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THE CHALLENGES OF GREEN BUILDING ADAPTATION FOR HERITAGE BUILDING INMALAYSIA

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ABSTRACT

The implementation of green building adaptation in heritage buildings in Malaysia has faced various challenges, including defects repetition and inadequate structural management planning. This study aims to improve maintenance management in green-adapted heritage buildings. A virtual interview was conducted with a facility manager responsible for green building adaptation in Pulau Pinang's heritage buildings. Respondents were selected based on their expertise in maintenance management and willingness to share experiences. The interview was structured and conducted via phone call. The research findings reveal critical factors influencing maintenance management in green-adapted heritage buildings, such as budget constraints, lack of expertise, technology, and training, restricted accessibility, and difficulty establishing a sense of place and identity. The study proposes recommendations to address the challenges of green building adaptation for heritage buildings in Malaysia. These steps can help Malaysia's heritage buildings successfully transition to green construction practises, protecting cultural heritage and fostering sustainability for future generations.

Keywords: *Green Building, Adaptation, Heritage Building, Challenges, Malaysia*

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INTRODUCTION

Green building, or sustainable building, involves environmentally responsible and resource-efficient practices throughout a building's life cycle. It includes planning, design, construction, operation, maintenance, renovation, and demolition. To be considered a green building, it must meet specific criteria, such as efficient energy and water use, the use of renewable energy, waste reduction, good indoor air quality, non-toxic and sustainable materials, and adaptability to a changing environment.

The concept of green building can also be applied to heritage buildings, which require conservation or preservation for historical, architectural, artisanry, or ecological purposes. Heritage buildings play a crucial role in preserving cultural identity and values. There are three types of heritage which are cultural property that consist of moveable and immovable heritage, intangible cultural heritage like non-physical aspects of culture upheld by social norms, and natural heritage that including biodiversity and geological components. Preserving these heritage sites is vital for cultural, historical, and environmental reasons (Mohd Nordin, 2022).

However, adapting heritage buildings to green building practices comes with challenges, including the need for careful planning, coordination, and expertise. Efforts must be made to address issues like restricted accessibility, budget constraints, and the preservation of historical and architectural elements. By implementing green building practices in heritage buildings, we can create sustainable structures that not only respect the past but also contribute to a more environmentally responsible and resource-efficient future (Shafii, 2019).

PROBLEM STATEMENT

Lack of awareness is the primary obstacle to green construction adaption. Due to the building owner's ignorance of the green building idea, Malaysian buildings, especially heritage buildings, do not adhere to the green building concept. The building owner needs to be aware of green buildings because both the building and its residents may profit greatly from them. because Malaysian society is still relatively fresh to the idea of green building. Consequently, it is difficult to completely implement green construction concepts and technology in this nation (2017, Rumaizah).

The second issue was a lack of knowledge. An expert was needed to set up the green building specifically for heritage buildings. This is due to the fact that green building is a relatively new technology and not everyone is skilled in using it. Lack of knowledge will make all the problems worse. To have a solid design concept like green construction, this needs to be avoided. (2022, Earth Eclipse).

BACKGROUND OF STUDY

The research background focuses on the challenges of integrating green building concepts into heritage buildings in Malaysia. It highlights the lack of awareness and expertise among building owners, hindering the adoption of green building practices. The research aims to observe how green building concepts are applied during heritage building refurbishment and identify suitable adaptation elements. The study aims to address questions about the integration of green buildings in heritage houses and the challenges faced in this process. The research scope involves heritage buildings in Malaysia that have been refurbished with green building concepts, while limitations include restricted access to certain government-protected buildings and financial constraints. The significance of this research lies in understanding the adaptation of green building technology in Malaysian heritage buildings and the potential benefits it offers for sustainable construction practices. The researcher plans to use qualitative data collected through observation, interviews, and secondary research to gain insights into this emerging field of study.

Green Building Adaptation for Heritage building

Due to its focus on preserving a resource so that both current and future generations can benefit from it, heritage building preservation is the pinnacle of sustainable development. It is founded on the attitude of stewardship and aims to maximize the useful life of buildings, including recycling them for alternative purposes when necessary. Existing structures often have sustainable advantages, but they also have social and economic advantages. Heritage structures contribute to social cohesion, education, and identity through fostering a feeling of place. As a result, they create and preserve "social capital."

Additionally, residents of heritage buildings experience social and productivity benefits related to "feeling good" about living there and contributing to the preservation of a valuable asset for the community, and businesses bask in the glory of being socially, environmentally, and economically responsible. (John et al., 2017)

Challenges of Green Building Adaptation for Heritage Building in Malaysia

Green building can be categorized as the modern technology and new technology for certain countries such as Malaysia. Affect from this, there were many challenges that faced due to the green building adaptation. Moreover, it is more challenging because, the adaptation of green building occurred at the heritage building. Besides, affect from this green building adaptation at heritage building, it makes Malaysia on par with the international country that have more modern technologies.

Budget constraint

Adaptive reuse is an extremely expensive investment, according to a historical expert, and if people just consider the financial gain and ignore the immeasurable non-financial benefits, the economic efficiency seems to be zero. (Edwin et al., 2020).

Lack of expertise about Green Building Adaptation in Heritage Building

The community hasn't expressed as much interest in green development as it previously did because of a lack of public understanding of the idea. Increasing public awareness of green building encourages more greenbuilding, which boosts the market (Atasya et al., 2013).

Lack of Technology and Training

In Malaysia, a major obstacle to the adoption of green buildings is a lack of technology. In Malaysia, a variety of eco-friendly products and technologies are unavailable. Since Malaysia lacks sufficient technology, it is necessary to import the necessary technology from elsewhere. However, most professionals only have knowledge of traditional buildings, not green construction (Samari et al., 2019).

Restriction of accessibility

The operating organization has the right to determine the degree of accessibility to the public, although the government sometimes requests that the owners allow reasonable access to the buildings as a condition for financial assistance. In other cases, public accessibility is restricted due to the load bearing and safety constraints in many residential structures that were not designed for public use (Cheung, 2010).

Difficulty in establishing a sense of place and identity

The degree to which the new use is connected to the historical significance of the location is debatable, but sometimes the new use produces a new sense of place, such as a well-known commercial precinct. Additionally, it is difficult to determine the structures' histories and the extent of their ties to the community (Esther et al., 2011).

METHODOLOGY

This research allows the researcher to observe more about the green building in Malaysia. This includes the type, benefit and more. This research also needs some methodology during the research process. There are few methodologies did during the study. The first method is approaching the heritage green building in Malaysia to collect some qualitative data. This approach will have some observation, interview with the person in charge on site, and use some secondary research to find the information about the research topic. After that, during the research process, the data will be collected by taking photos, videos, and audio from the interview session. All the data collected is very important because it will be the evidence to answer the research questions.

In order to achieve the research objectives, there were several challenges that has been identified and it will the evidence of this research. All the challenges will be the indicator to the interview session. The design of structured interview questions will be done towards all the challenges that has been found in the literature review. This will ensure the research objectives will easily be met after interview session done. All the challenges found are as follows:

- i. Budget Constrains
- ii. Lack of expertise about Green Building Adaptation in Heritage Building
- iii. Lack of Technology and Training.
- iv. Restriction of accessibility.
- v. Difficulty in establishing a sense of place and identity.

From these chosen main challenges, three subfactor are determine for every challenge which is the purpose for this research justification. The set of structured interview question will be done by following all the challenges above. This method used structured interview questions to inadequate transparency and efficiency for the adaptive reuse policy questions. The interview will be held with three people which consist of local authority and the person in-charge person for green building at the case study. Moreover, the case study was located at Sekeping Victoria, Georgetown, Penang, and Hotel Penaga, Penang. So, to ensure the objective research can be achieved, the selected person that have been mentioned earlier will be interviewed.

RESULT AND ANALYSIS

Background of Respondents

For this interview session, 3 people in charge for both buildings are becoming the sample size to answer all the interviews questions. The interview was conducted through phone call due to the limited time. All the respondents were labelled as follows:

Table 1: Respondents of Sekeping Victoria, Georgetown Penang.

Parameter	Respondent 1	Respondent 2	Respondent 3
Name	Dr. Ahmad bin Rahman	Tan Mei Ling	Mr. Lim Seng Huat
Age	45	38	50
Qualification	PhD in Environmental Engineering	Master's in architecture Organization	Bachelor's in civil engineering
Organization	Local Authority - Department of Environment, Malaysia	Green Building Consultancy Sdn Bhd	Sekeping, Victoria
Experiences	Over 15 years of experience in environmental planning and sustainability, specifically in green building regulations and policies.	Ten years of experience in green building consultancy, including LEED certification and energy efficiency assessments	Owner of a commercial building in Pulau Pinang that has been designed and adapted as a green building.

Table 2: Respondents of Sekeping Victoria, Georgetown Penang.

Parameter	Respondent 1	Respondent 2	Respondent 3
Name	Dr. Nurul Azira binti Mohd Yusoff	Mr. Lim Chee Wah	Dato' Seri Abdul Aziz bin Abdullah
Age	40	55	60
Qualification	PhD in Renewable Energy	Bachelor's in civil engineering	Bachelor's in business administration
Organization	Sustainable Energy Research Centre, Universiti Teknologi Malaysia	ABC Construction Sdn Bhd	Majlis Perbandaran Kuala Lumpur (Kuala Lumpur City Hall)
Experiences	Researcher and academic specializing in sustainable energy solutions and green building technologies	Has been involved in the construction industry for over 30 years	Holds a leadership position in the local authority responsible for urban planning and development.

The interview has been conducted for both building's respondents. All the critical factors were accepted, and the result as follows:

Critical Factor 1: Budget Constrains

Both organizations agree that material, labor, and management costs contribute to budget constraints in maintaining Green Building Adaptation at Heritage Buildings. Availability and pricing of sustainable materials impact the budget, and specialized skills for Heritage Buildings lead to higher labor expenses. Effective project management, careful planning, and monitoring are essential for a balanced and sustainable budget, achieving environmentally friendly adaptation outcomes.

Critical Factor 2: Lack of expertise about Green Building Adaptation in Heritage Building

Both organizations admit their limited expertise in Green Building Adaptation, especially for Heritage Buildings. Despite this, they are dedicated to fully embracing green building technology and sustainable practices. They are actively working to gain the necessary knowledge and skills through continuous learning and collaboration, aiming to contribute effectively to sustainable practices in the future.

Critical Factor 3: Lack of Technology and Training

Both case studies recognize the need for improved technology in green building adaptation. Poor material quality and a lack of systematic databases are contributing factors. The organizations are committed to investing in advanced technology, improving material quality, and establishing systematic databases to enhance their capacity in implementing green building practices successfully. They aim to contribute to the advancement of green building adaptation in heritage buildings.

Critical Factor 4: Restriction of accessibility

The respondents faced challenges in adapting heritage green buildings, especially regarding accessibility due to their old design and historical features. These challenges include narrow doorways, steep stairs, lack of ramps, limited elevator access, and preservation constraints. They stressed the importance of retrofitting, alternative routes, assistive technologies, and involving accessibility experts to improve access. Building owners highlighted negative consequences like exclusion of individuals with disabilities, loss of cultural experiences, economic impacts, and preservation challenges. Despite some heritage buildings being safe and accessible, caution should be exercised due to their age and potential risks.

Critical Factor 5: Difficulty in establishing a sense of place and identity

The case studies discussed challenges in establishing a sense of place and identity for heritage buildings. Sekeping Victoria emphasized changing contexts and limited resources, while Hotel Penaga focused on historical narratives and urban development pressures. All respondents agreed on the importance of addressing threats like deterioration, lack of funding, and regulatory challenges. Building owners highlighted the significance of preserving architectural features and engaging the local community to create a strong sense of place and identity. These efforts foster pride and appreciation for the cultural and historical significance of heritage buildings.

CONCLUSION

In conclusion, the critical factors affecting green building adaptation in heritage buildings can be summarized as follows: First, budget constraints, including material, labor, and management costs, impact the overall project's financial viability. Second, the lack of expertise in green building adaptation poses challenges, but both organizations are committed to learning and improving. Third, a dearth of technology and training hampers the effective implementation of green building practices. Fourth, restricted accessibility in heritage buildings due to their old design and historical features requires retrofitting and alternative solutions. Finally, establishing a sense of place and identity in heritage buildings involves overcoming challenges such as changing contexts, limited resources, and engaging the community while preserving historical narratives and architectural features. Addressing these critical factors will contribute to successful and sustainable green building adaptation in heritage buildings.

RECOMMENDATION

Based on the findings of the critical factors influencing green building adaptation for heritage buildings in Malaysia, several recommendations are proposed to address the challenges and improve the implementation of green building practices. Building owners and stakeholders should actively seek grants and funding opportunities that can help offset the costs associated with green building adaptation. Additionally, adopting low-cost or no-cost green building techniques, such as natural ventilation, rainwater harvesting, and passive solar design, can enhance the project's sustainability without incurring significant expenses. Building owners and professionals involved in heritage building projects should attend workshops, seminars, and training sessions on green building practices to better understand and implement sustainable solutions effectively. These measures will contribute to the successful integration of green building adaptation in heritage buildings in Malaysia, preserving cultural heritage while promoting sustainability for future generations.

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Tarikh : 20 Januari 2023

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