Green Technology Management Issues in Science Social Perspective

Hayati Saleh

Centre for Islamic Development Management Studies, Universiti Sains Malaysia
Pulau Pinang, Malaysia
Email: hayatisaleh@yahoo.com

Abstract

Management of green technology and environmental sustainability are often discussed as an academic discourse, however, very few of the management of green technology based on Islam are highlighted. In fact, the management of green technology based on Islam is very important as a development platform that is not only sustainable but more comprehensive. The management of green technology that is highlighted takes into accounts both the physical and spiritual aspects. This paper presents some of the issues in this matter by focusing on social science in public buildings. The purpose of this paper is to provide an overview of management issues of green technology and conservation in public buildings to meet the requirements of Islam. It examines and explores the relationship between green technology and conservation in public buildings and its impact on society from the Islamic perspective. Therefore, the study of literature and research was conducted to obtain a clearer picture of both the aspects under discussion. This paper expects a clear link between the two subjects from the Islamic aspect that will be the basis for a more comprehensive management and conservation of green technology in buildings.

Key words: Management, Green Technology, Islam, Buildings, Public Buildings

Introduction

Buildings act as catalyst for productivity and safety to humans. Buildings with high occupancy such as public buildings should provide comfort and safety to the occupants. According to Croome (1997) productivity, motivation and satisfaction of residents are affected by the healthy and comfortable environment of the building. It also includes public buildings seen to play many important roles in generating productivity and sustainability agenda of an organization. Among the measures to ensure the sustainability of these include the introduction of green technology that is increasingly taking place in all aspects of economic, social and environmental. In the next section definitions of green technology is provided to facilitate understanding of the issues to be discussed.

Green Technology

The term green technology is known as green engineering or environmentally conscious manufacturing which specifically involve the development and application and methods to achieve environmental health involving several levels of processes. In the building construction sector, the term 'green technology' is defined as a green building, sustainable design and building, high-performance and integrated building (Zuo & Zhao, 2014; Bhamra & Lofthouse, 2007).

According to the Green Technology Organization (2014), an organization is assigned the responsibility to implement the promotion of green technology in the United State, defines green technology as a group of effort implemented including the methods and materials used which involves techniques to generate power to the production and use of cleaning products that are non-toxic. Green technology is a system of gradual approach (system-level approach) involving the design of products and processes that puts priority on the importance of nature while also concerned about the quality and economy (Billatos & Basaly, 1997). This system can be seen clearly when it is interpreted in the context of the life cycle of the system or the system life cycle of the building. The life cycle system of a building starts from planning building design, construction, operation, maintenance and disposal during the entire existence of the building.

There are four key points discussed in this paper on the issues of green technology management and environmental sustainability in public buildings. First, the government's policy towards the management of green technology. Second, the problems of the environment, safety and health. Third, management of green technology does not measure the real environment of sustainable development. Fourth, the management of green technology is not comprehensive.

Government's Policy towards Green Technology

In Malaysia the responsibility for the implementation of green technology falls under the auspices of the Ministry of Energy, Green Technology and Water (KeTTHA). An action plan that includes the 10th Malaysia Plan (short term), the 11th Malaysia Plan (medium term) and the 12th Malaysia Plan (long-term), was designed to motivate Malaysian citizens to enjoy quality life and healthy environment. All three of these plans contain plans of action to raise awareness, promote the use and foreign investment into the country's green technology sector. However, all three Malaysian Plans (RMK-10, RMK-11 and RMK-12) are more inclined towards the generation of economy compared to the development that provides safety to man and nature/environment. In order to achieve these three goals, the government has already built and provide green technology infrastructure network, such as hydroelectric dams, farms, solar panel systems and grid system to generate and distribute electrical energy to large capacity buildings such as public and non-public buildings.

With that, the government has taken the initiative to build hydroelectric dams, biogas and solar farms to meet the country's growing energy needs (Ahmad, Kadir, & Shafie, 2011). However, this step does not resolve the issue of sustainability that is plaguing the society. Instead, it adds another environmental crisis with rising river water temperatures and pollution flowing through the hydroelectric power station which threatens the life of the river. The infrastructure was built as advanced and as big as possible to accelerate the listing of Malaysia as a major producer of green technology. The citizens/people are urged to use and

develop green technology innovation through the merit introduced by the green building index (GBI). The goal is to accelerate and prove the government's commitment in responding to the global call towards sustainability. However, in order for the country to be listed in the green technology arena, aspects that support the healthy structure of the society are ignored in favor of the commercial and industrial sustainability.

Problems of Environment, Safety and Health
In retrospect public buildings revolution began in the west in the 1950s. At first, the building was designed with a simple construction that included water and electricity supply facilities in order to achieve the function of the building as an office, a hospital, a commercial center and so on. The impact of the industrial revolution that occurred in the 18th century contributed to the use of machines, engines and production on a large scale. That revolution was seen as a stepping stone to the building sector especially in public building sector. This makes business that operates in the building to experience a development phase that is widespread. All communication, industrial and trade affairs were supported by the use of telephone, fax and computer which resulted in another revolution - the communication and information technology in the 1960s. As a result, both revolutions changed the previous building landscape that was environmentally friendly to technology that use energy and produces heat release.

This situation eventually prompted the use of air conditioners to cool the occupants, spaces and computer rooms. This requires a lot of energy consumers in the inhabited building. However, the use of centrally-controlled air conditioning has been reported to produce casualties as a result of airborne diseases such as Legionnaire's Disease (Wood, 2003). Furthermore, poor management of the flow of water from the building cooling system also contributes towards breeding ground for mosquitoes and causes the spread of epidemics. The resulting technology has led to health problems and endangers the lives of building occupants.

In addition, it can also be stated that the economic growth could not keep pace with environmental quality. Even if green technology building is built in the area but located close to each other, it will definitely generate heat island. This condition causes the heat during the day to be trapped in the gaps of the building and the road surface. While, at night, the heat trapped in the road surface will be released into the atmosphere. This phenomenon affects the rise in building temperature. Therefore, a lot of energy is required by the air conditioning system to cool the building either during the day or night. As a result, the extreme use could not be accommodated by the generation of energy from fossil fuels, which is currently experiencing a depletion of resources. So, people began turning to new energy sources and more environmental friendly. However, the price to be paid for using green technology is not cheap. It should be paid at a high price in the name of the environment, safety and health. Hence, organizations that inhabit buildings, including public buildings transfer the burden of the cost of operating the service to the end user. This makes a man burdened and certainly contributed to the collapse of values and morals. Religious institutions are not viewed as clarifiers to humans as a source of damage.

Green Technology Management Does Not Measure The Actual Sustainability Development

In general, the progress of a nation is measured by the development of the economic sector known as gross national product (GNP) and gross domestic product (GDP). The construction industry includes among the contributors to the economic growth. It indirectly involved the construction sector, which consists of various categories of buildings, including public buildings. According to Green (1997), the building sector contributes to the GNP and enables the non-building sectors to reap the benefits. These contributions enable the wealth to be distributed (Hasan, 2006). Therefore, the construction sector directly influence in stimulating the economy of a country.

However, Cracolici, Cuffaro, and Nijkamp (2010) were of the opinion that GNP and GDP do not reflect the real atmosphere of a country's development. They said GNP and GDP do not take into account human well-being and the environment. GNP and GDP are seen as not relevant when the issue of pollution is not taken into account. For example, when the economy grew, the issue of contamination exists and threatens human health and the environment. Consequently, spending on medical costs and care for the environment increase. This of course affects the GNP and GDP. Western scholars have been arguing against the method of measuring the economic growth of GNP and GDP without taking into account the quality of the environment (Pearce, Markandya, & Barbier, 1989). This crisis makes it clear that sustainability could not be measured without regard to the environmental quality as is done in the west.

In addition, the GBI assessment that was presented also does not measure the overall preservation of nature. Environmental sustainability should be measured according to sharia. In Sharia, there exists maqasid syariah to take care of the five aspects of human well-being that is, religion, life, intellect, lineage and property. Instead, the GBI only assess and examine the six elements namely energy efficiency, air quality inside the building, sustainability of design and maintenance of the site, resources and materials, water efficiency and innovation. The six elements assessed by GBI only encompass two aspects namely maqasid syariah life and property. However, the assessment is insufficient by just looking at maqasid syariah, it needs to be seen also from the five aspects of the fiqh law that is, halal (allowed), haram (forbidden), makruuh (discouraged/disapproved), harus/mubah (permitted) and sunat/mandoob (recommended). Therefore, the management of green technology is insufficient if only to maintain the well-being of man and nature. Maintenance of green technologies needs to be viewed in greater depth from the spiritual aspects as well as the overall aspects of human life for measuring the true atmosphere of sustainability development.

Green Technology Management Is Not Comprehensive
Globally, the world is now faced with various global challenges. Smalley (2005) lists several challenges facing the world today, namely energy, water, food, environment, poverty, violence and war, epidemic, education, democracy and the population. According to him, the energy crisis could be overcome effectively and non-threatening to the environment if man has the knowledge to manage the environment sustainably. Building management, especially public buildings is particularly relevant to those challenges. Not only that, the management of public buildings also involves the conversion of land status, change land products, water consumption and building materials (Wiedmann et al., 2013). Therefore, these four aspects still involved the environment.

These four aspects were present before the building was even built. After the building was built, it is followed by the process of ensuring that building occupants are comfortable and secure. It requires building services such as air conditioning systems, elevators, fire systems, and security systems, communication networks such as telephone, fax, internet and appropriate lighting. Such systems require energy to operate at the required level. Operating costs of a building are affected by energy and water consumption patterns. Consumption pattern is influenced by several aspects such as the use of materials, design, location, climate, purpose and occupants of the constructed building (Suh, Tomar, Leighton, & Kneifel, 2014).

The modern technology of the western world believes that every problem could be solved by using technology solutions (Pearce, Markandya, & Barbier, 1989). Thus, by giving birth to various alternative methods from western theories and Europe such as the construction and design methods such as IBS, zero energy buildings and intelligent buildings and new energy sources in buildings. Environmental and energy crisis has dragged the world to find a solution, resulting in enactment of legislation and regulations to conserve the environment and the development of new energy sources.

In the building sector, for example, an assessment of the management of green technology was implemented. Green Building Code and Certification System were introduced by most countries to assess and reward organizations that reach and integrate environmentally friendly features in the category of buildings nominated including public buildings (Suh et al., 2014). In Malaysia, the Green Building Code and Certification System are known as the Green Building Index (GBI). GBI involves two categories of building, that is, residential buildings and non-residential. This makes public buildings to be included in the category of non-residential buildings. The Green Building Rating System (GBI) is viewed not be comprehensive. As is often the case, the police and this assessment is designed from the Western point of view and adapted to the Malaysian community.

According to Rasdi and Manan (2001) systems that underpin society are adapted from the West to develop their economic agenda and gain the support of the community. It is clear here that humans play an important role in managing the things that were discussed in the previous section. In the public buildings sector, the execution and management groups consisting of engineers, architects, building owners, building managers should have faith because the actions carried out involved the management of desires/nafs that is present in the spiritual dimension (Saleh, 2008). The solution put forth at the present moment involves only physical solutions and the results are temporary. Therefore, it does not take all aspects of human well-being.

Conclusion

Four issues of green technology in Malaysia were presented. The four issues are seen to be related to the sustainability of human life. The management of green technologies was implemented only from the physical dimension only. Humans are the actual person who live in this world and also manages the environment is not focused as a solution. Thus, the issues of environmental and human well-being could not be resolved because it is rooted in the spiritual dimension from the viewpoint of Islam. Therefore, the management of green

technology should be reviewed and reevaluated from the perspective of Islam that is comprehensive.

Corresponding Author
Hayati Saleh
Centre for Islamic Development Management Studies,
Universiti Sains Malaysia
Pulau Pinang, Malaysia
hayatisaleh@yahoo.com

References

Ahmad, S., Kadir, M. Z. A. A., & Shafie, S. (2011). Current perspective of the renewable energy development in Malaysia. *Renewable and Sustainable Energy Reviews*, 15(2), 897-904.

Bhamra, T., & Lofthouse, V. (2007). *Design for sustainability: A practical approach*. England: Gower Publishing, Ltd.

Cracolici, M. F., Cuffaro, M., & Nijkamp, P. (2010). The measurement of economic, social and environmental performance of countries: A novel approach. *Social Indicators Research*, 95(2), 339-356.

Fisk, W. J. (2000). Health and productivity gains from better indoor environments and their relationship with building energy efficiency. *Annual Review of Energy and the Environment*, 25(1), 537-566.

Green Technology Organisation. (2014). *Green technology-what is it?*. Retrieved from http//www.green-technology.org/what.htm

Green, R. K. (1997). Follow the Leader: How changes in residential and non-residential investment predict changes in GDP. *Real Estate Economics*, 25(2), 253-270.

Guo, K. W. (2012). Green nanotechnology of trends in future energy: A review. *International Journal of Energy Research*, 36(1), 1-17.

Hasan, Z. (2006). Sustainable development from an Islamic perspective: Meaning, implications, and policy concerns. *Islamic Economics*, 19(1), 1-10.

Pearce, D. W., Markandya, A., & Barbier, E. (Eds.). (1989). *Blueprint for a green economy*. London: Earthscan Publications Ltd.

Rasdi, M. T. M., & Manan, R. A. (2001). *Konsep perbandaran Islam suatu gagasan alternatif*. Skudai: Universiti Teknologi Malaysia.

Saleh, M. S. (2003). *7 Prinsip Pembangunan Bereteraskan Islam*. Kuala Lumpur: Zebra Editions.

Suh, S., Tomar, S., Leighton, M., & Kneifel, J. (2014). Environmental performance of green building code and certification systems. *Environmental Science and Technology*, 48(5), 2551-2560.

Wong, J. K. W., Li, H., & Wang, S. W. (2005). Intelligent building research: A review. *Automation In Construction*, 14(1), 143-159.

Wood, B. J. (2003). *Building care*. Oxford: Blackwell Science.

Zuo, J., & Zhao, Z. Y. (2014). Green building research–current status and future agenda: A review. *Renewable and Sustainable Energy Reviews*, 30, 271-281.