

Green Architecture for Flat: Study Case Bekasi Flat

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Abstract— Based on GBCI Chairperson Iwan Prijanto said that the saving of electricity and water within two years in nine green buildings in building studies was very encouraging. Based on the issue. Green buildings in Bekasi must be designed in such a way as to reduce electricity and water use and support the Green Architecture program. Rusunawa Bekasi is one of the newly completed towers built in Bekasi. Green Architecture is one aspect that needs to be considered for a building for both horizontal and vertical buildings. Penuils conduct research in Bekasi Flat Housing. This method uses parameters in the form of 3 criteria from green architecture including: energy use in buildings, use of waste in buildings, energy savings in buildings. Based on the results of the analysis obtained, rusunawa located in Bekasi, have not applied Green Architecture to the building, the minimum use of solar energy that enters the unit of waste, does not recycle waste water. The conclusions that can be obtained is that it would be nice to design vertical housing, to apply Green Architecture to buildings

Keywords: *Green Architecture, apartment, architecture, lighting*

I. INTRODUCTION

Based on GBCI Chairperson Iwan Prijanto in Jakarta published on Medcom.id news, stated that the saving of electricity and water within two years in nine green buildings in building studies is very encouraging In the study, it was stated that to reduce emissions by 29 percent by 2030, the government encouraged energy efficiency improvements from buildings and buildings. Since 2012, the Provincial Government (Pemprov) of DKI Jakarta has implemented the Green Building Regulation that regulates the design of buildings and buildings, conserves electricity and water consumption, and optimizes the use of building materials IFC Global Head, Strategyand Business Development Marcene Mitchell said that green buildings provide environmental and financial benefits for developers, tenants and other stakeholders

In this day and age, green architecture is an important aspect that is considered, both horizontal and vertical

buildings. Environmental problems in general are global warming that is happening lately. In the world of architecture it is recognized by the term sick building syndrome, which is a problem of discomfort and health pollution and air quality that is occupied by residents, including natural lighting and air vents. Rusunawa Bekasi is a residential area in Bekasi, where vertical housing in Bekasi is quite limited (not much). Rusunawa Bekasi is ready to operate in December 2015 by having 2 building towers. The purpose of the study was to determine the extent of the application of green architecture in vertical occupancy, including the utilization of waste recycling, energy savings in buildings and energy utilization in Bekasi Flat Housing. The benefit of this research is that developers can pay more attention to the importance of green architecture in building vertical housing

II. MATERIAL AND METHOD

A. Literature Review

Bekasi Flat Building should follow the DKI Jakarta Regional Regulation Number 02 / PRT / M / 2015 concerning green buildings that housing buildings must have the organization and governance of green building utilization, operational standards and procedures for utilization, and preparation of guidelines for the use of green buildings for residents .

Green architecture is architecture that minimally consumes natural resources and minimally impacts negatively on the environment, which is a step to realize sustainable human life. The application of green architecture will create a sustainable form of architecture

Efficiency of energy use is aimed at achieving optimal energy levels in accordance with building functions, reducing negative impacts on the environment, and reducing costs associated with excessive energy use, including: Natural ventilation system is used as much as possible to minimize cooling loads Lighting systems in green buildings include natural lighting systems and artificial lighting systems that are used when natural lighting systems are unable to achieve minimal lighting levels Prohibition of smoking is carried out by providing non-smoking signs with a minimum radius of 10 m.

According to Priatman J in the book Energy-Efficient Architecture [1], the Paradigm and Manifestation of Green Architecture, green architecture is an architecture that has insight into the environment and is based on concerns about the conservation of a natural global environment and has an emphasis on efficiency, sustainable patterns and holistic approaches.

According to Harsono [2], there are 5 aspects that are assessed in the standard greenship, namely:

- Accuracy of site development
- Energy efficiency and energy savings
- Water saving Material and recycling sources
- Health of the dressing room in comfort

In the book Green Design for Sustainable Future, Brenda and Robert Vale paid 4 aspects of green buildings including:

Energy saving The building is designed thin and elongated to maximize lighting and can save electrical energy. Installing an electric lamp is only for those with low intensity where using the lamp only to emit the required light until certain light.

- Working with Climate (Utilizing Natural Energy Conditions and Sources) Using water and plants for climate control in buildings, for example making ponds around buildings. There are windows and roofs that can be opened to get maximum exposure and light. Maintain site conditions with the shape of the building following the shape of the site. Use local materials that do not damage buildings.

Respect for User Users and green architecture have a close relationship, namely paying attention to users who are established for their operation

Green levels in buildings can be measured based on several criteria or parameters, namely efficiency of energy use, efficiency of water use, protection of the environment, physical quality of the interior, other green aspects and design innovation. the operational phase of the building, user behavior plays a major role in energy consumption. buildings that have been designed to save energy will not work as they should if building users continue to behave wastefully in energy

Green is a term become a concept sustainable development or sustainable development as applied in industrial buildings. The 'green' architecture is architecture that considers the concept of sustainable development. Daniel [3] said that for Indonesia which has a tropical climate, it is necessary to apply the approach of six green house strategies, which include building coatings, lighting, heating, cooling, energy consumption, and waste treatment.

B. Method

Based on the above theories, the researcher summarizes these theories into the Green Architecture criteria measuring parameters in the building in table 1.

Table 1. Measuring Parameters

No	Category	Indicator
1	Aeration and Natural Lighting	Using natural air, with obtained from windows
		Light entering the room obtained from natural lighting / not lights
		Use lighting and artificial aeration if only light and natural air does not support
2	Convenience at Flat	No smoking around the building
		Installation of fish ponds around the building
		Plant trees around the building
		Does not cause air pollution
3	Building Footprint	The shape of the building is designed with
		Using material materials recycled and does not damage the environment
4	Building Users	The design of the building must also be pay attention to supporting aspects useful green architecture for users

The results of the survey data in the study location were collected and then analyzed by comparing the field conditions with the supporting theories summarized in table 1. Then conclusions were taken that explained the condition of the Bekasi Flat Building to get the results of consideration.

C. Study Case



Picture 1. Flat Bekasi

SOURCE: WWW.GOOGLEMAPS.COM

The research was conducted in Bekasi Flat Housing located in Bekasi Jaya. This location was chosen because Rusunawa Bekasi is one of the vertical housing classified as a new building. So the writer decided to take Bekasi Flat Housing as the object of research for Green Architecture

III. ANALYSIS

A. Aeration and Natural Lighting



PICTURE 2.

BEKASI FLAT SOURCE: PRIVATE DOCUMENT

The utilization of energy obtained from the sun for Green Architecture must be maximized, especially for daytime. For Rusunawa Bekasi, on each floor of the corridor area there is energy use, which is lighting from the sun even though it is not optimal. For the windows of the social unit, they get lighting from the sun and natural air, but many people use it to hang clothes in the windows so that the lighting from the sun entering the room decreases.



Picture 3. Bekasi Flat Source: Private Document

The shape of the building should be long and thin to maximize lighting into the spaces. There are 2 buildings for Bekasi Flat Housing but the shape of the Bekasi Flat Building is elongated but not thin

B. Convenience at Bekasi Flat



Picture 4. Bekasi Flat Source: Private Document

Around the Bekasi flat, there are gutters, but the gutters are not well maintained. Where a pool of water is needed as a natural resource to support green architecture. There are no signs for smoking, which are a reminder for residents not to cause pollution due to smoking.



Picture 5. Bekasi Flat Source: Private Document

Around the building there are trees. But unfortunately the planting of trees is not evenly distributed, so the location seems arid and hot. There are also windows from each room, but the air change is not optimal due to the small window size

C. Building Footprint



Picture 6. Bekasi Flat Source: Private Document

The shape of the building is appropriate and follows the shape of the site. The use of building materials has not used environmentally friendly building materials. Where for green architecture, building materials are needed that do not damage the environment.

D. Building Users



Picture 7. Bekasi Flat Source: Private Document

This Bekasi Rusunawa building has not fully paid attention to green architecture, where the green architecture with building users is very related Based on the explanation of the above analysis it can be concluded as follows:

Table 2. Green Architecture Analysis at Rusunawa Bekasi

No	Category	Indicator	Note
1	Aeration and Natural Lighting	Using natural air, with	V
		Light entering the room obtained from natural lighting / not lights	V
		Use lighting and artificial aeration if only light and natural air does not support	~
2	Convenience at Flat	No smoking around the building	~
		Installation of fish ponds around the building Plant trees around the building	V
		Does not cause air pollution	V
3	Building Footprint	The shape of the building is designed with follow existing site patterns	~
		Using material materials recycled and does not damage the environment	~
4	Building Users	The design of the building must also be pay attention to supporting aspects useful green architecture for users	~

Source: Analysis of Author, 2019

Based on the table above, of the 10 indicators of green architecture criteria, 3 of them have been reached, while 7 have not been reached.

IV. CONCLUSION

The conclusion that the writer gets after studying Bekasi Flat Housing is that the Green Architecture concept has not been applied to vertical occupancy. Green Architecture can make buildings last longer and save use for residents who live. It would be nice, Bekasi Flat Housing reduces the use of energy, reduces waste, and rearranges water use, which has a positive impact on the environment, economy, and social.

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