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# SHAPING SUSTAINABLE URBAN SPACES: UNDERSTANDING GREEN SPACE USER NEEDS IN MALAYSIA

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A b s t r a c t

Urban regeneration aims to create vibrant, sustainable, and inclusive urban areas. In this context, this study investigates user preferences for green retail space in Johor Bahru, focusing on activities and facilities required for an enhanced experience. Based on 400 questionnaires analyzed through descriptive statistics, relative importance index, and cross-tabulation, the results reveal that social interaction is the most preferred activity, followed by exercising, stress relief, education, and relaxation through nature appreciation, while recreational activities are the least favored. Demographic factors, such as gender, age, and education level, do not significantly influence activity preferences. Users highlight the need for comfortable seating, shelter, drinking water, walking trails, sanitation, security, lighting, air cooling, and charging stations. These findings contribute to the understanding of user needs in urban green spaces and offer practical insights for future design improvements in retail green environments, supporting the goals of urban regeneration.

Keywords: green, user preferences, shopping mall, urban green spaces, green retail spaces

## 1. INTRODUCTION

The integration of green spaces within urban retail environments has gained prominence, particularly in rapidly urbanizing contexts like Malaysia, where sustainability and user experience are increasingly prioritized. As urban development focuses more intensively on sustainable practices, the incorporation of “green retail spaces” within built environments reflects a commitment to enhancing environmental performance and user satisfaction. While the term "green retail spaces" is not explicitly defined in the existing literature, the concept can be contextualized by examining the definitions of "green spaces" and "retail environments" separately. According to [1], green spaces are defined as outdoor areas partially or completely covered with vegetation, including parks, forests, and gardens. These spaces are

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recognized for their multifunctional benefits, such as environmental improvements, social advantages, and climate change mitigation. On the other hand, retail environments are typically characterized as commercial spaces designed for the sale of goods and services to consumers, often emphasizing functionality, customer experience, and economic viability [2]. By synthesizing these definitions, green retail spaces can be conceptualized as commercial environments that integrate vegetation and sustainable design principles to achieve ecological, social, and economic benefits, while maintaining their primary function as retail establishments.

This "green retail spaces" trend is particularly evident in the retail sector, where the presence of green elements in shopping malls and other commercial spaces has been shown to enrich user experience and foster a sustainable image. This dual benefit of enhancing customer satisfaction while promoting environmental sustainability is a key reason for selecting retail spaces as the focus of this study. In this context, understanding user preferences for green spaces is essential, as these insights are instrumental in informing the effective design and implementation of green retail environments that meet both functional and aesthetic expectations. Existing literature extensively explores the diverse benefits of urban green spaces, emphasizing their role in enhancing environmental quality and user well-being. [3], [4] and [5] show that green spaces contribute significantly to air quality improvement, the reduction of urban heat islands, and increased biodiversity. Moreover, study by [6] and [5] highlight the mental and physical health benefits associated with green spaces, such as stress reduction, relaxation, and encouragement of physical activity. These findings suggest that green spaces play an integral role in urban health and sustainability, offering a range of ecosystem services that support urban dwellers' quality of life [7].

The incorporation of green elements in retail environments offers unique advantages that extend beyond conventional urban spaces. According to [3] and [4], greenery within retail settings enhances the shopping experience, leading to higher levels of customer satisfaction and extended dwell time. Recent studies in Malaysia have highlighted the growing importance of green spaces in urban retail environments. Malaysian mall visitors show a preference for environmentally friendly features such as lush greenery, energy-efficient technologies, and solar panels [8]. The incorporation of green elements in shopping malls is particularly valued by older and higher-income patrons [9]. Research indicates that the frequency of green space use is influenced by proximity, with most people visiting parks within a 2 km radius of their homes [10]. Integrating such natural elements into retail environments not only aligns with ecological benefits but also enhances user experience, making these spaces more inviting and potentially more profitable.

However, despite the documented benefits, a gap exists in our understanding of user preferences for green retail spaces, particularly in the Malaysian context. While existing research provides insights into the general benefits of urban green spaces and their impact on consumer behaviour, little is known about the specific activities and facilities users desire within green retail spaces. This knowledge gap hinders the development of effective design strategies that cater to user preferences and maximize the potential benefits of such spaces. Quantitative assessment on effectiveness of green spaces on users is crucial to ensure that there is a blend of "top-down" (expert inspitration) with bottom-up local subsidiarity (community involvement) and eventually attain social sustainability [11; 12; 13 and 14].

Therefore, this study aims to investigate user preferences for green retail space in Johor Bahru, Malaysia. By focusing on the activities users engage in and the facilities they require for an enhanced experience, this research seeks to bridge the existing knowledge gap and provide valuable insights for architects, developers, and retail space managers.

## 2. LITERATURE REVIEW

In this study, the scope has been determined to focus on Johor Bahru, a prominent city in Malaysia and the capital of the state of Johor. Johor Bahru is strategically located in southern West Malaysia, near the tip of the Malay Peninsula, and is directly adjacent to Singapore, separated only by the Johor Strait as stated by [15]. To provide a clearer visual representation of Johor Bahru's geographical context, Figure 1 illustrates the location of Johor state within Malaysia and its proximity to Singapore.

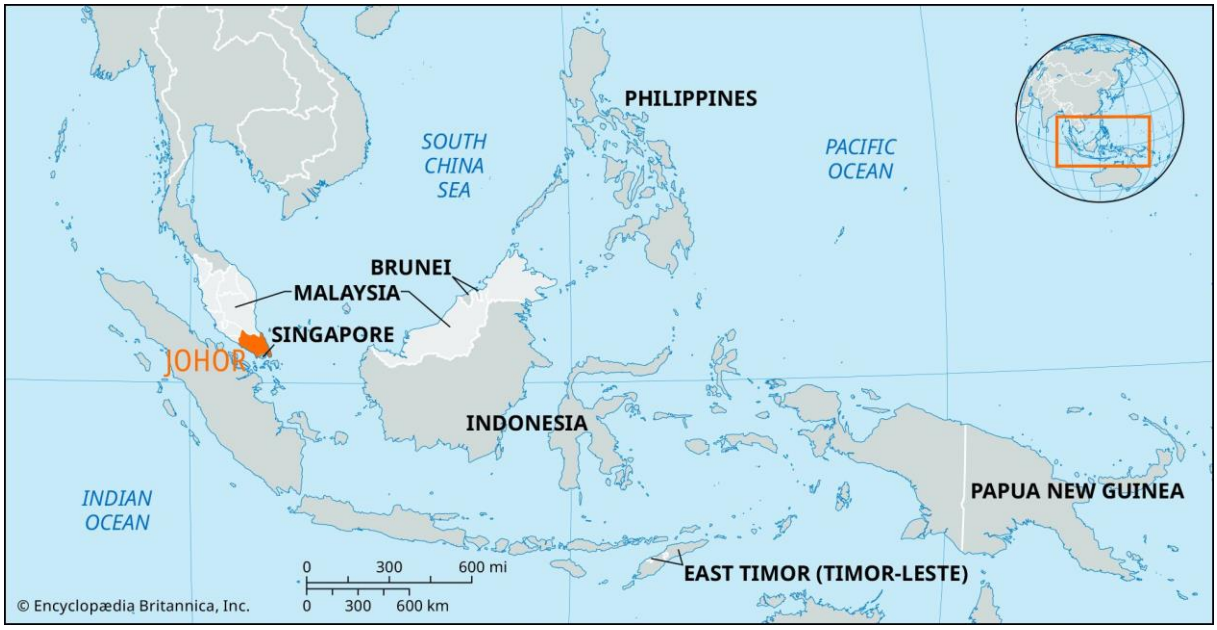


Fig. 1. Johor Map [16]

This unique geographical positioning has made Johor Bahru a key economic and cultural hub, fostering strong cross-border ties with Singapore and serving as a gateway for international trade and tourism [17]. The city has experienced rapid urbanization and development in recent years, driven by its role in the Iskandar Malaysia economic region, one of the largest integrated development projects in Southeast Asia [18].

Johor Bahru is a diverse urban area with a population of approximately 1.7 million. The demographic composition includes Bumiputera (52.1%), Chinese (38.2%), Indian (9.1%), and others (0.6%) [15]. The city's proximity to Singapore significantly influences its economy and population dynamics [19].

However, this growth has also raised concerns about environmental sustainability, particularly in urban areas, prompting initiatives to incorporate green infrastructure and sustainable practices into the city's development [20]. As such, Johor Bahru presents an ideal case study for examining the implementation and impact of green retail spaces, given its dynamic urban landscape and ongoing efforts to balance economic growth with environmental stewardship.

Toppen Shopping Mall in Johor Bahru has been selected as the study area due to its distinctive feature, The Topp—a rooftop garden and green space that also serves as a vibrant shopping destination for both locals and tourists. The mall is anchored by IKEA Tebrau and functions as a comprehensive retail hub, housing 300 stores across various categories, including international brands and local specialty outlets. Spanning 1.1 million square feet across four floors, it offers diverse retail and

entertainment options, including play areas, sports facilities, and a cinema. Notable tenants include Harvey Norman, TGV Cinemas, and B.I.G (Big Independent Grocer), which further enhance the mall's appeal. Additionally, the multi-purpose rooftop area features a community garden, recreational spaces and variety of food stores options.

Fig. 2. Rooftop Garden zone


Fig. 3. Event zone

Fig. 4. Active zone

Fig. 5. Family zone

Figure 2, 3, 4 and 5 View of variety zones available at 'The Topp' [21]


Fig. 6. Aerial perspective view of Toppen Shopping Mall [22]

## 3. METHODOLOGY

This research employs a quantitative approach through a questionnaire survey distributed to a sample of users in Toppen Shopping Mall, Johor Bahru.

The questionnaires are segmented into three sections which is Section A: Demographic of respondent, Section B: Users preference levels of activities carried out at green space and Section C: Facilities needed by users when carrying out activities at the green space. Section A focuses on demographic information regarding gender, age, nationality, ethnicity, education level, and reasons for coming to the mall. Section B collects users' preference on the type and level of preference activities at green space such as recreational, social interaction, sporting/exercising, educational, releasing stress through health and well-being, relaxing through trees and flowers, and enjoying drinks. Meanwhile Section C identifies facilities needed at green space such as shelter, comfortable seating, walking trait, drinking water, sanitation facilities, adequate security measures, and lighting. Section A and C utilise multiple choice while Section B utilises 5-point likert scale to collect responses from the respondents.

The sample size was determined using Taro Yamane's formula, e.g. (3.1) based on the given population. According to [23], the projected number of visitors to Toppen in 2020 was 15 million. To calculate the sample size, the margin of error was set at 0.05, ensuring a 95% confidence level that the interval contains the true population mean. Hence, to calculate the sample size of Toppen users, the Taro Yamane's formula was applied where: *n*: sample size, *N*: population size (15,000,000) and *e*: margin of error (0.05).

$$n = \frac{N}{1+N(e)^2} \tag{3.1}$$

$$n = \frac{15{,}000{,}000}{1 + 15{,}000{,}000(0.05)^2}$$

$$n = 399.999$$

The sample size obtained is 399.99, then rounded to 400. Thus, the survey will be distributed to 400 users of Toppen Shopping Mall aged from 18 years and above based on convenient sampling.

The data will be analysed using frequency analysis. Frequency analysis is used to show how often each response was selected by respondents. This approach applied descriptive statistics to summarise and characterise data through mean and median. In this study, this analysis will be used to analyse data from two sections of the survey: respondent demographics and green space facilities.

Relative Importance Index (RII), e.g. (3.2) also will be used to determine user priorities for activities. The Relative Importance Index (RII) is a widely utilized statistical tool for prioritizing and ranking factors based on their perceived significance in various fields. It enables the systematic evaluation of data gathered through surveys by calculating the relative weight of each factor, using a formula that considers the weighted responses, the maximum possible weight, and the total number of respondents. The following is the formula for RII:

$$RII = \frac{\Sigma W}{(A \times N)} \tag{3.2}$$

Where, RII is Relative Importance Index, *W* is the weight given to each choice by the respondents. In this research, 1, 2, 3, 4 and 5 for very unpreferred, unpreferred, neutral, preferred, very preferred respectively, while, *A* is the highest weight. In this research, 5 is the highest weight; and *N* is the total number of respondents. Hence, this method provides a straightforward approach to identifying and ranking critical factors that influence specific outcomes, thereby offering valuable insights for decision-making.

Finally, cross-tabulation analysis is used to analyse the relationship between first section (demographic of respondents) and second section (respondent preference levels of activities carried out at green space) in the survey form.

## 4. RESULTS

This section discusses the findings of the survey beginning with the background of respondents, activities at green space, and facilities required by green space users.

### 4.1 Respondents Demographics

Table 1 tabulates the background of respondents. In this survey, the questionnaire forms were participated by 199 (49.8%) females and 201 (50.2%) males which equivalent to 400 respondents. It can be seen that the number of male and female respondents is comparable, with only a difference of 2. These two groups were segmented into five age cohorts, with 18 to 27 years old occupying 115 (28.7%), 28 to 37 years old engaging 125 (31.3%), 38 to 47 years old involving 94 (23.5%), 39 to 57 years old holding 57 (14.2%), and 58 years old and above covering 9 (2.2%). The second cohort, 18 to 27 years old is the one that occupies the most respondents, and conversely, the group of 58 years old and above is the lowest.

The age cohorts used in this study are adapted from the [24], an official government publication. Although the [24] primarily focuses on medicine usage, its structured age categorization provides a reliable and standardized reference for segmenting the population. Given its official status, the classification ensures consistency and comparability with national demographic data. Therefore, this study adopts the same age groupings—18-27, 28-37, 38-47, 48-57, and 58 and above—as a guideline for analyzing preferences across different age demographics in the context of green space utilization and social well-being.

The respondents' backgrounds were predominantly represented by two primary nationalities: Malaysians and Singaporeans. Malaysians constituted the majority, accounting for 215 respondents (53.8%), followed by Singaporeans with 179 respondents (44.8%). Additionally, a small minority comprised five respondents from Myanmar (1.2%) and one respondent from Indonesia (0.2%). Moreover, Chinese respondents were the majority among green space users, with 227 individuals (56.1%), followed by Indians with 103 (25.7%) and Malays with 70 (17.5%).

Meanwhile, educational level is also included as one part of the demographic. 69 (17.3%) respondents had primary education, 223 (55.8%) respondents had secondary education, and 108 (27%) reached higher levels of education including Diploma, Bachelor's Degree, Master's Degree, Doctor of Philosophy. The result indicates that most of the respondents held secondary education.

The last question on the survey form is reason for coming to the mall. This question is multiple choice. Of these, needed to eat was chosen 258 times as the highest reason. Other reasons such as shopping for daily necessities was chosen 234 times, shopping for luxury products was chosen 187 times, window shopping was chosen 94 times, recreation at rooftop was chosen 89 times, continue with events organised by Toppen were chosen 52 times as the lowest reason.

Table 1. Respondents background

| Demographic variables | Categories | Frequency | Percentage (%) |
|---|---|---|---|
| Gender | Male | 201 | 50.2 |
| | Female | 199 | 49.8 |
| Age | 18 to 27 | 115 | 28.7 |
| | 28 to 37 | 125 | 31.3 |
| | 38 to 47 | 94 | 23.5 |
| | 48 to 57 | 57 | 14.2 |
| | 58 and above | 9 | 2.2 |
| Nationality | Malaysian | 215 | 53.8 |
| | Singaporean | 179 | 44.8 |
| | Myanmar | 5 | 1.2 |
| | Indonesian | 1 | 0.2 |
| Ethnicity | Malay | 70 | 17.5 |
| | Chinese | 227 | 56.7 |
| | Indian | 103 | 25.7 |
| Educational level | Primary education | 69 | 17.3 |
| | Secondary education | 223 | 55.8 |
| | Higher education (Diploma, Bachelor's Degree, Master's Degree, Doctor of Philosophy) | 108 | 27.0 |
| Reasons for coming to the mall | Eating out | 258 | 64.5 |
| | Recreation at rooftop | 89 | 22.3 |
| | Shopping for daily neccessities | 234 | 58.5 |
| | Shopping for luxury products | 187 | 46.8 |
| | Window shopping | 94 | 23.5 |
| | Attending events | 52 | 13.0 |

## 4.2 Activities at Green Space

Various activities are performed at green spaces namely, recreation, social interaction, exercise, education, stress relief, nature viewing, and enjoying refreshments. Table 2 summarizes users' activities and their preference levels for each activity in green spaces.

Table 2. Activities at green space

| Activities | Preferences level | | | | |
|---|---|---|---|---|---|
| | Strongly Unpreffered | Unpreferred | Neutral | Preferred | Strongly Preferred |
| | Frequency | | | | |
| Social interaction | 28 | 68 | 118 | 121 | 65 |
| Sporting/Exercising | 34 | 90 | 114 | 106 | 56 |
| Releasing stress through health and well-being | 31 | 94 | 113 | 108 | 54 |
| Educational | 38 | 68 | 111 | 122 | 45 |
| Enjoying drinks | 40 | 97 | 107 | 91 | 65 |
| Relaxing through trees and flowers viewing | 37 | 90 | 129 | 98 | 46 |
| Recreational | 38 | 134 | 127 | 62 | 39 |

Out of all the activities, social interaction was the most preferred activity, with the highest RII of 0.664, aligning with [25] who suggest that green spaces can enhance social connections. Stress relief and sporting activities followed closely, emphasizing the physical and mental health benefits. Education, with an RII of 0.627, was also valued, as noted by the World Bank (2017, as cited in [26], who highlight the pedagogical and wellness benefits of green spaces. Enjoying drinks and relaxing through nature appreciation were also popular choices. Recreational activities, however, were the least preferred, potentially due to individual preferences and interests. Table 3 below summarizes the RII results based on collected frequency data.

Table 3. Ranking of activities at green space

| Activities | Total respondents | Weight total | RII | Ranking |
|---|---|---|---|---|
| | Frequency | | | |
| Social interaction | 400 | 1327 | 0.664 | 1 |
| Sporting/Exercising | 400 | 1260 | 0.630 | 2 |
| Releasing stress through health and well-being | 400 | 1260 | 0.630 | 2 |
| Educational | 400 | 1254 | 0.627 | 3 |
| Enjoying drinks | 400 | 1244 | 0.622 | 4 |
| Relaxing through trees and flowers viewing | 400 | 1226 | 0.613 | 5 |
| Recreational | 400 | 1130 | 0.565 | 6 |

### 4.3 Activities at Green Space According to Age, Education, Gender, Nationality, and Ethnicity

Preferred activities at green space were then analysed according to age, education, gender, nationality, and ethnicity. Table 4 illustrates the crosstabulation results.

Table 4. Activities at green space according to age, education, gender, nationality, and ethnicity

| Activities | Categories of the highest preference | | | | |
|---|---|---|---|---|---|
| | Age | Education | Gender | Nationality | Ethnicity |
| Social interaction | 28 until 37 years old | Secondary education | Female | Malaysian | Chinese |
| Sporting/Exercising | 28 until 37 years old | Secondary education | Female | Malaysian | Chinese |
| Releasing stress through health and well-being | 28 until 37 years old | Secondary education | Male | Malaysian | Chinese |
| Educational | 18 until 27 years old | Secondary education | Male | Malaysian | Chinese |
| Enjoying drinks | 18 until 27 years old | Secondary education | Male | Malaysian | Chinese |
| Relaxing through trees and flowers viewing | 18 until 27 years old | Secondary education | Male | Malaysian | Chinese |
| Recreational | 18 until 27 years old | Secondary education | Male | Malaysian | Chinese |

The results indicate that the age group 18-27 generally preferred green space activities more than other age groups. However, statistical analysis showed no significant relationship between age and activity preference. This finding contrasts with previous studies [27] suggesting that older generations may have a stronger preference for natural environments.

While for the education, the results show that respondents with secondary education generally preferred green space activities more than other education levels. However, statistical analysis showed no significant relationship between education level and activity preference. This aligns with [28], who found that education level does not influence green space activity preferences. While [29] suggest that secondary education may be associated with lower perception of green spaces, it does not necessarily translate to lower preference for green space activities. Therefore, education level is not a significant factor in this study.

Compared with the gender, the results show the male is more preference for engaging in green space activities compared to females in five out of seven, aligning with the survey by [30], which identified males as predictors of green space usage. Gender differences in perceptions and values of green spaces also influence activity preferences, as noted by Conedera et al. (2015 as cited in [31]), who observed that females prioritize facilities like playgrounds for their children.

Moreover, for the nationality and ethnicity, the results show that all of seven activities, the preference level of the Malaysian and Chinese was relatively the highest compared to others. The result illustrates respondents from Malaysian and Chinese respondents are most prefer to conduct activities in green space. This finding is supported by a survey conducted by Aziz (2012, as cited in [29], which

explored green spaces and sustainable development goals among Malaysians. The survey highlighted that Malaysians are highly aware of the benefits of green spaces.

### 4.4 Facilities Required by Green Space Users

Shelter, comfortable seating, walking trail, drinking water, sanitation facilities, adequate security measurement, and lightning are important facilities at green space. Table 5 tabulates these facilities according to the priorities of green space users.

Table 5. Facilities required by green space users

| Facilities | Frequency | Percentage (%) | Ranking |
|---|---|---|---|
| Seats | 252 | 63.0 | 1 |
| Shelter | 233 | 58.3 | 2 |
| Drinking water | 155 | 38.8 | 3 |
| Walking trail | 149 | 37.3 | 4 |
| Sanitation facilities | 109 | 27.3 | 5 |
| Security | 77 | 19.3 | 6 |
| Lighting | 35 | 8.8 | 7 |
| Air cooler | 24 | 6.0 | 8 |
| Charging station | 3 | 0.8 | 9 |
| Signage | 1 | 0.3 | 10 |

Comfortable seating and shelter were the most preferred facilities, selected by 63% and 58.3% of respondents, respectively. This aligns with [32], who emphasized the importance of these facilities. Drinking water and walking trails followed, with 38.8% and 37.3% of respondents indicating their need. [33] also highlighted the importance of these facilities in green spaces. Sanitation facilities and security measures were selected by 27.3% and 19.3% of respondents, respectively. [34] emphasized the importance of well-maintained and secure green spaces. Lighting was the least preferred facility, with only 8.8% of respondents selecting it. [35] noted that lighting and police presence can enhance safety perceptions. Additionally, respondents suggested the need for air coolers, charging stations, and signage boards, reflecting the evolving needs of green space users in the digital age.

## 5. DISCUSSION

The findings of this study offer valuable insights into user preferences for green retail spaces in Johor Bahru. Social interaction emerged as the most preferred activity, highlighting the importance of green spaces as social hubs. This aligns with existing research that suggests green spaces play a critical role in enhancing social connections and well-being. For instance, [36] found that public open spaces, including green areas, significantly contribute to mental health and social well-being by fostering opportunities for interaction. Similarly, [37] demonstrated that green spaces facilitate social contacts, which serve as a key mechanism for improving health outcomes. [38] further emphasized the role of local parks in strengthening neighborhood social ties, underscoring the importance of green spaces in building community cohesion. Additionally, [39] highlighted how urban parks stimulate social interactions, promoting a sense of belonging and social cohesion. [25] also reinforced the idea that urban green spaces are vital for fostering social cohesion and improving community health through enhanced social engagement. Collectively, these studies support the notion that green spaces serve as essential social hubs, aligning with the findings of this study regarding user preferences in Johor Bahru.

Interestingly, demographic factors such as gender, education level, nationality, ethnicity were not found to significantly influence activity preferences as shown in Table 6 below. Table below show chi-square result between gender, age, nationality, ethnicity, and educational level and preference level for each activity. To analyze the Chi-Square results effectively, interpretation the Asymptotic Significance (p-values) in relation to the common significance threshold ($\alpha = 0.05$). If a p-value is less than 0.05, it indicates a significant association between the demographic variable and the activity preference. Otherwise, there is no significant relationship.

The Chi-Square analysis below reveals significant associations between certain demographic variables and preferences for specific activities, asillustrated in Table 6. However, the chi-square values obtained for gender, education level, nationality, and ethnicity across all activities exceed the threshold of 0.05, indicating no statistically significant relationship between these demographic factors and preference levels for the surveyed activities. It can be concluded that these is not important variable in the survey. This suggests that green spaces can appeal to a diverse range of users, regardless of their demographic characteristics.

Table 6. Chi-Square Result Between Gender, Age, Nationality, Ethnicity, And Educational level and Preference Level for Each Activities

| Activities | Pearson Chi-Square Asymptotic Significance (2- sided) | | | | |
|---|---|---|---|---|---|
| | Gender | Age | Nationality | Ethnicity | Educational level |
| Recreational | .629 | .017 | .001 | .166 | .388 |
| Social interaction | .335 | .543 | .605 | .500 | .014 |
| Sporting / Exercising | .276 | .788 | .028 | .944 | .636 |
| Educational (vegetation knowledge) | .790 | .728 | .055 | .006 | .676 |
| Health and well-being (releasing stress) | .304 | .953 | .903 | .274 | .747 |
| Relaxing (trees and flowers viewing) | .261 | .150 | .782 | .417 | .593 |
| Enjoying drinks | .439 | .927 | .126 | .267 | .276 |

The findings of this study align with existing research on the role of green spaces in fostering social interaction and community building. Numerous studies have highlighted the importance of green spaces as facilitators of interpersonal relationships and social cohesion. For instance, [38] emphasized that green spaces serve as vital settings for social interaction, enhancing a sense of community and belonging among users. Similarly, [25] found that green spaces provide opportunities for social engagement, which is critical for mental well-being and community resilience. The strong preference for social interaction activities in green spaces, as observed in this study, underscores their significance as platforms for strengthening social bonds and fostering collective identity.

In contrast, the lower preference for recreational activities in green spaces may reflect shifting user interests and lifestyle choices. [40] noted that individuals may prioritize indoor or urban recreational activities over outdoor pursuits due to convenience, accessibility, or personal preferences. Additionally, [41] suggested that a lack of interest in outdoor recreational activities could stem from limited exposure to natural environments or competing leisure interests. These insights support the study's findings, indicating that recreational activities may not resonate as strongly with users as social interaction activities do.

The study also highlights the importance of well-designed facilities in enhancing the usability and appeal of green spaces. Comfortable seating, shelter, drinking water, and walking trails were highly rated, reflecting user demand for functional and accessible amenities. This aligns with the work of [42], who identified seating and walking paths as critical elements for encouraging prolonged use of green spaces. Furthermore, the emergence of modern facilities such as air coolers, charging stations, and signage boards as suggested amenities reflects the evolving needs of users in an increasingly technology-driven world. [43] similarly emphasized the need for green spaces to adapt to contemporary user expectations, including the integration of technology-friendly infrastructure. These findings collectively underscore the importance of designing green spaces that are not only aesthetically pleasing but also equipped to meet the diverse and dynamic needs of modern users.

## 6. CONCLUSION

While this study provides valuable insights into user preferences for green retail spaces, its findings are specific to the context of Johor Bahru, which may limit their generalizability to other urban settings. Johor Bahru's unique socio-cultural, economic, and environmental characteristics could influence user preferences, making it essential for future research to investigate other urban contexts to identify potential regional or cultural variations. Comparative studies across diverse cities and regions would offer a broader understanding of user preferences, enabling more tailored and inclusive approaches to green retail space design.

Moreover, to enhance the robustness and reliability of future findings, researchers should consider expanding the study area, adopting a larger sample size, and employing higher confidence levels with smaller margins of error. These methodological improvements would help capture a more accurate and comprehensive representation of user preferences.

Incorporating user preferences into the design and management of green retail spaces holds significant potential for creating urban environments that are not only more attractive and functional but also aligned with sustainability goals. Thus, integrating user preferences into green retail space planning can contribute to developing vibrant, sustainable urban landscapes that meet both economic and environmental objectives.

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