

The Role of Environmental Quality on Healthy Urbanism Planning (Case Study of Soetomo General Hospital, Surabaya, Indonesia)

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Abstract— Healthy Urbanism is a concept of urban development that supports the improvement of environmental quality such as clean air and water. This is to provide comfort for the citizens of the city. The award of e-health received by Surabaya in 2015 also encouraged the urban government's desire to develop the city's attractiveness. The concept is supported by the availability of health facilities and infrastructure that are adequate and spread out flat in the city area. One area of the hospital with the spread of health facilities are quite a lot around the Soetomo General Hospital's area. Referring to the background of the hospital, it is necessary to evaluate the environment of the hospital area. This research used direct observation to understand environmental quality in the hospital street area. This study can benefit to encourage the successful public space and comfortable environment by understanding the role of environmental quality in planning healthy urbanism.

Index Terms— Environmental Quality, Healthy Urbanism, Urban Livability.

1 INTRODUCTION

Hospitals as a health care institution have a great opportunity in giving annuities to the community. It happens through a new concept on looking at health from different paradigms. The form of the concept is the goal of Healthy Urbanism, which is change the mindset of urban people in seeing the hospital as a gathering place for the community to meet a healthy lifestyle.

Healthy Urbanism is a concept that can be used to improve a better lifestyle. The design is able to build an environment that encourages active humans and chooses sustainable travel mode. Places with the concept of healthy urbanization have the condition of healthy and comfortable city facilities in integrating hospitals with other community facilities optimally. The boundaries between health facility providers (hospitals) and extreme environments are blurred and fused. Healthy urbanism can be done through the improvement of harmonious environmental quality. One of the hospitals in Indonesia, precisely in the city of Surabaya supports the improvement of environmental quality toward the design of the concept of healthy urbanism. Surabaya received an e-health award in 2015 has prompted the government to develop the facility as a city attraction. The largest and most influential health facility in Surabaya is Soetomo General Hospital.

Soetomo General Hospital has complete and diverse health facilities. The concept of a healthcare industry that is

mutually integrated and evolved from hospital buildings. This hospital area has several problems such as traffic jam, decreasing the quality of open space and the damaged of various facilities.

Improving the quality of the environment provides opportunities for urban communities not only to create a healthy environment but also community development. The public sector plays an important role in reducing risk by providing assistance and regulation throughout the process. Environmental quality can be improved, such as pollution handling, protection against climatic, and open space. Aspects that can be used on the scale of the road (public space) to the community (environment).

2 LITERATURE REVIEW

2.1 Healthy Urbanism Concept

Opportunities for local residents and city governments are enormous to create a healthy environment and community development. The public sector provides a vital role in reducing the risk of eco-district development by providing assistance and regulations throughout the process [1]. Hospitals should be at the center of the community where people come together to take a role in improving a better lifestyle, rather than being the only place to go when ill [2]. Strengthening environmental identity through branding and design directions that reach the public sphere through assembled space, maximizing unused space, converting the function of passive space to be used as a public space.

Healthy urbanism can also be achieved by supporting proximity to nature, it will encourage sports activities, good diet, mental health, and carbon emission reduction coming from consumptive lifestyles [3]. Healthy district planning is

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the planning of the area as a hub (centre) that connects and integrates health facilities with its surroundings [4]. Healthy community design criteria can be achieved through environmental aspects. Health in urban planning can be targeted at the scale of the road (public space) to the community sphere (neighbourhood) because it is proven most effective in promoting healthy lifestyles [5].

According to the literature above, the main aspects of improving the quality of the environment that can affect health in urban space include:

- Pollution management: Public health will increase if environmental pollution levels are low. Pollution management is seen from the handling of garbage pollution and noise pollution. The noise level standard at hospital's environment area was 55 dB [6].
- Climate protection: The average condition of the weather has an effect on the comfort of the public space users so that climate protection is required. Reality is obtained from the sheltered environment of the sun and rain with optimal thermal comfort. In the principle of the development of the hospital area requires a physical environment that becomes shelter in the form of buildings and vegetation as a protector against the sun and rain [7]
- Open space planning: at least 20% of public open spatial arrangements should be greening to create a carbon sink space, improving air quality, reducing soil erosion, and providing shade to mix the sun [8]. In addition, green open spaces also encourage sports in the wild, including games to stimulate the liveliness of children and adolescents. The median and buffer as a barrier is essentially a separator without any activity on it.

3 METHODOLOGY

This study of Soetomo General Hospital's public space was conducted in 2017 and included 3 streets: Prof. Dr. Mustopo, Dharmawangsa, and Airlangga street as shown on Figure 1. Streets were chosen as the primary and direct relations with the hospital, which reflected the area zoning for the health facility.

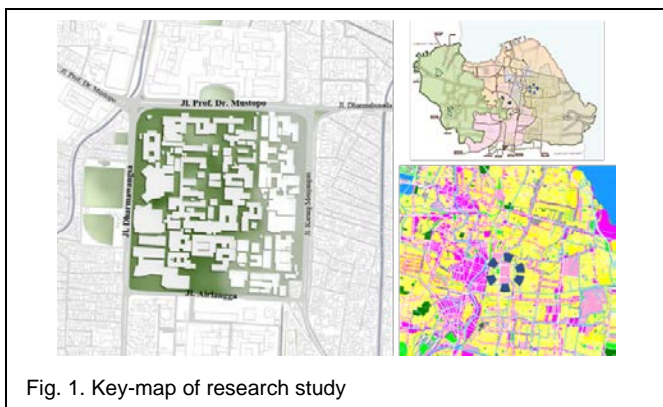


Fig. 1. Key-map of research study

This research used direct observation to understand environmental quality in the hospital street area. To understand the environmental quality of the study area, it is necessary to observe some aspects related to the concept of healthy urbanism, namely aspects of pollution, climate protection and open spaces on each streets. After observation on some aspects, then compared with the standard of literature study that has been described previously. This study can benefit to encourage the successful public space and comfortable environment by understanding the role of environmental quality in planning healthy urbanism.

4 RESULTS AND DISCUSSIONS

4.1 Pollution Management

Pollution management is one of the main aspects of improving the quality of the environment that can affect health in urban space. The description of waste pollution and noise pollution in each corridor in dr. Soetomo Hospital's Area is shown below.

TABLE 1
NOISE AND WASTE POLLUTION

Corridor	Pollution	
	Noise Pollution	Waste Pollution
Dharmawangsa street	High Avg. : 79.8 dB Max. : 85 dB	Poor many piles of garbage due to street vendors
Mustopo street	High Avg. : 78.1 dB Max. : 82.9 dB	Good enough no waste heap
Airlangga street	High Avg. : 81.7 dB Max. : 98.8 dB	Good enough no waste heap

Avg.= average, Max. = maximal; dB= decibel.

According to the noise level standard at hospital's environment area [6], the noise level on the three streets in Soetomo General Hospital's area is still high. This phenomenon is caused by traffic congestion that occurs at certain times. Airlangga corridor is the highest noise road because it has narrow road space and has a less extensive border of buildings.

The most widely found waste heap is on the Dharmawangsa corridor. This is due to a large number of street vendors found on this road corridor. The absence of zoning trade area with pedestrian way creates a slum atmosphere because of society and traders lack discipline on managing outer space.









Fig. 2. Climate Protection at Dharmawangsa Street Corridor

4.2 Climate Protection

Climate protection is one of the main aspects

of improving the quality of the environment that can affect health in urban space. The description of climate protection in each corridor in Soetomo General Hospital's Area is shown below.

TABLE 2
CLIMATE PROTECTION

<p>Dharmawangsa street corridor</p> 		<p>Strength: Distance between trees is good enough to provide shade corridor.</p>
		<p>Weakness: The root of the tree destroys the pedestrian pavement.</p>
<p>Moestopo street corridor</p> 		<p>Strength: The corridors are shaded by various tree species such as shrubs, angšana, acacias as well as some ornamental shrubs</p>
		<p>Weakness: The root of the tree destroys the pedestrian pavement.</p>
<p>Airlangga street corridor</p> 		<p>Strength: The tree types are dadap and tanjung which distance interval quite regularly to provide shade corridor</p>
		<p>Weakness: The root of the tree destroys the pedestrian pavement and the lush trees block the visual of the pedestrian pathway</p>







Referring to Table 2 above, it can be seen that climate protection in dr. Soetomo hospital's area is good enough. The study area's conditions are in accordance with [7] which states that in the principle of the development of the hospital area requires a physical environment that becomes shelter in the form of buildings and vegetation as a protector against the sun and rain. However, there are some problems caused by the presence of trees as pedestrian's shelter. The problem is the root of the tree that destroys the pedestrian pathways. The problem will greatly affect the comfortability and hospitality of the pedestrian pathways. So it needed a direction that still retains the existence of the tree as a climate protection without decreasing the comfort and hospitality of the pedestrian

pathways.

4.3 Open Spaces

Open spaces are one of the main aspects of improving the quality of the environment that can affect health in urban space. The description of open spaces available in each corridor in Soetomo General Hospital's Area is shown below.

TABLE 3
OPEN SPACES

<p>Dharmawangsa street corridor</p> 		<p>Strength: Open space on the corridor is utilized as an economic activity, such as street vendors</p>
		<p>Weakness: Street vendors activity makes the corridor look unorganized.</p>
<p>Moestopo street corridor</p> 		<p>Strength: Open space on the corridor is used as transportation activity.</p>
		<p>Weakness: The absence of street furniture along the corridor</p>
<p>Airlangga street corridor</p> 		<p>Strength: Open space on the corridor is utilized as an economic activity, such as street vendors</p>
		<p>Weakness: Street vendors activities bring up illegal parking in corridors that disrupt pedestrians.</p>

Referring to Table 3 above, it can be seen that the open space in Soetomo General Hospital's area is used as economic activity (street vendors) and transportation activity. This re-

sulted in some negative effects, such as street vendors activity makes the corridor look unorganized and bring up illegal parking that disrupts pedestrians. The condition becomes worse with the absence of street furniture along the corridor. At least 20% of public open spatial arrangements should be greening to create a carbon sink space, improving air quality, reducing soil erosion, and providing shade to mix the sun [8].

Therefore, to create healthy urbanism in Soetomo General Hospital's area formulated a direction that is able to turn open space into a functional place. Thus, an open space design is required to support various types of activities by minimizing adverse impacts to the environment and human well-being.

5 CONCLUSION

Generally, environmental conditions in Soetomo General Hospital's area has supported efforts in making a healthy area (healthy urbanism). The existence of vegetation along the corridor in the hospital area not only serves as a sheltered corridor but also as the decomposition of vehicle smoke pollution and noise pollution from passing vehicles. Nevertheless, it needs to be improved in terms of the way of placement of vegetation along the corridor as not to damage pavement and pedestrian path. So that can make the area that is not only healthy but also comfortable to pass.

Open space in Soetomo General Hospital's area is used by street vendors and pedicabs drivers and taxis to make the area unorganized. This needs to be done by organizing arrangements to provide space for street vendors to trade and space for pedicabs and taxis waiting for passengers in the Soetomo General Hospital's area. Thus, will make the area neat and comfortable.

Further research will be needed to encourage the beneficial effects of healthy urbanism. These should aim not only for further clarification of the interrelations between environmental quality and public health, but also and aim to include more lifestyle oriented control. Based on these suggestions and considerations presented in this article it would be especially important to include outdoor activities [9] [10].

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