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Public Open Space in Realizing Sustainable Urban Development (Study: Environmental Park in East Jakarta, Indonesia)

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Abstract. Environmental Park has a role as a social space that function as a place where people could enjoy recreation, social interaction, educational space, and evacuation facilities. The importance of the availability of Environmental Park as a public open space is a challenge facing of urban areas. Limited land and the domination of private land ownership are often obstacles in the provision of Environmental Parks. This study aims to measure how far the successful use of the Environmental Park in Settlements could improve the quality of life of urban communities. The measurement of the success level is done by looking at the accessibility criteria, giving pleasure and interest, having a sense of place, comfort and attachment to the citizens. The study was carried out at 11 Environmental Parks in Duren Sawit District, namely Bambu Kuning Park, Cempaka Taman Cengkir Park, Taman Duren Sawit Indah, Jl.IG.Ngurah Rai Park, Kesenian Park, Lembah Palem Park, Malaka Selatan 2 Park, Pondok Kopi 8 Park, Rusun Klender Park and Viaduct Klender Park will be evaluated to measure the level of success. Evaluation is based on people's perceptions of the Environmental Park using a questionnaire. Random samples, using descriptive analysis and Qualitative Variation Index (IQV) to measure their achievement. From the results of the study the success rate of utilizing the overall he 11 environmental parks was not successful as a public open space. Finally, the existence of the Environmental Park is very necessary in urban areas and can contribute to realizing sustainable urban development.

1. Introduction

In an effort to improve “the quality and function of urban spaces in the urban area,” Green Open Space is considered as an “important” part of “building structuring activities”. Because, buildings and environment are integral component of settlements, that are supporting each other in balance, harmonious, and consistent manner. In accordance to Law Number 26 Year 2007 regarding Spatial Planning, it is stated that a city must have a Green Open Space of 30 percent of the total area of the city. Specifically in articles 29 and 30 of the same law, it is determined that 30 percent of Green Open Space constitutes 20 percent of publicly owned Green Open Space and 10 percent of private Green Open Space. The 30% proportion is a minimal measure to ensure the balance of the city's ecosystem, both the balance of the hydrological and microclimate systems. The target of 30% of the city area can be achieved gradually through the typical allocation of urban land [1]. Directly proportional to the flood problems experienced by Jakarta for years, according to Nirwono Yoga, Jakarta lacks 20 percent



of Green Open Space as rainwater recharge. Therefore, it is not surprising that the heavily inundated area is the area that should be a water absorption area [2]. With the enactment of the Law on Spatial Planning, many local governments find it difficult to provide public Green Open Space, which is 20 percent of the total urban area. The lack of Green Open Space proportion in Indonesian cities is caused by uneven development which progressively narrows the existing green open space. The development in Indonesia cities generally does not consider the element of Green Open Space. In addition, the lack of Green Open Space proportion in urban areas is caused by the high demand of land for urban activities. Many parties consider Green Open Space to have low economic value, hence it is marginalized [3]. "One of the main obstacles of Green Open Space procurement in Jakarta today is land acquisition. Although many citizens are willing to sell their land to the Jakarta Provincial Government, only a few have legality clarity." This was stated by the Head of Jakarta Forestry, Landscaping, & Cemetery Office, Djafar Muchlisin [4]. City Park or Environmental Park acts as a social space that functions as a place of recreation, social interaction space, educational space, and evacuation area in solid housing (Jakarta Parks Office, 2008) [5]. By looking at the above phenomenon, the Jakarta Provincial Government has limited area that functions as public open space. Based on the disclosure above, it is necessary to functions area optimally, especially in settlements where public open space is not comparable to the number of services of the surrounding population.

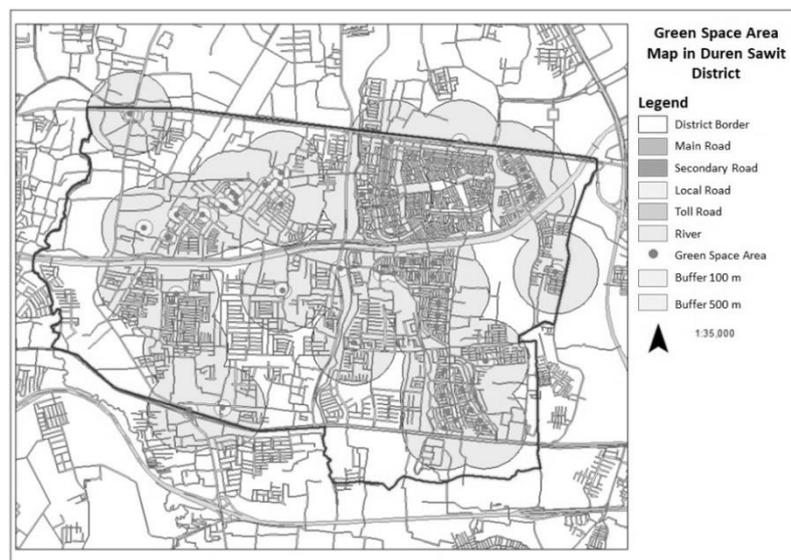


Figure 1. Green Open Space Buffer Map Kec. Duren Sawit
Source: Processed by researchers with GIS; 2018

Figure 1 shows that Green space area spread in Duren Sawit District. A study is needed to evaluate the use of Green Open Space (Environmental Parks) in Duren Sawit District. The study is carried out with an assessment based on an urban perspective by looking at the spatial aspects, namely among geographical elements (contained in digital data with certain study area boundaries). In addition, social aspects are also needed, namely the Green Open Space as a public open space for social interaction such as recreation areas, sports facilities, or play ground. This study is aimed at evaluating or assessing the success rate of the Environmental Park utilization as an existing public open space in Duren Sawit District, based on the perspective or perception of the people living in the District.

2. Materials and Method

2.1 Materials

Carmona et al. [6] stated that public open space is a space that can provide recreational opportunities, natural environment, a place to hold special events, and a space for a city to breathe. On a larger scale, public open space must create a relationship between humans and nature. For a smaller scale, the standard of public open space is usually set by the local government. [1] Open space is a space in a city or wider area in the form of an area or in the form of a longitudinal area/path. Marcus and Francis in Chairunnisa [7] argue that Environmental Parks are parks that are dominated by grass, tree, and soil landscapes for plants. Usually, it is located in a residential area and is equipped for various facilities to support active (sports, play, walk) and passive (sitting, sunbathing, resting) activities. Its utilization varies according to the density and location of the environment. Environmental Parks can also be interpreted as the basic unit (smallest) of the park system that is intended for recreation and social functions, and focused on informal recreation (American Planning Association, 2007) [8]. Meanwhile, the definition of Environmental Parks, according to Minister of Public Works Regulation No. 05/PRT/M/2008 concerning Guidelines for Provision and Utilization of Green Open Space in Urban Areas, is an open land that functions socially and esthetically as a means of recreational activities, education, or other activities at the environmental level.

Based on literature studies that have been carried out, it can be concluded that there are criteria that have similarities with one another. These criteria are Accessibility, Fun and Attractive, Security and Comfort, Binding the Community. According to Jalaludin Rackhmat (2011: 50) [9] perception is the experience of objects, events, or relationships obtained by inferring information and interpreting messages. Another opinion from Leavitt Harold J [10], perception can be seen in the narrow sense of vision, how one sees something. The perception process cannot be separated from the sensing process and the process is a preceding process of the perception process. Sensing can be interpreted as a stimulus received by an individual through a receptor device called the senses. The sensory device is the link between the individual and the world. Stimulus sensed by individuals will be organized, then interpreted. Hence, individuals realize and understand about something that is sensed and then create perception.

2.2 Method

This study employs a quantitative approach. Quantitative research is a method to test a theory by examining the relationships between variables [11]. Testing a theory on quantitative research is also done by specifying a specific hypothesis, and collecting data to support or refute the hypothesis [11]. Variables in quantitative research are measured using research instruments. Therefore, the data consisting of numbers can be analyzed based on statistical procedures [11].

The fulfillment of indicators of the success of public open space is based on the measurement of the achievement of each variable obtained from the questionnaire. Variable measurement, which is used as an indicator of the success of public open space, is obtained from people's perceptions as measured by the mode of each variable. Mode is the most frequently occurring variable value [5], so it must consider its qualitative variation index (IQV). It is the ratio of the amount of variation observed significantly in a distribution of values to the maximum variation that can occur in the distribution [5]. IQV values used in this study must be smaller equal to 0.5 [5].

$$IQV = \frac{k(n^2 - \sum f^2)x^2}{n^2 (k - 1)} \quad (1)$$

Description: k = number of categories

n = number of cases

$\sum f^2$ = number of squares of frequency

The range taken for categories is fulfilled from 0 to <0.5. (Source: (Hariz) [5].)

3. Results and Discussions

The pattern analysis of Duren Sawit District's park utilization is calculated using IQV as described before, regarding indicators and measurement categories. The indicators fulfillment of public open space success is based on the measurement of the achievement of each variable obtained from the questionnaire. Variable measurement which is used as an indicator of public open space success is obtained from people's perceptions as measured by the mode of each variable.

Mode is the variable value that most often appears [5], so it must consider its qualitative variation index (IQV). It is the ratio of the amount of variation observed in real terms in a distribution of values to the maximum variation that can occur in the distribution [5]. IQV values used in this study must be smaller equal to 0.5 [5].

Table 1. Criteria, Variables, and Indicators for Fulfilling the Success of Parks

Criteria	Variable	Indicator	
Accessibility	Easy access to the park	Environmental Park is easily accessible by the public, both pedestrians and non-motorized vehicle users (bicycles).	The respondent mode stated that "accessed on foot and the bicycle" was achieved with $IQV \leq 0.5$
	Frequency of park visits by the community	High and repeated visits by the community to the park	The respondent mode stated daily visits with $IQV \leq 0.5$
The park's ability to provide enjoyment and attract users	The intensity of activities carried out in the park by the community,	Accumulation of mean intensity "often and very often" in response to "activities carried out in the Park"	Respondent mode stated that the intensity of visits was "very often" and "often"
	The park's level of cleanliness according to public perception.	The park's level of cleanliness according to public perception.	The respondent mode stated that the park was in a clean condition with $IQV \leq 0.5$
The park's ability to provide safety and comfort.	The park's level of security according to public perception	The park's level of security according to public perception	The respondent mode stated that the park was in a safe condition with $IQV \leq 0.5$
	Air quality according to public perception	Air quality according to public perception	The respondent mode stated that the park air was in fresh condition with $IQV \leq 0.5$
The park's ability to bind the community	The frequency level of community participation in community park events	High community participation in RT/RW or community events	The respondent mode stated that they often participated in community events in the park with $IQV \leq 0.5$
	The frequency level of community participation in community service/taking care of the park	High community participation in community service	The respondent's mode stated that they often participated in community service/taking care of the park with $IQV \leq 0.5$

Source: Processed by the authors, 2018

Table 1 shows The Criteria, Variables, and Indicators for Fulfilling the Success of Parks. The success percentage the of the Environmental Park as a public open space can be calculated using the following formula:

$$\% \text{ Success} = \frac{\text{Amount Fulfilled}}{\text{Total Indicator}} \times 100 \% \quad (2)$$

(source: Hariz) [5]

To find out the success percentage obtained in the Environmental Park is by dividing the indicators fulfilled by the overall number of indicators, then multiply by 100%. The number of indicators used are 8 indicators. The assessment of indicators fulfillment is categorized as follows: The Environmental Park is considered to be successful as a public open space if all indicators are met, which includes the criteria of a public open space. The Environmental Park is considered to be less successful as a public open space if more than equal to 50% of the variable indicators are met. The Environmental Park is considered to be unsuccessful as a public open space if less than 50% of the variable indicators are met [5].

Table 2. Success Rate of Environmental Park Utilization in Duren Sawit District
(11 Environmental Parks)

No	ENVIRONMENTAL PARK	Number of Indicators Fulfilled	Total Indicators	Success Percentage	Level of success
1	Bambu Kuning	2	8	25%	Unsuccessful
2	Cempaka	4	8	50%	Less successful
3	Cengkir	1	8	12.5%	Unsuccessful
4	Duren Sawit Indah	2	8	25%	Unsuccessful
5	I Gusti Ngruh Rai	1	8	12.5%	Unsuccessful
6	Kesenian	1	8	12.5%	Unsuccessful
7	Lembah Palembang	3	8	37.5%	Unsuccessful
8	Malaka Selatan 2	3	8	37.5%	Unsuccessful
9	Pondok Kopi 8	2	8	25%	Unsuccessful
10	Rusun Klender	0	8	0%	Unsuccessful
11	Viaduct Klender	0	8	0%	Unsuccessful

Source: Processed by the authors; 2018

Table 2 shows 11 success rate of environmental park utilization in Duren Sawit District. It can be seen from the results of the checklist and evaluation, that the success rate of Environmental Park utilization, especially the 11 object study parks in Duren Sawit District, is still far from expectations. This is dominated by the absence of activities carried out in the Park, so that The Environmental Park tends to be passive, and only functions as a green infrastructure for water absorption.

4. Conclusions

Realizing Sustainable Urban Development depends on how successful the utilization of public open space is in the study area. Based on the analysis of the Success Level of Environmental Park Utilization in Duren Sawit District as a public space, it shows that the success rate of its utilization, mainly in 11 locations of the Environmental Park study, namely Taman Bambu Kuning, Taman Kencana, Taman Cengkir, Taman Duren Sawit, Taman IG Ngruh Rai, Taman Kesenian, Taman Lembah Palembang, Taman Malaka Selatan 2, Taman Pondok Kopi, Taman Rusun Klender, and Taman Viaduck Klender in Duren Sawit District, is still far from expectations. This is due to the absence of activities carried out in the Environmental Park, whether by the park community, local residents, as well as governmental offices who can increase the sense of belonging and concern for the public space. As a result, the presence of the Environmental Park does not give an impression to the society. The Environmental Park tends to be passive because it is only used as a green infrastructure for water absorption only. In addition, the park does not have updated facilities, such as sports facilities, children's playgrounds, facilities for the elderly, facilities for disabled people, and others.

Based on field survey in 11 locations of the Environmental Park, it shows that the local residents generally want the parks equipped with additional facilities, such as chairs, trash bins, varied children's

games, trees, other sports venues. It shows a sense of concern for the neighborhood and enthusiasm. The limited green open space and the rapid increase of settlements, are not the cause of the reduced percentage of Green Open Space that is difficult to control. However, it is more important to control the percentage of Green Base Coefficient on the Area of Planning of the buildings. This has been stated in the Building Permit issued by the Government. Based on the findings, analysis, and discussion, this research recommends that The government must continue to expand Green Open Spaces. To achieve this, control is needed on building permits related to the predetermined Green Base Coefficient and can be controlled. Intense research is needed on the evaluation of public space utilization with varying time of the study (morning, afternoon, and evening), so that the data and results are as expected.

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