MANAGEMENT KEY PRACTICES FOR IMPROVING GREEN BUILDING PERFORMANCE

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Abstract

Green building practices provide a high level of supporting environment, increasing efficiency in the usage of various energy resources such as electricity, water, and environmental friendly materials, and decreasing negative impacts on human health and environment during their life cycle. This paper carried out to fill the gap about management key practices in green building management. The objective of paper is enhancement green building performance through recognizing the management key practices. This paper based on previous study identify five management key practices such sustainable procurement, sustainable operation, resource management, repair and maintenance management and environmental health in green building management for improving green building performance as a whole.

Keywords: *Management, Practices, Building Performance*

1.0 INTRODUCTION

Green buildings have appeared during the 19th and 20th centuries (Cassidy, 2003; Wu and Sui Pheng, 2010). Broadly, green building aims at preserving environment and decreasing pollution (Lstiburek, 2008). The purpose of green building practices is constructing buildings and infrastructures in a way to protect resources, minimize negative impact on the environment, and create environments with higher standards for residents (Chatterjee, 2009; Samer, 2013; Shiela Sharif et al., 2013). In addition, green building is one of the measures put forward to mitigate significant impacts of building stock on the environment, society, and economy (Zuo and Zhao, 2014). Management of green building plays a great and considerable role in decreasing greenhouse gas emissions, using energy more efficiently, saving the cost of energy, and preserving the environment sustainability. Indeed, green building management practices are comprehensive set of methods or techniques adopted for protecting the environment and reducing building's negative impacts on the environment. On the other hand, according to Fowler et al. (2011), green building performance to evaluate the performance of green buildings in different baseline such as water, energy, maintenance and operations, waste generation and recycling, occupant satisfaction and transportation.

2.0 GREEN BUILDING MANAGEMENT KEY PRACTICE

According to Samer (2013), sustainability is a great achievement of green building practices. Over the last two decades, the construction industry has made efforts to develop green building practices (Gluch, 2005; Samer, 2013). Commonly, it has been accepted that green buildings should be designed and constructed to reduce the overall impact of the built environment on human health and natural

environment. The original objective of green building management is to help owners and occupants enjoy a satisfying and comfy living environment (CW Ho et al., 2006). According to Goodman (2008), implementation of green building management in green buildings results in optimizing various energy, decreasing emissions, and saving cost for facility owners, managers, and tenants. Undoubtedly, every management key practice is alternative to achieve energy efficiency and affordable costs and decline negative impacts on human health and environment. The current study reviewed world green building standards to analyze the green building management criteria and its sub-criteria used in the world. Based on, the "management" criteria and sub-criteria addressed in various established green building standards, this study identified five green building management key practices (GBMKP) for green building management, namely: sustainable procurement, sustainable operation, resources management, repair and maintenance management, and environmental health. Each GBMKP is briefly described in the following sections.

2.1 Sustainable Procurement

Sustainable procurement is a procedure during which organizations meet their obligations for goods, services, and capital projects in a way to achieve value for money on a whole life basis during the generation of benefits not only to the organization, but also to society, the economy, and the natural environment (Brammer and Walker, 2011; Wilkinson and Kirkup, 2009). Sustainable procurement practices follow the principles of sustainable development performed for preserving a healthy society, protecting the environment, and encouraging appropriate governance (Walker and Brammer, 2007). According to Brammer and Walker (2011), the aim of sustainable procurement practices is to decrease the detrimental environmental, social, and economic impacts that are made by purchasing goods and services during their life cycle.

2.2 Sustainable Operations

Sustainable operations are of a great importance to researchers of operations management and management science (Gunasekaran and Irani, 2014). According to Gimenez et al. (2012), there are several concepts in sustainable operation management. The first one is sustainable operation management, which is the set of skills and leverages that allow a company to structure its business processes in such a way that it can achieve sustainable performance. Sustainable operation management can be considered as the operations strategies, scheme, and techniques and operational policies, which can assert both economic and environmental goals. Second definition containing, sustainable operation management can be explain as the planning, consonance and control of a system that creates cost-effective, while truly preserving the natural resources and environment (Gunasekaran et al., 2013).

2.3 Resources Management

Environmental policy has focused on resolving the most urgent problems as regarding environmental pollution. Progressively, the public and policy makers are also directing attention to the need for reducing resource use and its impact on the environment. According to Kakkar (2014), resources management addresses the usage of natural and artificial resources for the purpose of managing green buildings and encourages the use of resources in a way through which less pollution is produced. According to Victoria (2007), sensible usage of our resources will automatically ensure that buildings are sustainable for the present and future usage. In addition, resources management is an essential practice because it leads to reducing overall operating costs, improving productivity and

profitability, and enhancing the competitiveness of the business. The benefits of resources management often extend well beyond just energy, water and waste. To sum up, resource management is relatively a new and emerging in the green building industry. Sensible use of our natural resources will help us minimize the usage of natural resources. To achieve aim of resource management accomplish energy, water and waste management is urgently necessary.

2.4 Repair and Maintenance Management

Repair and Maintenance practice is a process that describes how buildings and structures during their lifetime face problems caused by environmental factors and vulnerabilities (Thaheem and Marco, 2014). However, "repair" and "maintenance" are apart linked meanings. Maintenance contemplates taking steps to hinder collapse of the building and its systems by preventative and reformative measures (Thomson, 2012). Furthermore, maintenance is to retrieve or improve every facility in any part of the building, its services, and surroundings according to accepted standards and encourage tool values of the facility. In fact, adequate and correct maintenance leads to decreasing negative effects on the environment, occupants, and finally improving the residents' quality of life (Oliveira et al., 2014). On the other hand, repair is defined as the process of reconstructing a broken, damaged, or failed tool, equipment, part, or property in order to improve them to an acceptable condition (Sikdar, 2014).

2.5 Environmental Health

Environmental health (EH) addresses human health and quality of life, which are measured by physical, biological, social, and psychosocial elements in the environment. Moreover, EH concerns the theory and practice of assessing, correcting, controlling, and preventing those factors in the environment that can potentially affect adversely the health of present and future generations (Frumkin, 2005).

3.0 GREEN BUILDING PERFORMANCE

Building performance is the physical performance specifications of a building as a whole and of its parts. It thus relates to a building's ability to contribute to fulfilling the functions of its intended use (Ping, 2004). In simple terms, building performance has been described in BS 5240 as conduct of a creation in use. In addition, it can be used to indicate the physical performance characteristics of a building as an entire and of its parts. Consequently, it is related to a building capability of having contribution to fulfillment of the functions of its intended use (Douglas, 1996). Building performance follows three key aims: (1) minimization of the subjectivity of assessment, (2) releasing a constantly-reliable result by the evaluation, when used on comparable buildings, and (3) proposing finally a significant suggestion regarding the building's total performance (Douglas, 1996).

Building performance is a compound procedure; thus, there are several scenarios regarding green building performance, which are described in this section. According to Preiser and Vischer (2005), building performance refers to health, safety, security, functionality, effectiveness, and workflow as well as psychological, social, cultural, and aesthetic performance. In fact, the performance conception is the most systematic method for evaluating buildings (Douglas, 1996). Building performance requires not only health, safety, and accessibility, but also aesthetics, cost effectiveness, functionality, operation, productivity, security, and sustainability (Carroon et al., 2006). According to Hitchcock (2002) and Foliente and Becker (2001), there is a basic framework of building performance hierarchy that comprises the five aspects demonstrated concisely in Table

Table 1: Building Performance Aspects

No.	Building Performance Aspects	Description
1	Safety	Safety recognizes safe and harmless situation for building tenants. In addition, safety is one of the crucial apprehensions of an architect, engineer, facilities and building managers
2	Comfort	One of the considerable phases of building performance is the comfort of the building residents. It addresses internal environment, thermal comfort, visual comfort, ergonomics, acoustics and noise comfort
3	Health and Hygiene	The health and hygiene items are the most important factors for building occupation. Sick Building Syndrome (SBS) is one of the symptoms that show lack of health and hygiene items
4	Durability	Durability covers up the durability of building materials and structure
5	Sustainability	Performing sustainability plan in buildings leads to saving energy resources, reducing CO_2 emissions, and decreasing bill each month

Source: Hitchcock (2002) and Foliente and Becker (2001).

4.0 DISCUSSION

The study intention is identify green building management key practices for improving green building performance which that is one of the significant and remarkable factors to improve green building performance. Indeed, the current observation emphasized on key role of management key practice to improve green building performance in three aspects environment, economic and social in green buildings. In environment aspect, management key practices are to decrease negative effects, preserve natural resource and protect environment. The economic aspect, management key practices cause to saving money and decreasing bill during life cycle building. The social aspect, management key practices is to improve and better the tenant's quality of life and ameliorate environment human health. Based on the findings and the investigation each management key practices in each aspect are presented used to achieve sustainable development.

5.0 CONCLUSION

Briefly, this study was conducted to identify management key practices, green building performance, and impacts on every one of them regarding the management green building in Malaysia. The purpose of green buildings is to increase the comfort and satisfaction of building occupants, while decreasing the negative impacts on environment, leading to reduction in costs. The considerable literature review illustrates which key role of management key practices to improve and develop green building performance as a whole is notable alternative. The future study recommends investigating role of green building management key practices to achieve improvement on green building performance of in any its aspects.

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