic information. To initiate this procedure, a questionnaire sheet was used, commencing with a condensed set of questions regarding the respondents' demographic information. This section is significant because it allows the identification of demographic characteristics that may prove crucial in defining future factors. The questionnaire inquired about the respondent's gender, age, ethnicity, place of residence, level of education, occupation, monthly household income, frequency of park visits, duration of each park visit, and reasons for park visit.

Table 1: Descriptive Statistics Analysis for Demographic Profile of Respondents

Demographic Variables	Frequency (n)	Percentage (%)
Gender		
Male	24	40
Female	16	60
Age (Years old)		
< 20	3	7.5
20 – 29	15	37.5
30 – 39	9	22.5
40 – 49	8	20
50 – 59	2	5
60 >	3	7.5
Race		
Chinese	9	22.5
Indian	10	25
Malay	21	52.5
Where do you live?		
Kuala Lumpur	2	5
Kuang	6	15
Rawang	16	40
Selayang	12	30

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Sungai Serai	4	10
Level of education		
Primary Education	0	0
Secondary Education	11	27.5
Tertiary Education	29	72.5
Occupation		
Government Sector	11	27.5
Private Sector	6	15
Retired	3	7.5
Self-employed	6	15
Student	14	35
Monthly household income		
Less than RM 1,000	14	35
Between RM 1,000 – RM 1,999	2	5
Between RM 2,000 – RM 2,999	14	35
Between RM 3,000 – RM 3,999	2	5
Between RM 4,000 – RM 4,999	7	17.5
More than RM 5,000	1	2.5
Frequency of visit at park		
Once in a month	14	35
Twice in a week	17	42.5
Thrice in a week	6	15
More than three times in a week	3	7.5
Length of time spent		
1/2 - 1 hours	17	42.5
2 – 3 hours	10	25
Above 3 hours	7	17.5
Less than 1/2 hours	6	15
Purpose of visits		
Enjoying Nature	8	20
Exercise	12	30
Recreation	4	10
Research / Study purpose	3	7.5
Sightseeing / Hangout	13	32.5

From the total of 40 respondents, 24 male respondents contributed 60% compared to 16 female respondents' 40%. In addition, the majority of respondents are between the ages of 20 and 29, comprising 15 respondents and 37.5% of the total, followed by those between the ages of 30 and 39, comprising 9 respondents and 22.5% of the total. In contrast, respondents between the ages of 50 and 59 comprised the tiniest proportion of the total, contributing just 5%.

Malay contributed to the most participants to this study, accounting for 21 responses and 52.5% of the total, followed by Indian, which provided 10 respondents and 25% of the total. With

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only nine respondents, or 22.5% of the total, the Chinese ethnic group had the lowest number of respondents in this study. In addition, most respondents live in Rawang, which accounts for 16 (40%) of the total respondents, followed by Selayang, which accounts for 12 (30%) of the total respondents. Surprisingly, the researcher was able to locate and interview 2 respondents from Kuala Lumpur, which is equivalent to 5% of the total. The remaining respondents came from Kuang, which contributed 6 respondents or 15% of the total, and Sungai Serai, which contributed 4 individuals or 10%.

Aside from that, most respondents (72.5% of the total) have completed at least one year of university education, followed by eleven respondents (27.5% of the total) who have completed at least one year of secondary education. In addition, 14 of the respondents, or 35% of the total, were students, making them the group that contributed the most to this study. The government sector ranked second with 11 responses, representing 27.5%. Currently, both the private sector and self-employed individuals have the same number of respondents, six, which corresponds to a 15 percent response rate. Only three retired individuals contributed 7.5% of the total, the smallest number of contributors.

Factor Profile Analysis

Table 2: Profile of Respondents Loading on Each Factor

Factor A						
No	**Contents**	**Gender**	**Age Group**	**Race**	**Occupation**	**Factor Loading**
1	Respondent 2	Male	30+	Chinese	Private Sector	0.6449
2	Respondent 3	Female	20+	Indian	Self-employed	0.6189
3	Respondent 11	Female	20+	Malay	Student	0.6862
4	Respondent 18	Female	<20	Chinese	Student	0.6512
5	Respondent 19	Female	30+	Malay	Self-employed	0.6886
6	Respondent 21	Male	30+	Malay	Government Sector	0.7783
7	Respondent 22	Male	20+	Malay	Self-employed	0.7510
7	Respondent 23	Male	20+	Chinese	Student	0.9291
8	Respondent 26	Male	20+	Indian	Student	0.7010
9	Respondent 27	Female	30+	Chinese	Private Sector	0.7009
10	Respondent 30	Female	40+	Indian	Government Sector	0.8121
11	Respondent 31	Male	40+	Indian	Government Sector	0.8309
12	Respondent 34	Male	20+	Indian	Self-employed	0.6387
13	Respondent 35	Female	30+	Malay	Private Sector	0.8643
14	Respondent 39	Male	20+	Malay	Student	0.7034
15	Respondent 40	Female	30+	Indian	Government Sector	0.7967
Factor B						
No	**Contents**	**Gender**	**Age Group**	**Race**	**Occupation**	**Factor Loading**
1	Respondent 10	Male	60+	Indian	Retired	0.5818
2	Respondent 12	Female	50+	Chinese	Private Sector	0.6229
3	Respondent 20	Male	20+	Malay	Student	0.4673
4	Respondent 24	Male	40+	Malay	Government Sector	0.6482

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5	Respondent 25	Female	40+	Malay	Self-employed	0.7374
6	Respondent 28	Male	60+	Indian	Retired	0.7195
7	Respondent 29	Male	20+	Malay	Student	0.8192
8	Respondent 32	Female	20+	Chinese	Student	0.7251
9	Respondent 33	Male	20+	Malay	Student	0.8392
10	Respondent 36	Male	20+	Malay	Student	0.7591
11	Respondent 37	Male	40+	Malay	Government Sector	0.5979
12	Respondent 38	Female	30+	Malay	Government Sector	0.6825

Factor C

No	Contents	Gender	Age Group	Race	Occupation	Factor Loading
1	Respondent 1	Female	20+	Malay	Student	0.7190
2	Respondent 4	Male	40+	Malay	Government Sector	0.7160

Factor D

No	Contents	Gender	Age Group	Race	Occupation	Factor Loading
1	Respondent 5	Female	30+	Chinese	Government Sector	0.4894
2	Respondent 6	Male	<20	Malay	Student	0.5965
3	Respondent 7	Male	<20	Malay	Student	0.7604
4	Respondent 8	Female	20+	Chinese	Private Sector	0.7515
5	Respondent 9	Female	50+	Malay	Self-employed	0.7253
6	Respondent 13	Male	30+	Malay	Government Sector	0.5742
7	Respondent 14	Male	20+	Malay	Student	0.5574
8	Respondent 15	Male	40+	Indian	Government Sector	0.5958
9	Respondent 16	Male	60+	Indian	Retired	0.6396
10	Respondent 17	Male	40+	Chinese	Private Sector	0.6189

Factor Interpretation

Table 3: Correlation Matrix Between Each Factor

Factor	A	B	C	D
A	1.0000	0.5286	0.5520	0.5021
B	0.5286	1.0000	0.1805	0.6089
C	0.5520	0.1805	1.0000	0.3833
D	0.5021	0.6089	0.3833	1.0000

Table 3 above presents the correlation matrix among four factors generated from the data analysis process. The correlation of 0.5286 between factor A and factor B suggests that factor A is less similar to factor B, as the correlation is only below 0.6. This implies that factor B and factor A should be distinct between each other. On the other hand, the correlation matrix between factor B and factor C recorded a low score at 0.1805, suggesting a potential similarity

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in theme interpretation. Nevertheless, the interpretation does not solely depend on the correlation matrix, but factor score assigned to each significant photo contribute to the interpretation process. Additionally, factor D is selected as one of notable factor as a significant outcome because factor D has lower correlation with factor A, B and C representing as one of the key factors to portray the outcome of this study.

Next, factor interpretation was conducted to evaluate the visual preferences of landscape elements for restoration experiences at Gamuda Garden, Rawang. Four variables were formulated to gauge the theme for each factor. These factors represent categories of individuals who having similar perspectives on the landscape features that believed to contribute to their restorative state. Factor score recorded for each photo facilitated the interpretation of the score during the data analysis process. To ensure the accuracy of the interpretation, a detailed analysis was conducted on photographs with both the highest and lowest score. Images that distinctly highlighted differences between each element were given priority as this illustration played a crucial role in highlighting how one element varied from another. Moreover, the additional sources such as informal interview during the Q sorting process and on-site observation contributed to the comprehensive understanding of the factors and enriched the interpretation process.

Theme A – Stress Relief

Table 4: Factor Score for Each Significant Photo in Theme A

Photo No.	*Photo Description*	*Factor Score*	*Categories*
22	Waterfall	+5	Water Features
15	Flowering Plant	+4	Plants
17	Flowering Plant	+4	Plants

This group of respondents showed strong interest in water feature such as waterfall and landscape features such as flowers. Waterfall identified as the most crucial landscape element that contribute to their restorative experiences. However, palms and garden lamps were deemed the least valued features in the park by this group. According to many respondents, palms were seen as potential obstructions or disturbances to their views, while garden lamps were criticized for lacking natural elements. A total of fifteen respondents associated with this theme, along with a single respondent commented that, *"The waterfall element in this park bring me piece of mind due to its calming soundscape"*. This is supported by Herzog et. al. (2003) asserted that a condition with a heightened sense of naturalness with water ambience are preferable being as a natural phenomenon. Kellert et. al. (2008) and Alvarsson et. al. (2010) found a correlation between the acoustic or ambient perception of water towards individual's restorative experiences. Consequently, individuals associated with this theme recognized water and landscape elements as environment setting that contribute to the restorative experiences.

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Figure 3: Significant Photos for Theme A – Stress Relief

Theme B – Social ValueRespondents associated with Theme B recognized a photograph featuring one of the park's rest platforms as the most influential factor of the landscape element that successfully facilitate relaxation. Followed by an image of a seated area and pavilion, these photos are highly valued by respondents. The findings of this study highlighted significance concern towards landscape element that enhance social interaction among park visitors. The rest platform and pavilion are one of the landscape elements provided in the park to offer visitors a space to rest and relax while participating in various recreational activities in the park.

Table 5: Factor Score for Each Significant Photo in Theme B

Photo No.	***Photo Description***	***Factor Score***	***Categories***
26	Rest Platform	+5	Landscape Construction
36	Landscape Seat	+4	Garden Facilities
27	Pavilion	+4	Landscape Construction

Informal interview sessions discovered that respondents valued the features such as rest area, benches and platform as comfortable spaces to indulge in family-oriented activities including picnic, bird watching and enjoying the scenic views of the lake. Therefore, Theme B was determined the social significance of the park and its importance in encouraging social interaction within local community and park visitors' participation.

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Figure 4: Significant Photos for Theme B – Social Value

Theme C – Natural Value

For Theme C, groundcovers identified as the most crucial element in optimizing visitors' restoration experiences in the park. Additionally, respondents associated with this theme displayed a notable preference for other aspects of the landscape elements especially the climbers' plants. The finding demonstrates that respondents who highly valued on these elements appreciating the park's aesthetic environment's view including the surrounding landscape elements. However, the park's least favoured features for this theme are the stone pavement and jogging paths as these elements perceived as the least conducive in facilitating visitors' restoration experiences.

Table 6: Factor Score for Each Significant Photo in Theme C

Photo No.	*Photo Description*	*Factor Score*	*Categories*
7	Groundcovers	+5	Plants
8	Groundcovers	+4	Plants
6	Climbers	+4	Plants

Figure 5: Significant Photos for Theme C – Natural Value

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Theme D – Comfort Value

Photograph portrayed the lake situated in the centre of Gamuda Garden received the highest score within Theme D among the group. The existence of this lake holds the utmost influence on visitors' impression of the park. In addition, photographs of park planning bed, rest platform and planting area received a score of +4, indicates that they are equally significant to provide restorative setting in the park.

Table 7: Factor Score for Each Significant Photo in Theme D

Photo No.	*Photo Description*	*Factor Score*	*Categories*
19	Lake	+5	Water Features
33	Planting Bed	+4	Garden Facilities
24	Rest Platform	+4	Landscape Construction

One respondent shared his opinion on the scenic view of the lake induces a sense of tranquillity and functions as a personal sanctuary for relieving stress and calming his mind. Clare C. (2012) stated that the integration of diverse elements such as plants with varying textures and colour are to create a multisensory experience thus emphasizing the importance of sensory stimulation in facilitating rehabilitation and human well-being in healthcare settings. Theme D was chosen to represent a comfort value to enhance the experience of park visitors as park visitors tend to seek for their personal comfort and satisfaction while spending their free time in natural environments.

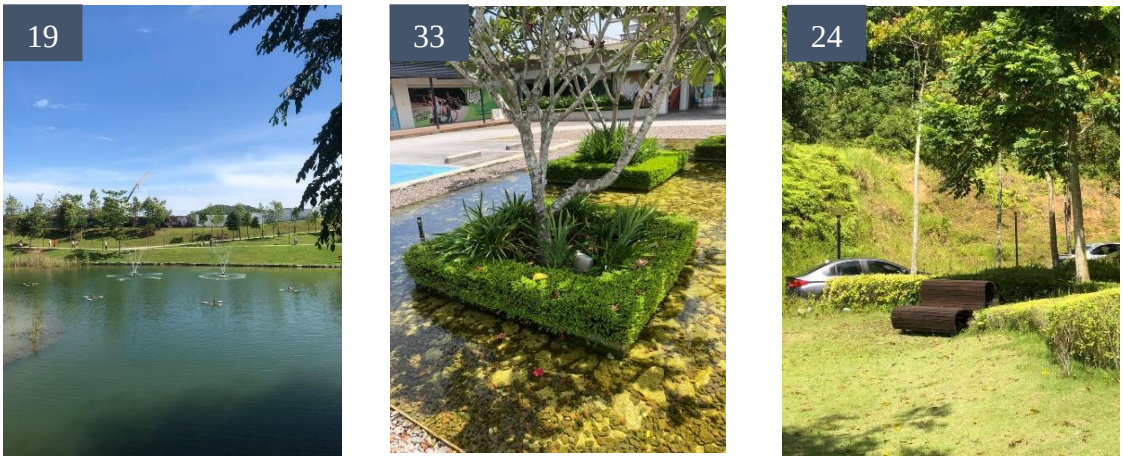

Figure 6: Significant Photos for Theme D – Comfort Value

Conclusion

This study aspired to be an invaluable resource aimed to enhance the primary function of urban park in ensuring that the landscape elements provided can effectively facilitate restoration experiences. Additionally, the application of Q methodology in this study has the potential to serve as a starting point for evaluating the diverse perspectives held by stakeholders' groups for the planning and managing particularly in urban green space. Additionally, this study contributes to the valuable insights into the factors that influencing visitors' restorative experiences at urban park.

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