PARK LANDSCAPE ATTRIBUTES FOR MENTAL RESTORATION: A CASE STUDY AT SHAH ALAM LAKE PARK (WEST LAKE)

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Abstract: Urban parks played an important role in supporting mental health and yet specific design attributes that assist in psychological restoration remain underexplored. This study examined specifically landscape attributes that contributing to mental restoration at Shah Alam Lake Park (West Lake), Malaysia by using comprehensive assessment model adapted from systematic review findings of Mental Restoration Attributes Wheel. The model integrates four theoretical frameworks of Attention Restoration Theory, Stress Recovery Theory, Arousal Theory, and Prospect-Refuge Theory. There are six main attributes categories identified through systematic review and thematic analysis, including green attributes, blue attributes, inclusion of living animals, safety, space representation and layout, and activities engagement opportunities. This study applied method of panoramic photography and GPS coordinates for accurate recording, a systematic observation at 20 selected hotspots within study area and were assessed using park design attributes checklists. Results showed that vegetative diversity, green space, natural substrate, and species richness were present in all 20 hotspots (100%). 85% of the places recorded for blue attributes, with water quality being the most common (80%). Overall, safety features showed 96% compliance, and places for family-friendly and physical activities were readily available. There were five hotspots that exhibited optimal combinations of mental restoration features including Cultural Stage, Zipline, Canopy Bridge, First Playground, and Observation Tower. These findings would assist landscape architects, policy makers, and urban planners in designing restorative urban parks concerning mental health restoration and associating with UN Sustainable Development Goals (SDGs), Goal 3 (Good Health and Well-being) and 11 (Sustainable Cities).

Keywords: Landscape Attributes, Mental Restoration, Sustainable Cities, Urban Parks, Well-being

1. Introduction

Urban parks are the most valuable natural places in cities as it contribute to dweller's well-being (Yang et al., 2025). However, a rising public health concern is indicated by an increasing number in mental health illness that are related to urban stresses. As an outcome, including natural settings into urban landscapes becomes a crucial remedy (Wan et al., 2023). In Malaysia, the quality and accessibility of urban parks are still inconsistent among communities due to the Malaysia's rapid urbanization, which has increased these demands. Significantly, the placement and layout of a attributes in the landscape environment influence visitors to experience positive emotional and psychological responses (Lyu et al., 2025). Yet the demands of various user groups are not adequately addressed in the majority of

urban parks that are now in existence. If the park's objective is to attract a varied range of visitors, then women, children, and the elderly must feel welcome (Ahmad Shafee et al., 2019).

Three out of every five people on the entire world are predicted to live in cities by 2030 (Grigoletto et al., 2023). In Malaysia, current park infrastructure continues to be challenged by this urbanization norm, thereby decreasing its ability to improve quality of life and encourage social well-being, resulting, significant direct and indirect influence on individual well-being (Ahmad Shafee et al., 2019). Urban parks function as an irreplaceable role in encouraging physical activity by offering cost-free, accessibility, and appealingly welcoming areas for its visitors (Li et al., 2025). Nonetheless, community engagement is still constrained by concerns with accessibility and insufficient park design. These shared areas are necessary for productive community participation as to feel the unify (Ahmad Shafee et al., 2019). This study playing a part in aligning with both SDG 3 (Good Health and Well-being) and SDG 11 (Sustainable Cities and Communities).

Therefore, this study aim to examine the mental restoration attributes of urban parks in Malaysian context. Specifically, the objective of this study is to examines specifically park design attributes that contribute to mental restoration of Shah Alam Lake Park (West Lake). Trough systematic review and thematic analysis of four theories used, Arousal theory, Prospect-Refuge Theory (PRT), Attention Restoration Theory (ART) and Stress Recovery Theory (SRT). This study using comprehensive assessment model adapted from Azmi et al. (2025) findings of Mental Restoration Attributes Wheel.

2. Literature Review

2.1 *Mental Health and the Urban Environment*

Since the WHO stated that there is "no health without mental health" in 2005, mental health is becoming more widely acknowledged as fundamentally connected to human health (Zhao & Gong, 2022). This realization is particularly significant in urban settings, where changes in living and working conditions brought about by urbanization have been found to be significant factors in individual's declining mental health (Zhu et al., 2023). Mental health problems are a serious nonverbal public health concern since it can interfere with day-to-day functioning, lower productivity, strain social connections, and threaten occupational stability (Ha et al., 2021).

The natural environment has become a significant counterbalance in this urban setting. Drawing on evolutionary history, several psychological theories have established that natural environmental qualities can deliver measurable mental health benefits (Yin et al., 2022). In particular, it seems that nature reduces stress by mitigating the impacts of air pollution and noise (Fleckney, 2023; Chen et al., 2023). Thus, spending time in natural environments has been associated with higher levels of physical activity, lower levels of anxiety, and a stronger sense of community (Cao et al., 2023), all of which contribute to better mental health (Yin et al., 2023).

2.2 *Urban Parks and Mental Health Benefits*

Urban park have drawn attention as a workable solution to the mental health issues that urban dwellers encounter because of these established links (Cheng, 2025). However, because of the variety of health methods implicated and many approaches used to evaluate such exposure, the exact impact and benefit of greenspace exposure remain debatable despite this expanding body of research (Liu et al., 2025). This contrast highlights a substantial knowledge gap that leaves the connection between green space and mental health unclear.

When taking to consider the variety of attributes that influence this connection, such as access, safety, amenities that are accessible, the surrounding context, and biodiversity, the complexity increases (Hussein et al., 2023). These factors imply that not all attributes are equally beneficial and that urban park management and design are vital. Crucially, studying this link has practical consequences in planning and directing, especially when addressing current gaps of equal urban parks within

frameworks for sustainable development (Cheng, 2025). The subjective form of psychological experience in these settings presents another difficulty as it is difficult to measure and makes the development of trustworthy evaluation indicators more difficult (Cheng, 2025).

2.3 *Theoretical Frameworks for Urban Park Design*

It is necessary to have a solid theoretical foundation in order understand how urban parks could enhance mental health. Cognitive functioning, which assists in decision-making, problem-solving, and daily performance, is influenced by a number of factors, including age, environment, and health (Rai et al., 2024). Therefore, cognitive functioning is a suitable perspective that may be used to evaluate park attributes.

This study limit to 4 theories only, including (1) Kaplan's Attention Restoration Theory (ART) (1995), where it proposed that natural environments aid in mental restoration by allowing the mind to rest and recover from overworked attention exhaustion. (2) Stress Recovery Theory (Ulrich, 1983), explaining on how exposure to nature encourages positive emotional responses while reducing physiological stress. While (3) Beryne (1951) stood for Arousal Theory, which it is proposed that nature helps balance psychological arousal, preventing both overstimulation and under-stimulation and lastly, (4) Prospect Refuge Theory (Appleton, 1975) highlighted that psychological importance of spatial configuration, with an open view for visibility (prospect) and enclosed areas for safety (refuge), it promotes comfort and security.

3. Methodology

This study adapting mental restoration attributes wheel, finding from (Azmi et al., 2025). Resulting finding in come out with 6 main attributes of (1) green attributes, (2) blue attributes, (3) inclusion of living animals, (4) safety, (5) space representation and layout and (6) activities engagement with total of 34 sub landscape attribute and 53 landscape features.

As the Attributes Wheel came from a prior SLR, its output was a structured a checklist where that checklist drove the qualitative fieldwork on site by researcher. Hence, the checklist is being use in this research as guidelines to evaluate study area, which is Shah Alam Lake Park (West Lake) by list out total park attributes and characters for each selected spot.

Landscape attributes is perceptual and spatial, not easily quantifiable due to that the fundamentally experienced through the body moving through space. It could not be fully by captured through surveys or remote sensing alone because its restorative quality depends on the simultaneous co-presence of multiple features within a bounded environment. Therefore, the expert-based mode is occupied by a professional researcher's methodical observation, which is seen to be most reliable approach for identifying physical features when the attributes themselves are established in advance.

3.1 *Study Area*

The study area located at Shah Alam, the state capital of Selangor, Malaysia, a modern planned city with construction starting during the 1960s. Covered over 43 hectares, Shah Alam Lake Park are designed by famous landscape architect Fumiaki Takano. It was the first public park to open in Selangor in 1985 with around a couple of man-made lakes and are managed by Shah Alam’s city council (MBSA). It divided into 3 areas of lakes including West Lake, Central Lake and East Lake. Therefore, this study only covered West Lake area, approximately 3.8 km length of access walking area. This area composed of 19 hectares overall and 10 hectares of lake area. The urban park site selection are due to it the largest area among the other zones Hence, most of the activity engagements and opportunities, mainly family-oriented activities and its well-defined pedestrian loop allowing systematic, bias-reduced hotspot selection. Thus, as it located in a centre of planned city, it been chosen due to the accessibility distance from the park to main roads, and to bus stops.

3.2 *Data Collection*

This study employed a qualitative research design. As the research area required exploratory method, prior to any quantitative measurement (Ellis, 2024). Within the environment-behaviour research standard, direct observation of the physical setting is recognised as the necessary precondition to understanding person-environment relationships which the attribute baseline must first be established empirically before visitor perception can be meaningfully measured. Hence, this study using qualitative method, which implies 2 observations.

Firstly, inspired by the simulated walking procedure & simulated viewing, that is commonly used in restoration studies. This study established a systematic observation method in the photo selection approach of selected 20 areas. It refers to a simulated individual observing environment created by rotating a landscape camera setting to show approximately 360 degrees of a panoramic picture. The horizon line remained in the centre of the screen while the picture was taken horizontally at the observer's eye level (approximately 1.48 meters above the ground). The first camera angle was aimed at the main viewpoint that presents most interest in the panoramic picture, which in this study, is the centre of the park pathway (Van Den Berg et al., 2014; Zhao & Gong, 2022; Jin et al., 2022; Asim et al., 2023 & W. Zhao et al., 2023).

Furthermore, the area capture in each photo in selected area are used as a boundary zone for the second observation on-site assessment by using mental restoration attributes checklist derived from the Attributes Wheel (Azmi et al., 2025). As the boundary zone were selected, it easy the study to limiting the covered area of this study. All landscape attribute and landscape features were included in the checklist. The use of a structured checklist instrument ensured that the observation remained systematic and standard-referenced, reducing the risk of selective thought while retaining the contextual sensitivity that qualitative fieldwork affords.

The panoramic photographs taken during these site visits will also serve as image references in a ensuing questionnaire-based survey on landscape attribute preferences, as part of the extended research findings in this case study. For this paper, the focus remains on the qualitative observational findings of mental restoration attributes at Shah Alam Lake Park (West Lake).

3.3 *Pre-Visit Preparation*

Pre – visit preparation was prepared in several process that represented in Figure 1, where it is started by define objectives of study is to examines specifically park design attributes that contribute to mental restoration of Shah Alam Lake Park (West Lake). Furthermore, review background information (desktop study) of study relevant literature, maps, prior research. Then, prepare materials to bring appropriate data collection tools such as phone camera with Global Positioning System (GPS) application, map of site area and the list of mental restoration attribute wheel checklists.

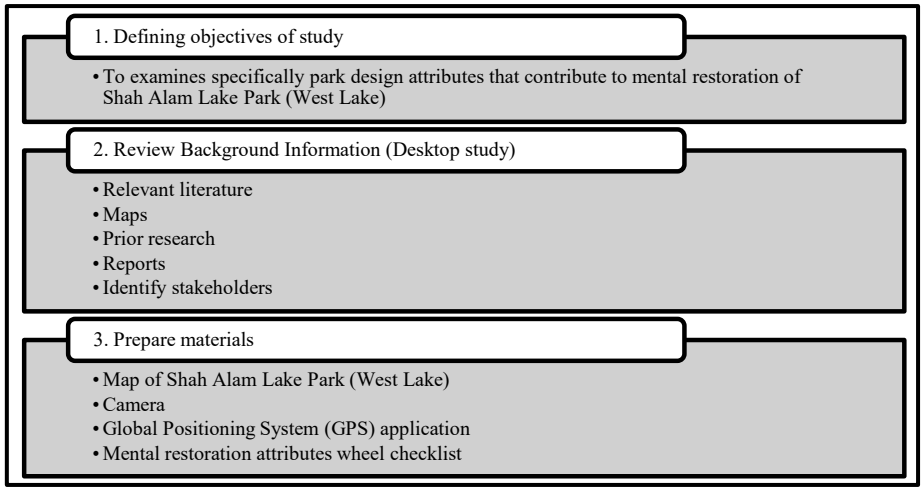

Figure 1: Pre-visit preparation to Shah Alam Lake Park (West Lake)

3.4 *During the Site Visit*

During the site visit, there is data collection procedure was implemented in several process that represented in Figure 2, where it is took months to visited required for data collection and double check, before finalized the hotspots as study area and confirming their attributes. Therefore, the photos will be use later as an image tool and use in questionnaires in survey form (preference landscape attributes) for extending research of this area. As for this paper, it focus in finding of mental restoration attributes at Shah Alam Lake Park (West Lake) results.

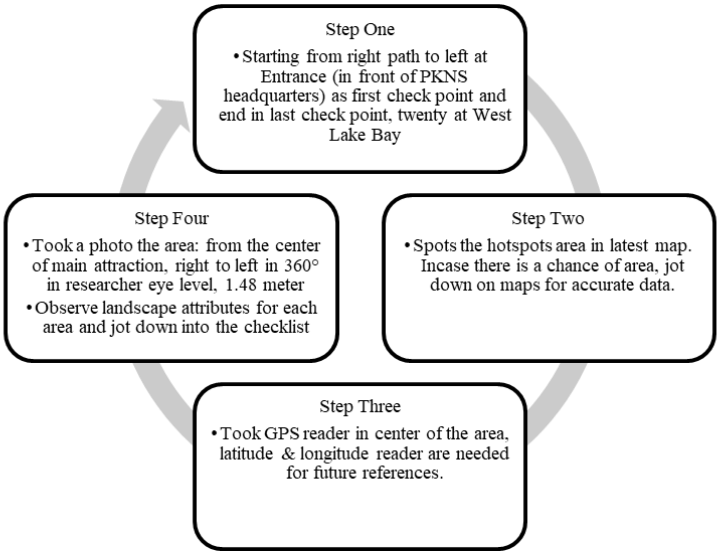

Figure 2: Procedure during data collection (photos and mental restoration checklist) of 20 selected areas at Shah Alam Lake Park (West Lake)

Starting from right path to left at Entrance (in front of PKNS headquarters). The hotspot where choose based on attractions area stated on (1) Park map, (2) attractions list in MBSA website, (3) attractions list in Selangor or Shah Alam tourism websites and (4) pin area in google map. Due to the findings, 20 hotspots area were chosen and finalize for this study materials. Below shown in Table 1, the name and photos, thus, the latitude & longitude coordinates of selected area.

Table 1: A brief description of selected 20 hotspot areas

No.	Hotspot name	Photos	GPS Coordinates
1	Entrance (in front of PKNS)		3°4.4170'N, 101°30.8940'E
2	Cultural Stage		3°4.4300'N, 101°30.8820'E
3	Zipline		3°4.4830'N, 101°30.8220'E
4	Observation Tower		3°4.4760'N, 101°30.8210'E
5	Canopy Bridge		3°4.4690'N, 101°30.7960'E
6	Children's Bicycle Track		3°4.4410'N, 101°30.7410'E
7	1st Playground		3°4.3770'N, 101°30.7290'E
8	Wet World		3°4.3330'N, 101°30.7390E
9	2nd t Solar Bridge		3°4.2670'N, 101°30.8420'E
10	Outdoor Gym		3°4.2210'N, 101°30.8260'E

11	2nd Playground		3°4.1630'N, 101°30.8990'E
12	Stalls 87		3°4.3770'N, 101°30.7290'E
13	Restaurant Kak Anie Shellrock		3°4.1590'N, 101°30.9300'E
14	Antan Batujra Watersport		3°4.1610'N, 101°30.9470'E
15	Malay Heritage Park		3°4.1790'N, 101°30.9950'E
16	1st Solar Bridge		3°4.'2360N, 101°30.9040'E
17	Shah Alam Gallery		3°4.3740'N, 101°30.8870'E
18	Cultural Plaza		3°4.3710'N, 101°30.8840'E
19	Cultural Musical Fountain		3°4.3890'N, 101°30.8680'E
20	West Lake Bay		3°4.4080'N, 101°30.8270'E

Notes: *20 hotspot areas

4. Results and Discussion

This study results and discussion are finding from the analysis done by using the mental restoration attributes checklist. Where researcher using observational method, including by few times of site visiting and observed all 34 sub landscape attribute and 53 landscape features from the checklist of each 20 hotspot areas.

4.1 *Blue Attributes*

20 hotspots analysed in total, resulting 17 hotspots (85%) have blue attributes. Only 3 hotspots (15%) not cater for blue attributes, likely due to the area were further from direct water interaction and mostly dominated more to landside amenities. By 6 landscape features, (1) water quality have highest coverage within 16 hotspots (80%) as the park has offering high coverage of blue attributes as their main attraction within park central. Thus, for (2) blue space and (3) water elements spotted within 15 hotspots (75%). Which is mean a consistency were integrated across majority area of this park. Furthermore, (4) water sensory was present within 12 hotspots (60%). As (5) water features and (6) waterfront planting presenting within 7 hotspots (35%).

Hence, total coverage of blue attributes at this park were in 60% coverage. This integration reflects as it main attributes of lake-centred environment, where it interact good opportunities to the visitors in experience including in viewing and sensory experiences. It show that blue attributes help in associated with restorative potential through nature-based environments, in line with the theoretical foundations of Attention Restoration Theory (ART), Stress Recovery Theory (SRT), and Prospect-Refuge Theory (PRT). Overall, 3 performing hotspots that have all landscape features of blue attributes are (1) Cultural Stage, (2) Zipline and (3) Observation Tower. Resulting due to their coverage positions of full blue attribute, it notable as prime area for visitors to cater their restorative experience.

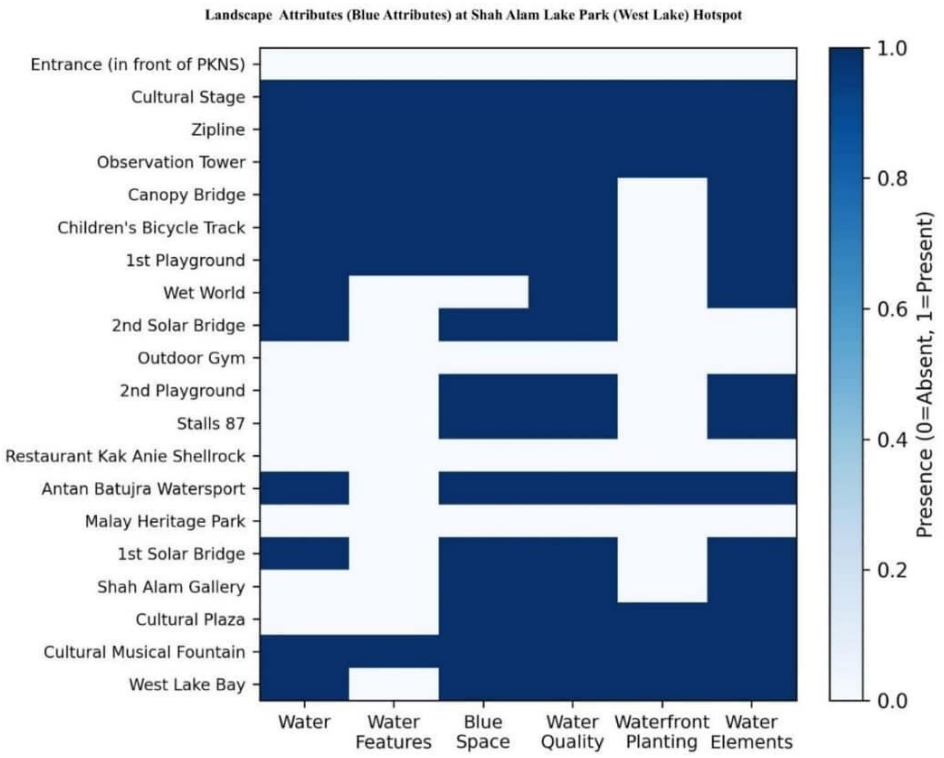

Figure 3: Blue Attributes at Shah Alam Lake Park (West Lake) Hotspots

4.2 *Green Attributes*

11 landscape features analysed, overall (1) Vegetation Diversity, (2) Green Space, (3) Natural Substrate and (4) Species Richness were located at 20 hotspots (100%), (5) Therapeutic and (6) Natural smells within 19 hotspots (95%), (7) Trees and (8) greenery distribution within 18 hotspots (90%), (9) tree canopy and (10) natural elements within 16 hotspots by 80% and (11) tree coverage within 11 hotspots (55%). Therefore, it showed that this park are consistently with high levels of green attribute integration as whole in cater their visitor needs. Within this level, a rich green attribute environment were capable indirectly for mental restoration, aligning with the restorative qualities described under Stress Recovery Theory (SRT) and Attention Restoration Theory (ART).

As results, 10 hotspots are spotted as top location that applies overall green attributes in total, including (1) Malay Heritage Park, (2) Stalls 87, (3) Observation Tower, (4) 2nd Playground, (5) 1st Playground, (6) Canopy Bridge, (7) Cultural Stage, (8) Zipline and (9) Entrance (in front of PKNS) have all 11 landscapes features and (11) Children's Bicycle Track have 10 by 11 of landscapes features.

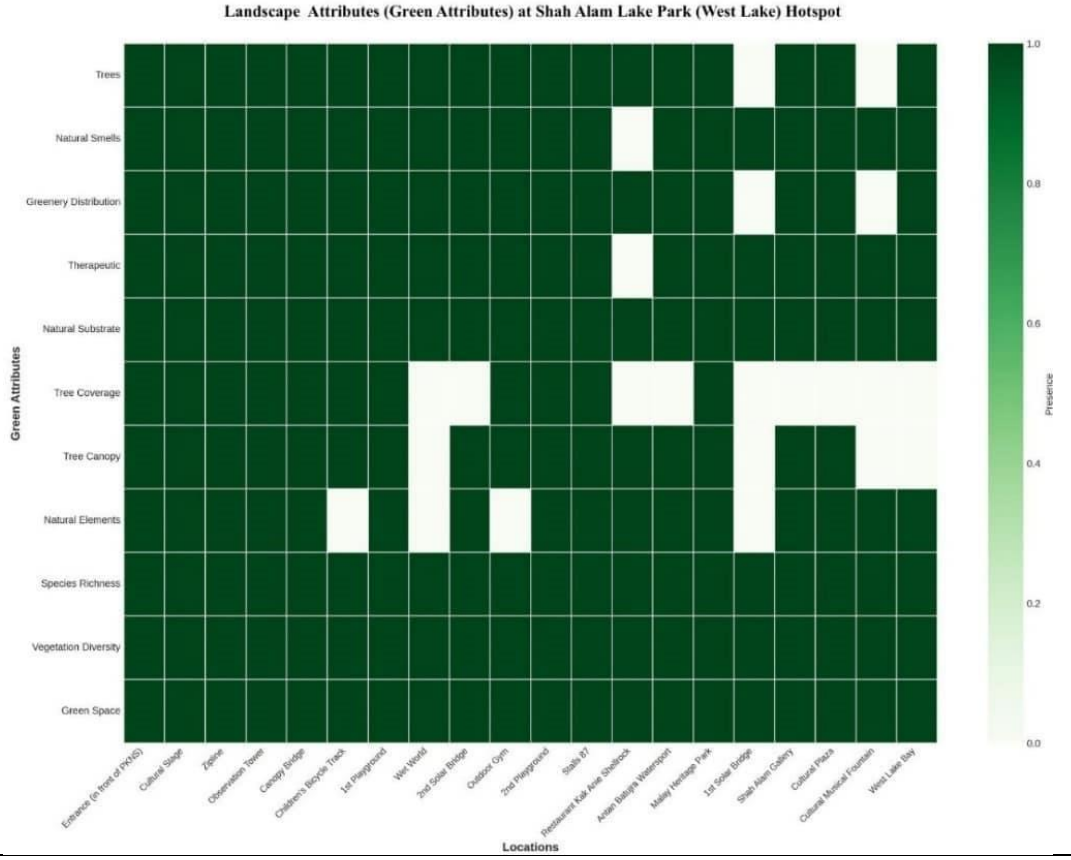

Figure 4: Green Attributes at Shah Alam Lake Park (West Lake) Hotspots

4.3 *Activities Engagement Opportunities*

Only 5 from 20 hotspots performing highest scores by having all 15 features in total which is (1) Zipline, (2) Children's Bicycle Track, (3) 1st Playground, (4) Canopy Bridge and (5) 2nd Solar Bridge. However, all 20 hotspots are 100% available with 5 landscape features for activities engagement opportunities which include (1) Family-oriented Activities, (2) Physical Activities, (3) Active Engagement, (4) Social Interactions and (5) Social and group engagement. Thus, 19 hotspots (95%) with (1) Walking Paths, (2) Pathway Design, (3) Amenities, (4) Relaxation Areas, (5) Passive Engagement, and (6) Diverse Facilities. Yet only 16 hotspots (80%) have seating areas and only 2 hotspots provide exercise equipment.

Although it is resulting in low scores, the whole park orientation are actually broadly consistent with the restorative landscape model. Where movement-based and passive nature engagement over structured fitness infrastructure were balance in its placement at the park. Resulting that this park demonstrates a consistent baseline of recreational and social infrastructure that valuable to diverse visitors group mental restoration.



Figure 5: Activities Engagement Opportunities Attributes at Shah Alam Lake Park (West Lake) Hotspots

4.4 *Space Represents and Layout*

All 20 hotspots were comprehensive to landscape structure attributes. Thus, 20 locations by 100% are fully accessible, 17 out of 20 hotspots offer landscape feature of aesthetic and calming qualities. 18 by 20 hotspots implies comfort area and 8 from 20 hotspots have access to trail length and access for blue space. As results, only 8 out of 20 hotspots that fulfil all landscape features which is including (1) Antan Batujra Watersport, (2) 1st Playground, (3) Children's Bicycle Track, (4) 1st Solar Bridge, (5) Canopy Bridge, (6) Observation Tower, (7) Zipline and (8) Cultural Stage.

Besides it been identified that this park actually reflecting both the physical geography of the lakeside landscape and the uneven distribution of waterfront connectivity across the hotspot network. Yet this park also demonstrates a strong and largely consistent structural foundation for restorative of park visitors. Which it led as a whole that the park's structural design is broadly conducive to the initiation and maintenance of restorative experiences across most of its spatial extent.

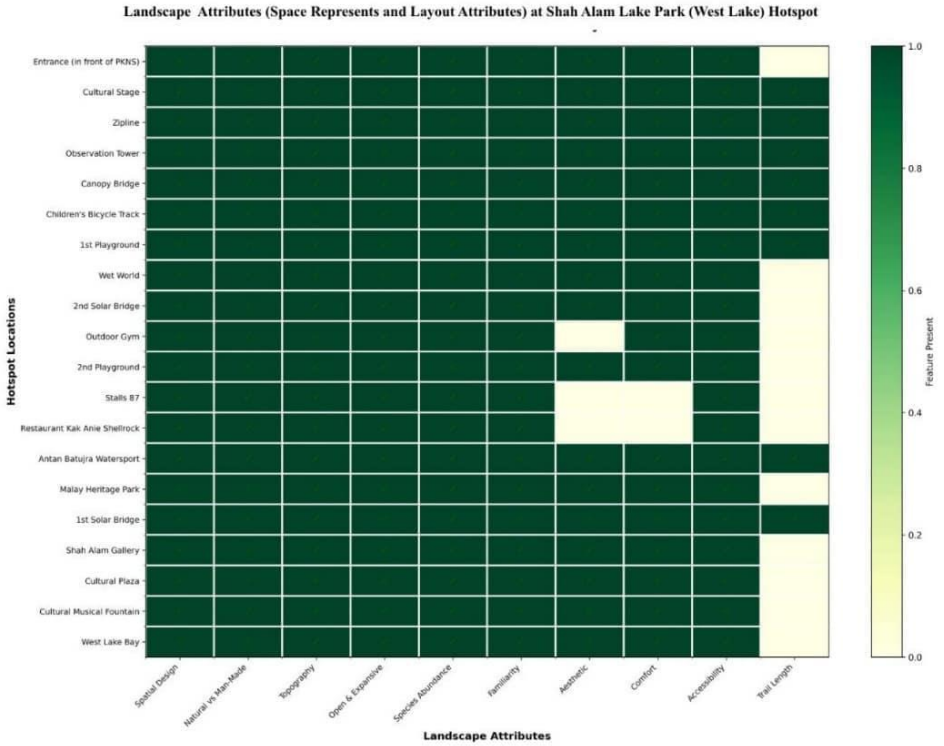

Figure 6: Space Represent and Layout Attributes at Shah Alam Lake Park (West Lake) Hotspots

4.5 *Safety*

Maintenance, safety and cleanliness are 100% compliance by 20 hotspots. However, for landscape features such as lighting and park safety only applied at 19 hotspots by 95%. Thus, in terms of safety features 18 out of 20 hotspots provided. As results, out from 20 hotspots, 96% compliant for safety features and only 4 % non-compliant. It reflect a strong park management practice and a consistent maintenance towards this park.

Safety are functioning not as direct generators in restoration process yet as necessary conditions for effective restorative engagement as whole. Shobri et al. (2023) mentioned that Visitors are unable to accomplish mental restoration in surroundings where they feel physically threatened, worried, or unsafe regardless of the park's landscape attributes only.

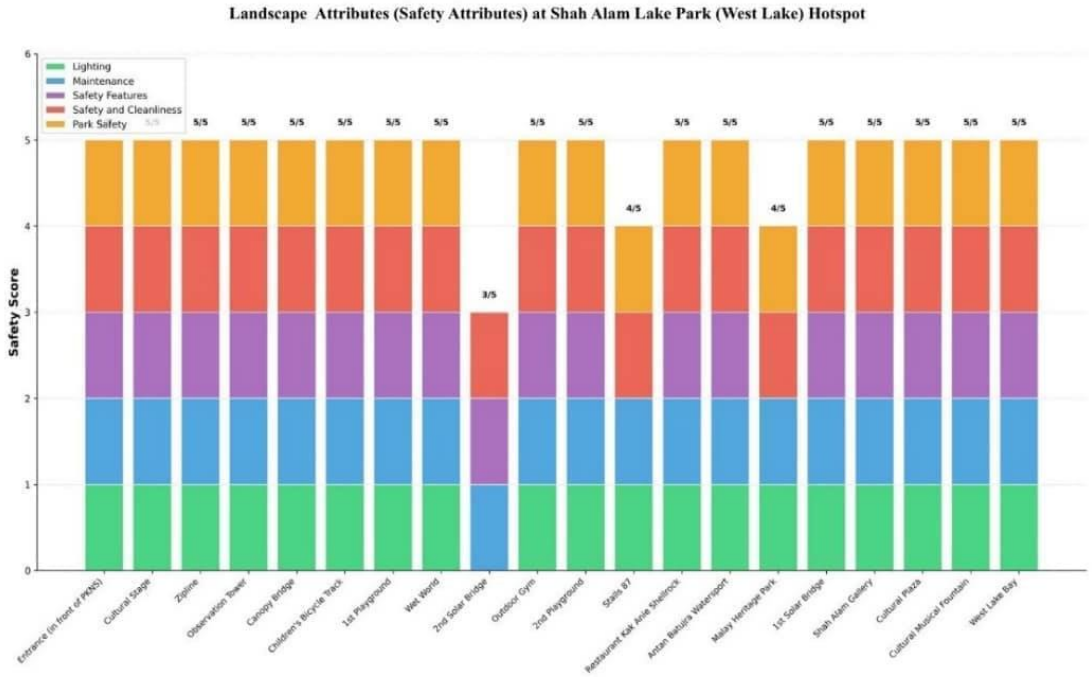

Figure 7: Safety Attributes at Shah Alam Lake Park (West Lake) Hotspots

4.6 *Inclusion of Living Animals*

Shah Alam Lake Park (West Lake) are compliant 100% with landscape features by having land animals, natural sounds, songs and animal biodiversity for their visitors. Though, only 7 out from 20 hotspots experience bird water sounds and 12 from 20 hotspot implies water animals. As results 12 hotspots (60%) were having both types of inclusion of living animals. Hence, 8 hotspots (40%) having land animals only. As for top hotspots that provide all landscape attributes is including (1) Cultural Stage, (2) Wet World, (3) 1st Solar Bridge and Cultural Musical Fountain.

Therefore, it can be concluded that this park establish a consistently rich biological baseline over the park's whole geographical area. Where indirectly it affects the qualities that have been consistently associated with heightened restorative responses, soft fascination, and enhanced perceptions of ecological authenticity among park visitors.

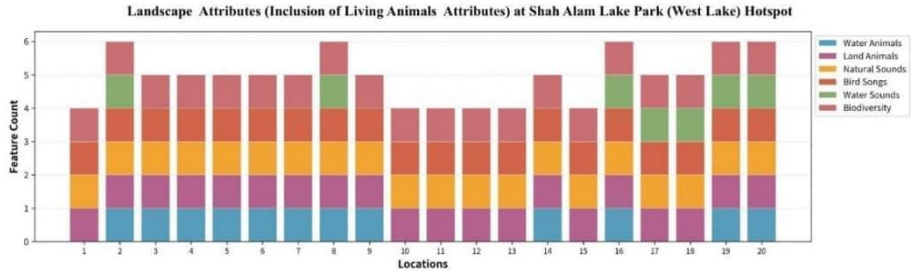

Figure 8: Inclusion of living animals Attributes at Shah Alam Lake Park (West Lake) Hotspots

4.7 *Park Landscape Attributes at Shah Alam Lake Park (West Lake)*

The overall analysis of park landscape attributes by 20 hotspots in Shah Alam Lake Park (West Lake) identified 5 hotspots as the park's highest performing areas which is (1) Cultural Stage, (2) Zipline, (3) Canopy Bridge, (4) 1st Playground and (5) Observation Tower. Resulting that Cultural Stage and Zipline scored same score out from 53 landscape features, where it reflects integration of green, blue, spatial

activity, landscape structure, safety, and living animal attributes within a single location. The scores indicate that this area has the greatest variety of restorative landscape qualities within it attributes that unite to generate the ideal environment for mental restoration and cognitive recovery.

As for Canopy Bridge and 1st Playground also have same score which is 50 out of 53 landscape features. It reflects similarly high level of overall landscape attribute integration, were confirming its status as one of the park's most restorative and ecologically connected locations, offering park visitors in a point that encourage both visual access t o the lake and immersive engagement with the park's natural environment as whole. Lastly, Observation Tower with scored 49 out of 53 landscape features.

It concluded that these 5 hotspots are represented well in comprehensively restoration area, with each demonstrating a high score, it not by excellence of single attributes category but with a integration of multiple landscape dimensions.

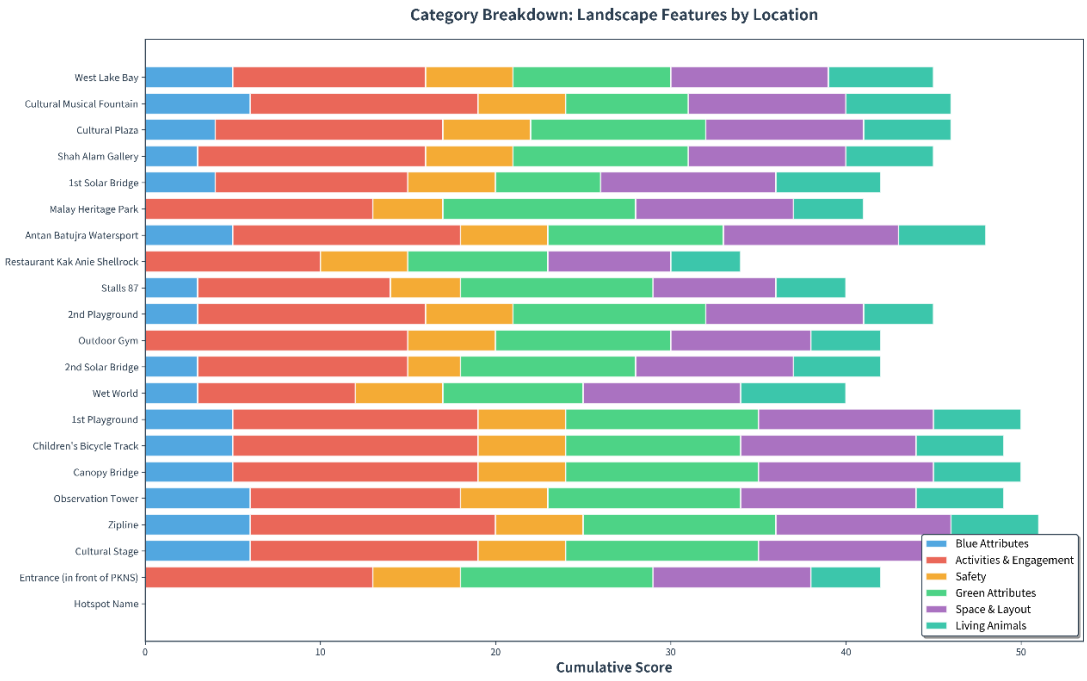

Figure 9: Inclusion of living animals Attributes at Shah Alam Lake Park (West Lake) Hotspots

5. Conclusion

Twenty hotspots were assessed across six attribute landscape attribute categories using Mental Restoration Attributes Wheel at case study, Shah Alam Lake Park (West Lake), Malaysia. Therefore, these findings provide the evidence-based guidance for a landscape architects, urban planners, and policymakers as future references in develop urban parks that cater mental restoration to its visitors. Furthermore, this study contributing to UN Sustainable Development Goals 3 (Good Health and Well-being) and 11 (Sustainable Cities and Communities).

Several limitations should be acknowledged from this study. Firstly, this study focused only on the West Lake zone of Shah Alam Lake Park. Hence, it limits the representativeness of findings to the Central and East Lake zones or other urban parks. Secondly, the qualitative observational method, while its systematic and relied on researcher judgement. it did not incorporate with visitor perception surveys or quantitative physiological measures of restoration. Finally, the Mental Restoration Attributes Wheel checklist, though it was adapted from a systematic review, it may not cover all culturally specific or contextual factors influencing mental restoration in Malaysian urban park settings as whole. As conclusion, for future studies are being encouraging to adopt mixed-method approaches, include

broader park zones, and participate a visitor's user-reported on restorative experiences to validate and widen these findings.

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