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IDENTIFYING THE FUNCTIONS OF SERANG CITY SQUARE AS A PUBLIC GREEN SPACE

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ABSTRACT

Serang City, as the capital of Banten Province, has met the urban green open space standards, achieving a percentage of 59.64%. Serang City Square is one of the representations of public green open spaces in the area. This study aims to identify the extent to which Serang City Square fulfills its ecological, socio-cultural, aesthetic, and economic functions as a public green open space. This study is based on the direct perceptions of visitors and addresses a research gap, as perception-based evaluations of public green open spaces remain limited, particularly in the context of Serang City Square. This research is a quantitative descriptive study. Data were collected through a questionnaire survey and field observations. The questionnaire survey was conducted with 100 visitors of Serang City Square. Field observations were also carried out to complement the questionnaire data. The data were then analyzed using descriptive statistical and qualitative descriptive analysis techniques. The results indicate that Serang City Square has fulfilled most of its ecological and economic functions; however, some aspects of its social and aesthetic functions remain suboptimal. This is shown by the absence of children's play areas, public perception of poor cleanliness and sanitation, and insufficient lighting that affects comfort and environmental aesthetics. These findings indicate the need for intervention by the Serang City Government to strengthen the functionality of Serang City Square as a public green open space.

Keyword: *Public Green Open Space, Ecological Functions, Socio-Cultural Functions, Aesthetic Functions, Economic Functions*

1. INTRODUCTION

Public Green Open Spaces (RTH) play a central role in the design and formation of urban structures. Based on Law No. 26 of 2007 on Spatial Planning, the definition of RTH is an area that stretches, forms a corridor, or clusters, which is used openly as a place for plants to grow, whether naturally or deliberately planted. In urban areas, a minimum of 30% of the total land area must consist of Green Open Spaces (RTH). This percentage includes at least 20% public RTH, which is accessible and usable by the public, and at least 10% private RTH, which is usually located on privately or institutionally owned land. The existence of RTH as a public urban facility serves as one of the indicators for assessing the quality of a city's living environment [1].

According to the Regulation of the Minister of Public Works No. 05/PRT/M/2008, Green Open Spaces (RTH) function ecologically, socio-culturally, and aesthetically. To achieve urban RTH with optimal functions, the main objectives of urban development and growth need to be aligned with ecological characteristics, as well as the conditions and aspirations of urban communities [2]. The fulfillment of RTH functions must be realized through the provision of adequate supporting facilities within the area. These facilities include park benches, children's playgrounds, appropriate and supportive vegetation, jogging tracks, parking areas, as well as organized spaces for street vendors as culinary centers, along

with other supporting elements [3]. Public green open spaces are considered effective if they are actively utilized by urban communities and provide a high level of satisfaction after being used [4].

Among various forms of public green open spaces, the alun-alun represents an iconic urban element in Indonesian cities and functions as a center for public activities [5]. Previous studies have shown that alun-alun can serve multiple roles, ranging from neighborhood-level spaces to city-scale public spaces, depending on patterns of use and activities [6]. The quality of vegetation, spatial arrangement, and supporting facilities significantly influences user comfort, social interaction, and surrounding economic activities [7], [8].

A growing body of research has evaluated the performance of public green open spaces in fulfilling their ecological, socio-cultural, aesthetic, and economic functions in various Indonesian cities [9]–[13]. These studies have identified common challenges, such as inadequate facilities, poor vegetation conditions, and limited support for social interaction. However, most existing research focuses on physical conditions or functional assessments, with relatively limited emphasis on evaluations based directly on user perceptions.

Despite the strategic role of Serang City Square (Alun-Alun Kota Serang) as a major public activity center in the capital city of Banten Province, studies that specifically assess its performance as a public green open space from the perspective of visitors remain scarce. This research gap is particularly notable given that Serang City had exceeded the minimum standard for urban green open spaces in 2023, reaching 59.64% [14]. Therefore, a perception-based evaluation is necessary to understand how well the ecological, socio-cultural, aesthetic, and economic functions of Serang City Square are experienced by users. Accordingly, this study aims to identify the extent to which Serang City Square fulfills the functions of public green open space based on visitors' perceptions.

2. RESEARCH METHOD

This research is a descriptive quantitative study. Data collection was carried out using two techniques, namely field observation and questionnaire distribution. Field observations were conducted in a non-participatory manner, guided by indicators that had been developed based on the four functions of green open space. Questionnaire distribution was conducted from July to August 2025, targeting visitors of Alun-Alun Kota Serang. This study also employed open-ended questionnaires to obtain visitors' perceptions according to their experiences when visiting Alun-Alun Kota Serang as a representation of public open space. In this case, the responses obtained from the open-ended questionnaires were analyzed using simple manual categorization to summarize and support the quantitative findings.

The study applied descriptive statistical and qualitative descriptive analysis techniques. Qualitative descriptive analysis was used to describe how the community perceives the social, ecological, aesthetic, and economic functions of Alun-Alun Kota Serang. Descriptive statistical analysis was used to process the questionnaire responses. The aim was to present respondents' perceptions in a more measurable way and to facilitate systematic presentation of the findings.

The population in this study consisted of all visitors to Alun-Alun Kota Serang. In this case, data were collected from a sample of 100 visitors. This number was considered appropriate according to the sample size requirements based on Slovin's formula with a significance level of 90%, considering the limited research timeframe. This level of significance was considered sufficient in the context of social research. Accidental Sampling (Convenience Sampling) was employed as the sampling technique in this study. This technique was deemed suitable since visitors arrive and leave dynamically, making it difficult to establish a population list. It is also appropriate for a qualitative approach because it allows the researcher to select samples based on specific criteria or the availability of subjects in the field.

To ensure validity, the questionnaire items were developed based on established indicators of green open space functions and pre-tested on a small number of respondents before full deployment. Reliability was assessed through a pilot test, with the internal consistency of the questionnaire items measured using Cronbach’s alpha, yielding a value of 0.82, indicating good reliability for social science research instruments. The following are the variables and indicators used in this study.

Table 1. Research Variables

Variables	Indicators	Criteria
Ecological Function	Shading Vegetation	<ul style="list-style-type: none"> • Availability of shade trees with a minimum of 150 trees (medium and small trees) • Function as shade providers • Visitors’ perception of the vegetation function in the Town Square
	Ornamental Garden	<ul style="list-style-type: none"> • Number and types of ornamental plants • Condition of ornamental plants • Visitors’ perception of the ornamental plants condition in the Town Square
	Drainage Channel	<ul style="list-style-type: none"> • Function of the drainage channel • Effectiveness of the Town Square in absorbing rainwater • Visitors’ perception of the Town Square as a rainwater absorber
	Basketball/Volleyball Court	<ul style="list-style-type: none"> • Availability of the court • Physical condition of the court • Intensity of use by visitors
Social Function	Running Track	<ul style="list-style-type: none"> • Area of running track with a minimum width of 7 m and length of 400 m • Physical condition of the running track • Visitors’ perception of the comfort of the running track in the Town Square • Visitors’ perception of the running track density in the Town Square
	Parking Area	<ul style="list-style-type: none"> • Availability of parking space • Accessibility and capacity of the parking lot
	Children’s Playground	<ul style="list-style-type: none"> • Availability of children’s play equipment • Condition of playground facilities • Safety and comfort of children’s play facilities
	Landmark (Identity Marker)	<ul style="list-style-type: none"> • Presence of identity elements of the Town Square
	Sports Facilities	<ul style="list-style-type: none"> • Availability of sports facilities • Condition of sports facilities
Aesthetic Function	Garden Lamps	<ul style="list-style-type: none"> • Function and condition of garden lamps
	Park Benches	<ul style="list-style-type: none"> • Number of park benches • Visitors’ comfort with the park benches in the Town Square • Visitors’ perception of the cleanliness of park benches in the Town Square
	Trash Bins	<ul style="list-style-type: none"> • Number of trash bins • Accessibility of trash bins for visitors • Cleanliness of trash bins
	Kiosks	<ul style="list-style-type: none"> • Number and availability of kiosks
Economic Function	Street Vendors (PKL)	<ul style="list-style-type: none"> • Number and distribution of street vendors in the Town Square area • Visitors’ perception of the presence of street vendors

Source: Result Analysis, 2025.

3. RESULT AND DISCUSSION

This section discusses the research findings on visitors’ perceptions of the functions of Serang City Square (Alun-Alun Kota Serang) as a public green open space, covering ecological, socio-cultural, aesthetic, and economic functions. The discussion is structured with reference to the criteria for public green open space functions as stated in the Regulation of the Minister of Public Works No. 05/PRT/M/2008, as well as several related references. The discussion is divided into four main aspects: ecological, socio-cultural, aesthetic, and economic functions.

3.1. Characteristics of Visitors to Serang City Square

The characteristics of visitors to Serang City Square are dominated by residents with a local domicile. Based on the categorization of responses from the open-ended questionnaire, 76.67% of respondents were residents of Serang City, while the remainder came from surrounding areas such as Serang Regency, Pandeglang Regency, and Lebak Regency. This indicates that Serang City Square functions effectively as a local public space actively used by residents in and around the city.

Most visitors reported coming to the square for physical activities such as jogging, group exercise sessions, and other light exercise. This finding suggests that the square serves not only as a social gathering place but also supports healthy lifestyle habits. As shown in Figure 1, 76.67% of respondents were between 20 and 25 years old, highlighting that young adults—who are generally more socially and physically active—make up the majority of users. This pattern is reinforced by the fact that the majority of respondents were university students. This indicates that the square has become a popular and relevant space for young people to gather, participate in recreational activities, and fulfill their daily leisure needs in an easily accessible and free environment.

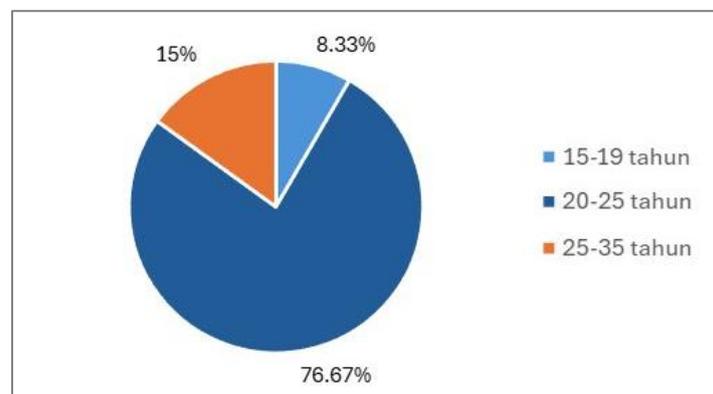


Figure 1. Age Distribution of City Square Visitors

3.2. Ecological Functions of Serang City Square

The ecological function of public green spaces is closely related to their ability to improve environmental quality through the presence of vegetation. Based on the classification of responses from the open-ended questionnaire, 90% of participants stated that the shade trees in Serang City Square create a comfortable and shady environment for outdoor activities. Conversely, only 10% felt that the area lacks shade. This perception aligns with field observations, which showed that shade trees are fairly evenly distributed across most of the square.



Figure 2. Greenery of Serang City Square

Based on visitor perceptions illustrated in Figure 3, the presence of ornamental plants is regarded as insufficient in enhancing environmental comfort. Only 43.3% of respondents indicated that the plants

were well maintained, while the remaining participants perceived them as poorly maintained or not maintained at all. Field observations further revealed that both the variety and spatial distribution of ornamental plants in the square are still limited. Only approximately two to three species were identified, placed in a repetitive pattern and unevenly distributed throughout the site. The limited plant diversity contributes to a reduced aesthetic quality and diminished visual comfort that should ideally be supported through more varied vegetation.

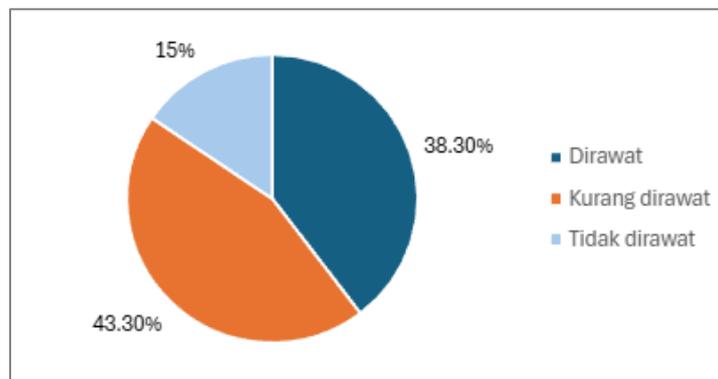


Figure 3. Percentage Distribution of Ornamental Plant Conditions

Overall, visitors felt the town square's ability to manage rainwater was still inadequate. Survey results showed that 33.3% of respondents reported occasional puddles, while 23.3% said puddles occurred frequently. This perception was supported by field observations, which noted puddles in several parts of the town square after rain—particularly along the jogging track and around the fountain area.

While most respondents agreed that the shade from trees significantly improved comfort and supported outdoor activities, ornamental plants were considered poorly maintained. Furthermore, both observation data and visitor feedback consistently indicated problems with drainage and water absorption performance in Serang City Square. Assessments of ecological aspects, including vegetation, ornamental plants, and drainage conditions, are summarized in Table 2.

Table 2. The Ecological Function Assessment of Serang City Square

No.	Indicator	Description	Assessment
1	Shade Vegetation	Shade trees offer adequate canopy coverage that enhances comfort for outdoor activities, with their distribution relatively uniform throughout the square.	Good
2	Ornamental Plants	The ornamental vegetation, however, lacks diversity—only about two to three species are present, arranged in a repetitive manner and exhibiting poor maintenance conditions.	Poor
3	Drainage System	The drainage infrastructure also performs suboptimally, as standing water commonly accumulates in several areas following rainfall.	Poor

Source: Result Analysis, 2025.

The ecological assessment of Serang City Square shows that shade vegetation enhances user comfort, while low ornamental plant diversity and poor drainage limit overall ecological performance. Similar findings have been reported in recent studies, where increased vegetation diversity, including shrubs and mid-story plants, was found to improve ecological function and habitat quality [15], and effective maintenance strategies were shown to significantly influence biodiversity in urban green spaces [16]. These parallels indicate that improving plant diversity and integrating better drainage systems are essential to strengthening the ecological function of Serang City Square.

3.3. Social Functions of Serang City Square

The findings indicate that Serang City Square has strong potential to fulfill its socio-cultural functions, as reflected in the availability of physical facilities such as sports facilities, a running track, parking areas, and seating areas. The basketball/volleyball courts, in particular, are frequently used by visitors for various community activities. Based on responses to an open-ended questionnaire, 56.6% of participants stated that the courts were still functional, while 31.6% felt their physical condition was less than ideal. As shown in Figure 4, the court surface has not been repainted, resulting in faded and worn-out boundary lines. This condition reduces the visual appeal of the space and gives the impression of a lack of maintenance.



Figure 4. Condition of the Basketball and Volleyball Courts

Besides the sports court, Serang City Square also provides social facilities such as a running track, parking area, and location signage. Figure 5 presents the categorized perceptions of visitors regarding the condition of the running track based on responses to the open-ended questionnaire. While most respondents (53.3%) indicated that the track is comfortable to use and does not cause complaints, some noted issues related to overcrowding and damage to the track surface. A smaller proportion of respondents even reported that the track feels generally uncomfortable.

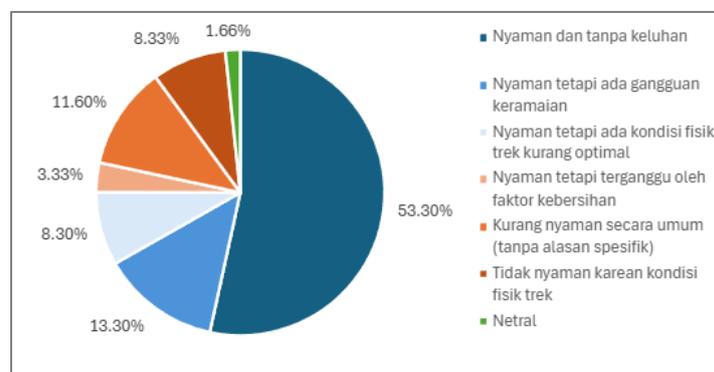


Figure 5. Percentage of Running Track Conditions

Sports facilities in Serang City Square are still quite limited. Field observations only recorded five pieces of outdoor sports equipment, two of which were damaged. The square also lacks a dedicated play area for children, as evidenced by the absence of basic play facilities such as swings or slides. As a result, children visiting the area often use the sports equipment as an alternative play space. This shift in use aligns with the findings reported in [12], which highlighted that public space users, especially certain age groups, often reuse facilities beyond their original purpose. The absence of dedicated play facilities indicates that Serang City Square does not fully meet the functional standards for public green open spaces stipulated in Minister of Public Works Regulation No. 05/PRT/M/2008.

The availability of parking spaces and location markers also emerged as important elements in the observations, as spatial integration is crucial for supporting social interaction. Based on questionnaire responses, 51.6% of participants stated that parking facilities in the square are easy to find and access. Integrated parking areas support smooth public visits to the space. However, based on observations, the

identity marker of the area in the form of the Serang City Square icon appeared poorly maintained and was not illuminated at night, thereby reducing the site’s attractiveness. In addition, the visibility of the icon was obstructed by poles and rows of parked vehicles directly in front of it. Table 3 presents the results of the identification of social functions based on the availability of facilities for interaction and public activities, such as courts, running tracks, and sports facilities.

Table 3. The Social Function Assessment of Serang City Square

No.	Indicator	Description	Assessment
1	Basketball/Volleyball Courts	The basketball/volleyball courts are still used for community activities and are considered adequate by most respondents, but require maintenance.	Fairly good
2	Running Track	The running track is considered fairly comfortable, but there are indications of limited width and suboptimal physical condition.	Fairly good
3	Parking Area	The parking area is easy to find and access for visitors, and is well integrated within the square area.	Good
4	Children’s Playground	No children’s playground was found.	Poor
5	Landmark (identity marker)	The landmark at Serang City Square suffers from inadequate maintenance and obstructed visibility, which lessens its aesthetic value and undermines its function as a spatial identity feature.	Poor
6	Sports Facilities	Sports facilities are insufficient in number and some are already in poor condition, with several pieces being used by children as substitute play equipment—potentially contributing to faster wear and damage.	Less good

Source: Result Analysis, 2025.

The social function assessment of Serang City Square shows that while sports courts, the running track, and parking support some activities, the absence of a children’s playground, limited sports facilities, and poorly maintained landmarks restrict social interaction and inclusivity. Recent studies emphasize that the quality, diversity, and maintenance of public facilities strongly influence community engagement, social cohesion, and usage across different age groups [17], [18]. This suggests that improving facilities and providing inclusive recreational opportunities could strengthen the square’s social function and support more diverse patterns of use.

3.4. Aesthetic Functions of Serang City Square

Based on the classification of responses from the open-ended questionnaire, 66.6% of participants stated that Serang City Square felt dark and uncomfortable for nighttime activities. This perception is corroborated by direct field observations, which reveal a clear contrast between daytime and nighttime spatial conditions. As illustrated in Figure 6, the square appears adequately active and visually legible during the day; however, at night the reduced lighting intensity, uneven light distribution, and limited visibility of activity nodes contribute to a diminished sense of comfort and safety. These physical conditions help explain respondents’ negative perceptions and indicate that inadequate nighttime environmental quality is a key factor influencing the underutilization of the square after dark.



Figure 6. Variations in Square Conditions Between Day and Night

The visual quality of Serang City Square is largely supported by the availability of seating and waste disposal facilities. Field observations indicate that six benches are placed along the running track, while six planter-style chairs are distributed around the fountain area, suggesting an initial effort to support

user comfort and visual order. However, the effectiveness of these facilities is questioned when user perceptions are taken into account. As demonstrated in Figure 7, more than half of respondents (53.3%) perceived the benches as poorly maintained or unclean. This discrepancy between physical provision and user experience indicates that the presence of facilities alone is not sufficient to enhance visual quality without proper maintenance and adequacy. These findings contrast with the study reported in [9], which emphasized that well-designed green open spaces should not only provide sufficient seating and water features, such as ponds or fountains, but also ensure their cleanliness and aesthetic appeal to support user satisfaction and sustained use.

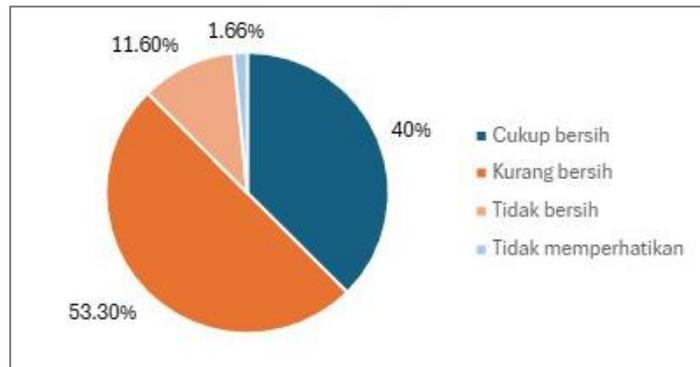


Figure 7. Park Bench Cleanliness Percentage

Concerns about cleanliness and sanitation in Serang City Square were also evident. 26.6% of respondents cited public restrooms and seating areas as their least satisfactory elements, while others noted additional issues throughout the area. Waste management facilities were also inadequate, with 53.3% of respondents stating that there were insufficient trash bins to meet visitor needs. However, perceptions of overall cleanliness varied considerably: half of respondents rated the square as quite clean, while the remainder rated it as either not very clean or not at all. These findings indicate a gap between visitors' visual impressions and the actual condition of supporting facilities. A summary of the assessments of aesthetic components—such as cleanliness, lighting, and layout—is presented in Table 4.

Table 4. The Aesthetic Function Assessment of Serang City Square

No.	Indicator	Description	Assessment
1	Garden Lamps	The garden lighting operates poorly, causing the square to appear dim during nighttime hours.	Poor
2	Park Benches	The number of park benches is viewed as inadequate, with the majority of visitors describing them as uncomfortable or very uncomfortable, as well as lacking cleanliness.	Fairly Poor
3	Trash Bins	Waste disposal facilities also remain insufficient, and public opinions on overall cleanliness are split, indicating a mismatch between the available infrastructure and on-site conditions.	Fairly Poor

Source: Result Analysis, 2025.

The aesthetic function assessment of Serang City Square shows that poor garden lighting, inadequate and uncomfortable park benches, and insufficient trash bins contribute to a decline in the visual quality and overall spatial experience. Recent empirical studies support these findings. Previous research on urban park lighting found that lighting quality strongly affects users' perceptions of safety, comfort, and usability at night, with poorly lit areas reducing nighttime activity and overall satisfaction [19]. Similarly, studies on user satisfaction with park benches indicate that comfort, design, and maintenance of benches significantly influence aesthetic evaluations and overall visitor satisfaction in public green spaces [20]. Together, these studies confirm that aesthetic elements such as effective lighting and well-maintained benches are key to enhancing the visual appeal and functional experience of public spaces, suggesting that improvements in these areas could substantially strengthen the aesthetic performance of Serang City Square.

3.5. Economic Functions of Serang City Square

Analysis of the questionnaire responses indicates substantial variation in visitor spending at Serang City Square. Approximately 30% of participants reported expenditures exceeding IDR 30,000, while 21.6% fell into the very low-spending category of IDR 0–5,000, typically allocated for basic expenses such as parking or bottled water. The remaining respondents were distributed across the moderate spending range of IDR 6,000–30,000, and 10% indicated that they did not make any purchases. This spread in spending capacity demonstrates the square’s economic potential, supporting expenditures from essential needs to complete meals.

Research reported in [3] notes that economic activity in public spaces is generally driven by street vendors. However, the findings of this study show that Serang City Square facilitates a wider spectrum of commercial interaction, involving both informal street vendors and formal kiosk businesses. Field observations recorded 18 kiosks managed by the local authorities, primarily serving food and beverages. Despite this, several respondents highlighted perceived price differences, noting that kiosk products tend to be more expensive than items sold by street vendors, even when offering similar types of food.



Figure 8. Kiosks Provided at Serang City Square

Several street vendors (PKL) were seen operating near the main entrance and along the outer edges of the square, occupying street-side spaces as their selling areas. Based on the classification of open-ended questionnaire responses shown in Figure 9, 60% of participants considered the presence of these street vendors beneficial and not disruptive. Conversely, 26.6% reported feeling uncomfortable, citing issues such as obstructed access, reduced visual quality, and hygiene concerns. Interestingly, 10% of respondents acknowledged the benefits provided by the street vendors but still felt disturbed by their presence. This reflects an ambivalence among visitors, who acknowledge the economic contribution of street vendors while also noting their negative impacts on accessibility, sanitation, and the aesthetics of the space.

Overall, the findings indicate that economic activity in Serang City Square is supported by both formal commercial enterprises (such as permanent kiosks) and informal trade (PKL). However, based on visitor expenditure reports, the square primarily serves as a passive recreational space, where financial transactions remain relatively limited. Despite the visible economic activity, not all visitors engage in commercial exchanges during their visit. A summary of the evaluation of economic functions including the distribution of kiosks and the presence of street vendors is presented in Table 5.

Table 5. the Economic FunctionAssessment of Serang City Square

No.	Indicator	Description	Assessment
1	Kiosk Facilities	The kiosks available are regarded as sufficient in quantity and conveniently reachable, although the prices offered are perceived to be higher compared to those sold by street vendors around the area.	Fairly Good
2	Street Vendors (PKL)	Street vendors are scattered irregularly along the perimeter outside the square’s fence, and most visitors view their presence as advantageous and not causing significant disturbance.	Good

Source: Result Analysis, 2025.

The economic function assessment of Serang City Square shows that kiosks are adequate and accessible, though somewhat expensive, while street vendors (PKL) are irregularly distributed but generally beneficial. This aligns with recent studies indicating that formal and informal commercial activities enhance economic vitality in urban public spaces if well-managed and accessible [21], [22]. Research in Jakarta and Bandung further highlights that integrating kiosks and street vendors promotes local entrepreneurship and visitor activity, emphasizing the importance of balancing facility provision and pricing to optimize economic function [21], [22].

4. CONCLUSION

The Serang City Square (Alun-Alun Kota Serang), as an urban public green open space, has generally been functioning well, although several aspects still require improvement. The ecological role is supported by the presence of shade trees, but the drainage system remains ineffective and frequently causes water accumulation. Social functions are accommodated through sports facilities, but the area lacks a dedicated playground for children. Aesthetically, the square has not achieved optimal quality due to inadequate lighting and cleanliness issues. Meanwhile, economic activities are relatively good, driven by both kiosk businesses and street vendors. This research contributes to discussions on the performance of green open spaces in urban settings by highlighting the importance of social, ecological, aesthetic, and economic dimensions based on visitor perceptions and field observations, while also providing an empirical, user perception-based evaluation of public green open space functions that reflects how visitors experience and value these spaces in everyday use. The findings may serve as a reference for developing evaluation indicators for public spaces in cities with diverse social characteristics. Based on the results, several improvements are needed to enhance the quality and diversity of supporting facilities, including better maintenance of sports equipment, increasing the number of trash bins, improving garden lighting, and providing children's play areas, which are currently lacking. Cleanliness and sanitation management also need to be strengthened to support comfort and visual quality. Future research is recommended to examine in more depth the correlation between demographic factors and space use patterns.

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