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THE COMPARATIVE STUDY OF PUBLIC PARK IN THE PERSPECTIVE OF LANDSCAPE DESIGN IN EAST JAVA PROVINCE

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Abstract

One way to find out the relative advantages of public parks is by conducting landscape design. The study aims to identify the impact of landscape elements and principles on public parks, To know the application of landscape design elements to public parks, and To find out how to apply landscape principles in public parks. The study was conducted on 10 regional cities in east Java with 3 public parks each, providing 30 public parks from March 2022 to August 2022. The study is achieved with a quantitative and qualitative method in which all data is obtained through direct observations in the field through a questionnaire. The data used in this study is research on landscape performance; landscape design elements and principles are subject to investigation. The observed variable includes 36.

Studies take as many as 30 respondents to interviews or fill out questionnaires. Research shows that the Sidoarjo Square, the Unfortunate Square, the Gong Garden, the Apricot Garden, the Torch Park, the Tremiron Garden, and the Bungle Garden take up the first quadrant. The Gersik Square, Stone Square, the Green Town of Stone Park, the Municipal Square, the Old Town Park, Ngronggo Park, Safari 2, Taji Park and Cape Puri occupied the second quadrant. The park occupying Quadrant 3 is Prambanan Gersik, Candra Wilwatikta Park, Kehati Park and Rainbow Park. Quadrant 4 comprises Pancasila Fortress Park, Archway Park, Kennedy park and Mojokerto Square.

Keyywords: Public Parks; Perspective; Landscape Design

INTRODUCTION

Indonesia is classified as a developing nation, exhibiting growth in its economy, infrastructure, and human population. Hence, the government must furnish public amenities in every locality, such as communal areas. According to Rustam Hakim (2012), Indonesia's increased public spaces significantly benefit the local population. These spaces serve as sources of entertainment and can also serve as attractions for tourists seeking destinations. Currently, the formation of public spaces still needs to align with expectations. Because there are insufficient public spaces to match the growing number of residential or high-rise buildings being constructed, this is a contributing factor to the problem. The layout of a city will be improved if it contains a significant amount of public space that can serve as a space that is simultaneously hospitable, productive, and environmentally friendly. In urban and regional planning, infrastructure is part of spatial structure planning, where infrastructure acts as a link for equal distribution and planning of growth centres (nodes or hubs). Infrastructure, better known as infrastructure networks, is

an essential component in the urban area. Connectivity between critical units in urban areas becomes dynamic and well-structured, providing space for cities to be more productive, efficient, and advanced (Dwie Retna Surjaningsih et al., 2021).

The problem that needs to be solved by this research is determining whether or not landscape elements and principles affect the performance of public parks, as well as how landscape design elements and regulations can be applied in a public park. The objectives of this study are to determine the influence of landscape elements and principles on public parks, the application of landscape design elements to public parks, and the usefulness of applying landscape principles to public parks.

METHOD

Research Methodology

The research on the performance of landscapes, elements, and principles of landscape design in parks that is the subject of this research is the source of the data that is used in this research. This research aims to determine the relative position of excellence of public parks, objects, or aspects used as variables (variables) arranged as variables in public parks. Specifically, this research aims to determine public parks' relative position of excellence. The observed variables include 36, which are then outlined as a questionnaire. The respondents for this study are people who use public parks, and the data analyzed is a development of the concept of the variables studied. The people who were asked to fill out the questionnaire were selected in such a way as to be representative of the people who use the park that is being researched. The elements and principles of landscape design in 10 different parks are the variables used in the assessment factors.

Data analysis

In the course of this investigation, the technique of biplot data analysis was utilized. The biplot method is categorized as an exploratory analysis of multiple variables (multivariate). Its purpose is to present data from various variables in a two-dimensional map, making it simple to observe and understand how the data behaves. The data used for analysis is an X matrix with rank r, size nxp (n=number of objects and p=number of changes), which is corrected for the mean. Matrix X uses the SVD (Singular Value Decomposition) concept with the following decomposition form:

$$X = ULA' \quad \text{.....(1)}$$

U and A are of size nxr and pxr, respectively, and U'U = I and A'A = I.

L is a diagonal matrix of size rxn with the elements on the main diagonal being the roots of non-zero feature roots of matrix X'X and 111 ≥ 122 ≥ 1π. These diagonal elements are called the singular values of the X matrix. Technically, the lanes of the matrix A are nothing but the feature vectors of the

X'X matrix, while the routes of the matrix U can be calculated through the equation:

$$Ui = 1\text{-}Xa1$$

Where i is the root of the characteristic = i of the X'X matrix and a1 is the –i column of the matrix

1. If defined: = and H = 1 - where is the factorization value,
2. then equation (1) can be written as X= GH'. (2)

Or

$$Xij = gi\ 'hj$$

With gi and hj, respectively, the matrices G and H rows. If X j is to the power of 2, then the row effect vector gi and the row effect vector hj can be described in two-dimensional space. If X has a strength of more than two, it is usually approximated by a matrix of the second power, so equation (2) can be written as

$$2Xij = gi\ '\ hj$$

With 2Xij being the element of the approximate matrix, the matrix taking a value = 0 is beneficial in interpreting biplot results. Taking this value results in G=U and H=LA' so that we get: X'X= (GH')(GH')=HH

Because X'X=HH'=(n=1)S, then the result Hj' Hk will be the same as n-1 times the multiplier of Sjk and hk' hk, describing the diversity of the K-th change, while the correlation of the j-th and k-th modifications is the same as the cosine value angle between hj and hk vectors (JolifTe, 1986).

DISCUSSION

Cluster analysis is a type of multiple-variable analysis that can be used to group observed objects into categories according to the characteristics of the observed variables. The primary purpose of cluster analysis is to classify items according to their similarities. These things will be grouped into one or more distinct clusters so that the stuff in each set will have characteristics in common.

Cluster analysis is a statistical method that aims to separate objects into several clusters (groups of data), which have the properties of things with similar characteristics within one set. These objects have different attributes between clusters.

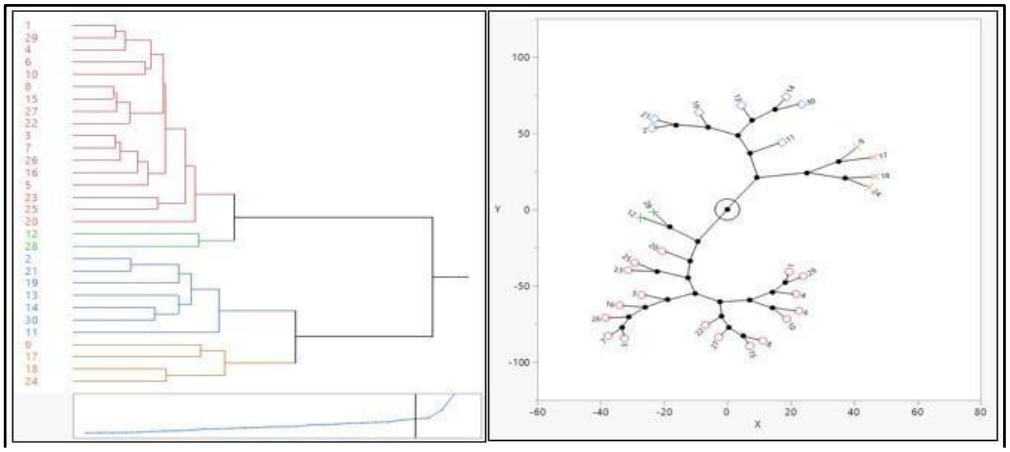

Figure 1

HierarchyClustering Analysis (Leveled Cluster Printing) Ward Method and Constellation Plots of Tiered Cluster Printing in 30 Public Parks in East Java (1, 2, 3, 30: Public Parks)

Hierarchy Clustering or Tiered Cluster Prints are made in 4 clusters: red, green, blue, and orange. In the red cluster, the performance of parks 1, 29. 4. 6, 10, 8, 15, 27, 22, 3, 7, 26, 16, 5, 23, 25. 20 has almost the same relative advantage, or the variance value is nearly the same; in the green cluster, the performance of parks 12 and 28 has virtually the same comparative advantage, or the variance value is almost the same; in the blue set, the version of park 2,19, 13, 14, 30, 11 have nearly the same relative advantage or practically the same variance value. In contrast, performance parks 9, 17, 18, and 24 in the orange cluster have the same comparative advantage or almost the same variance value.

The blue and orange clusters are the ones that have the best advantages in this hierarchical clustering or tiered cluster pattern. Based on the highest performance values seen from the factors totalling 36 variables.

Biplot is a statistical technique that is descriptive quantitative-qualitative from multiple variable data into numerous variables, namely with two dimensions, which can visually present a group of objects and variables in one graph.

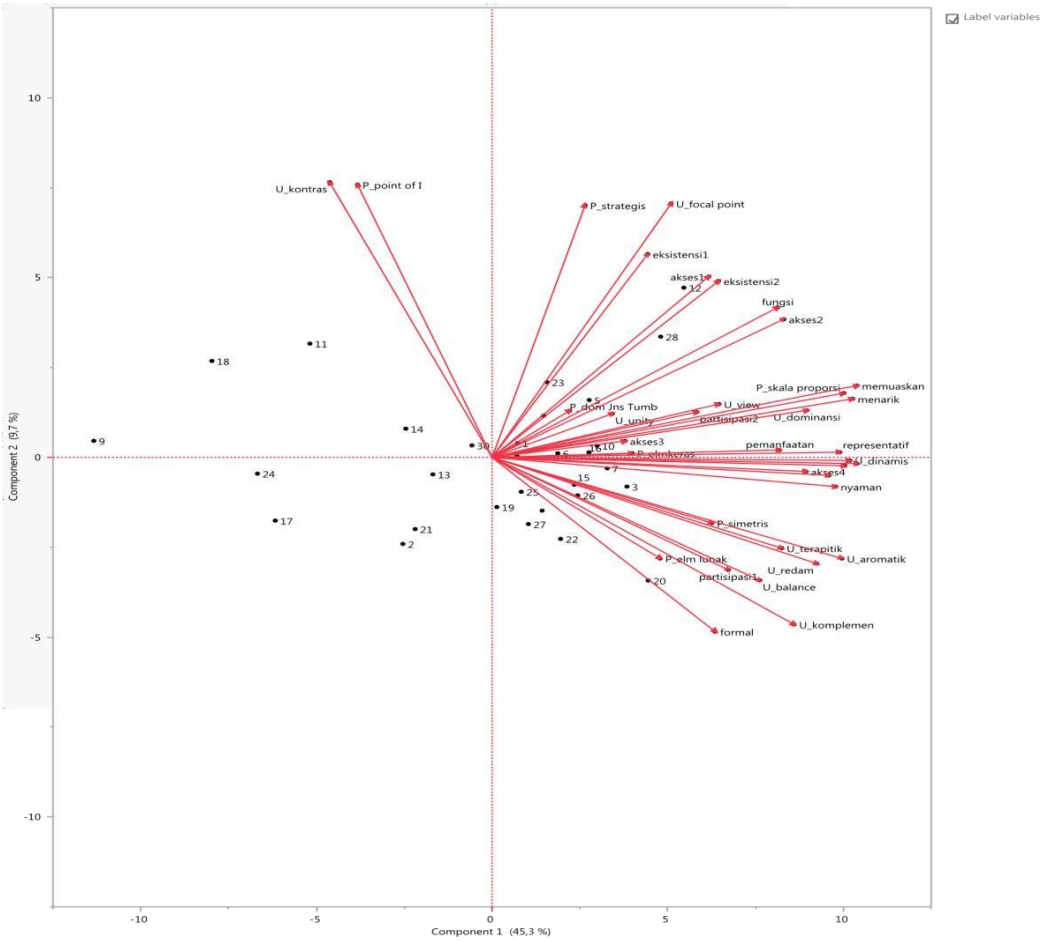

Figure 2. Quadrant***Two Dimensional Biplot Graph***

Information:

1. Quadrant 1 Positive positive (PP) (Sidoarjo Square), 5 (Malang Square), 16 (Ngegong Park), 10 (Apkasi Park), 23 (the Torch Park), 28 (Trembesi Park), 12 (Bungkul Park).
2. Quadrant 2 positive negative (PN) Alun-alun Gersik), 7 (The Stone Park Square), 15 (Garden City Green Park), 19 (Pasuruan City Park), 20 (Elderly Park), 22 (Nngronggo Park), 25 (Safari Park 2), 26 (Sekartaji Park), 27 (Tanjung Puri Park).
3. Quadrant 3 negative negative (NN) (Prambanan Gresik), 13 (Candra wwt), 17 (Kehati Park), 24 (Rainbow Park).
4. Quadrant 4 Negative Positive (NP) 11(Pancasila Castle Park), 14 (The Gates), 18 (Kendedes Park) 30 (Mojokerto Square)

The suitability measure value depicted on the two-dimensional biplot graph is 45.3%. This value is low even though the biplot results obtained are representative. In the biplot above, each variable is described by a line vector length; the line angles (vector) represent the degree of correlation between the variable and the direction of the vector. The smaller the rise, the higher the level of correlation.

The graph shows that quadrant 1 (PP) has advantages in Y1 (landscape performance) but has a lack of combination of variables X1 (landscape elements) and) and

In quadrant 1, several groups can be described in biplot analysis. Wonorejo Square Park, Ngegong Park, and Apkasi Park are grouped by characterizing superiority in access three and challenging elements, meaning that the three parks correlate with x2 and y1. Sidoarjo Square Park and Malang Square have advantages in the dominance of plant species and functions. Taman Obor Park has advantages in terms of focal point and existence 1, while Taman Bungkul and Taman Trebesi have advantages in terms of access one and existence 2.

In quadrant 2, several groups are described in the biplot analysis. The graphic shows that Taman Lansia, Taman Safari II, Tanjung Puri Park, Ngronggong Park, and Pasuruan City Park are grouped by characterizing their superiority in formality. Batu City Green Park and Sekartaji Park are grouped by describing the advantages of balance and dampness. Park 3 has the advantage regarding symmetry, while Alun-alun Batu Park has the edge regarding comfort.

In quadrant 3, the graph shows that Prambanan Gresik Park, Candra WWT, Kehati Park, Merbabu Park, and Pelangi Park do not have any advantages, which means there is no correlation between variables. In quadrant 4, Mojokerto and Gresik Square Gardens have advantages in terms of contrast and points of interest, which means that X1 is mutually correlated with X2.

CONCLUSION

Following is a possible conclusion that can be drawn from the findings of the multivariate biplot analysis: (1) Based on the large variance values, proximity between variables and objects, and the direction of the thing in which the park is located, there are various relative positions (competitive advantages) from quadrant I to quadrant 4 in the 30 public parks that were studied. These relative positions range from the first to the fourth quadrants. Sidoarjo Square, Malang Square, Ngegong Park, Apkasi Park, Torch Park, Trembesi Park, and Bungkul Park occupy quadrant one. (2) Gersik Square, Batu Square, Batu City Green Park, Pasuruan City Park, Elderly Park, Ngorongoro Park, Safari Park 2, Sekartaji Park, and Tanjung Puri Park occupy quadrant two. (3) Parks in quadrant three are located opposite the direction of all vectors. It means that all of these parks have scores below the average, which can be interpreted as meaning that all parks in quadrant three are considered parks that do not yet have landscape elements, principles, and performance because there is not a single variable vector that leads to the park. Prambanan Gersik, Taman Candra Wilwatikta, Taman Kehati, and Taman Pelangi occupy quadrant three. (4) Parks in quadrant 4, namely Pancasila Fort Park, Gapura Park, Kendedes Park, and Mojokerto Square, have a strong level of correlation with variables x1 (contrast) and x2 (point of interest), but public parks are not strongly correlated.

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