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Comparison of Criteria between Green Building and Non-Green Building Concept

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Abstract: Green construction is one of the strategies proposed to lessen the substantial environmental, social, and economic effect of buildings. Sustainable construction is progressively being promoted internationally. If this concept of green development is still underestimated by some communities nowadays, it is not impossible our country will lack animal and plant habitats. So, the objective of this research is to differentiate design and concept of two different buildings. In addition, to classify the characteristic features of green buildings. Finally, analyzing public awareness of green buildings is the final objective of the study. To achieve the objectives of this study, visual inspection and Google form were made. This visual inspection involved hospitals namely Jasin Hospital and Sultanah Fatimah Muar Specialist Hospital. Among the things compared between the two hospitals are energy and atmosphere, indoor environment quality, water efficiency, innovation, and sustainable sites. Both hospitals were surveyed to obtain data to be analyzed to complete this study. Google form has also been distributed and got 60 respondents. After analyzing the data, improvements need to be made in several aspects. Among the proposed improvements is to build more green buildings in Malaysia

Keywords: Green Construction, Green Development, Design, Concept

1. Introduction

Green construction is one of the strategies proposed to lessen the substantial environmental, social, and economic effect of buildings. Sustainable construction is progressively being promoted internationally [1]. However, the development of green buildings is still hampered by a lack of a proper project structure and management. In recent years, environmental conservation is increasingly neglected due to lack of knowledge about the use of green building concepts [2].

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Green buildings adhere to the principle of careful handling of natural resources, which cause environmental disturbance as possible, using environmentally friendly materials, requiring low operating energy, using renewable energy sources to meet its necessity, adhering to high-quality and longevity as a construction guideline and practicable [3]. The green building design also includes locating the balance on homebuilding and the sustainability of environment. Green buildings help conserve natural resources while improving our quality of life [4]. Green construction is typically connected with the framework and implementation of environmentally responsible and resource-efficient processes throughout the building lifecycle [5]. The green building practice expands and contributes the classical building design associated with economy, utility, durability, and comfort [6]. The green building design also includes locating the balance on homebuilding and the sustainability of environment [7].

The notion of "Green Building" is an interdisciplinary theme that encompasses a wide range of features, components, and methods that are divided into various subtopics and linked to form the green building concept [8]. Green building is normally associated with the structure and the implementation of process which are environmentally responsible and resource-efficient in building life cycle from design, construction, operation, maintenance, renovation, to demolition [9]. The goal is the planning, design, construction, and operation of buildings with utmost economizing of resources (energy, land, water and material), pollution reduction, environmental protection and provision of people with healthy and comfortable interiors use of energy, water and other resources effectively and without waste [10].

2. Materials and Methods

The materials and techniques section explains all the information needed and the items used to get the necessary data.

2.1 Materials

In this study, tools, or items to make observations on green buildings and not green buildings. First, stationery used such as pens, rulers, paper and erasers to record some information and data which were obtained from such visual inspection. Therefore, data was recorded from green buildings and make comparisons and cell phones utilized to photograph the contrast between green and non-green buildings.

2.2 Methods

i) Visual inspection was carried out

The first step in a visual inspection is to conduct an inspection on buildings that have a green building concept with buildings that do not have a green building concept. After that, comparison between the two buildings was made. This visual inspection needs to be done to clearly see the concept of green building instead of green building. After completing the building inspection and comparison, then collected data for more in -depth analysis.

ii) The collected data were analyzed

Visual inspection is the first step performed on the structure of two block buildings. This visual inspection also is done to know in more detail about the concept of green buildings and non -green buildings. The main purpose of this inspection is to compare the concept of green buildings with non - green buildings. Visual inspection characteristics may be related to the characteristics found on building, the workability structure, or the contractor. It is important to conduct a survey to achieve the objectives of the project which is to differentiate the design and concept of green buildings with non - green buildings and to classify the building features found in green buildings and to carry out because it can make extensive comparisons between the buildings of the building.

iii) Created a Google form

To analyze the awareness of the local community about green buildings, Google forms were distributed and within a period were given to be filled by the public. Then the data from the Google forms has been analyzed and the third objective of this project was achieved.

3. Results and Discussion

After conducting monitoring and visual inspection of green buildings as well as non -green buildings, data was obtained on the comparison between the two buildings monitored and inspected. From the data obtained, the data have been analyzed and it has achieved all the objectives of this study. Through the visual inspection that has been made, the design and concept of green buildings and non -green buildings can be distinguished. In addition, building features can also be classified through this study. Through Google form analysis, local community awareness of green buildings can be improved.

3.1 Design and concept of green building and non-green building.

Table 1 shows the comparison of green building and non-green building based on five types which are energy and atmosphere, indoor environment quality, water efficiency, innovation, and sustainable sites.

Table 1: Comparison of Green Building and Non Green Building

Types	Hospital Jasin, Melaka	Hospital Pakar Sultanah Fatimah, Muar
Energy and atmosphere	**Solar Pv Car Parking Canopy 72kwp**  Use 180 pieces of solar panel type of 390wp-q cell are used while 2 pieces of solar panel type Huawei inverter used on solar PV car parking canopy.	**Regular Car Parking**  Parking lots are commonly used in public places and have no privileges unless the disabled have a special place
Indoor Environment Quality (IEQ)	**Installation Of Floor Mat To Capture Dirt**  Permanently placed at entryways to capture dirt and particulate to improve Indoor Air Quality	**Installation Regular Floor Mat**  The use of regular floor mats at the entrance is for decoration only

Table 1: Comparison of Green Building and Non Green Building (Continue)

Types	Hospital Jasin, Melaka	Hospital Pakar Sultanah Fatimah, Muar
Water efficiency	**Rainwater And Ro Water Harvesting Systems**  This system serves as a water collection centre and is used for watering trees around Hospital Jasin and to wash the car.	**Pipe Channel**  Using regular tap water tanks for daily use in hospitals and outdoor activities such as watering trees and washing cars
Innovation	**Bike Station**  Provide transport facilities such as bicycles for staff to move to other places more easily	**No Transport Provided**  No transports facilities provided for staff to move easily
Sustainable sites	**Protect And Restore Habitat**  A sustainable site design considers the building's influence on the surrounding environment and its intended inhabitants.	**Main Emplacement**  A main site plan that only takes into account the beauty and neatness aspects of the building

3.2 Awareness of the local community about green buildings.

Figure 1 and **Figure 2** shows the results of the Google form answered by a total of 60 respondents. Among the questions discussed in the Google form are the challenges of building green buildings and ways to apply green buildings.

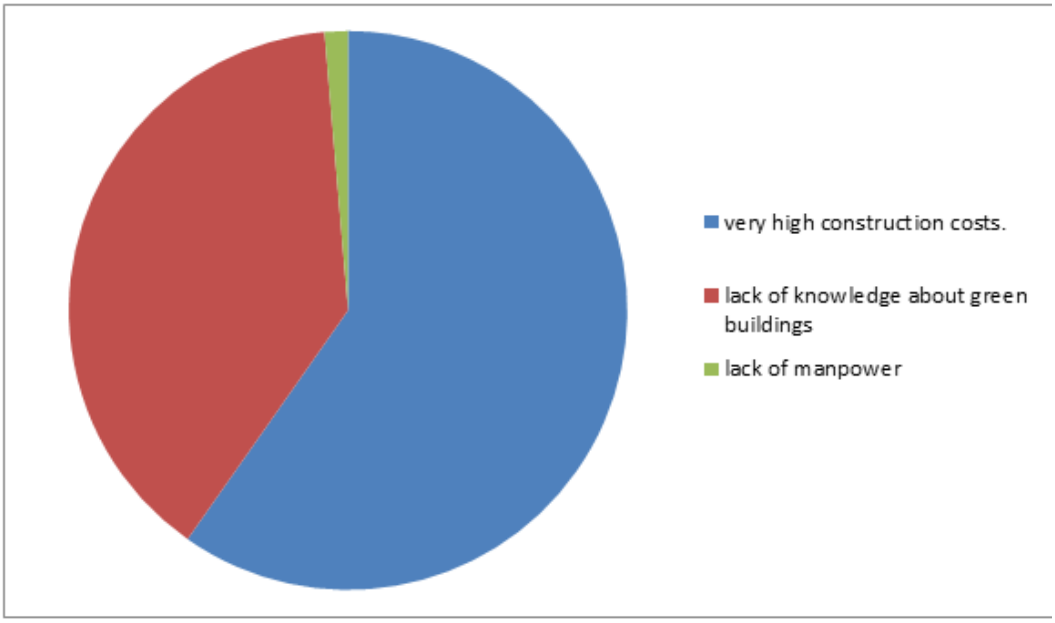

Figure 1: The challenges of building green buildings

From the data obtained, a total of 23 respondents equivalent to 44.23% think that the challenge faced by Malaysia to build green buildings is due to the very high construction costs. A total of 15 people from respondents equivalent to 28.8 % answered the lack of knowledge about green buildings is a challenge in the development of green buildings in Malaysia. Each one respondent equivalent to 1% answered the lack of manpower; the authorities take a low view of green buildings, lack of funds resulting in insufficient supply and lack of technology. These are among the challenges of green building construction stated by respondents

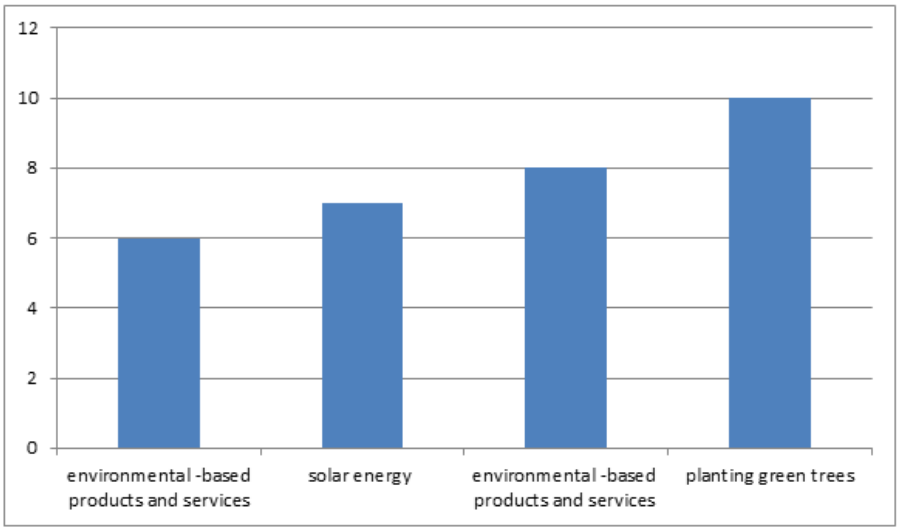

Figure 2: Ways to apply green buildings

A total of 7 people out of 60 respondents gave answers related to the use of solar energy for how to apply the characteristics of green buildings in the environment while a total of 10 respondents thought that planting green trees in the surrounding area is a way to apply the characteristics of green buildings. There are also some respondents who answered that the use of environmental -based products and services is a way to apply the characteristics of green buildings to the environment. In addition,

respondents also answered that reducing pollution, waste and environmental problems are also one of the ways.

4. Conclusion

In conclusion, the design and concept of green buildings with non -green buildings can be seen and distinguished by conducting a survey on the building. With that, it is possible to see in more depth about the features and systems used for energy saving and in turn can reduce induction and atmospheric. In addition, the features used can be further classified and specified. By conducting a survey of the building, it can be seen clearly how each environmentally friendly system works such as solar panels and rainwater collection points and can even find out about the amount of energy savings and costs that are very much up to 50% savings.

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References

[1] J. Zuo and Z. Y. Zhao, “Renewable and Sustainable Energy Reviews”, vol. 30, pp.271281, 2014.

[2] A. Darko and A. P. Chan, “Review of barriers to green building adoption,” Sustainable Development, vol. 25, no. 3, pp. 167-179, 2017.

[3] L. Ye et al., “Developments of green building standards in China,” Renewable energy, vol. 73, pp. 115-122, 2015.

[4] Chan, “Critical barriers to green building technologies adoption in developing countries: the case of Ghana”, vol. 172, pp. 1067-1079, 2018.

[5] T. R. Rider et al., “Understanding green building materials. WW Norton & Company, 2011.

[6] H. Omid and M. Golabchi, “A review on green building architecture utilizing environmentally friendly energy-saving technologies,” In 5th National Conf. & 1st Int'l Conf. on Research in Civil Engineering, 2018.

[7] T. Khodadadzadeh, “Green building project management: obstacles and solutions for sustainable development,” Journal of Project Management, vol. 1, no. 1, pp.21-26., 2016.

[8] M. Samer, “Agricultural Engineering International,” The CIGR e-journal,vol. 15, no. 2, pp.25-46 , 2013.

[9] Z. J. Zhang, “Goals and Operation of Green Building. In Applied Mechanics and Materials,” Trans Tech Publications Ltd, vol. 438, pp. 1706-1709, 2013.

[10] P. O. Akadiri et al., “Design of a sustainable building: A conceptual framework for implementing sustainability in the building sector,” Buildings, vol.2, no.2, pp.126-152, 2012.