

Key Practice for Green Building Management In Malaysia

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Abstract. This paper identifies the management practices for green building management in Malaysia. A set of practices was ascertained from the reviewed of various established Green Building Standard in the world. Green building practices are significant role in attaining sustainability particularly in the construction industry. Green building is constructed for minimizing impacts to environment as well as decreasing building effects on occupants. To achieve the goals of green buildings, set of management practices is required. A comprehensive review on the world green building standards that include the criteria of “management” has been carried out. The results of the content analysis have identified a total of five clusters of practices that found important for effective management of green building in Malaysia. These including Sustainable Procurement, Sustainable Operation, Resource Management, Repair and Maintenance Management, and Environmental Health. Each cluster of management practice composed of few activities. The identification of the set of practices contributes to the effective and efficient operation of green building in advancing the sustainability agenda, hence decreasing building’s operating costs and realising increase in return of investment.

Keywords: Green Building, Management, Practice

1 Introduction

Green buildings appeared throughout the 19th and 20th centuries (Cassidy, 2003; Wu & Sui Pheng, 2010). There are several terms in green buildings. Green building practices are to protecting environment and reducing pollution (Alex Lukachko & Joseph Lstiburek, 2008). Green building practice as a procedure to generate buildings and infrastructure to order protect resources, decrease negative impact on the environment, and create to a higher standard environments for inhabitant (Chatterjee, 2009; Samer, 2013). Green building design might be a desirable topic than management, but the key to a successful green building is management. Green building management is as a win-win-win alternative for building management, proprietor, and residents. Using green principles to building management provides saving money during time, a special and appropriate business master plan, also make better lifestyle situation for its

residents (Goodman, 2008). Management of green building plays great and considerable role in decreasing greenhouse gas emissions, energy efficiency, saving the cost of energy and the preservation and environmental sustainability. In this respect, green building management practices are comprehensive set of methods or techniques to protecting the environment and to ameliorate or reduce building’s negative impact on the environment. Undoubtedly, identify and recognize key practices management are essential to achieving effective management of the green buildings.

2 Green building management practices

According World Green Building Council (World GBC), an appearing non-governmental institution at the international grade is the World GBC, established by David Gottfried in 1999. The World GBC is a network of national green building councils is largest international institution in almost one hundred countries which it

significant impact on the green building marketplace. Members of green building council including Australia, Canada, India, Japan, Korea, Spain, and the U.S. World GBC with one hundred thousand buildings and approximately one billion square meters of green building space recorded which significant impact is in social and environmental global network. In early 2007, national council leaders recognized the immediate requirement found a secretariat for the World GBC that accountable to the increasing industry in green buildings and an international view. The secretariat was officially founded in Toronto, Canada. According to World GBC, member of World green building council fall into one of three categories based on how developed their organizations are: "Established", "Emerging" or "Prospective".

These are independent organizations that have developed and operate according to the best practices of the international GBC model. Green buildings to enhance the conventional construction process to the sustainable buildings throughout world nations. Green rating tools was introduced by many countries to assess performance of green building such as UK was the earliest country that started the green building rating system in 1990 known as Building Research Establishment Environmental Assessment Method (BREEAM), followed by United States in 1998, with Leadership in Energy and Environmental Design (LEED), and thereafter Japan Comprehensive Assessment System for Building Environmental Efficiency (CASBEE) in 2001, Australia (Green Star) in 2003, Singapore (Green Mark) in 2005, Hong Kong Comprehensive Environmental Performance Assessment Scheme (CEPAS) in 2009, and Malaysia (Green Building Index) in 2009 (Zainol, Woon, Ramli, & Mohammad, 2013). Eventually, there are various GB standard adopted by various countries in the world. According to green building rating system (2009) every green building standards arrange brief frame for recognizing and performing function, as well as evaluating green buildings practice. This study reviews various practices contained in the "management" criteria included in various green building standards in the world, including BREEAM, Green Globe, HQE, Green Star, Green Star NZ, Green Star SA and BEAM Plus.

Based on the review on various GB standards in the world, this study proposed five key practices to manage green building effectively: (1) Sustainable Procurement; (2) Sustainable Operation; (3) Resources Management; (4) Repair and Maintenance management and (5) Environmental Health.

2.1 Key practice ¹: Sustainable procurement

"Sustainable procurement" is a safe procedure for purchasing goods, service and investment project to minimize effect on society, economy and environment (Brammer & Walker, 2011; Wilkinson & Kirkup, 2009).

Sustainable procurement (SP) is one of the criteria included in the BREEAM and Green globes standard. Sustainable procurement plays significant role in the economic contribution in UK construction industry. SP as a broad concept first emerged following the Rio Earth Summit in 1992. SP is procurement which is in accordance with the principles of sustainable development to maintain a healthy society, protecting environment and encourage pleasant governance (Walker & Brammer, 2007). The aim of SP practice decrease the detrimental environmental, social and economic impact make a purchase goods and services during their life-cycle (Brammer & Walker, 2011).

There are two themes in sustainable procurement activities which are as follows: policy & compliance activities and development & collaboration activities. Table 1 shows different factors to evaluate procurement sustainability such as developing procurement policies, a written procurement policy stating a commitment to purchasing sustainable goods & services, developing targets for sustainable procurement, ISO 14001 certification, and integrating sustainability into procurement process (Meehan & Bryde, 2011).

2.2 Key practice ²: sustainable operations

Sustainable Operation (SO) practice is about collection of skills which is its arranged business procedure to attaining sustainability (Gimenez, Sierra, & Rodon, 2012). As well as, sustainable operation recognized in three steps such the planning, coordination and control cause to saving money while protecting natural resources, environment and decrease the carbon footprint (Gunasekaran, Irani, & Papadopoulos, 2013). Sustainable Operation practices include life cycle cost and service life planning in BREEAM and Adoption of sustainable development principles in operation in Green Star, Green Star NZ and Green Star SA.

In this context, there are various activities of sustainable operations in managing a green building: evaluating building investment cost, evaluating building energy cost, assessing building maintenance cost, taking into account building alteration cost, determining building acquisition cost, taking into account building salvage value, examining building environmental cost, assessing building interest rate and assessing building life-cycle (Kayaş, 2009).

2.3 Key practice ³: resources management

Resources management is the usage of all the resources natural and artificial for management of green buildings. It encourages the use of resources in a manner that it is less polluting. Also sensible usage of our resources will automatically ensure that buildings are sustainable for the

present and future usage (Kakkar, 2014). Also, resources management is essential practice because it leads to reducing overall operating costs, improving productivity and profitability, enhancing the competitiveness of the business. The benefits of resources management often extend well beyond just energy, water and waste (Victoria, 2007). In this study, resources management practice contains energy management (EM), water management (WM) and waste management (WM).

EM is not a one-time but ongoing process. In the words, EM is the continuous process of managing behavioral, organizational and technical change to improve energy performance (Sinopoli, 2008). The EM is the first steps to establishing an ongoing program of resource management to improve energy efficiency of the building itself (Mokhtar Azizi, Fassman, Wilkinson, & Che Ani, 2012; Victoria, 2007). EM is a set of energy efficiency activities, process and management action to achieving cost effective energy and decrease CO₂ emissions (Ates & Durakbasa, 2012; Coad & Dimick, 2012). Simply, EM is a continuous process that is leads to declining energy cost in the shortest time possible. According to Natural Resources Canada (2015), EM practices can be grouped into eight equally important categories, which each practice categories has its specific action. See table 3.

Water management (WM), includes design and operating practices that are applicable to water supply and distribution systems. WM includes the installation of high efficiency plumbing fixtures and control technologies in the building for example: toilets, urinals, tap, showerheads, and cooling towers, reuse systems, a regular programme of leak inspections at the building, the use of treated and recycled water, catch rainwater and grey water, and the use of relevant water saving control systems (Smallwood, Snoxall, Highmore, & Sauntson, 2010). Table 4 shows the measurement items of water management in green building management.

Waste management (WM) describes gathering, carriage, processing and recycling or disposal of waste produce through human activities which negative impact on the health of the environment (Awosusi, 2010). WM activities contain storage of waste, reuse, recycling and improvement, treatment of waste, and disposal of waste (schalkwyk, 2009).

2.4 Key practice 4: repair and maintenance management

Repair & Maintenance (R&M) practice is a process that describes how buildings and structures during its lifetime will face problems caused by environmental factors and vulnerabilities (Thaheem & Marco, 2014). Concisely, repair and maintenance play a crucial role in the life of building namely hindering risks of buildings, using proper materials and appropriate tools to reduce life-cycle cost (Horner, El-Haram, & Munns, 1997). Repair

and maintenance management practices are included as one of the practice in HQE (France) green building standard. Maintenance management of building is the skill that it protects since the beginning of lifetime building to the end. In the other words, this step is long period in building industry. In fact, adequate and correct maintenance leads to decreasing negative effects on the environment, occupants and finally improve quality of life residents. Simply, maintenance management is as an appearance of “steady state” activity in buildings (Oliveira, Lopes, & Figueiredo, 2014). Table 5 shows the measurement items of repair and maintenance management in green building management.

2.5 Key practice 5: environmental health

Environmental Health (EH) is about perspectives human health which contains the quality of human life by taking into account environmental factors, including physical, biological, social, and psychosocial. EH including several practices such as evaluating, correcting, controlling, and preventing that can potentially decrease negative impact on human health over the centuries (Links, 2006). EH contained two items, which are emergency response, plan health & safety. The practice of emergency response plan (ERP) is included as part of the criteria in Green Globe Canada while health & safety and environmental (HSE) performance is included in BREEAM UK and BEAM Plus in Hong Kong. Buildings encounter with natural or unnatural unforeseen and disaster incidents such earthquake, flood, hurricanes, building system failures, elevators, emergency power systems, medical emergency and fire (Dorge & Jones, 2000). According to Green Globe rating system (2004), ERP used to reduce the risk of harm and the environmental effect of emergency occurrence.

3 Discussion

This study aimed to identify the set of practices contributes to the effective and efficient operation of green building in advancing the sustainability agenda, hence decreasing building's operating costs and realising increase in return of investment. Meanwhile, the term sustainability combines social, environmental and economic obligations (Gimenez, et al., 2012). In this way, function of each of these approaches is as follows:

As mentioned before, sustainable procurement includes society, economy and environmental dimensions. Sustainable procurement leads to have cost effective activates, decreasing carbon emissions, reducing waste, lowering energy, and improving health outcomes. These are considered as some practical examples to be considered within sustainable procurement.

The purpose of recognizing sustainable operation in this paper is to evaluate energy and other resources which are used in buildings. In fact, sustainable operation is one

of the factors which lead to reduce negative effect on buildings. On the other hand, personnel health protection and safety of society can be covered by sustainable operation. Generally, sustainable operation provides new opportunities in building industry to achieve sustainability.

As previously mentioned, resources management contains three lines such as energy management, water management and waste management. The main objective of energy management is to attain and conserve optimum energy resources which can minimize energy costs and mitigating environmental effects namely, decreasing costs, reducing carbon emissions and dropping risk of energy price fluctuations and supply shortages. As a matter of fact, energy management is widely authenticated as the foremost solution for direct and immediate decrease of energy consumption. In addition, water management can offer many benefits achieving sustainability in buildings. Some of these benefits contain: reduced water and sewage costs, reduced energy usage and waste water treatment energy usage which upgrades and optimizes energy usage.

Finally, the main role of repair and maintenance practice recognized to reduce equipment maintenance costs, save time in managing maintenance and repair contracts and guarantee the success of end user maintenance procedures. As a summary, the goal of management practices is to reduce cost and decrease negative impacts on the environment and achieve sustainability in building industry.

4 Conclusion

In essence, review on “management” criteria in the world green building standards was carried out in present study. Current study identifies management practices that are new perspective for management of green building in Malaysia. These five key practices of GB management are: (1) sustainable procurement; (2) sustainable operation; (3) resources management; (4) repair and maintenance management and (5) environmental health.

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