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Multi-Purpose Open Space (MPOS) Evaluation to Support Inclusivity in Public Spaces PKOR Way Halim, Bandar Lampung

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Abstract

Public open spaces play a key role in sustainable urban development through their social, ecological, and cultural functions. However, their planning and design in many cities remain largely exclusive and have yet to fully incorporate inclusivity and sustainability principles. This study aims to evaluate the performance of the Way Halim Sports Activity Center (PKOR Way Halim) in Bandar Lampung as an inclusivity- and sustainability-based Multi-Purpose Open Space (MPOS) in supporting adaptive public spaces. The study uses a descriptive mixed-methods approach, combining a questionnaire survey of 100 purposively selected respondents with structured field observations. Data were analyzed using percentage-based descriptive statistics, categorized as low (<40%), moderate (40–60%), and high (>60%). The results show that social inclusivity, covering user diversity, spatial comfort, and activity flexibility, achieved high performance (64.8%–77%). In contrast, basic physical accessibility was low, particularly in disability-friendly facilities (38%) and adaptive lighting for visually impaired users (39.2%). Supporting facilities and user participation were rated moderate (42.8%–57%). PKOR Way Halim has strong potential to be developed as an MPOS but requires targeted design and policy interventions focused on universal accessibility. Strengthening public open space planning and management policies, including technical regulations for disability-friendly facilities, is essential to enhance its functionality and sustainability.

Keywords: Inclusivity, Multi-Purpose Open Space (MPOS), PKOR Way Halim, Public Open Space, Sustainability

Evaluasi Multi-Purpose Open Space (MPOS) dalam Mendukung Inklusivitas Ruang Publik di PKOR Way Halim, Bandar Lampung

Abstrak

Ruang terbuka publik memiliki peran strategis dalam mendukung pembangunan kota berkelanjutan melalui pemenuhan fungsi sosial, ekologis, dan kultural. Namun, praktik perencanaan dan perancangan ruang terbuka publik di banyak kota masih cenderung eksklusif dan belum sepenuhnya mengintegrasikan prinsip inklusivitas dan keberlanjutan. Penelitian ini bertujuan untuk mengevaluasi kinerja Pusat Kegiatan Olahraga (PKOR) Way Halim di Kota Bandar Lampung sebagai Multi-Purpose Open Space (MPOS) berbasis inklusivitas dan keberlanjutan dalam mendukung ruang publik yang adaptif. Pendekatan deskriptif kuantitatif dan kualitatif digunakan melalui survei kuesioner terhadap 100 responden yang dipilih secara purposif, didukung observasi lapangan terstruktur. Analisis menggunakan statistik deskriptif berbasis persentase dengan kategori kinerja: rendah (<40%), sedang (40–60%), dan tinggi (>60%). Hasil menunjukkan bahwa dimensi inklusivitas sosial berada pada kategori tinggi (64,8%–77%). Sebaliknya, aksesibilitas fisik dasar tergolong rendah, terutama pada fasilitas ramah difabel (38%) dan pencahayaan adaptif bagi tunanetra (39,2%). Sementara itu, kelengkapan fasilitas pendukung dan partisipasi pengguna berada pada kategori sedang (42,8%–57%). PKOR Way Halim berpotensi dikembangkan sebagai MPOS, namun memerlukan intervensi desain dan kebijakan berbasis aksesibilitas universal. Penguatan kebijakan perencanaan dan pengelolaan ruang terbuka publik, termasuk regulasi teknis fasilitas ramah difabel, penting untuk meningkatkan fungsi dan keberlanjutannya.

***Kata-kunci**: Inklusivitas, Multi-Purpose Open Space* (MPOS), PKOR Way Halim, Ruang Terbuka Publik, Keberlanjutan

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Introduction

Public open spaces hold an important role in supporting urban sustainability through social, ecological, and cultural aspects. The multi-purpose and multifunctional open spaces are complex concept which consist of spatial, temporal, use, and service dimension [1]. The activity diversity in public spaces also reflects aspiration, need, and ideas from people, making the spaces as a representation of the city and the community quality [2].

Multifunctional landscape in public open spaces highlights the importance of social activities and use diversity, since the higher social interaction in public spaces, the better the spaces for people, since multi-use in public spaces includes physical factors (accessibility and facilities), support factors, and attraction factors [3] It also gives benefit of ecology for rainwater infiltration, flood mitigation, and urban air quality improvement [4]. In sustainable development, public open spaces should have been designed for inclusivity, an easy access to all group of people, especially for vulnerable groups such as disabled people, elderly people, women, and children.

Inclusive design not only eliminates the stigma against vulnerable groups but also ensures their accessibility, welfare, and participation in development [5][6]. Openness and inclusivity in public spaces in urban development are needed to address social inequality, social tension, and violence [7]. The effectiveness of Multi-Purpose Open Spaces (MPOS) itself has been proven through several studies that have shown positive impact on several aspects, including social cohesion, cultural exchange, economic benefits, inclusivity, participatory design, mental health, and sustainability. MPOS could maintain community engagement and social interaction through public activities[8][9], promote cross-cultural understanding and learning through inclusive design [10][11], stimulate the local economy through tourism and foot traffic [12][13], ensure accessibility and representation of all community groups [14] [15], involve the community in the design process to create spaces that are accessible and usable equally [14][15], provide a restorative environment to improve mental health [9][10] and provide the benefits of multifunctional spaces for environmental, social, and economic sustainability [1] [11].

On the other hand, the implementation of MPOS in Indonesia, especially in terms of accessibility and inclusivity of public open spaces, has several challenges. Challenges in creating women-friendly public spaces, for example, are still found in aspects of lighting, cleanliness, and inadequate security [6]. In Kalpataru Field Green Open Space, Bandar Lampung, public open spaces are used by various user groups (children, teenagers, adults) but the facilities are limited to physical and social activities such as sports and recreation, with economic functions (street vendors) being poorly managed, with the lack of facilities for cultural activities, disaster management, health protocols, the use of temporary spaces for exhibitions, temporary markets, and disaster evacuation [16]. If only open spaces were managed well with a multifunctional approach, they can increase the vitality of the city while strengthening social cohesion between residents [17]. It could support sustainable development goals (SDGs), especially point 11 by creating an inclusive, safe, resilient, and sustainable city through the provision of safe and easily accessible public spaces for all groups [18].

Sustainable Development Goal 11 addresses the right to an inclusive, safe, and resilient urban zone, emphasizing the reduction of inequalities and injustices based on race, disability, social class, gender, and age by 2030. Despite global attention to sustainable urban and community development, the understanding of the meaning of inclusivity remains very limited. This research addresses this gap through a quantitative study conducted at the Way Halim Sports Center (PKOR). The concept of inclusivity identifies five key elements that constitute an inclusive community, emphasizing that inclusivity is determined by the interconnectedness of social, economic, and built environmental systems, and is experienced through space and mobility in everyday life [19].

PKOR Way Halim is a major public open space used by the community for a variety of activities, from sports and family recreation to informal economic activities. This area has the potential to be a multifunctional open space due to its strategic location, significant area size, and high visitor frequency. However, its utilization still faces several challenges, such as suboptimal spatial planning, limited supporting facilities, and low levels of inclusivity for vulnerable groups. For example, pedestrian paths, children's play areas, and accessible facilities for the disabled are still inadequate to support the principles of a friendly and sustainable public space. Furthermore, increasing commercial pressures have the potential to shift the primary function of public space as a means of social and ecological interaction.

Therefore, developing a Multi-Purpose Open Spaces (MPOS) concept in PKOR Way Halim is crucial for balancing the area's social, ecological, and economic functions while addressing the diverse needs of the urban community. This study aims to analyze the potential and challenges in designing an MPOS concept specifically targeted at vulnerable groups, with a focus on children, the elderly, women, and people with disabilities. Previous research on public open spaces and inclusive design has generally focused on conceptual aspects, activity typologies, or assessing user perceptions of the comfort and accessibility of the space.

This study develops a simple, weighted MPOS-Inclusive Index, compiled based on indicators of accessibility, safety and comfort, availability of supporting facilities, spatial flexibility, and representation of the needs of vulnerable groups (children, the elderly, women, and people with disabilities). Assigning weights to each indicator allows for a more objective and comparative evaluation of MPOS performance across zones, ensuring that the analysis results are not only qualitative but also quantitative and operational. Second, this study maps accessibility gaps based on MPOS area zoning, identifying disparities in meeting the needs of vulnerable groups in each spatial zone. In the context of MPOS, existing studies are still dominated by normative and descriptive approaches, such as the principles of universal design, functional flexibility, and the role of open spaces in supporting social interaction and community well-being.

Methods

This study used a quantitative method with a survey technique, distributing questionnaires to respondents within vulnerable group, especially women, children, elderly people, and disabled people who actively use PKOR Way Halim, Bandar Lampung.

Sampling Methods

Determining the total respondents needed for researches was conducted using the Slovin formula. The sample size, which is a formula that can be used to determine the total respondents, was formulated as follows:

$$n=\frac{N}{1+N(e)^2}$$

Notes:

n = Sample Size
N = Total Population
e = Margin of error

By taking a sample from the population of Bandar Lampung City of 1,077,664 people [20] and an error limit of 10%, a sample size was obtained with the following calculations:

$$n=\frac{1.077.664}{1+1.077.664(0,1)^2}$$

$$n=\frac{1.077.664}{1+10.776,64}$$

$$n=\frac{1.077.664}{10.777,64}$$

$$n=99,99\approx 100$$

The number of questionnaires needed to be distributed in this research was 100 respondents, which was considered sufficient to obtain a general picture of community perceptions of the development of MPOS in the site. Respondents were selected by using purposive sampling, who used PKOR for various activities, such as sports, family recreation, economic activities, social interactions, and community activities. The respondents were also part of vulnerable groups, especially women, the elderly, people with disabilities, and children. The distribution of questionnaires was carried out in the morning (7:30-10:00) and afternoon (16:00-18:00), with locations inside the stadium, outside the stadium (rest area near the motorcycle parking area), around the softball field, the art market, and the night market area (see Figure 1). The location was determined based on the intensity and frequency of activities in the Way Halim PKOR Area.

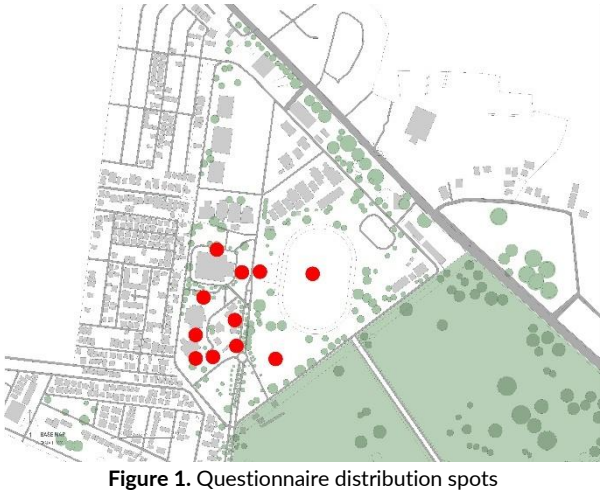

Figure 1. Questionnaire distribution spots

The questionnaire included questions related to important aspects of the MPOS concept, including:

1. Ease of access
2. Availability of disability-friendly facilities
3. Lighting and road markings for users who are blind or have visual impairments
4. Facilities specifically for the elderly, pregnant women, and people with special needs
5. Availability of facilities such as seating, shade, and a drinking water fountain that are evenly distributed.
6. Availability of spaces or facilities that reflect cultural diversity and the needs of minority groups
7. Availability of programs or activities that involve various user groups
8. Fulfillment of user needs and involvement in the design of public open spaces

Each question used a Likert scale with five scoring categories: strongly agree (5), agree (4), neutral (3), disagree (2), and strongly disagree (1). This approach allows researchers to determine the level of public approval, particularly for visitors who directly use the facilities, regarding the existing conditions and development needs of the PKOR as a multifunctional open space. The collected data were analyzed descriptively using percentages for each response category. Percentages were calculated by comparing the number of respondents in each category with the total number of respondents, which were then presented in tables and graphs. This percentage analysis aims to facilitate interpretation of the level of public satisfaction, needs, and aspirations for the PKOR Way Halim public space, especially from vulnerable groups.

Data Collection Methods

The data collection method in this study was conducted through a survey using a questionnaire as the primary instrument. The survey was chosen because it allowed researchers to obtain primary data directly from the Way Halim PKOR user community through structured communication. The questionnaire was designed using a five-point Likert scale (strongly agree, agree, neutral, disagree, strongly disagree), with the aim of exploring respondents' perceptions, needs, and level of satisfaction with the MPOS concept.

Data Analysis Method

The data obtained from the questionnaire were analyzed using descriptive quantitative analysis with a Likert scale scoring approach. Descriptive analysis was chosen because it aligned with the research objectives, in order to describe the existing conditions and public perceptions of the MPOS development in PKOR Way Halim. The Likert scale scoring approach allowed for a measurable assessment of public open spaces for a clear and objective understanding. The Likert scale scoring formula used in the data analysis was as follows:

$$P=\frac{f}{N}\times 100\%$$

P = Percentage of respondents' answers
f = Frequency of respondents' answers in each category
N = Total number of respondents

After finding the percentages based on the Likert scale measurements, categorizations were made based on the percentages (%), with details as shown in Table 1.

Table 1. Categorization based on Percentage

No	Percentage	Scoring
1	0-20 %	Very Poor
2	21-40%	Poor
3	41-60%	Neutral
4	61-80%	Positive
5	81-100%	Very Positive

Source: Sugiyono, 2017

Validity and Reliability Test

Instrument validity and reliability test was conducted using the Cronbach's Alpha coefficient. Validity test aimed to assess the accuracy and appropriateness of a research instrument in measuring the variables under research. An instrument was considered valid if it accurately represented and measured the concepts it was intended to measure. Therefore, validity test was the stage of evaluating the content of the instrument (questionnaire) to ensure the suitability and accuracy of the measurement tool used in the research.

Meanwhile, reliability test aimed to measure the internal consistency of the instrument, namely the extent to which the questionnaire can provide stable and consistent results in measuring the research constructs or variables. The Cronbach's Alpha method is particularly suitable for data in the form of rating scales or score ranges. The alpha coefficient (α) is used as an indicator of reliability, with an α value > 0.70 indicating adequate reliability, an α value > 0.80 indicating strong reliability, and a value > 0.90 indicating very high reliability. An α value between 0.70 and 0.90 is categorized as high reliability, 0.50 and 0.70 as moderate reliability, and <0.50 as low reliability, indicating inconsistent or unreliable instrument items.

The instrument's reliability was tested using Cronbach's Alpha coefficient:

$$\alpha = \frac{k}{k-1}\left(1 - \frac{\sum \sigma_i^2}{\sigma_t^2}\right)$$

Notes:
α = Cronbach's Alpha reliability coefficient
k = number of question items
σ_i^2 = variance of each item
σ_t^2 = variance of total score

Reliability value:
α >0,90 = very high reliability
0,70≤ α ≤0,90 = high reliability
0,50≤ α <0,70= average reliability
α <0,50 = low reliability

Validity Test

$$r_{xy} = \frac{N\sum XY - (\sum X)(\sum Y)}{\sqrt{[N\sum X^2 - (\sum X)^2]\,[N\sum Y^2 - (\sum Y)^2]}}$$

Description:

r_{xy} = correlation coefficient between item score (X) and total score (Y)
X = item score
Y = total score
N = total respondents

Decision criteria:

If $r_{count} > r_{table}$ → item is **valid**
If $r_{count} \leq r_{table}$ → item is **not valid**

Result and Discussion

General Condition of PKOR Way Halim

PKOR Way Halim was one of the largest public open spaces in Bandar Lampung City, serving as a sports, recreation, and social interaction area. Designed primarily as a sports facility, the area had been evolving into a multifunctional space accommodating a variety of activities, including arts, culture, economics, and religious activities.
Access to PKOR Way Halim consisted of internal and external routes. The external route consisted of a pedestrian path, while the external route was a vehicular or transportation path with a width of 6-8 meters. The only active vehicle access point at recent times was the main entrance in the south of the area. Vehicles entering through the main entrance used a ticketing system for security purposes, and a parking area was provided directly after the ticketing area. Motorcycle parking was located to the east of the ticketing area and car parking was located to the west of the ticketing area. The parking area in PKOR Way Halim had a capacity of 60-70 motorcycles and 20-30 cars. Pedestrian circulation was provided to access facilities within the area via a pedestrian path approximately 2 meters wide along the edge of the vehicle lane. Details of the circulation and access routes were be able to be seen in Figure 2.

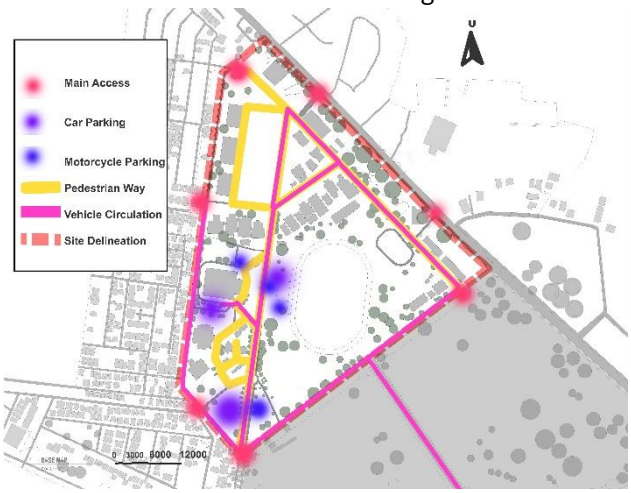

Figure 2. Accessibility Map and Users' Circulation at PKOR Way Halim

Based on the observation results, there were several facilities in the area, most of which were not functioning optimally with poorly maintained conditions, especially stalls/kiosks that were more utilized and enlivened by the presence of street vendors, open stages, gazebos, and toilets that unfortunately were in poor condition, signage and information boards that did not provide easy access to the lack of sanitation facilities for hygiene purposes. Details and locations could be seen in Table 2 and Figure 3.

Figure 3. PKOR Way Halim Area Facilities Mapping

Table 2. Facilities condition in PKOR Way Halim

No	Fasilitas	Keterangan
1.	Benches and Seating	Consisting of benches with and without backrests, made of various materials (iron, wood, and stone). Seats were placed under trees or along the roadside with a canopy above.
	 	
2.	Playground	The playground was predominantly used for children by utilizing the skatepark and multi-purpose field area which could be used for painting, fishing, scooter games, and balloon palaces held at night.
	 	
3.	Stall/Kiosk	There were places provided as stalls/kiosks, but unusable and filled with informal traders on the roadside with various types of merchandise.
		
4.	Outdoor Stage	The PKOR Way Halim area had an outdoor stage area which was intended for performances, socialization and other activities, but rarely used and poorly maintained
		
5.	Gazebo/ Shade	There were shaded areas provided by shady trees and man-made canopies. The shade provided by trees provided natural coolness better than man-made canopies. Furthermore, many gazebos were built but are in disrepair and poorly maintained.
	 	
6.	Toilet	The restroom area was unhygienic and didn't provide comfort. There's another restroom area near the stadium that was relatively clean, but visitors had to pay Rp 2,000.00 to use it, and signs weren't clearly marked to indicate the location.
		
7.	Waste and Sanitation facilities	There were no sanitation facilities, such as sinks for handwashing. Trash disposal was also unevenly distributed and of varying quality. Some dumpsters were in good condition, while others were damaged and uncovered.
	 	
8.	*Signage*	Signage consisted of parking prohibitions, parking instructions, and signage containing prohibitions when visiting Sumpah Pemuda Stadium area. There was no directional information for each area.
	 	
9.	Information Sign	The information sign in the PKOR Way Halim area was damaged and uninformative.
		

The Way Halim PKOR area was divided into seven zones, mapped as shown in Figure 4. These zones were:

Zone 1, the reception area, consisting of a sculpture area to welcome visitors and several outdoor parking areas with a ticketing system.

Zone 2, a zone for creative and communal activities for several communities, such as an art market, a mini amphitheater, and the Lampung Arts Council building.

Zone 3, a zone for buying and selling activities, specifically street vendors (PKL) who set up stalls on the roadside, selling goods such as food, clothing, accessories, and more.

Zone 4, a sports zone, features several facilities such as a jogging track, the Sumpah Pemuda stadium, a softball arena, a multi-purpose field for gymnastics, and training areas for professional and general athletes, including volleyball, archery, and Muay Thai.

Zone 5, a cultural zone consisting of traditional Lampung houses.

Zone 6, a temporary children's play area, such as painting, fishing toys, scooters, balloon castles, and a skateboarding practice area.
Zone 7, a passive activity zone dominated by a decorative garden that is rarely visited due to its location far from the main entrance.

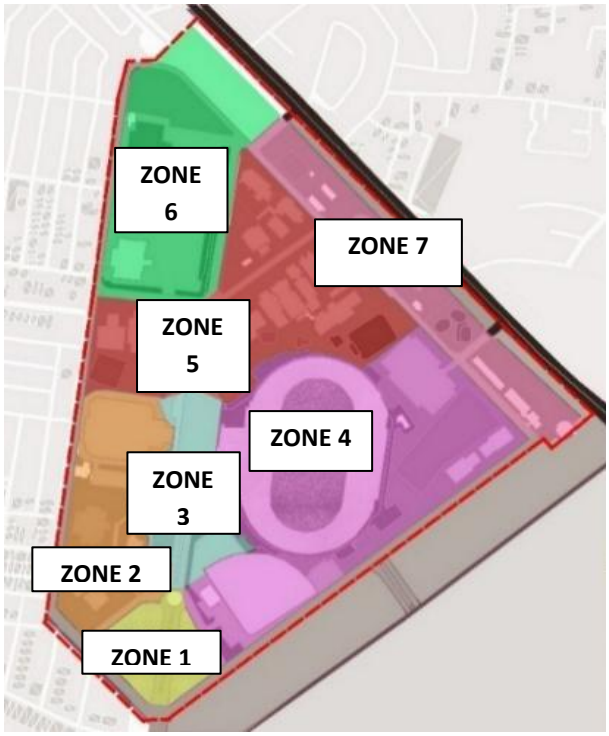

Figure 4. Zoning Map in PKOR Way Halim.

Validity and Reliability Test Results

Calculations based on 100 samples (Table 3) revealed that the Cronbach's Alpha value for each question item was above 0.600, with a total Cronbach's Alpha value of 0.776, thus the data can be considered reliable.

Table 3 Results of Variance Calculation per Question Item for Reliability Test

Question	Variance per item	Cronbach Alpha Score	Standard	Criteria
P1	1.02	0.776	0.600	Reliable
P2	0.98			
P3	0.97			
P4	0.97			
P5	0.65			
P6	0.85			
P7	0.99			
P8	0.57			

Source: Author, 2025

The results of the questionnaire validity test also showed that the calculated r $_{count}$ was greater than the r $_{table}$ value for each question, indicating valid data. Details of the calculations can be seen in Table 4.

Table 4 Results of Validity Test

Question	R_{count}	$R_{table\ (5\%)}$	Criteria
P1	0.872	0.195	Valid
P2	0.889	0.195	Valid
P3	0.841	0.195	Valid
P4	0.816	0.195	Valid
P5	0.548	0.195	Valid
P6	0.376	0.195	Valid
P7	0.700	0.195	Valid
P8	0.592	0.195	Valid

Source: Author, 2025

Respondent Characteristics Data

Respondents were visitors of PKOR Way Halim with characteristics that met the criteria for vulnerable groups. The questionnaire results also mapped the diversity of respondent characteristics based on age, gender, ethnicity, occupation, income, and physical ability.
Based on age categories (Figure 5), 71% of visitors were aged 19-44 years old, 21% were under 18 years old, and only 8% were aged 45-59 years old. No elderly visitors were found aged 60 years old and over. This indicates the still-large dominance of the productive age group, followed by children. Only a few, if any, elderly visitors were found at PKOR Way Halim. This may be due to the limited time allocated to find elderly respondents actively involved in activities at the Way Halim Community Health Center. Based on the results of interviews with the elderly community who often visit PKOR Way Halim, activities are usually carried out in the morning from 06.30 a.m. to around 11.00–12.00 a.m. if the atmosphere is comfortable, with the average activities carried out such as morning exercise, walking, jogging, chatting, and cycling.

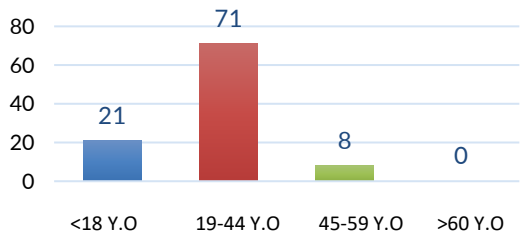

Figure 5. Percentage diagram of respondents' ages at PKOR Way Halim

Based on gender (Figure 6), visitors in vulnerable groups are dominated by women at 97%, with only 3% being men. This indicates that women are the

most frequent vulnerable group visiting and engaging in activities at PKOR Way Halim.

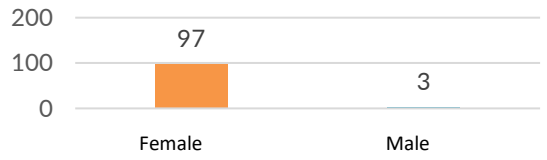

Figure 6. Percentage diagram of respondents' gender at PKOR Way Halim

Based on ethnic group (Figure 6), a diverse range of respondents was found, with the majority being Lampung (33%), Javanese (26%), Sundanese (12%), Batak (9%), Minangkabau (7%), Chinese (3%), Bugis (2%), and Malay and Balinese (1%). Six percent of respondents were from outside these ethnic groups.

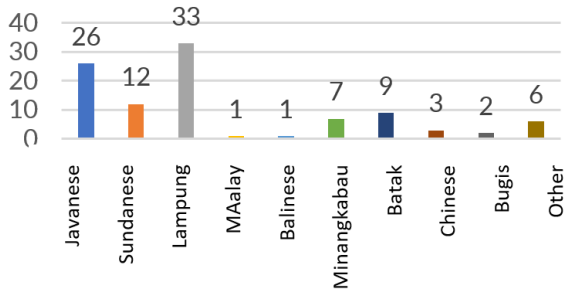

Figure 7. Percentage diagram of respondents' ethnic group at PKOR Way Halim.

In the employment category (Figure 8), the majority of respondents were students (51%), while 18% were unemployed, 16% were private employees, 13% were civil servants, 1% were entrepreneurs, and 3% were in other occupations.

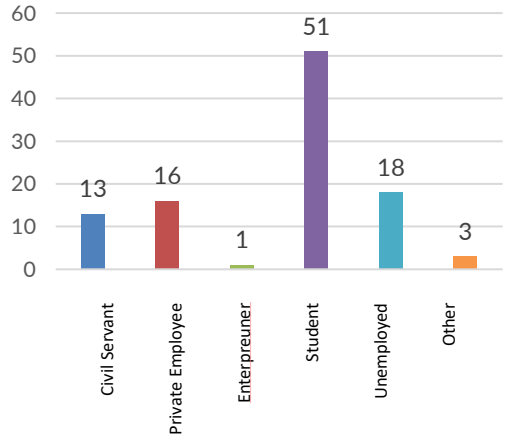

Figure 8. Percentage diagram of respondents' employment at PKOR Way Halim.

Based on the income/salary category (Figure 9), it was found that 69% had not received any income, 23% were in the range of Rp. 1,200,000.00-6,000,000.00, 3% had income above Rp. 6,000,000.00, 2% of each group had income <Rp. 354,000.00 and Rp. 532,000.00-1,200,000.00.

Figure 9. Percentage diagram of respondents' income at PKOR Way Halim.

Based on the physical ability category (Figure 10), 90% were in the physical and psychological health (well-being) category, while only 10% were in the physical health category. No respondents were found to be physically ill (disease), mentally ill (sickness), or sociologically ill (illness). This indicates that the average visitor to PKOR Way Halim is physically and psychologically healthy and does not have special needs in utilizing or accessing public open spaces.

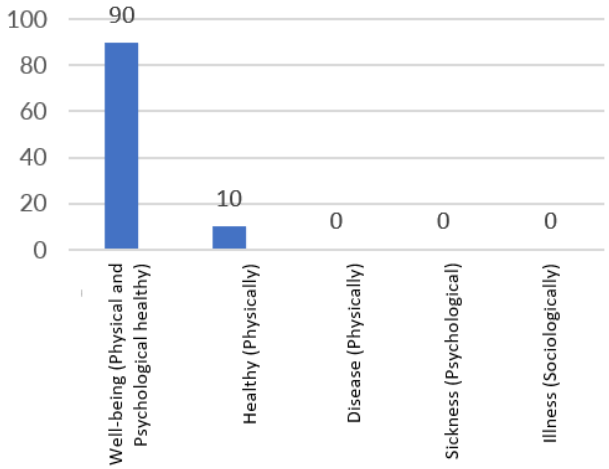

Figure 10. Percentage diagram of respondents' physical ability at PKOR Way Halim

Public Open Space Use Data

The questionnaire results showed the types of activities, frequency of visits, days of visit, and time of visit by respondents as users of the Way Halim PKOR. Figure 11 showed that the activities were dominated by recreation (55%) and sports (48.43%). The remainder were for research/education (1.1%), culture (4.4%), and other activities (2%).

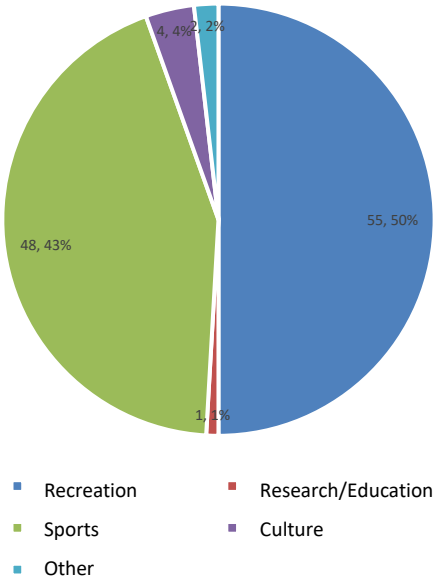

Figure 11. Percentage diagram of respondents' activities at PKOR Way Halim

The data shows that the Way Halim PKOR has been quite successful in fulfilling its primary function as an active public space and a source of escapism, particularly with the predominance of recreational and sports activities, along with research/education, cultural, and other activities that enhance the diversity of activities at the site. This percentage indicates that this space is not only for formal sports, but also for relaxation and informal socializing.

Based on visit frequency (Figure 12), the majority of visitors are frequent visitors to the Way Halim PKOR, with a frequency of more than 10 visits (35%). Other users, meanwhile, visit 3-5 times (25%), 5-10 times (20%), and 1-2 times (19%).

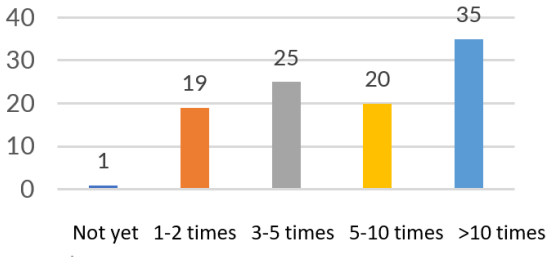

Figure 12. Percentage diagram of respondents' visit frequency at PKOR Way Halim

Based on the day of visit (Figure 13), 50% of respondents visited PKOR Way Halim on weekends (Saturday-Sunday and national holidays), 33% visited on weekdays, and 17% visited both on weekdays and weekends.

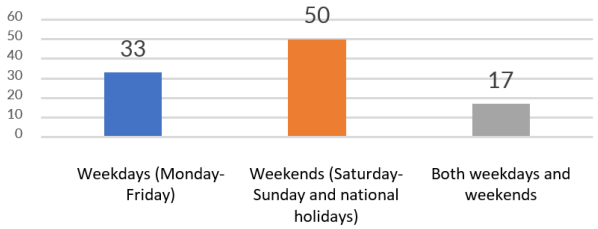

Figure 13. Percentage diagram of respondents' day of visit at PKOR Way Halim

Respondents' visiting times also showed varying results (Figure 14), with 56% of respondents visiting in the afternoon (3:00 PM - 4:00 PM), 32% in the evening (after 6:00 PM), 12% in the morning (6:00 AM - 10:00 AM), and at least 5% during the day (10:00 AM - 3:00 PM). These data indicate that the afternoon is visitors' favorite time for activities, possibly due to the cooler weather conditions and a more comfortable atmosphere for exercising and socializing.

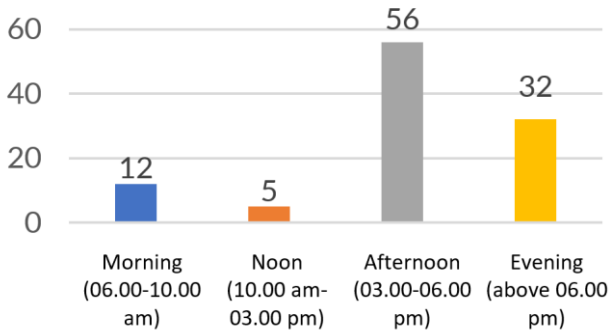

Figure 14. Percentage diagram of respondents' time of visit at PKOR Way Halim

Percentage Analysis

There were 8 questions asked for Likert scale scoring, ranging from scale 1-5, with a summary of the data shown in Table 5.

Table 5. Respondents' Percentage Data

Score	Frequency of Respondents' Answers							
	P1	P2	P3	P4	P5	P6	P7	P8
1	43	48	44	37	10	4	24	9
2	20	20	22	17	13	12	11	9
3	30	26	28	41	65	49	56	71
4	7	6	6	5	11	26	7	10
5	0	0	0	0	1	9	2	1

Source: Author, 2025

Ease of access at PKOR Way Halim was assessed by respondents with a rating of Strongly Disagree at 43%, Disagree at 20%, Neutral at 30%, and Agree at 7% (Figure 15), so that the percentage assessment

obtained was an average of 40.2% or in the Poor category. The assessment results indicated a lack of easy access for wheelchair users and people with physical disabilities, such as standard ramps and guiding blocks.

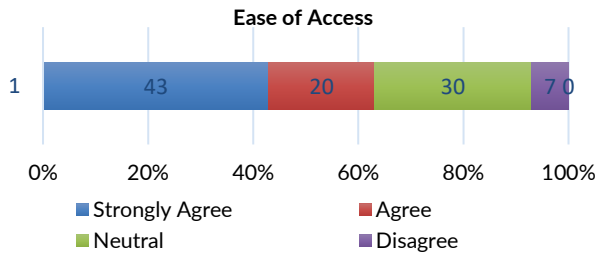

Figure 15. Percentage Diagram of Ease of Access based on the Respondents' Perception at PKOR Way Halim.

Regarding the aspect of disability-friendly facilities, 48% of respondents strongly disagreed, 26% were neutral, and 20% agreed that disability-friendly facilities were easily accessible, and 6% disagreed that the facilities were quite accessible (Figure 16). Based on these data, the average assessment was at 38%, or in the Very Poor category. The assessment results indicated the inadequacy of disability-friendly facilities, particularly the availability of ramps, guiding blocks, handrails, and toilets for those with special needs, thus receiving the lowest rating among other aspects.

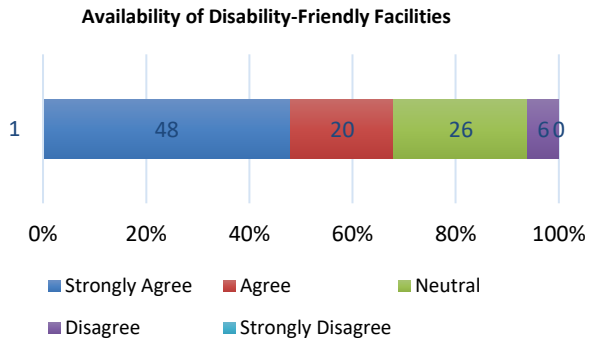

Figure 16. Percentage Diagram of Availability of Disability-Friendly Facilities based on the Respondents' Perception at PKOR Way Halim

Adequate lighting and street markings for the visually impaired showed a response of Strongly Disagree with a large percentage of 44%, Disagree with 22%, Neutral with 28%, and Agree with 6% (Figure 17). The average rating was 39.2% or in the Poor category. The lack of adequate lighting and the lack of compliance with road marking standards that are accessible to the blind caused respondents to give a low rating in this aspect.

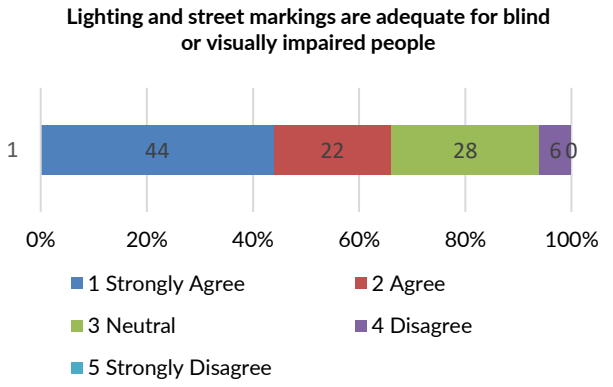

Figure 17. Percentage Diagram of Lighting and Street Markings Based on The Respondents' Perception at PKOR Way Halim.

The availability of adequate space for the elderly, pregnant women, or people with special needs showed a response of 41% Neutral, 37% Strongly Disagree, 17% Disagree, and 5% Agree (Figure 18). The average assessment was 42.8% or Neutral.

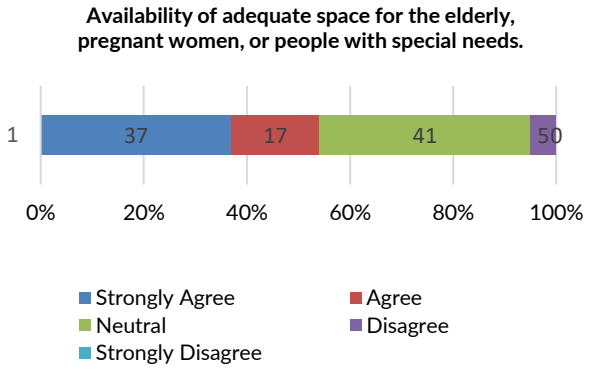

Figure 18. Percentage Diagram of Availability of adequate space for the elderly, pregnant women, or people with special needs based on Respondents' Perception at PKOR Way Halim

Facilities such as seating, shade, and drinking water are evenly available, with a response rate of 65% Neutral, 13% Disagree, 11% Agree, 10% Strongly Disagree, and 1% Strongly Agree (Figure 19). The average rating is 56%, or in the Neutral category.

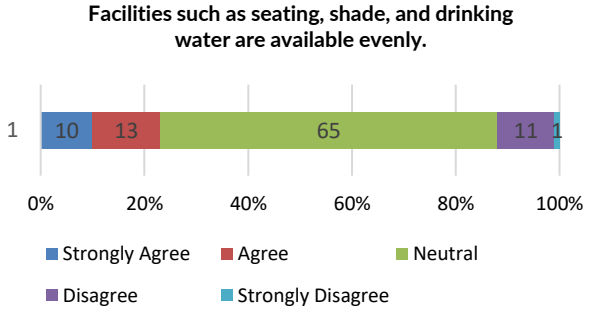

Figure 19. Percentage diagram of facilities based on respondents' Perceptions at PKOR Way Halim

The assessment of public spaces that reflected cultural diversity and the needs of minority groups (e.g., multilingual signage, inclusive symbols) received responses of 49% Neutral, 26% Agree, 12% Disagree, 9% Strongly Agree, and 4% Strongly Disagree (Figure 20). The average assessment was 64.8%, or in the Positive category.

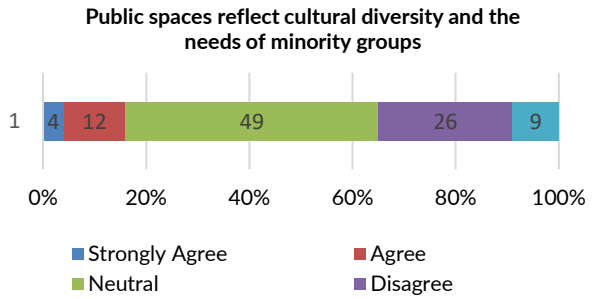

Figure 20. Percentage diagram of cultural diversity and the needs of minority groups of respondents' at PKOR Way Halim.

The assessment of the availability of programs or activities involving various groups (disabled, elderly, children, and women) received a Neutral response of 56%, Strongly Disagree of 24%, Disagree of 11%, Agree of 7%, and Strongly Agree of 2% (Figure 21). The average assessment for this aspect was 50.4%, or in the Neutral category.

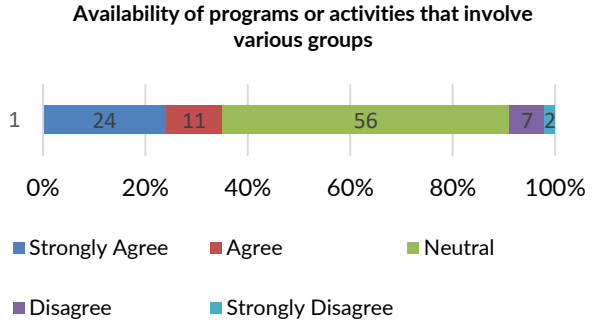

Figure 21. Percentage diagram of the availability of programs or activities involving various groups (disabled, elderly, children, and women)

The assessment of aspirations and needs considered in the design of public open spaces in PKOR Way Halim received a rating of 71% Neutral, 10% Agree, 9% Disagree, 9% Strongly Disagree, and 1% Strongly Agree (Figure 22). The average rating obtained was 57% or falls into the neutral category.

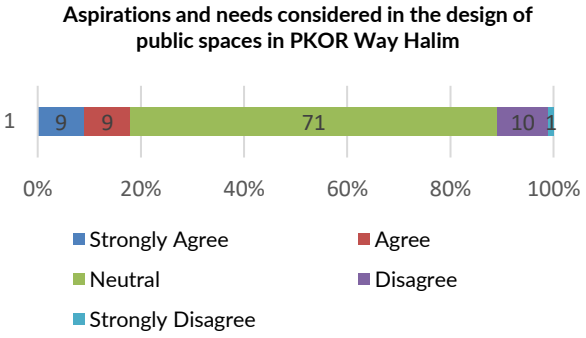

Figure 22. Percentage diagram of spatial design suggestions based on respondents' perception at PKOR Way Halim.

Assessment of Way Halim's PKOR for Implementing the MPOS Concept

Based on the results of the respondent assessment (Table 6), several conclusions were drawn:

1. Way Halim's PKOR was assessed as strong especially to reflect cultural identity and the needs of minority. The public space was assessed as reflecting cultural diversity and the needs of minority groups (64.8%).
2. There were aspects that needed improvement (Neutral to Very Poor), including poor physical accessibility due to the lack of facilities for people with disabilities, such as ramps, guiding blocks, and accessible toilets, resulting in a score of Very Poor (38%). Ease of access for wheelchair users was also assessed as Poor (40.2%). Lighting and street markings for the blind or visually impaired still received a score of Poor (39.2%). The availability of space for vulnerable groups, particularly the elderly and pregnant women (42.8%), and basic facilities (seating and shade) are still rated Neutral (56%). The involvement of various groups in the program (50.4%) and consideration of user needs in the design was also still in the Neutral category (57%).

Basic physical accessibility aspects still showed low performance. The availability of disability-friendly facilities, wheelchair access, and lighting and signage for the visually impaired were inadequate. This condition indicated a gap between functional flexibility and the implementation of inclusive design. Therefore, the application of landscape design principles for universal design, complete with sensory zoning, transition spaces, compartmentalization, and sensory evacuation spaces, needs to be integrated to strengthen the role of PKOR Way Halim as an inclusive MPOS. Based on the basic concepts of equality, accessibility, and diversity, inclusivity emphasizes providing equal opportunities for the widest possible spectrum of users while still taking

differences into account. Despite sharing universal aspirations, conceptual ambiguity regarding inclusivity remains found in various spatial studies [21].

Table 6. Respondents' scoring result of the MPOS Concept at PKOR Way Halim

Code	Description	Mean Value	Category
P1	This public open space is easily accessible to everyone, including wheelchair users and people with physical disabilities.	40.2	Poor
P2	There are accessible facilities such as gently sloping ramps, guiding blocks, handrails, and accessible restrooms.	38	Very Poor
P3	Lighting and signage are adequate for people who are blind or visually impaired.	39.2	Poor
P4	This space provides adequate space for seniors, pregnant women, or people with special needs.	42.8	Neutral
P5	Facilities such as seating, shade, and drinking water are evenly distributed.	56	Neutral
P6	This public space reflects cultural diversity and the needs of minority groups (e.g., multilingual signage, inclusive symbols).	64.8	Positive
P7	There are programs or activities that involve various groups (people with disabilities, seniors, children, etc.).	50.4	Neutral
P8	I feel my voice and needs are considered in the design of this space.	57	Neutral

Design Recommendations

To improve the quality of the Way Halim PKOR and its ability to support a wider range of users, particularly minority and vulnerable groups, the development of several segments within the PKOR area needs to be improved. Zoning can initially be proposed into three segments: Segment 1, as a support zone; Zone 2, as a social zone; and Segment 3, as a sports zone (Figure 23).

Figure 23. The zoning map consists of three segments

Social Zones

Social zones in MPOS play a crucial role as inclusive and welcoming interaction spaces for all groups, including people with disabilities, children, and the elderly. The design of areas such as outdoor food courts, educational plazas, and communal areas not only facilitates meetings and communication activities but also ensures accessibility: wheelchair-friendly ramps, accessible seating areas, and comfort for all visitors (see Figure 24 and 25). Studies show that inclusive public spaces can improve well-being, reduce social isolation, and support active community participation [22]. Furthermore, disability-friendly and multigenerational parks can strengthen place identity and social cohesion, making MPOS a fun, safe, and educational public destination [23].

Figure 24. Visualization of Social Zone 1 (Relaxation Park, Educational Park)

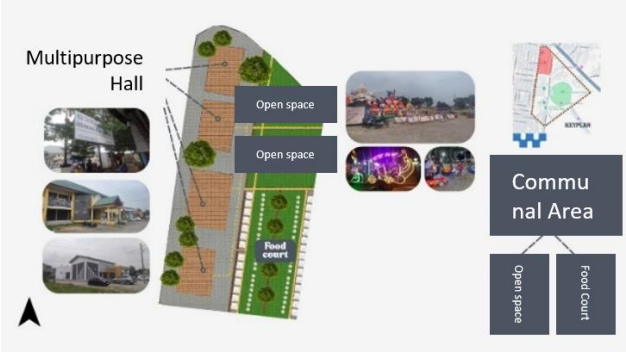

Figure 25. Visualization of Social Zone 2 Detailed visualization of Social Zone (Communal Area, Playground)

Sports Zone

The sports zone is an improvement on existing facilities, optimizing the space for greater accessibility and multifunctionality.

General Sports Area

This area is designed to support leisurely physical activities such as jogging, gymnastics, and recreational games. The center is designed as a circular running track surrounding an open exercise area with outdoor gym equipment. The area's surface uses paving and rubber flooring for user comfort and safety. Shading vegetation around it creates a cool and comfortable atmosphere, while clear circulation paths facilitate movement between zones. This area functions as an active public space to encourage healthy lifestyles and social interaction. A detailed visualization can be seen in Figure 26.

Figure 26. Visualization of General Sports Area

Archery Range

The main area consists of a long shooting range with distances divided according to training level, as well as a safety zone behind the targets. To the side are a row of supporting structures, including equipment storage, an athlete waiting area, and a rest area (Figure 27).

Figure 27. Archery and Communal Area

Softball Field

The main area consists of an infield with a hard-packed playing surface and a large grass outfield for catching balls. Surrounding the field are the stands, the players' locker rooms, and support buildings such as equipment storage and rest areas (Figure 28).

Figure 28. Visualization of Softball Field Area

Karate Area

The karate supporting area is designed as an additional physical training area, equipped with a gym and various fitness equipment. The floor uses rubber mats for safety and comfort during training (Figure 29).

Figure 29. Karate Area

Support Zone

The support zone is a proposed zone to optimize more compact spaces and address accessibility and circulation issues that arise from mixed vehicular and pedestrian paths, reducing the use of space for service

needs such as parking and optimizing space for social functions.

Parking Area

The parking area is designed to support the vehicle needs of visitors to the area, with an integrated, efficient and environmentally friendly parking system (See Figure 30). It is recommended that the parking area be constructed as a parking structure to make it more compact, allowing visitors easier access on foot, and avoiding the mixing of pedestrians, motorcyclists, and cars.

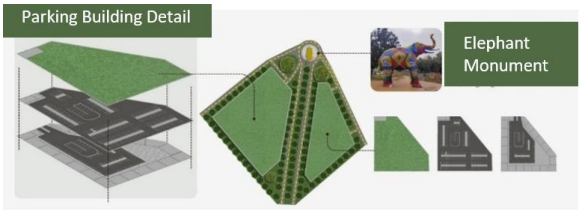

Figure 30. Parking Area

Communal Area

This communal area is designed with a central area featuring a fountain as a visual focal point. Surrounding it is a gathering area with several gazebos that provide shaded areas for visitors to rest or socialize (Figure 31).

Figure 31. Communal Area

Conclusion

According to the user perspectives of this research, PKOR Way Halim successfully created a socially inclusive space which reflects cultural diversity, but was less successful in meeting basic physical accessibility standards, particularly for people with disabilities and other vulnerable groups. The research found that PKOR Way Halim has potential for development of a comprehensive system of public services (MPOS) by addressing physical accessibility aspects, particularly for people with disabilities and other vulnerable groups. Therefore, further research that could involve the participation of these groups should be conducted.

Inclusivity and the active participation of people with disabilities (PWD) are crucial prerequisites for developing the concept of human-centered design (HCD) as an effort to achieve justice [24]. In practice, an inclusive design approach, despite its good intentions, still has the potential to ignore the complexity of the lived experiences of people with disabilities, resulting in less effective interventions. Integrating research developed collaboratively with and by people with disabilities is expected to unify design concepts [19]. Understanding the lived experiences and expertise of people with disabilities is closely linked to the social model of disability, which emphasizes that social and environmental barriers limit the full participation of people with disabilities in society.

Even supporting smart city development, for example, requires attention to the needs of these minority groups. Technology cannot automatically address the structural and social barriers that underlie exclusion. The development of smart urban public open spaces is closely linked to the Sustainable Development Goals (SDGs) agenda, particularly SDGs 8, 11, and 16, which emphasize inclusive growth and social justice. Without a social justice-oriented planning and policy approach, technological innovation risks widening existing inequalities [25].

The spatial organization of MPOS also requires the application of a sensory hierarchy, which contains spaces based on levels of sensory stimulation (high, medium, and low), separated by transitional spaces to help users adapt gradually. A compartmentalization approach allows users to move to quieter areas when experiencing sensory fatigue [26].

AI Use Declaration

The authors acknowledge the use of Scispace to organize the literature review. The prompts used are “academic insights on the use of public space at PKOR Way Halim in Bandar Lampung”. The output from these prompts was used to select related papers or references as source materials. While the authors acknowledge the usage of AI, the authors maintain that they are the sole authors of this article and take full responsibility for the content therein, as outlined in COPE recommendations and journal policies.

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