

The Green Building Index (GBI): An Innovation in Landscape Architecture

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Abstract

This paper presents a review of the Green Building Index as a new innovation in landscape architecture scope of works. The Green Building Index (GBI) is a green rating system introduced by the Pertubuhan Arkitek Malaysia (PAM) to evaluate the performance of building across a broad range of environmental considerations. Apart from evaluating the building's performance, the landscape design aspect has become a major part and parcel from the overall GBI assessment through the criteria of open spaces, landscaping and heat island effect. The paper is intend to highlight the important role played by the landscape architects to conserve natural area, encourage restoration of the habitat as well as maximise the ecodiversity through native and adaptive vegetation. It is hoped that GBI may possibly be a new innovation and added-value to espouse landscape architecture field as a leading role together with the architecture and other components in built environment industry.

Key words: The GBI, green rating systems, innovation, landscape architecture

1. Introduction

Landscape comprises the visible features of an area of land which involve physical elements of landforms and water bodies as well as living elements like human beings and wildlife. Combining both the physical origins and the cultural overlay of

human presence, landscape reflects the living interface of people and place which is very vital to shape up local and national identity. Through various, unique and distinctive characters and qualities, landscape helps to define the self-image and speciality of space, structures and region since the ancient civilization epoch (Fruehwirth, 2008). From the base idea on how landscape interacts and works, the field of landscape architecture is progressively evolved all around the world including Asia. It deals with the design of outdoor and public spaces in order to achieve environmental, socio-behavioural as well as aesthetic outcomes (Dzarul Hardy Azwar, 2005). Besides, it involves various scopes of work at varying scales of project such as urban design, site planning, town or urban planning, environmental restoration, parks and recreation planning, green infrastructure planning and lots more. As a multi-disciplinary field in built environment industry, landscape architecture is not just merely dealing with plantings but it incorporates wide range of field such as architecture, ecology, environmental sciences, geology, art and many more (Dzarul Hardy Azwar, 2005).

Furthermore, landscape architecture professionals are prepared to work on all types of structure and external space – be it large or small; urban or rural; hardscape or softscape, but in the same time they are also prepared to integrate ecological sustainability. Many of us may not notice this very well, but the reality of the environmental catastrophes that always occurred in these recent years is caused by the negligence of the ecological sustainability (Noor Fazrina Kamal, 2011). This negligence attitude has caused so many tragedies such as tsunami back in year 2004 which also affected the northern region of Malaysia. The tragedies rate may be reduced if the natural landscape system is not being disturbed along the coastal line. Therefore, the issue of ecological sustainability is very crucial and the landscape architects are the people who really responsible to cater this issue. If we may refer towards the advanced countries such as United States, landscape development is the top priority before a township can be developed. Meaning to say, landscape architecture field is not just filling up the outdoor space but it is worth more than that. Landscape architecture is always about designing the space for people comfort without neglecting the balance of physical development and ecological sustainability which leads to a better and healthier life (Dzul Hardy Azwar, 2005; Noor Fazrina Kamal, 2011).

2. Green Building and Landscape Architecture

Malaysia nowadays has gone through lots of development phases especially in the urban area. The establishment of new urban centres have gradually degrading the quality of ecology and environment (Ahris Yaakup, et.al., 2000). We are getting to

lose our precious green lung as one by one green areas have been turned into buildings and structures development area (Almeida, 2009). Due to the degradation of environmental quality, the government with the assistance of professionals in the built environment industry started to think of the best alternatives to reduce these environmental problems. As the best resort, the idea of green technology or green building has been brought into our country. This technology is the most popular alternative that has been used by the developed countries such as United Kingdom, United States of America, Japan and many more.

Concerning the idea of green building, an organisation known as the Green Building Index (GBI) organisation under the subsidiary of the Pertubuhan Arkitek Malaysia (PAM) and the Association of Consultant Engineers of (ACEM) has introduced the GBI as the local green building rating system to the public. According to Cole (2001), “Green building rating systems are in fact environmental assessment methods applied for buildings that have emerged as a widely adopted way to evaluate the performance of building across a broad range of environmental considerations” (Tuan-Viet Do, 2008). Eventhough the GBI is very much related to the performance of building in the context of architecture field, this paper is intend to reveal a new path or seek the GBI potential as a new innovation to the landscape architecture scope of works. As landscape architecture deals with the environmental sustainability, it is hoped that the development of the GBI may add some new positive values in improving landscape architecture education and profession in this new century.

3. Roots and Relationships of Green Building and Landscape Architecture

Green building has its own beginning and history. In point of fact, the historic development of green building has shown that it came from various origins and has a very close relationship to the idea of landscape architecture (Fruehwirth, 2008). At that time, the popular terminology used to replace green buildings was green roof. Most of the time, the plants that have been used for green roof were tendrillar plants or usually known as climbing plants or vines (Figure 1).



Figure 1
Examples of tendrillar plants or better known as climbing plants
(Source: <http://www.google.com>)

As mentioned by Fruehwirth (2008), there were four major ways of portraying the idea of green buildings during the ancient civilization era. The first one was cultic garden. The word cultic came from the word cultivation. Therefore, the cultic garden was a garden that used to cultivate herbaceous plants and crops in the middle of the roof area. One of the examples of the cultic garden was the Adonis cult, which had been adopted from Syria. It was introduced in Ancient Greece in the 6th century and also known in Imperial Rome (Figure 2).



Figure 2
Artist's illustration on the ancient Adonis Garden
(Source: <http://www.google.com>)

The second way was through sacred garden. This type of garden had a relationship with the spiritual aspects which are god, life and death. There was an element called as ‘Tumuli’ in the sacred garden. Tumuli are mounds of earth and stones raised over grave(s). Tumuli are also known as barrows, burial mounds. These Tumuli were built to protect the corpse against the animals and grave robbers.

The examples of the sacred garden can be found in the Egyptian temple which was the temple in Deir-el-Bahari for Queen Hatshepsut in the honour of the Sun God Amun-Ra and The Mausoleum in Rome which was the tomb that Emperor Augustus built for himself (Figure 3 at the next page).



Figure 3

From left to right: Example of the Tumuli and the Mausoleum for Augustus
(Source: <http://www.google.com>)

Furthermore, Fruehwirth (2008) further elaborated that the third way of portraying the idea of green building was through the symbolism of nature. Egypt is the oldest country where the idea of viticulture came from. Viticulture or also known as viculture is the science, production and study of grapes used for winemaking which always took place in the vineyard (Harrington, 2004). In the Egyptian dynasty, the art and paintings always told stories about grapevines (Figure 4).



Figure 4

Artist's illustrations on the viticulture tradition in the vineyard during ancient Egypt
(Source: <http://www.google.com>)

The final way was the hanging garden. The custom of creating hanging gardens was on vault cavities or on rooftops. The first hanging garden of the world, the Semiramis which was believed constructed by the Assyrian king for one of his wives to give her a reminiscence of her hilly homeland. There were some important stories told by two ancient historians, Diodor and Strabo; in which they described the hanging garden is similar to a theatre with tall trees that look like mountains. However, there is no clear narration on how the Semiramis really looks like. Eventhough if the hanging garden might only be a fantasy or myth, it still gave an impetus for the spreading of rooftop garden tradition in bigger scale for global use (Figure 5).

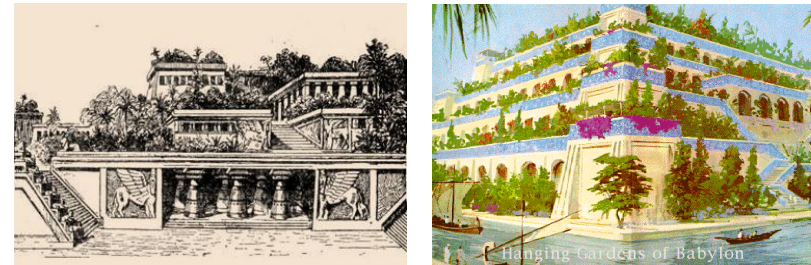


Figure 5

Artist's illustrations on the Hanging Garden of Semiramis
(Source: <http://www.google.com>)

Moreover, according to the history, the green roofs helped in protecting the building against climatic condition. It is claimed that the green roofs offered a good protection against heat and humidity or in short was an effective climate modulator. For example, in the traditional 'Turf Sod' house of Ireland, no artificial heating was needed in the winter. The roof served as a heat reservoir. There were some examples of grass roofs found in Tanzania, which were the 'Hehe' house, the 'Mbulu' house and the 'Gogo' House. The differences of each house were the roof pitch and the thickness of the grass layer (Fruehwirth, 2008). Below are the examples of these traditional houses (Figure 6 and 7 at the next page):



Figure 6
Examples of 'Turf Sod' house in Ireland
(Source: <http://www.google.com>)



Figure 7
Examples of 'Mbulu' house in Tanzania
(Source: <http://www.google.com>)

From the historical facts mentioned above, it is proven that people in the earliest world civilization were the first people who invented the idea of architecture and landscape architecture. They used all the natural resources to develop the structures as their shelters and plantings to serve several functions and aesthetic purposes. The combination of structural and landscape elements during that epoch had inspired the following generations to start develop and combine the idea of architecture, landscape architecture and the rest which have been the components of the present green building concept especially on the GBI rating system.

4. Review on the GBI Framework on Landscape Architecture Scope of Works

As mentioned in the introduction, the GBI emerged to help in evaluating the environmental design and performance of buildings particularly in Malaysia. Besides that, it also provides an opportunity for the architects, designers, and developers to have sustainable buildings that can offer energy savings, water savings, healthier indoor environment, better connectivity to public transport, carbon footprint reduction as well as to suit the locality, climate, and culture (Chin Mui Yoon, 2009). As stated in the GBI fact sheet, the GBI is developed specifically for the Malaysian-tropical climate, environmental and developmental context and it is created to:

- a) define green buildings by establishing a common language and standard of measurement;
- b) promote an integrated, whole-building design that provides a better environment for all;
- c) recognise and reward environmental leadership;
- d) transform the built environment to reduce its negative environmental impact; and
- e) ensure new buildings remain relevant in the future and existing buildings are refurbished and upgraded to improve the overall quality of our building stock.

Basically, the GBI assess the buildings' performance based on six main criteria which are energy efficiency (EE), indoor environment quality (EQ), sustainable site planning & management (SM), materials & resources (MR), water efficiency (WE) as well as innovation (IN). Apart from evaluating the building's performance based on the mentioned criteria, the GBI has specifically outlined a section that concentrate on the landscape design aspect. Green building design has always to deal with the environmental sustainability. In order to sustain the environment, the natural resources and landscapes should be remained untouched. However, most of the developments nowadays have far astray from the actual sustainable development principles. This is the reason of why landscape architecture is very important in realising the concept of green building. As mentioned by the president of Institute of Landscape Architects Malaysia (ILAM), landscape architecture is a vital field to educate the current generation on the preciousness of the environment. Humans nowadays are greedy and irresponsible by altering the natural land resources for development without noticing their impacts towards the ecology and environment (Noor Fazrina Kamal, 2011). Therefore, landscape architecture been incorporated as

a major part and parcel from the overall GBI assessment through the criteria of open spaces, landscaping and heat island effect. This criterion will be further elaborated in 4.1.

4.1 Open Spaces, Landscaping and Heat Island Effect

Referring to the GBI assessment sheets, it has outlined several important aspects that need to be covered in this section such as the intent of the assessment, the description of assessment as well as several requirements to be fulfilled in order to achieve highest points during the assessment. The details of them are shown as follows:

- i. Intent of the assessment - to conserve existing natural area or create larger soft landscaping area to provide habitat, promote biodiversity and reduce Heat Island Effect.
- ii. Descriptions of the assessment - encourage protection or restoration of the habitat and maximise the ecological diversity by introducing native or adaptive vegetation as well as maximise potential for open spaces on grade or on rooftops.
- iii. Specific requirements - maximize open spaces by providing a high ratio of open space to development footprint to promote biodiversity & reduce Heat Island Effect:
 - a. 1 point: Provision of landscaping with indigenous plants is up to 10% of total development area;
 - b. 1 point: Landscaping with indigenous plants is up to 15% of total development area;
 - c. 1 point: Landscaping with indigenous plants is up to 20 % of total development area; and
 - d. 1 point: Landscaping with indigenous plants is up to 25% or more of total development area.

In total, this section holds a cumulative 4 points from the total 39 points outlined in the assessment criteria. Comprehensively, the important input that should be carried out in this assessment will be as follows – the development should have smaller footprints and more landscape, thereby reducing the well known effects of heat islands around hardscaped areas. The provision of landscape with indigenous plants up to 10% of total development area will be awarded 1 point and the provision of additional similar landscape and plants of every extra 5% will be awarded 1 point each up to a maximum of 3 points.

From the elaboration above, it can be seen that landscape architecture plays very important roles in achieving the objectives of green building design. The intention of

conserving natural lands, enhancing biodiversity and reduce the impacts on the earth are the roles that landscape architecture holds since the beginning of the world civilization. All the requirements and details outlined for this section need to be further improved by the help of the professional landscape architects. This is the right platform to implement everything that has been outlined in '*Dasar Landskap Negara*' in improving and detailing the current landscape requirements in the GBI assessment. Indirectly, the development of the GBI has opened a path for the landscape architecture professionals to bring their profession to a better standard and it is a new innovation that could be implemented in landscape architecture education. On the other hand, this new innovation also could demolish the sceptical stigma towards the landscape architecture profession which saying that it is only about plants and decoration; but the reality is it has to do with so many things else (Dzul Hardy Azwar, 2005; Noor Fazrina Kamal, 2011).

5. Roles of Landscape Architects from Several Islamic Points of View

Venturing into the 21st century, the world is confronted with more and more serious challenges on managing the environment as it forces everyone to see things in a larger perspective especially the landscape architects. They play big roles; not merely as the steward of the earth but more than that. They are prepared and trained to manage and treat the environment in a sustainable manner in order to ensure the better quality of life (Ismail Ngah, 2007). This is in line with the teachings of Islam which educate Muslims to protect and preserve the environment. As mentioned by Sheikh Khalifa Ezzat (2008), Islam is the greatest religion and it is a way of life. Islam teaches human beings to respect the environment by conserving it for several reasons as follows:

- i. The environment is Allah's creation. The creation of this earth and all its natural resources are a sign of His wisdom, mercy, power and His other attributes and therefore serves to develop human awareness and understanding of this creator (Surah Ar-Ra`d: 2-4);
- ii. Muslims should protect and preserve the environment because it is the sign that they protect another Allah's creatures which pray to Him and praise Him. Humankind might not be able to understand how these creatures praise Allah but humankind must believe in it. As Allah says, "The seven heavens and the earth, and all beings therein, declare His glory: There is not a thing but celebrates His praise, and yet ye understand not how they declare His Glory!" (Al-Israa': 44); and

- iii. The environment contains Allah's creatures which the Muslim scholars consider to also deserve protection.

There is obviously a serious need to heal and care for the environment, where the landscape architects in particular, must play proactive role by reviewing their contribution to the environment and society and find ways to address the environmental issues. Indeed, landscape architecture in Malaysia has proven itself today as an essential and indispensable element in the design, planning and implementation for a better quality of life and management of built environment industry. Moreover, it also has a significant contribution in creating conducive habitats for the sustenance of civilization. The landscape architects has so far been successful in greening the Earth by developing greens for the communities, as well as putting efforts to increase people's awareness and perception towards a balanced landscape within the present rapid development scenario (Ismail Ngah, 2007). The landscape architects task is not easy as they are trained to protect the right of nature over human and vice versa. Mohamad Fadly (2009) mentioned that the holy Qur'an has stressing a lot about nature, its damages and the way of protecting its rights. This can be seen from several Qur'anic and Hadith verses as follows:

- i. All the damages on earth are caused by the actions of human themselves. This is proven by the verse in the 30th chapter which says, "Mischief has appeared on land and sea because of the hands of men has earned, that (Allah) may give them a taste of some of their deeds: in order that they may turn back (from Evil)";
- ii. God created nature in a perfect balance among all its factors, that human must keep that balance. This is proven by the 19th verse in Surah Al-Hijr which says, "And the earth We have spread out (like a carpet); set thereon mountains firm and immovable; and produced therein all kinds of things in due balance";
- iii. Prophet Muhammad encouraging all members of Islamic community to spread the trees and reclaim the desert lands. This is proven by his sayings in Sahih Al-Bukhari, "There is none amongst the Muslims who plants a tree or sows seeds, and then a bird, or a person or an animal eats from it, but is regarded as a charitable gift for him";

On the other hand, the Qur'anic verses sayings of the Prophet also continuously reminding the Muslims to keep the resources of nature and to use them in a balanced way as well as avoid from mischief and extravagance. This can be seen in several verses which are:

- i. Men should keep the earth resources wisely and not to waste them. This is mentioned in verse 26 and 27, Surah Al-Isra' which says, "But squander not (your wealth) in the manner of a spendthrift. Verily spendthrifts are

brothers of the Evil Ones; and the Evil One is to his Lord (himself) ungrateful";

- ii. Men are inhibited to waste the products of nature. This is proven by the verse 141 in Surah Al-An'am which says, "It is He Who produceth gardens, with trellises and without, and dates, and tilth with produce of all kinds, and olives and pomegranates, similar (in kind) and different (in variety): eat of their fruit in their season, but render the dues that are proper on the day that the harvest is gathered. But waste not by excess: for Allah loveth not the wasters".

Overall, nature and environment can be regarded as a very important component in human lives and the landscape architects are responsible to care and manage them sustainably. Islam also really cares about the idea of protecting the environment by teaching the Muslims on how to respect nature; keep the natural resources wisely away from misuse and extravagance; increase the amount of plants and trees; as well as protect the lands. This is also supported by Zaini Ujang (2010) by saying that the idea of keeping the trees alive should be comprehended by the men as it is closely related to the divine philosophy. He further said that the initiative to protect the environment and the ecosystem in providing a safer living place for the community is a medium for Muslims to increase the iman or faith to Allah SWT.

6. Conclusion

The Green Building Index (GBI) is conceived to be able to aid architects, designers, builders, government bodies, building owners, developers and end users to understand the impact of design towards the environment. It also helps to provide choice and solution in producing a better design with full consideration to the environment in the future. Apart from that, it incorporates the landscape design aspect has become a major part and parcel from its assessment through the criteria of open spaces, landscaping and heat island effect. Therefore, the landscape architecture role has come into the business in which it is vital to conserve natural area, encourage restoration of the habitat as well as maximise the biodiversity through native and adaptive vegetation. The GBI has become a new innovation and added-value to espouse landscape architecture field as a leading role together with the architecture and other components in built environment industry. Indirectly, this innovation gives a positive signal in inspiring the needs of respecting our nature as inculcated by the Islamic teaching regarding the rights and relationship between man and environment.

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