THE IMPORTANCE OF LANDSCAPE ARCHITECTS IN THE GREEN BUILDING INDEX (GBI) PRACTICE

BY

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A thesis submitted in fulfilment of the requirement
for the degree of Master of Science (Built Environment)

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ABSTRACT

The Green Building Index (GBI) is a green rating system introduced by *Pertubuhan Arkitek Malaysia* (PAM) and the Association of Consulting Engineers (ACEM) to evaluate the performance of buildings across a broad range of environmental considerations. Apart from building performance evaluation, the idea of the green building design carried by the GBI is said to have an interconnection with landscape architectural aspect. This study fundamentally discusses the importance of landscape architects in the context of the GBI practice. It is very important to investigate the professionals' perception towards the GBI general application and practice, to examine the influential factors that lead to the importance of landscape architects in the GBI practice, as well as to evaluate the roles and contributions of landscape architects in the GBI application and practice. For that purpose, this study employed a combination of questionnaire surveys and semi-structured interviews. The analyses were conducted by using the Statistical Package of Social Science (SPSS) for Windows and QSR NVivo 8. The findings demonstrate that the roles of landscape architects are very important in the GBI practice. This includes the involvement of landscape architects from the very beginning of the green projects, their participations as green building design teams as well as their attachments to the GBI organisation. On the other hand, it is found that there are several factors that lead to the importance of landscape architects in the GBI practice. The factors are: i) knowledge expertise and involvement in the GBI practice; ii) roles of landscape architects in the GBI practice; iii) landscape design approaches in the context of the GBI application and iv) landscape design considerations. This study has contributed an added value towards the landscape architecture profession; especially in creating awareness on the importance of this profession in the GBI practice and the green building industry as a whole.

خلاصة البحث

مؤشر المباني الخضراء (GBI) هو نظام تصنيف الخضراء التي أدخلتها معهد ماليزيا للمهندسين المعماريين (PAM) ورابطة للمهندسين الاستشاريين (ACEM) لتقييم أداء المباني عبر مجموعة واسعة من الاعتبارات البيئية. وبصرف النظر عن تقييم الأداء بناء، ويقال إن فكرة تصميم المباني الخضراء التي حملها GBI أن يكون هناك ربط مع الجانب المشهد المعماري. هذه الدراسة تتناول بشكل أساسي على أهمية مهندسي المناظر الطبيعية في سياق ممارسة GBI. من المهم جدا للتحقيق التصور المهنيين تجاه التطبيق العام GBI والممارسة، لدراسة العوامل المؤثرة التي تؤدي إلى أهمية مهندسي المناظر الطبيعية في ممارسةGBI ، وكذلك لتقييم الأدوار والمساهمات من مهندسي المناظر الطبيعية في GBI تطبيق والممارسة. لهذا الغرض، استخدمت هذه الدراسة مجموعة من الدراسات الاستقصائية الاستبيان والمقابلات شبه المنظمة. وأجريت التحليلات باستخدام الحزمة الإحصائية للعلوم الاجتماعية (SPSS) ل ويندوز وQSR 8 NVivo. النتائج تثبت أن الأدوار لمهندسي المناظر الطبيعية مهمة جدا في ممارسة GBI. ويشمل ذلك إشراك لمهندسي المناظر الطبيعية من البداية للمشاريع الخضراء، ومشاركتهم الخضراء فرق تصميم المباني وكذلك مرفقاتها إلى المنظمة GBI. من ناحية أخرى، وجدت أن هناك العديد من العوامل التي تؤدي إلى أهمية مهندسي المناظر الطبيعية في ممارسة GBI. العوامل هي: ط) ومشاركة الخبرات والمعارف في الممارسةGBI ؛ ٢) أدوار مهندسي المناظر الطبيعية في ممارسةGBI ؛ ٣) النهج تصميم المناظر الطبيعية في سياق تطبيق GBI ٤) اعتبارات تصميم المناظر الطبيعية. وقد ساهمت هذه الدراسة قيمة مضافة نحو مهنة الهندسة المعمارية المشهد، خصوصا في نشر الوعي حول أهمية هذه المهنة في ممارسة GBI وصناعة المباني الخضراء ككل.

APPROVAL PAGE

I certify that I have supervised and read this study and that, in my opinion, it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a thesis for the degree of Master of Science (Built Environment).

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DECLARATION

I hereby declare that this thesis is the result of my own investigations, except where otherwise stated. I also declare that it has not been previously or concurrently submitted as a whole for any other degrees at IIUM or other institutions.

Norhanis Diyana Binti Nizarudin

Signature …… Date ……...

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Affirmed by Norhanis Diyana Binti Nizarudin

…….. ……
Signature Date

This thesis is lovingly dedicated to…….

Ayah, my unsung hero

Mama, my lifetime inspiration

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LIST OF ABBREVIATIONS

ACEM	Association of Consulting Engineers of Malaysia
BEI	Building Energy Index
CLA	Creative Landscape Approaches
EE	Energy Efficiency
GBI	Green Building Index
GBIAP	GBI Accreditation Panel
GBISB	Green Building Index Sdn. Bhd.
GHG	Greenhouse Gases
EQ	Indoor Environmental Quality
INC	Industrial New Construction
IEB	Industrial Existing Building
IN	Innovation
IN1	Interviewee 1
IN2	Interviewee 2
IN3	Interviewee 3
IN4	Interviewee 4
IN5	Interviewee 5
IN6	Interviewee 6
IN7	Interviewee 7
IN8	Interviewee 8
ILAM	Malaysian Institute of Landscape Architects
IPCC	Intergovernmental Panel on Climate Change

MGBC	Malaysia Green Building Confederation
MR	Materials and Resources
NREB	Non-Residential Existing Building
NRNC	Non-Residential New Construction
PAM	Pertubuhan Arkitek Malaysia
RNC	Residential New Construction
SPSS	Statistical Package of Social Science
SM	Sustainable Site Planning and Management
T	Township
UHI	Urban Heat Island
UNFCC	United Nations Framework Convention on Climate Change
USGBC	United States Green Building Council
WE	Water Efficiency
WRI	World Resources Institute
WWF	World Wildlife Federation

CHAPTER ONE

INTRODUCTION

1.1 INTRODUCTION

This chapter discusses the foundation of the research; background study, problem statement, research aim, research objectives, research questions, and structure of the thesis. These items are very essential in developing thorough understanding about the whole study.

1.2 RESEARCH BACKGROUND

Malaysia has rapid growth of development phases especially in urban areas. In order to cater to the needs of the urban dwellers which have increased recently (Malaysian Urban Quality of Life, 2002). According to Von (2010) from Malaysia Green Building Confederation (MGBC), statistics show that the population of Malaysia's rural area was always greater than the urban areas from the year 1950 until 1985. However, from the year 1990, the urban area population has surpassed the rural area population by almost nine million people. From this point, the urban area population started to increase at an average rate of 4.6 per cent per annum, about twice the national population growth rate of 2.2 per cent from the year 1990 until the year 2000 (Malaysian Urban Quality of Life, 2002). As a result, the establishment of new townships and urban centres increased year by year. Rapid and uncontrolled development in urban areas has become a public issue resulting in bad impacts or catastrophes to the environment. According to Zaid et al. (2009), large cities normally face bigger environmental problems such as building collapse, hilly land

erosion, severe fogs, climate change, global warming, greenhouse effect, excessive carbon dioxide (CO_2) emission and urban heat island effect (Ahris et al., 2000). In the context of Malaysia, some big cities, such as Kuala Lumpur are said to be having problems in keeping the environment clean, green and healthy. In fact, there are not many green areas left, where people can enjoy clean air especially after tiring hours at their workplaces, driving through heavy traffic and also enjoying recreation in the weekends. Furthermore, similar situation are also occurring in many urban residential areas in Malaysia. Most of the residents live in flats, condominiums, apartments or terrace houses with building scenario and manmade landscape which are often poorly laid out (Zaid et. al, 2009). This kind of scenario not only produces bad impacts to the environment but it also affects the psychological well-being of the urban residents.

Due to the degradation of environmental quality, the green technology has become the most popular alternative used by developed countries such as United Kingdom, United States of America, Japan, Australia and Singapore. In regard to this technology, the idea of green building is introduced as a way of transforming the building market and transfiguring the common way of thinking about design, inhabit and operate buildings which is at the same time reducing the impact on environmental quality (United States Green Building Council [USGBC] News, 2005). Furthermore, according to the Green Building Index (GBI) fact sheet (2010), a green building focuses on improving the efficiency of resource use – energy, water, and materials – while reducing building impact on human health and the environment during the building's lifecycle, through better sitting, design, construction, operation, maintenance and removal. The GBI is aimed to develop high performance buildings without causing any harm to living things and the environment. Therefore, global

demand on the green building is increasing from time to time due to its advantage in producing lower development risks (Ting, 2009; Larsson, 2010).

Concerning the idea of green building, an organisation known as the Green Building Index Sdn. Bhd. (GBISB) under the subsidiary of *Pertubuhan Arkitek Malaysia* (PAM) and the Association of Consulting Engineers of Malaysia (ACEM) has introduced the GBI as a local green rating system as a medium to evaluate the environmental quality for buildings. According to Tuan-Viet Do (2008), 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. Therefore, the GBI has become the first step in promoting sustainability in the built environment and raising awareness among professionals of the field as well as the public about environmental issues and our responsibility to the future generations.

The GBI provides an opportunity for architects, designers and developers to have sustainable or high-end 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, 2009). As stated in the GBI fact sheet (2010), it is developed specifically for the Malaysian-tropical climate, environmental and developmental context and it is created to:

i. characterize green buildings by setting up a common language and standard of measurement;
ii. promote an integrated building design that offers a better environment for all;
iii. recognise and reward environmental leadership;

iv. transform built environment in order to lessen its negative environmental impact; and

v. ensure that new buildings remain relevant in the future and existing buildings are refurbished and upgraded in order to improve the total quality of our building capital.

Basically, the GBI has outlined six primary assessment criteria for commercial and residential projects that include energy efficiency (EE), indoor environmental quality (EQ), sustainable site planning and management (SM), materials and resources (MR), water efficiency (WE) as well as innovation (IN). The GBI certification process begins with an assessment of the building design by a certifier appointed by the GBISB. Then, a provisional certification will be issued followed by the issuance of the final certification when the completed building has been verified according to the design. The building can be reassessed every three years in order to maintain the certification but it all depends on building owners whether they are required to renew it or not. Points are given for performance above benchmarks and based on the scores achieved, the buildings will be awarded one of four types of ratings which are Certified, Silver, Gold and Platinum (GBI Fact Sheet, 2010). As a future accredited green rating system which will be recognized domestically and internationally, the GBI may be a very useful green rating system not only for the prospect of architectural buildings and its indoor quality but may also cross to the other branches of built environment, such landscape architecture; urban regional and planning; interior design and other related fields of its kind. In relation to this study, the parameter has been set out to highlight the significance of the landscape architecture field and its professionals in the practice of the GBI.

As known, landscape architecture deals with the design of outdoor and public spaces in order to achieve environmental, socio-behavioural as well as aesthetic outcomes (Dzarul Hardy, 2005; Norhanis Diyana et al., 2011). 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 others. However, as a multi-disciplinary field in the built environment industry, landscape architecture is not just merely dealing with plantings but it also incorporates and combines a wide range of job scopes of different fields, such as architecture, ecology, environmental sciences, geology, applied art and urban planning (Dzarul Hardy, 2005; Norhanis Diyana et al., 2011). Apart from that, 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 at the same time they are also prepared to produce designs with concerns of the environmental and ecological sustainability in mind. Henceforth, this study is very important in order to explore the professionals' knowledge and experience as well as the factors that lead to the importance of landscape architects in the GBI practice.

1.3 PROBLEM STATEMENT

In the green building development as well as the GBI practice, the involvement of the allied built environment professionals as the green building team is very important. The green building team, which includes the design team, should be able to demonstrate their experiences in technical qualifications pertaining to green building projects (GGGC Draft, 2003). Furthermore, the team should have excellent track records based on past projects which accentuate their ability in optimizing the design

and environmental performance of all aspects in the green building projects. Hence, selecting the right team is considered as an important aspect to the success of any construction or green building projects (Mahesh et al., 2007). The optimal selection of the right team should take place before a project is started as this will contribute to a greater opportunity of the team's success (Paul and Carr, 2002). The development projects today require the involvement of a team of people with a range of relevant experience (Elforgani and Rahmat, 2010). Therefore, the involvement of these kinds of professionals and experts in the green building area is very vital in order to showcase and promote the niche and needs of having this new area of interest.

According to Elforgani and Rahmat (2010), there are several professions that are mostly active in the green building and the GBI projects. Architects take the first place for the most involved and active profession during the design process of the green buildings followed by mechanical and electrical engineers at the second place. Meanwhile, structural engineers, civil engineers, interior designers and quantity survivors are among the third professions that are most involved in the green building process and the GBI application and practice. The team may consist of the following consultants: architects, land surveyors, structural engineers, electrical engineers, mechanical engineers, hydraulics engineers as well as quantity surveyors (Paul and Carr, 2002). However, as seen earlier, landscape architecture professionals are not put in place together with other allied professions in the green building team.

If we look into the current GBI organisation, it can be assumed that most of the professionals that have an attachment to the organisation are architects and engineers (GBI Fact Sheet, 2010). Based on the list of the GBI members in the GBI official website - be it certifiers or facilitators, it is found that most of them are architects and engineers. This is proven by out of 542 registered facilitators, more than half of them

(295 facilitators) are registered architects (Ar.) and registered engineers (Ir.). However, there is none of registered landscape architects (LAr.) are stated in the list of the members. More evidences were required to support the information on the involvement of the landscape architects in the GBI. Few organisations such as the GBI organisation itself and also the Institute of Landscape Architects Malaysia (ILAM) have been approached to gather other strong evidences. Nevertheless, the GBI organisation did not have any detailed statistics concerning the involvement of all built environment professions. On the other hand, ILAM as a responsible body for landscape architects also did not have any information about the landscape architects' attachments to any green organisations. Hence, there was minimal information on this finding but based on the aforementioned list of the GBI members, it can be said that there is currently a lack in numbers of landscape architects who are actively involved in the green building and the GBI practice.

This phenomenon is something that should be of concern because landscape architects are supposed to play very important roles in achieving the objectives of green building design. The intention of conserving natural lands, enhancing biodiversity and reducing the impacts on earth are roles that landscape architects have held. The development of the GBI practice would have opened a path for landscape architects to bring their profession to a better standard and it is a new innovation that could be implemented in landscape architecture (Norhanis Diyana et al., 2011). On the other hand, this new revolution could also demolish the stigma towards the landscape architect profession which assumes that the profession is only about designing plants and decoration. However, the reality is that, it has to do with various broad range of design aspects and inputs (Dzul Hardy, 2005; Noor Fazrina, 2011; Norhanis Diyana et al., 2011).