Journal of Tourism, Hospitality and Environment Management
JTHEM
EISSN: 0128-178X
Volume 6 Issue 26 (December 2021) PP. 105-110
DOI 10/35631/JTHEM.626008

JOURNAL OF TOURISM, HOSPITALITY AND ENVIRONMENT MANAGEMENT (JTHEM)
www.jthem.com

A REVIEW OF MALAYSIAN SUSTAINABLE BUILDING ASSESSMENT TOOLS: THE SOCIAL DIMENSION

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Article Info:

Article history:
Received date: 01.10.2021
Revised date: 01.11.2021
Accepted date: 15.11.2021
Published date: 01.12.2021

To cite this document:

Mansor, R., & Low, S. T. (2021). A Review of Malaysian Sustainable Building Assessment Tools: The Social Dimension. *Journal of Tourism Hospitality and Environment Management, 6* (26), 105-110.

DOI: 10.35631/JTHEM.626008.

Abstract:

Building assessment tools have been introduced for nearly two decades to specifically recognize buildings performance towards sustainable development goals. However, the requirements to achieve sustainability in buildings are mainly focused on the environmental and economic aspects, while the significance of social aspects has been scarcely emphasized in many building assessments tools. This paper presents a review of social aspects in the sustainable building assessment tools adopted in Malaysia. In total, four building assessment tools are selected and discussed with the aim to identify to what extent the building assessment tools cover the social dimension. The results of the content analysis indicate that the assessment tools have included partial criteria of social aspects but the scope could further expand to preserve the key features of the social aspects including quality of life, human health, and environmental satisfaction. The findings provide a valuable overview of the building assessment tools and address gaps in existing building assessment tools from a social aspect perspective.

Keywords:

Social Dimension, Sustainable Building, Building Assessment Tool

Introduction

In the 1990s, the building sector has started to recognize the impact of their activities on environmental problems such as pollution, waste and resources depletion (Haapio and Viitaniemi, 2008). These problems have resulted in a range of considerable efforts have been made to reduce the environmental impacts of the building sector (Park et al., 2017). For

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instance, the development of new technologies, new policies, including assessment tools for buildings (Wallhagen and Glaumann, 2011). Several assessment tools were developed to measure the performance of buildings towards sustainability. According to Park et al. (2017), the concept of sustainability includes the need for environmental protection, economic development and social aspects. However, the need to achieve sustainability in buildings has for many years been associated with environmental and economic performance without fully examining the significant impacts of buildings on their occupants (Potrč Obrecht et al., 2019).

A large fraction of the population spends the greatest amount of their time indoors, hence the quality of indoor condition is becoming highly important (Othman et al., 2018). Previously, the impact of the indoor environment on occupants has been recognized since the occurrence of sick building syndrome (Tong and Leaman, 1993). The issue of the indoor environment has become a matter of concern in global sustainability because the concentrations of pollutants in the indoor environment is much higher compared to the outdoors environment (Riley and Kamaruzzaman, 2016). Previous studies have examined the negative impacts of indoor environments on occupants. For instance, occupant exposure to poor indoor conditions can potentially cause adverse health effects, poor work performance, and subsequently resulted in the loss of productivity (Al Horr et al., 2016). The World Health Organization (WHO) calculates that nearly 12.6 million people die each year as a result of living or working in an unhealthy built environment (WHO, 2017). In Malaysia, on the other hand, sickness absenteeism was observed to be growing in trend, whereby, the average employee absence in the year 2016 was higher compared to 2015 from 2.35 days to 4.32 days (Malaysia Employer Federation, 2016).

The indoor environment is a vital part of building and integral to the occupant; thus, it is becoming more essential to guarantee a better condition of indoor environment in the building. Several studies have demonstrated that the proper condition of a building's indoor environment leads to healthier occupants, more comfortable physical conditions, greater work efficiency, and lower rates of absenteeism (Li et al., 2016; Andargie and Azar, 2019). Traditionally, generic indoor environment parameters such as thermal, indoor air quality, noise and lighting were often adopted in building assessment tools to assess the quality of the indoor environment in a building. However, several studies have indicated that other parameters such as personal control over the indoor environment and occupant privacy may also be associate with occupant performance in building (Kim and de Dear, 2012). Many assessment tools have been developed worldwide which are tailored mainly to environmental protection and economic growth. Moreover, each of these tools is not equivalent in terms of sustainability assessment (Schwartz and Raslan, 2013). In Malaysia, few assessment tools have been introduced to assess the building performance, including Green Building Index (GBI), Green Performance Assessment System (GreenPASS), Green Real Estate (GreenRE) and Malaysian Carbon Reduction and Environmental Sustainability Tool (MyCREST). This paper aims to review the coverage of social aspects in existing sustainable building assessment tools in Malaysia.

The Social Aspect of Sustainable Building

The social aspect of sustainable development is always described as improving and preserving the quality of life, environmental satisfaction, human comfort and health in present and future generations (Vallance et al., 2011). As the sustainable building is designed and constructed to be occupied by humans, greater consideration should be given to the social dimension in building (Nimlyat and Kandar, 2015). The notion of social aspect is crucial in the context of

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sustainable building as occupants often seek health, comfort and refreshments in their living or working space (Dodge et al., 2012). Moreover, in the current economic context, the role of buildings is not only limited to providing shelter for humans but also maintaining a healthy and comfortable indoor environment for the occupants (Prowler and Vierra, 2012). In the context of sustainable development, the social aspect is described as a comprehensive concept covering the key features of human life including quality of life, human comfort, health and environmental satisfaction.

Most studies have proposed that the dimension of the social aspect of a building is an inter-related concept correlated with tangible and intangible human needs (Ward et al., 2012). Several examples of tangible factors that are associated with the social dimension of sustainability include amenities, sustainable urban design, decent housing, and the neighbourhood (Dempsey et al., 2011). Meanwhile, intangible factors corresponding to the social dimension of sustainability include social justice, education and training, health, quality of life, well-being and safety (Dempsey et al., 2011). According to Bachrun et al. (2019), the indoor environment is integral to achieving sustainability in the social context by providing opportunities for building balance and connectivity. This is because occupants in buildings are exposed to various indoor environmental parameters simultaneously, hence a broader view of indoor environmental quality should be considered in building assessment tools where building should not only be comfortable and healthy for the occupant, but connected to the natural environment, provide positive sensation, and pleasant to be in.

Methodology

This paper focuses on four building assessment tools in Malaysia namely Green Building Index, Green Performance Assessment System (GreenPASS), Green Real Estate (GreenRE) and Malaysian Carbon Reduction and Environmental Sustainability Tool (MyCREST). These four assessment tools were reviewed while addressing it through the social aspect of sustainable development. All of the building assessment tools included in this paper is applied at a national level. These four assessment tools were chosen as these are the most adopted tools to promote sustainability in the Malaysian building (Bernardi et al., 2017). The structure of the occupant requirements that are compared in this paper was derived from published works of literature and used as a feature of discussion to support the objective of this paper.

Results and Discussion

In 2009, Green Building Index (GBI) was developed in Malaysia to measure the environmental impact and performance of buildings. The criteria in GBI are mainly focused on the impacts of the building sector on the natural environment such as energy efficiency, water efficiency, waste reduction and resources stewardship than social factors, for example, occupant health and comfort (Hassin and Azlani, 2018). Although the indoor environmental quality was considered in the GBI assessment, the features are limited to indoor air quality, thermal comfort, lighting quality and acoustic comfort. These four features are not adequate to reflect the impact of the indoor environment on occupants comprehensively (Kim and de Dear, 2012). Thatcher and Milner (2012) suggested that green buildings need to focus on specific design features that are associated with social aspects as the positive impact of green building are less significant on achieving occupant's productivity, health and comfort as a whole.

Green Performance Assessment System (GreenPASS) was introduced by the Construction Industry Development Board of Malaysia (CIDB) in 2012. GreenPASS is an assessment tool

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that aims to encourage sustainable construction through the reduction of carbon emissions during the construction and operational stages of the building's life cycle (CIDB, 2012). GreenPASS targets the impact of the site, material, energy, water, waste, and indoor environmental quality, which includes thermal comfort, indoor air quality, indoor lighting, indoor acoustics, cleanliness and maintenance. However, the development of GreenPASS initiatives emphasise on carbon emission reduction throughout the building life cycle and include minimal consideration of social aspects in building. Although the indoor environmental quality was included in GreenPASS assessment, however, the generic indicator of the indoor environment is unable to provide a complete reflection of the social aspect in a building.

Green Real Estate (GreenRE) was developed in 2013 by Real Estate and Housing Developers Association (REHDA). The goal of GreenRE is to encourage the real estate sector in Malaysia towards sustainability and a liveable built environment (REHDA, 2015). This assessment tool has incorporated six main pillars to assess the performance of building namely energy efficiency, water efficiency, sustainable management and operation, indoor environmental quality, carbon emission of development and other green features. GreenRE claimed to offer a set of assessment strategies to measure and benchmark the sustainability of buildings based on predefined measurement criteria and standards. However, GreenRE has incorporated partial requirements of social aspect in the building. For example, the pillar of indoor environmental quality includes subcategories of indoor air quality, indoor air pollutants, lighting quality, thermal comfort and internal noise level. GreenRE has less coverage on the occupant's comfort requirements such as personal control, view quality and ergonomic which have been identified in published works of literature affecting the occupant in a building.

In the year 2016, Construction Industry Development Board (CIDB) and the Public Works Department (PWD) introduced the Malaysian Carbon Reduction and Environmental Sustainability Tool (MyCREST). This building assessment tool aimed to reduce carbon emissions and environmental impact from buildings across all levels of building life cycle including construction, operational, maintenance and demolition (Ohueri et al., 2019). However, the coverage of sustainability criteria in MyCREST has mainly focused on energy performance to achieve carbon reductions in all stages of building life cycle without fully assessing the impact of building conditions on its occupant in terms of their comfort, productivity and well-being (Abdullah, 2017).

Conclusion

This paper has demonstrated a review of four building assessment tools in relation to the social aspect of building. Since 2009, four green building rating tools have been developed in Malaysia: Green Building Index and Green Real Estate were developed by professional associations, while the other two MyCREST and Green PASS were established by the government. These assessment tools have been developed at the national level to assess building performance towards sustainability (Hamid et al., 2014), but have limited credits focused on the social aspect. As most of the assessment tools have limited coverage of social dimension, comprehensive assessment tools that capture the holistic requirements of social aspect in building and are tailored specifically for Malaysian buildings is essential.

Acknowledgement

This work was supported by the Universiti Teknologi Malaysia under the research grant with vote number Q.J130000.2452.09G28.

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