

CONDITION AND COMFORT OF PEDESTRIAN PATH AROUND BOTANICAL GARDEN, BOGOR CITY

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ABSTRACT

In pedestrian path, people often do the walking activities to get to somewhere, exercise, relaxing and enjoying beauty scenic. One of the famous pedestrian path in the Bogor City, is pedestrian path around the Bogor Botanical Garden (KRB). Areas around the KRB is a part of Bogor city centre. Rapid development of trade activities and services in this area, increased the use of pedestrian path around the KRB. Besides for walking, people also used the pedestrian path for various activities, such as trading, and parking. These conditions caused the comfort of pedestrian path was reduced. The objectives of this study were: a). to assess conditions and problems of pedestrian path around the KRB using 3 dimensions: i.e circulation, beauty and cleanliness, and security; b). to assess public opinion about the comfort of walking on pedestrian path around the KRB. The method that used is Multi Dimensional Scaling using software Rapfish. The result showed, conditions of pedestrian path around the KRB based on 3 dimensions are 58,71, that means condition of the pedestrian path is good enough. Public opinion about the comfort of walking in the pedestrian path around the KRB, is 58,12, that means according to public opinion, the pedestrian path is comfortable enough.

Keywords: *pedestrian path; the comfort of walking*

A. INTRODUCTION

In urban areas, transportation besides causes traffic congestion, also the largest contributor to greenhouse gases that caused global warming. Walking was the mode of green transportation, because it does not cause air pollution, such as motor vehicles. Pedestrian path, as sidewalk, is required where there are enough people to use them, as on high use area such as a downtown, and roads that classified as collectors or commercial uses (Gibbons,1990). Pedestrian paths should be separated from the bike, safe and comfortable that it becomes comfort to walk.

Bogor city is located in southeast of Jakarta, and is a part of the Jabodetabek area. Therefore, development of Bogor city is affected by the activities of cities and districts in the Jabodetabek area. Botanical garden and its surroundings are part of the Bogor city center. As a part of Bogor city center, which function as a tourism, trade and services zone, this

area has growth very rapidly. Bogor Botanical Garden (KRB) is an iconic city of Bogor. The area around the Bogor Botanical Garden (KRB) is the most attractive and frequently visited by people of Bogor city, and from outside the city of Bogor. The beauty of Bogor Botanical Garden (KRB) can be enjoyed while driving down the street or through a pedestrian path around it. Pedestrian path around the KRB is pedestrian path beside a road, or sidewalk. The pedestrian path around the KRB serves to connect the various places of activities such as offices, commercial areas, campus, housing, hospital and other.

People are walking around the KRB for many reasons, such as to work, to school, to shopping, for relaxing, for exercising, or for enjoying beauty scenic. Walking around the KRB is a pleasant activities because you can see the palace from the sidewalk on Jalak Harupat street and Juanda street. While walking around the KRB, you can see the ancient relic of colonial buildings. There are many ancient relic of colonial buildings with interesting architectural such as Post Office, Museum of Zoology, Center of Agro Industry, building of Forestry, Land Research Center, Campus IPB, official house of Mayor, building of BPN, building of Residency of Bogor (Bakorwil), Hotel Salak, office of the Mayor, school and church.

However, very unfortunate, pedestrian who through on pedestrian path around the KRB was disturbed his circulation, because the travel zone of the sidewalk has occupied by hawkers who sell some kind of goods. Besides that, in the travel zone also encountered the various obstacles, such as street furnitures, and trees. The existence of these obstacles and hawkers, are forcing pedestrians walking on the road. The question are how and what condition and problems of pedestrian path around the KRB, and how public opinion about the comfort of pedestrian paths around the KRB. Therefore_ in this paper will be discussed: a) the conditions and problems of pedestrian path around the KRB, and b) public opinion about the comfort of walking on the pedestrian path around the KRB..

B. METHOD

Pedestrian path is defined as the path provided for pedestrians in order to provide services to pedestrians, therefore is needed improvement of smoothness, security, and comfort of the pedestrians (Dep PU, 1995). Pedestrian path around the KRB is pedestrian path beside a road, or sidewalk. The pedestrian path length 4.126 km, is surrounded by four main roads, that are: Padjadjaran, Jalak Harupat Ir. H. Juanda and Otto Iskandar Dinata street. The research sites was laid on Longitude $106^{\circ}47'30''$ - $106^{\circ} 0' 48' 10''$ East, and Latitude $6^{\circ} 35'10''$ - $6^{\circ}36'30''$ South (Figure 1).

This research used primary and secondary data. The primary data acquired by field surveys on Maret-April 2010 of the physical condition and questionnaire distribution. The number of respondents determined purposively 150 peoples. In this case, the accidental

sampling technique is used. Secondary data consists of location map , literature, and standards/ regulations.

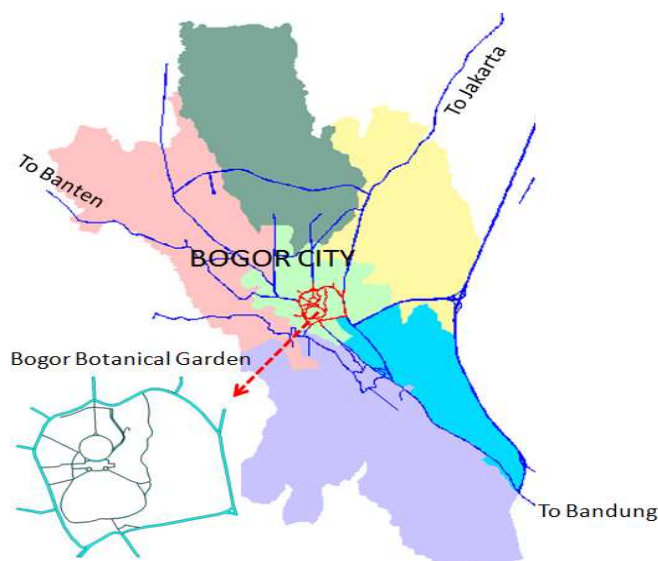


Figure 1. Bogor City

The data tabulated and compared with standard /regulation and analyzed by Multi dimensional scaling (MDS) method, using Rapfish software. To assess the condition and problems of pedestrian path around KRB, are used 3 dimensions and 17 attributes ie: circulation dimension (6 attributes); cleanliness and beauty dimension (5 attributes), and security dimension (6 attributes).These attributes showed by Table 1

Table1. Attributes of Condition and Problem Pedestrian Path Around The Bogor Botanical Garden (KRB)

Dimensions and Attributes of Pedestrian path	Criteria and Score			Exist Score
	Bad (0)	Moderate (1)	Good (2)	
Circulation				
1. Width	All of pedestrian path <1,5 m	<1,5 m in some places	All of pedestrian path >1,5 m	1
2. Pedestrian Sign	No	in some places	All of pedestrian path	0
3. Trees in travel zone	All of pedestrian path	in some places	No	1
4. Parking in travel zone	All of pedestrian path	in some places	No	1
5. Hawkers in travel zone	All of pedestrian path	in some places	No	0
6. Flower pots in travel zone	All of pedestrian path	in some places	No	1

Dimensions and Attributes of Pedestrian path	Criteria and Score			Exist Score
	Bad (0)	Moderate (1)	Good (2)	
Beauty of and cleanliness				
1. Graffiti and advertising	All of pedestrian path	in some places	No	1
2. Bad Views	All of pedestrian path	in some places	No	1
3. Good Views	No	in some places	All of pedestrian path	1
4. Garbage and smell	All of pedestrian path	in some places	No	0
5. Shade trees	No	in some places	All of pedestrian path	1
Security				
1. Crushed by trees	All of pedestrian path	in some places	No	1
2. Edge protection	No	in some places	All of pedestrian path	1
3. Poles obstruction	All of pedestrian path	in some places	No	0
4. Unstable and slippery	All of pedestrian path	in some places	No	1
5. Change in level	All of pedestrian path >1,3 cm	>1,3 cm in some places	All of pedestrian path <1,3 cm	0
6. Travel zone damaged	All of pedestrian path	in some places	No	1

Furthermore, to assess public opinion about the comfort of walking on the pedestrian path around the KRB, used 15 attributes, with score bad (0), quite bad(1), moderate(2), and good (3). Scores are determined by the largest percentage of responden's answers (showed by Table 2).

Table 2 Attributes of Public Opinion

No	Atrributes	Score Value			Eksisting score
		Bad	Moderate	Good	
1.	Circulation	0	2	3	2
2.	Obstacles	0	2	3	2
3.	Hawkers &parking	0	2	3	0
4.	Travel zone damage	0	2	3	2
5.	Disabled needs	0	2	3	0
6.	Width	0	2	3	2
7.	Safety from traffic	0	2	3	3
8.	Safety from crushed by trees	0	2	3	1
9.	Safety from falling into drainage	0	2	3	2
10.	Cleanliness	0	2	3	1
11.	Drainage conditions	0	2	3	1
12.	Cleanliness facilities	0	2	3	1
13.	Good Views	0	2	3	2

No	Atrributes	Score Value			Eksisting score
		Bad	Moderate	Good	
14.	Graffiti and advertising	0	2	3	0
15.	Bad Views	0	2	3	0

Furthermore, both were analyzed using software rapfish. Assessment of conditions and comfort using the interval of ordonansi, as followed(Table 3).

Table 3. Interval of MDS Ordonansi and Condition Status

Items	Interval			
	0 - 25	25 - 50	50 - 75	75 - 100
MDS Ordinansi	0 - 25	25 - 50	50 - 75	75 - 100
Condition status	Bad	Quite Bad	moderate	Good/comfortable

C. RESULT

1. Conditions and Problems of Pedestrian Path Around Bogor Botanical Garden (KRB)

Pedestrian path is provided to improve the smoothness, security and comfort of pedestrians (Dep PU, 1995). Therefore in this paper will discuss the conditions and problems of pedestrian path using 3 dimensions, ie: circulation, beauty and cleanliness, and security. Analysis of three dimensions as a whole, showed the condition index is 58.71 (moderate). It is means that condition of pedestrian paths around the KRB are good enough. The accuracy of the analysis are shown by the stress value of <math><0.25</math> and

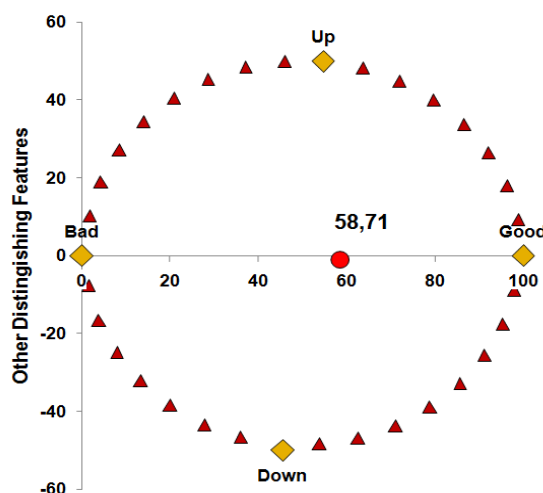


Figure 2. Condition Index of Pedestrian Path for Three Dimension

Furthermore analysis for each dimensions as follow

a. Circulation Dimension

Analysis of circulation dimension, using six attributes, showed moderate condition with index 63,49. It means that condition of circulation around the KRB is good enough. Most of circulation attributes, indicating moderate condition, except attribute of the hawkers and Pedestrian sign, that showing the bad condition. There are many hawkers that obstacle pedestrian zone. There are not any pedestrian signs as the objective information about the shared-use path conditions (e.g., grade, cross slope, surface, width, obstacles, etc). Pedestrian paths around KRB are used for various activities other than walking, such as selling petrol, fruits, pets, food, and vegetables. Even in some places there is a section of the pedestrian way in which all the parts are used to sell food. This condition occurs mainly around the entrance, which is located in the south, and west of KRB. Location of these two entrances, near Pasar Bogor and Bogor Trade Mall. The area around the KRB entrances are always crowded, especially in the morning and evening. In this area, the hawkers selling on pedestrian travel zone. Activities of the hawkers, especially on Sundays and holidays are very busy. There are several locations with pedestrian volume large enough, so that they are contact each other especially when they are in opposite directions and carry large items. This happens because pedestrian path width is narrow (<1,5 m). These conditions are worsened by placement of flower pots on the travel zone without widening the travel zone, it is very disturbing because the travel zone to be narrower and forcing pedestrians to walk on the road.

b. Beauty and Cleanliness Dimension

Analysis of dimension beauty and cleanliness, using five attributes, showed moderate condition with index 56,57. It means conditions of the beauty and cleanliness around the KRB is good enough. The dominant problem of the beauty and cleanliness dimension is garbage. Sources of garbage are hawkers, pedestrians, and trees. Besides the garbage scattered on the pedestrian paths, also found trash in the channel beside pedestrian paths. Pedestrian tend to littering, because lack of the trash along the pedestrian paths. There is a garbage container stand in the pedestrian travel zone and garbage container with garbage scattered. The garbage are not only a garbage of vegetables, but there are also animal faeces, because there are also sold rabbits. Nevertheless there is beautiful views in some parts, such as in northern part KRB which was the Bogor Palace, and in the eastern part of KRB where park in the KRB can be seen from the pedestrian paths. Bad views found in locations where the pedestrian paths are occupied by hawkers. Graffiti and advertisement taped on a tree or a wall, reduced the beauty of the scenery around the pedestrian paths.

c. Security Dimension

Analysis of the security dimension, using six attributes, showed moderate condition with index 57,14. It means that condition of the security around the KRB is good enough. The dominant problems are lack of security for disabled; obstacle as the poles; lack of edge protection along the steep grade in Jalak Harupat street; and damage of travel zone. There are change in level between pedestrian paths and the entrance of buildings, changes in level (CL) $\geq 1,3$ cm. So It is difficult for pedestrians, especially for disabled, young children and elderly. There are lack of edge protection to prevent pedestrians from falling into drainage channels that located in certain locations beside the pedestrian travel zone. The traffic sign poles, telephone poles, and street lighting poles, have obstructed the pedestrian travel zone. (See Figure 3).

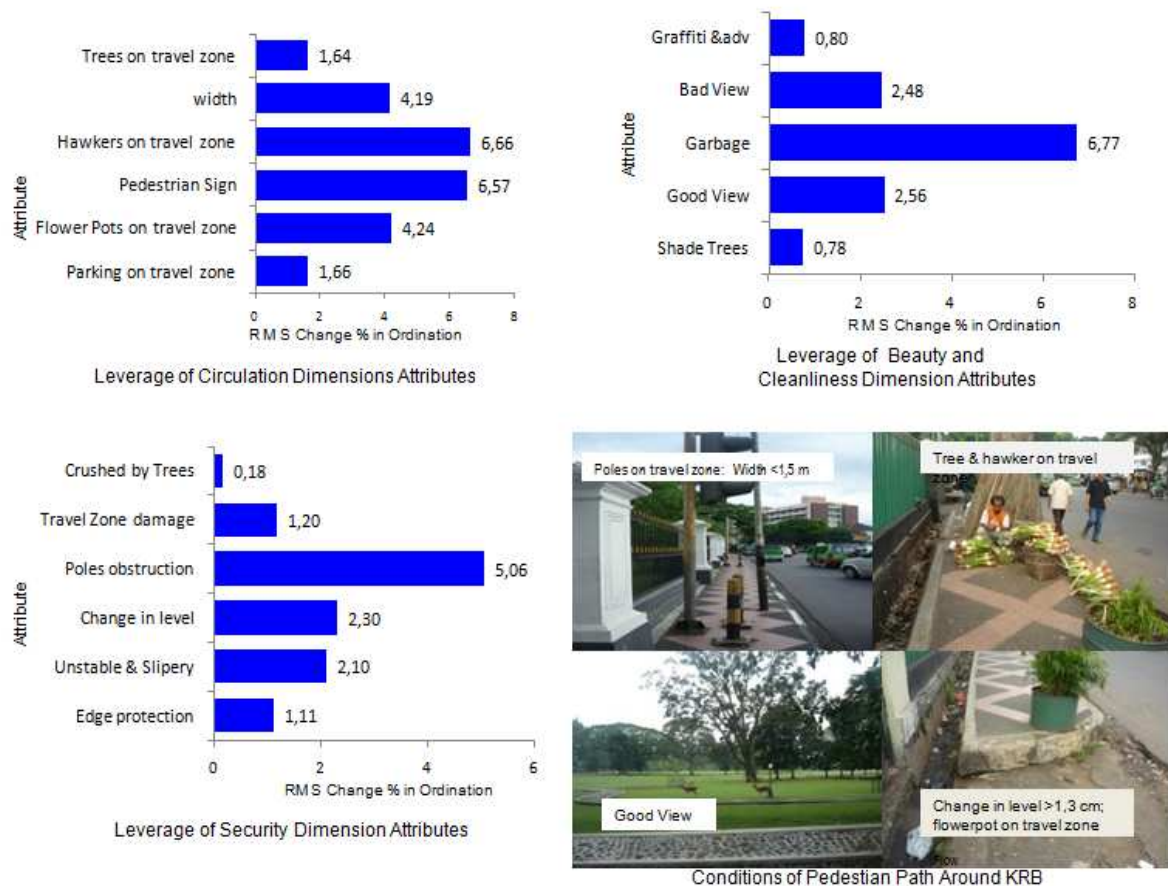


Figure 3. Condition of Pedestrian Path Around Bogor Botanical Garden (KRB)

2. Comfort of Walking on Pedestrian Paths Around Bogor Botanical Garden (KRB)

Analysis of public opinion relating with comfort of walking on the pedestrian path around the KRB showed comfort index is 58.12. (See Figure 4). This means walking along the

pedestrian paths around KRB is comfortable enough, this index is close to condition index 58,71. The dominant problem is security dimensions, the pedestrian path not yet accommodate the needs of disabled. Pedestrian path around the KRB are difficult to access by parents with strollers, pedestrians who have vision impairments, and people that using wheelchairs and other assistive devices. This conditions are shown by the pedestrian path width are too narrow (1,2 to 1,8 m.); change in level more than 13 mm; there are many obstacles on the zona travel, such as flowerpots, poles, parking and hawkers; and edge of the sidewalks are not completed by the facilities for the disabled, particularly wheelchair users. Another dominant problems are hawkers, and bad view that caused by hawkers .The hawkers not only caused the pedestrian walking on the road, but also make the pedestrian path became slum and dirty.

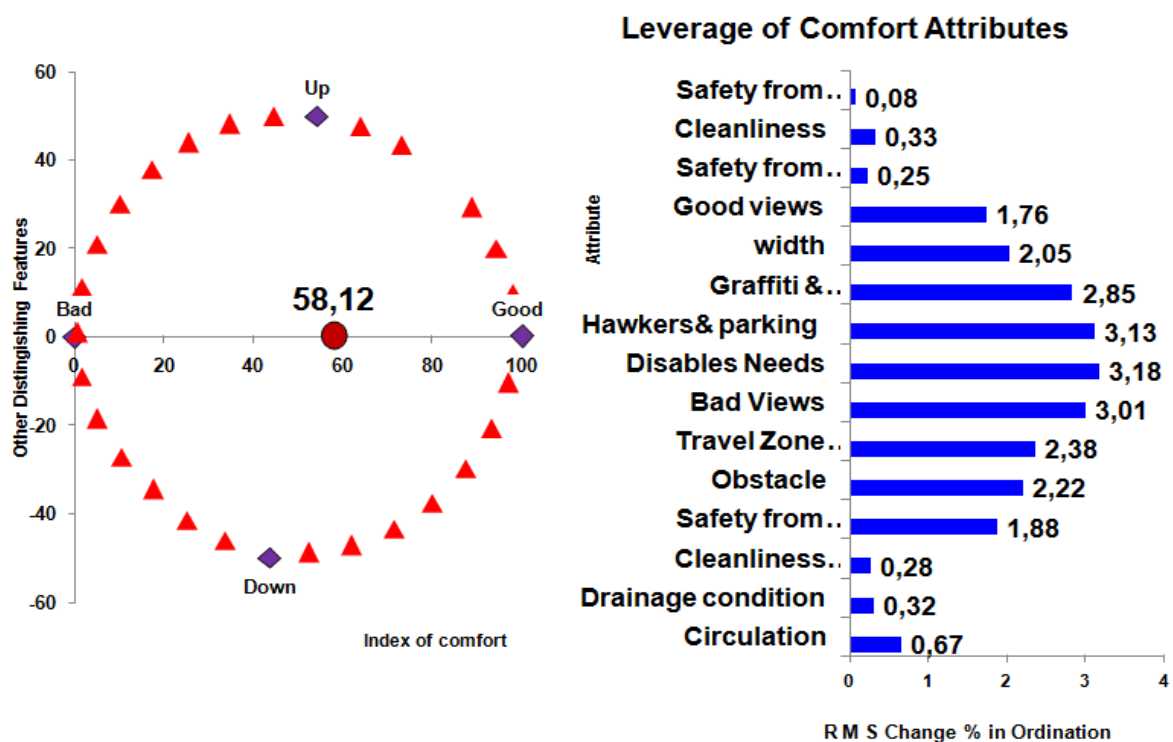


Figure 4 Index and Leverage of Comfort of Walking Attributes of Pedestrian Path Around KRB

D. DISCUSSION

Pedestrian safety is a major issue, so pedestrians must be perceive that pedestrian path is safe and secure (Gibbons,1990). In KRB, security dimension is a major problem in the pedestrian path, compare with circulation and beauty and cleanliness dimension. These problems are how to clear up many obstacle, and how to minimized the risk of tripping on slippery surface, fall in roadside ditches, crushed by a tree trunk, or from other traffic hazards. This is too many obstacles in the pedestrian zone such as pole, flower pots,

trees, motorcycle and hawkers. The surface of pedestrian zone relatively stable and smooth, but the edge protection is needed in some parts of the pedestrian path, especially along the steep grade in Jalak Harupat street. Street furnitures as traffic sign poles, telephone boxes, and flower pots should be outside the pedestrian zone, as well as shade trees, telephone poles and electric poles (Dep PU, 1995; Office of Transportation Portland City, 1998; Boodlal, 2006).

Pedestrians should reach the destination as soon as possible, that means pedestrian circulation should be smooth. The smoothness of the circulation is determined by the width of pedestrian travel zone, and lack of obstacles in the pedestrian travel zone, so that pedestrians can reach his destination without being disturbed. The width of pedestrian paths around KRB ranged from 1,2 to 1,8 m and worsened by too many obstacles in the travel zone. Minimum width of pedestrian paths tailored to the width required for pedestrian movement two people side by side, or two people who passed without contact (Dep PU, 1999). Travel zone width varies depending on usage, Office of Transportation Portland City (1998) recommended ranged between 1,5 m – 2,5 m, while Department of Public Works has been recommended that a minimum pedestrian travel zone width is 1,5 m or 1,8 m with frontage zone, for two pedestrian walking side by side (Dep PU ,1999). Placement of flower pots, the hawkers, advertising and other street furniture do not obstruct accessibility.

To create a visual comfort, the condition along the pedestrian paths, must have beautiful scenery . Pedestrian path around the KRB has beautiful scenery in some parts, and bad view in another part. Hawkers must be move, do not stay in one place, as well as advertisements, banners, etc. must placed in certain locations so they do not damage the visual comfort.

Pedestrian path must be accessible to all pedestrians (Gibbons,1990; Office of Transportation Portland City, 1998; Boodlal, 2006). So pedestrian path should be designed to serve all users. This includes children, older people, parents with strollers, pedestrians who have vision impairments, and people using wheelchairs and other assistive devices. Pedestrian path around the KRB are not accessible by all users, because the change in level from the street to pedestrian travel zone and pedestrian travel zone to the building entrance, are difficult for persons with disabilities, and children. FHWA recommended change in level between 0,6-1,3 cm (Boodlal, 2006), so that the pedestrian path must not be disturbed by change in level at the building entrance, or pedestrian crossing.

E. CONCLUSION

Pedestrian path around the KRB is slightly comfortable to use on walking because it has several problems. Dimension of the circulation, showed less smooth circulation because of too many obstacles in the travel zone, which is due to occupation by the hawkers, street furnitures, and width of travel zones in some parts that are less than standard. Dimension of the beauty and cleanliness showed a lot of garbage on the travel zone, the hawkers stall,

and graffiti on the walls that make the pedestrian path looks slum and dirty. Security dimension showed poles and obstacles such as street furnitures in the travel zone, maybe hit by pedestrians. Besides that, change in level between travel zone and entrance of building more than 1,3 cm. Pedestrian path around the KRB is not accessible by disabled, children and the elderly, because the design does not support their needs.

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