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A STUDY ON GREEN BUILDING ELEMENT ADAPTATION AT GREEN CERTIFIED SHOPPING MALL

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ABSTRACT

This research study investigates the implementation of green building elements in existing shopping malls to promote sustainability and reduce environmental impacts in the retail sector. By analyzing green certified shopping malls, the study identifies key elements and provides recommendations to overcome implementation challenges, contributing to sustainable building practices. The research methodology employs a quantitative approach, using online questionnaires as the primary data collection method, supplemented by secondary data from literature reviews. The findings reveal that green building elements such as proximity to public transport, natural lighting, and smart building systems are commonly adopted Ultimately, this study offers practical solutions to guide the construction and retail industries towards more sustainable building practices, thereby supporting a greener future.

Keywords: *"Green building element*

INTRODUCTION

Green building practices have gained significant attention in recent years as a means to reduce environmental impacts and promote sustainable development. Green buildings prioritize water conservation, energy efficiency, resource conservation, waste reduction, and healthier indoor environments. They incorporate techniques such as passive solar design, active solar systems, green roofs, and rainwater management to utilize renewable resources and minimize environmental harm. By adopting these practices, green buildings contribute to a greener and more sustainable future. (Liu et al., 2022)

One important aspect of green building is the certification of green products. These certifications validate that a product meets specific environmental standards and provide assurance to consumers, designers, and specifiers. Independent third-party certifications, recognized by comprehensive green building rating systems like LEED, Green Globes, and BREEAM, carry greater credibility as they are not affiliated with product manufacturers. These certifications evaluate factors such as energy use, recycled content, and emissions throughout a product's life cycle, ensuring that the environmental claims made by the product are accurate. (LEED Certification for Retail | U.S. Green Building Council, 2023)

In the retail sector, green shopping malls have emerged as environmentally friendly alternatives. These malls prioritize low-carbon materials, energy-efficient designs, and eco-friendly product offerings. By implementing smart building management systems, they optimize energy consumption, lighting, and air conditioning, resulting in reduced electricity usage and increased profitability. As consumer demand for green and healthy lifestyles continues to grow, green shopping malls provide appealing choices that promote sustainability and offer an eco-friendlier lifestyle. (Kuang, 2009)

LITERATURE REVIEW

Green building development in Malaysia primarily focuses on areas such as Kuala Lumpur, Putrajaya, and Selangor. The 10th Malaysia Plan serves as a foundation, introducing the AFFIRM frameworks, covering awareness, faculty, finance, infrastructure, research, and marketing. These frameworks aim to create a comprehensive ecosystem for environmental sustainability, particularly in terms of green building initiatives and the development of green townships, starting with Putrajaya and Cyberjaya (Shahrul Nidzam Rozali, 2013).

In response to growing concerns about sustainable construction and green buildings, Malaysia has taken significant steps. The Malaysian Construction Industry Master Plan (2005–2015) recognizes the importance of promoting sustainable development

and green buildings. Both the government, led by the Construction Industry Development Board Malaysia (CIDB), and the business sectors are actively involved in this endeavor. They have established a technical committee and an eco-label task force to create guidelines for sustainable construction and green buildings, along with an eco-label accreditation scheme for construction materials (Kamar & Hamid, n.d.).

Recent years have witnessed the completion or commencement of various green construction projects in Malaysia, including office buildings, shopping malls, hospitals, and residential complexes. These projects aim to reduce energy consumption, enhance water efficiency, improve indoor air quality, and utilize environmentally friendly materials. Although public awareness of the environmental benefits and cost-saving measures in commercial buildings used to be limited, there is now a growing understanding of the importance of green construction. This highlights the need for innovative approaches that prioritize the comfort of building occupants. According to Singh et al., green buildings tend to be more ecologically friendly, pleasant, and productive. Green construction presents a viable solution to address environmental concerns and contributes to building sustainability while reducing indirect impacts on human health and the natural environment.

Green building element based on Green Building Index(GBI)

The Green Building Index (GBI) in Malaysia, established in 2009 under the auspices of Pertubuhan Arkitek Malaysia (PAM) and the Association of Certified Engineers (ACEM), serves as a local green building rating system. This comprehensive system evaluates the environmental design and performance of buildings based on six main criteria. The first criterion, energy efficiency (EE), aims to reduce energy consumption and carbon dioxide emissions. It involves implementing an energy management system, using efficient lighting, high-efficiency HVAC systems, and integrating renewable energy sources like solar panels. The second criterion, material & resource (MR), promotes the use of eco-friendly materials and effective construction waste management, encouraging the use of sustainable materials and providing recycling stations.

The third criterion, water efficiency (WE), focuses on water conservation and protection. Rainwater harvesting, water-saving fixtures, leak detection, and waterless urinals are some of the strategies employed to achieve this. The fourth criterion, indoor environment quality (IEQ), ensures a high indoor environment quality by considering indoor air quality, acoustic control, daylighting, and thermal comfort. The fifth criterion, sustainable site & management (SM), emphasizes suitable locations, stormwater management, and transportation options that support sustainable development. Lastly, the sixth criterion, innovation, encourages the integration of GBI requirements into designs and the incorporation of innovative elements like smart building systems and water treatment/recycling solutions. By adhering to these components, retail buildings can achieve GBI certification and contribute to a greener and more sustainable built environment in Malaysia.

METHODOLOGY

The data collection method for this research will primarily involve a literature review to gather secondary data from sources such as journals, articles, websites, and previous studies. This approach will provide valuable insights and knowledge on the implementation of green building elements in shopping malls in Malaysia. Additionally, a quantitative data collection method will be used through a survey.

questionnaire administered to facility management personnel. The objectives of the study are to determine the key element of green building element at green certified shopping mall.The questionnaire will gather specific information on the key green building elements adopted in selected shopping malls, allowing for the collection of direct responses from individuals involved in green building initiatives. This combined approach will provide a comprehensive understanding of the current state of green building practices in shopping malls.

Case study

Table 1: Case Study Selected

CASE STUDY	MyTown Shopping Centre	IPC Ikano Shopping Centre	Setia City Mall
LOCATION	Kuala Lumpur	Petaling Jaya, Selangor	Shah Alam, Selangor
BUILDING STATUS	Certified Green Building Silver Rated	Green Building Index (GBI) certificate	Green Mark Gold Award

FINDING AND RESULT

In this study, a total of 45 individuals from the facilities management team at My Town Shopping Centre, IPC Ikano Shopping Centre, and Setia City Mall participated by filling out a questionnaire.The data collected from the questionnaire responses were analyzed to address the research objectives, which focused on identifying the key elements of green building implementation and the challenges encountered in the process. These three shopping centers were chosen as case studies due to their successful implementation of green building elements. The analysis of the data obtained from these case studies will provide valuable insights into the green building practices in the selected shopping malls.

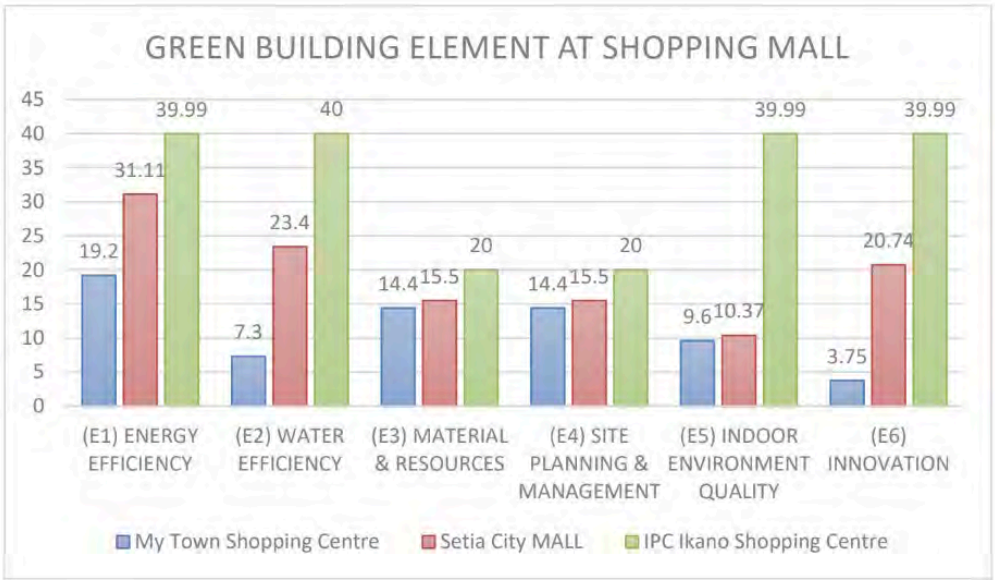

Figure 1: Green Building Element at shopping mall

The summary outlines the findings of a case study conducted on three different shopping centres: My Town Shopping Centre, IPC Ikano Shopping Centre, and Setia City Mall, with a focus on several green building elements. The study surveyed respondents to determine the presence of eco-friendly features in three shopping centers: IPC Ikano, Setia City Mall, and My Town. Regarding energy efficiency (E1), IPC Ikano and Setia City Mall utilized LED lights (31.11% and 39.99% respectively), while My Town did not. Solar panels and high-efficiency HVAC systems were present in all three centers, totaling 90.3% of respondents. For water efficiency (E2), rainwater harvesting was found only in IPC Ikano and Setia City Mall, while sensor-activated faucets were present in all three, reaching 70.6% of respondents. Leak monitoring devices and waterless urinals were exclusive to Setia City Mall, accounting for 10% of respondents. Recycling stations were implemented in all three centers, confirmed by 70% of respondents. In site planning and management (E4), stormwater management was not reported, but all centers were near public transport, chosen by 50% of respondents. Skylights were present in My Town and Setia City Mall (60%), while sound-absorbing materials were exclusive to Setia City Mall (13.33%). Plenty of windows were observed in My Town and Setia City Mall confirmed by 60% of respondents. For innovation (E6), integrating smart building.

systems and automation technology were seen in My Town and Setia City Mall, totaling 70.33% of respondents. Water treatment and recycling were reported in both centers, with 70.33% of respondents confirming their presence. EV Car Charging was present in My Town and Setia City Mall (9.6% and 13.33%). The study highlights varying degrees of green building element implementation across the three shopping centers, with some elements garnering higher adoption percentages than others.

Overall, respondents generally confirmed the presence of green building elements, indicating their importance in achieving green building certification for shopping malls.

Figure 2: Green Building Criteria

Based on the table, it was found that the majority of 45 respondents wit percentage (100%) from the three different case studies reported that their buildings have adopted all these green building elements criteria , including energy efficiency, water efficiency, material & resource, indoor environment quality, and innovation. However, for site planning and management, only 50% of respondents indicated that this green element was implemented in their buildings, while the remaining respondents stated that their buildings did not adopt this particular type of element which is implement Stormwater management at their building . According to this data

it is confirmed that all these six green building elements were the key to the green building element for shopping mall building. Where the answer from the respondent for these green building elements stated that all these criteria has been implement at their building which confirm that these green building element criteria were the key element of green building element that adopted at green certified shopping mall and also answered the research objective 1 for this study.

CONCLUSION

This research study concludes that the selected shopping centers, My Town Shopping Centre, IPC Ikano Shopping Centre, and Setia City Mall, have successfully implemented various green building elements, promoted sustainability and reduced environmental impacts in the retail sector. The majority of respondents (100%) confirmed the presence of all green building elements in their buildings, indicating a strong commitment to sustainable practices. Energy efficiency measures, water conservation strategies, and improved indoor environment quality were among the implemented elements. However, site planning and management elements were reported in only 68.9% of the surveyed buildings, suggesting potential areas for improvement. The study emphasizes the importance of certifications like the Green Building Index (GBI) and recommends further education, training, and innovative approaches to enhance sustainable building practices in the retail industry, contributing to a greener and more environmentally responsible future in Malaysia.

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