Aesthetics Evaluation of Bandar Lampung Streetscapes

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Abstract. Street landscape is one of the things that represent a city. Several studies over the past 30 years have shown that there was significant decreased on the quality of green open spaces which also shown on the aesthetic quality of the green lines that is often unnoticed. There is a need of precaution measures in order to balance the growth in physical aspect with the better landscape planning. Thus, it is necessary to evaluate the value of streetscape in Bandar Lampung. The objectives of this research is to evaluate the aesthetic and fnctional value of Bandar Lampung streetscape. The evaluated streetscapes consists of 16 streets that are divided based on their accessibility to the city center and education area. The method for assessing aesthetic is SBE method. Respondents involved were students with a background in landscape architecture and its related sciences. Designing character or identity of an area can be achieved through the arranging and designing its physical and non-physical elements. The arrangement includes organizing the street furniture both hard and soft elements such as plants. Therefore, the completeness of street furniture will also be assessed and evaluated. The evaluate of street furniture is using scoring method. In this study will be carried out in relation to the availability and conditions of street furniture for all types. Assessment of street furniture is done by the Gutman scale scoring method. The completeness of street furniture in 16 streets segments of the city of Bandar Lampung is still low, besides a lot of the street furniture not in a good condition, damaged, does not work according to its function or in a messy condition. The completeness of street amenities in 16 Bandar Lampung streets are not high enough, which ranging from 65% to 75%. The condition quality of the amenities available also very low, ranging from 55% to 60%. From the aestetical analysis, the best desirable is Sultan Agung Street. The least desirable is Soekarno Hatta Street. Based on Functional and Aestetical Analysis, we got the conclusion that the functional and aestetical aspect can affect each other value.

Keywords: Green infrastructure, Green street, Plant aesthetic, Scenic Beauty Estimation, Street Landscape

1. Introduction
Developing the city along with its circulation path. Physical development such as streets need to be balanced with the arrangement of the landscape within the city. The streetscape is one of the city's identities that is representing the face of a city. In addition, the streetscape can provide important benefits in the aspect of ecological functions for the sustainability of the city. Bandar Lampung City is developed rapidly and has the potential to become a metropolitan city. This development will increase physical development in the city of Bandar Lampung. However, the physical development of cities cannot ignore the importance of landscape layout which can result in decreasing the aesthetic and ecological value of a city. Hence, the physical development of the city road cannot ignore the greenery aspect. The green landscape will be able to support the sustainability and aesthetic value of the street. As the Capital City of Lampung Province, Bandar Lampung has the potential as the representative for
Lampung Province as well as the main gate to Sumatra Island. Therefore, Bandar Lampung City must have a city identity. By creating specific structure design into the road landscape, it is a good strategy to display the identity of the city as the community main activities cannot be separated from the circulation of the street.

The aesthetic aspect of the street landscape is an important aspect that cannot be ignored. The aesthetic and functional aspects of the street landscape must be fulfilled in order to obtain a sustainable landscape. Arrangement of plants such as trees, shrubs and ground covers in accordance with the principles of design will be able to provide a beautiful visual appearance. The path arrangement must be based on function without forgetting its beauty.[1]

The aesthetics of the streetscape can also be formed from the structural canopy of tree canopies. Structuring plants on the street landscape is needed to improve the aesthetic of the city and become the city's identity. An assessment of the aesthetic value of the street landscape in Bandar Lampung City is needed to determine the contribution of the street landscape as the identity of the city. Assessing the beauty of the landscape by evaluating the visual quality of the landscape must involve a number of respondents.[2] The study of evaluating the aesthetics of this street landscape can be used as consideration in the planning, design and development of street landscapes in order to form a pathway that is able to provide aesthetic and sustainable visual quality, and meet its functional criteria. The street selected for evaluation is a street that has accessibility to the city center, education area and the main street in the city of Bandar Lampung which are widely traversed and have a high enough vehicle density.

This research aims to:
1. Evaluate the aesthetic and functional values of streetscape in Bandar Lampung City
2. Evaluate the streetscape in Bandar Lampung City as the identity of the city

2. Research Method
2.1 Research Location
The study was conducted in Bandar Lampung City streets. The city of Bandar Lampung is the gateway to the island of Sumatera. The street selected for this study was based on the access to education center and city center such as Tanjung Karang, UNILA Campus, ITERA Campus, and UIN Campus. Additional condition also including the characteristics of the street. The street to be evaluated is a street that have to represent the characteristics of the street in Bandar Lampung City. The characteristics of the street are such as one-way streets, two-way streets, streets with green lanes, streets with median, and streets that do not have green lanes. Based on these criteria and characters, there are 16 streets selected for the evaluation, which are:

1. Endro Suratmin St.
2. Pangeran Tirtayasa St.
3. Pangeran Antasari St.
4. Ryacudu St.
5. Sultan Agung St.
6. Teuku Umar St.
7. Gatot Subroto St.
8. Yos Sudarso St.
9. Wolter Monginsindi St.
10. Soekarno Hatta St.
11. Pagar Alam St.
12. Diponegoro St.
13. Gajah Mada St.
14. Sudirman St.
15. Raden Intan St.
16. Arif Rahman Hakim St.
2.2 Aesthetical Analysis
The analytical method used in this study consists of aesthetic and street functional analysis. Aesthetic analysis was performed using the SBE method. The Scenic Beauty Estimation (SBE) method was introduced by Daniel and Boster [2] which is a procedure for estimating beauty by evaluating the visual quality of a landscape, in this study the landscape boundary used is the visual element of tree species. The application of the SBE method consists of three main steps, which are: (1) taking photographs, (2) photo presentation, and (3) data analysis. In each street the researcher will select photos to be tested using photo slide to the respondents. The criteria that use to choose the photo is the photo must have good visibility. Shooting height is as high as human eyes and normal eye level. Respondents are landscape architecture student. In the SBE method, each photo slide of the street is displayed and assessed on the SBE questionnaire sheet provided. The photo presented to the respondent for 10 second. The photo of 16 selected streets are:

![Selected photos](image)

Data from the results of the questionnaire will be processed using the SBE calculation method. The score (1-10) that the respondent has given to each image will be processed. Each rank value is calculated as cumulative frequency, cumulative probability, Z value and average Z value, and then determined one Z value from a particular landscape photo as a standard landscape with the most Z value near zero. Formulation of SBE values:

\[
SBE_x = (Z_{Lx} - Z_{Ls}) \times 100
\]

- \(SBE_x\) = SBE score landscape \(n\)
- \(Z_{Lx}\) = Average score of \(Z\) landscape \(n\)
- \(Z_{Ls}\) = Average score \(Z\) standard landscape
- \(n\) = Total of respondents
- \(x\) = Number of street
2.3 Amenity Analysis
Whereas functional analysis is done by analyzing the amenity that exists in the street landscape. Street furniture can improve the aesthetic value of street landscape (Sims 1991). Street furniture is divided into three types based on its function, safety and comfort, complementary functions, and aesthetic functions (Harris and Dines 1988). In this study the scoring will be conducted to the availability and condition of street furniture for all types. The method used to assess the aspects of amenity is the scoring method using the Gutman scale approach. The amenity aspect define the completeness of street furniture. The scale used in this assessment is 1 and 2, a value of 2 is given if street furniture is available and also for street furniture that is still in a good condition. The researchers assessed 16 street that were chosen based on accessibility to the city.

The formula used in this assessment is as follows:
\[ K = \frac{a - b}{u} \]

\( a = \) The sum of the highest score  
\( b = \) The sum of the lowest score  
\( u = \) The total of variable (street furniture)  
\( k = \) The total of the category

3. Result
The photos obtained at the study site were compiled to be used for the visual evaluation of the street landscape questionnaire. The questionnaire material was delivered to 60 respondents who had Landscape Architecture academic background and live in Bandar Lampung. Landscape Architecture Student has been chosen because in their college they study about the aesthetic value of landscape. Based on SBE analysis, the aesthetic value of 16 Bandar Lampung City streets can be seen in Figure 2.

![Figure 2. SBE Score for Street Landscape Bandar Lampung](image)

In Figure 2 it can be seen that the highest SBE value is at L5, which is Sultan Agung Street, while the lowest SBE value is at L10, which is Soekarno Hatta Street. Based on the opinion of respondents, Soekarno Hatta Street is so dry and Sultan Agung Street is more shady than the other. In general, it can be seen that the majority of SBE values from the Bandar Lampung
street landscape are below 0. This shows that the majority of the Bandar Lampung street landscape is not meeting the expectation of the respondents aesthetically.

One element to add to the beauty of the street landscape is the element of street furniture. Furthermore, the tree element is very important in the street landscape. The design of the character or identity of an area can be achieved through the arrangement and design of physical and non-physical elements of the region or a particular site. The arrangement includes street furniture both hard and soft elements such as plants. Therefore, the completeness of street furniture will also be assessed and evaluated properly. Street furniture is divided into three types based on its function, which are safety and comfort, complementary functions, and aesthetic functions (Harris and Dines 1988). In this study a scoring related to the availability and condition of street furniture for all types. The Amenity Percentage is obtained from the average of total score from all variabel (street furniture). Detail scoring can be seen in Tables 1 and 2.

Tabel 1 Scoring of Street Furniture completeness assessment (Amenity)

| Street code  | a | b | c | d | e | f | g | h | i | j | k | l | m | n | o | p |
|--------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Drainage     | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Pedestrian   | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Median       | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Greenery Lines (left/right side) | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Bus Stop     | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Street Lamp  | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Directions Signs | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Trash Can    | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Fire Hydrant | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Bench        | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Amenity Percentage(%) | 60 | 65 | 75 | 80 | 90 | 85 | 60 | 75 | 60 | 85 | 80 | 85 | 80 | 80 | 85 | 65 |

Notes:

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g. Gatot Subroto St.
h. Yos Sudarso St.
i. WolterMonginsindi St.
j. Soekarno Hatta St.
k. Pagar Alam St.
l. Diponegoro St.
m. Gajah Mada St.
n. Sudirman St.
o. Raden Intan St.
p. Arif Rahman Hakim St.

1= Not available
2= Available

Based on the result of Table 1 that the completeness of Street Furniture in 16 Bandar Lampung streets is sufficient because all segments have an average score of more than 50%, but the value is not high, ranging from 65% to 75%. Whereas based on Table 2 it is found that the condition of Street Furniture is very low, ranging from 55% to 60%. There are still many street furniture that are not in good condition. The condition that are not good including damaged furniture, not functioning, and the arrangement is not right and aesthetically unpleasant. The street furniture condition score is get from the average of score for all variabel (street furniture).
Tabel 2. Street Furniture Condition Score

| Street Code | a | b | c | d | e | f | g | h | i | j | k | l | m | n | o | p |
|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Drainase    | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Pedestrian  | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Median      | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 1 | 1 |
| Greenery Lines (left/right side) | 2 | 1 | 1 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Bus Stop    | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Street Lamp | 1 | 1 | 2 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Directions Signs | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Trash Can   | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Fire Hydrant | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Bench       | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Street Furniture Condition Percentage (%) | 60 | 55 | 65 | 55 | 85 | 80 | 55 | 60 | 55 | 60 | 55 | 55 | 55 | 55 | 55 |

Notes:

- a. Endro Suratmin St.
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- j. Soekarno Hatta St.
- k. Pagar Alam St.
- l. Diponegoro St.
- m. Gajah Mada St.
- n. Sudirman St.
- o. Raden Intan St.
- p. Arif Rahman Hakim St.

1= Bad condition
2= Good condition

Based on the SBE analysis and amenity analysis, the result showed that the highest SBE value and amenity are on Sultan Agung Street (Figure 3). While the lowest SBE value is on Soekarno Hatta Street, and the amenity value of Soekarno Hatta Street is also included in the lowest value. The respondents give low score for Soekarno Hatta Street because the street more dry than the other. The photo of Soekarnoo Hatta street can be seen in Figure 4. It can be assumed that the availability of street infrastructure and conditions can affect the respondents' perception of the aesthetic value of the street.
4. Conclusion
Most of Bandar Lampung street landscape has low value for SBE. The completeness of street furniture in 16 street segments in Bandar Lampung is low, ranging between 65% -75% out of the 10 types of street furniture which are the main requirements for the completeness of the street landscape. Its mean that the functional value of Bandar Lampung streetscape is not enough for user activity. Its can be one of the reason the street in Bandar Lampung is not desirable and aesthetical value.

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