

THE MOTIVATION FACTORS IN THE PROVISION OF GREEN  
CRITERIA IN GREEN BUILDING DEVELOPMENT

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A project report submitted in partial fulfilment of the  
requirements for the award of the degree of  
Master of Science (Construction Management)

Faculty of Civil Engineering  
Universiti Teknologi Malaysia

JANUARY 2016

Specially dedicated to *Ayah*

I really miss you,

*Al-Fatihah*

And specially dedicated to my mother Kamisah Khamis, wife Harlina Md Nor , my children Nursyahirah, Nur Umairah Batrisyia, Mohamad Hariz Lutfi, Nur Darwisyah Balqis, Muhammad Khalish Daniel, all family member and friends

I owe you so much time to materialize this report

Thank you for your endless love and support

## ACKNOWLEDGEMENT

Alhamdulillah syukran, thankful to Almighty Allah finally I manage to complete this report after having long time journey before stop at ending point. I would also like to express my deepest appreciation to my project supervisor, Dr. Rozana Zakaria, for her time, generous advice, patience, guidance and motivations during the years of my study.

I would like to express my special thanks to I&P Sdn. Bhd, UEM Sunrise Berhad, all the consultants, who have given me information to complete this report and friend who generously spent their precious time to participate in the interview of my project data collection and comment to my work. Their opinions and comments were useful indeed. My bosses, superior and friends, who have provided assistance in arranging the interviews and at various occasions, also deserved my special thanks.

Lastly, I would like to express my gratitude appreciation to my beloved family especially to my Mother and wife Harlina Md Nor for their warmest support and encouragement throughout this study period especially towards last hurdle in completing this report.

Without the contribution of all those mentioned above, this work would not have been materialized.

## ABSTRACT

Recently, green building has become globally vital especially in developed countries such as United State, Europe, Australia, Hong Kong, Japan, Korea and Singapore. The Green Building Index (GBI) is Malaysia's industry recognised green rating tool for buildings to promote sustainability in the built environment and raise awareness of these issues among relevant stakeholders such as developers, architects, and contractors. The assessment of commercial and residential properties under the GBI rating tool is based on six main criteria: energy efficiency, indoor environment quality, sustainable site planning and management, materials and resources, water efficiency and innovation. In this paper, the motivation factors, common criteria of green building and interrelated between motivation factors versus provision of green criteria are discussed. The data presented in this thesis are mainly derived from interviews and responses to a questionnaire that was developed for this research project. The questionnaire was distributed to architects, engineers, urban planner, contractors and builders, developers and other consultants who are involved in the construction industry. In order to analyse the gathered data, a variety of statistical methods are used and the results are evaluated in detail. In addition to questionnaire survey, two case studies of green building projects in Johor Bahru are examined and so a snapshot picture of current situation of the green movement is taken. The findings shall assist in understanding the common criteria of green building and motivation factor in Malaysian development industry. Thus, the study is expected to demonstrate the motivation factors of green building in residential development. Based on the series of questionnaires and interview conducted, the finding of this study is considered as an important outcome for the developers as a guidance into a decision of future green building development. This research concludes that the motivation factors and criteria of green building is interrelated and vital for the benefits of environmental, human being and organization.

## ABSTRAK

Kebelakangan ini, bangunan hijau telah menjadi sangat penting di peringkat global terutama sekali di negara membangun seperti Amerika Syarikat, Eropah, Australia, Hong Kong, Jepun, Korea dan Singapura. “Green Building Index” (GBI) adalah alat penarafan hijau yang diiktiraf oleh industri di Malaysia bagi menggalakkan pembangunan lestari dan meningkatkan kesedaran mengenai isu-isu ini di kalangan pihak berkepentingan yang berkaitan seperti pemaju, arkitek, dan kontraktor. Penilaian terhadap hartanah komersial dan kediaman dengan kaedah alat penarafan GBI adalah berdasarkan enam kriteria utama: kecekapan tenaga, kualiti persekitaran dalaman, perancangan tapak dan pengurusan mampan, bahan-bahan dan sumber, kecekapan air dan inovasi. Dalam kertas kerja ini, faktor-faktor motivasi, kriteria bangunan hijau yang biasa atau serupa serta hubungan kait antara faktor motivasi dan peruntukan kriteria hijau dibincangkan. Data yang dibentangkan dalam kertas kerja ini kebanyakannya diperoleh daripada hasil temu bual dan maklum balas kajian soal selidik yang telah dihasilkan untuk projek penyelidikan ini. Kajian soal selidik tersebut telah dijayakan oleh arkitek, jurutera, perancang bandar, kontraktor dan kontraktor, pemaju dan para perunding lain yang terlibat dalam industri pembinaan. Dalam usaha untuk menganalisis data yang dikumpul, pelbagai kaedah statistik digunakan dan keputusan dinilai secara terperinci. Selain soal selidik, dua kajian kes projek-projek bangunan hijau di Johor Bahru diteliti dan gambaran keadaan semasa teknologi hijau diambil. Hasil kajian diharap dapat membantu pemahaman terhadap kriteria biasa yang serupa bangunan hijau dan faktor motivasi dalam industri pembangunan Malaysia. Oleh itu, kajian ini dijangka akan memperlihatkan faktor-faktor motivasi bangunan hijau terhadap pembangunan pembinaan bangunan kediaman. Berdasarkan siri kajian soal selidik dan temu bual yang dikendalikan, hasil kajian ini dianggap penting buat pemaju sebagai panduan di dalam membuat keputusan untuk membangunkan bangunan hijau di masa depan. Kesimpulan kajian ini menunjukkan bahawa faktor-faktor motivasi dan kriteria bangunan hijau adalah saling berkaitan dan penting untuk manfaat alam sekitar, manusia dan organisasi.

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**LIST OF ABBREVIATIONS**

ACEM	-	Association of Consulting Engineers Malaysia
GBI	-	Green Building Malaysia
GBIF	-	Green Building Index Facilitator
I&P S/B	-	Island and Peninsular Sendirian Berhad
PAM	-	Pertubuhan Akitek Malaysia
ROI	-	Return of Investment
SPSS	-	Statistical Package for Social Science
TM	-	Telekom Malaysia Berhad
WCED	-	World Commission on Environment and Development

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## **CHAPTER 1**

### **INTRODUCTION**

#### **1.1 General Overview**

Buildings negatively impact people and the environment through the over consumptive use of raw materials like wood and minerals, energy resources, and water, and the production of waste and unhealthy indoor air. They account for one-sixth of the world's freshwater withdrawals, one-quarter of its wood harvest, and two-fifths of its material and energy flows (David Malin Roodman and Nicholas Lenssen, 1995). Building and construction projects use many resources and affect the public's health and wellbeing. Such significant resources present a wreak havoc on our environment, causing deforestation, air and water pollution, stratospheric ozone depletion, and the risk of global warming. Within the construction of most modern buildings, about half of the energy used in the building construction and operation is expended in creating an artificial indoor climate in heating, cooling, ventilation, and lighting systems, a climate that often leads to sick building syndrome.

Green building is defined as a building that optimized performance in reducing the impact on human's health and the environment during the building

lifecycle through the application of eco-concept in design, resources conservation, building component, construction method, maintenance, operation and removal. In term of hotel, a sustainable hotel improves the living quality of the occupants through the implementation of ecology practices. This thesis project begins with an introduction and background overview of the reason why green building is so important and continues with a discussion of some of the barriers to develop green building and the benefits to be gained by green building.

## **1.2 Background of Research**

Green building is the foundation of sustainable construction development. Construction industry is represented with high contributes of gross domestic product, has undeniable impacts on the economy. Although Green buildings provide a wide range of benefits for the society, green building development suffers from different kinds of market barriers in developing countries including Malaysia (Samari et al, 2013). Green buildings have become really popular in the construction industry nowadays. Many construction and developer companies from various countries are interested on applications of sustainable design to the building. More and more building owners are trying to makes their buildings certified as a green building. Achieving this status however, is not as easy as anyone thinks. This is because of the fact that construction companies, developers or even building owners needs to abide the guidelines of green construction. Actually, the renowned Architect Association of Malaysia is the one responsible for these guidelines and implementations. These guidelines are typically known as the Green Building Index (GBI) which is made to stand as the reference document for achieving green status.

Green Building Index (GBI) is developed by Pertubuhan Arkitek Malaysia (PAM) and the Association of Consulting Engineers Malaysia (ACEM). It is a profession driven initiative to lead the property industry towards becoming more

environment-friendly. Green building is an important area where cities can implement sustainability objectives. Green buildings are designed to reduce the negative impacts on the environment while increasing the occupant health, by addressing these five categories:

- i. Sustainable site planning
- ii. Safeguarding water and water efficiency
- iii. Energy efficiency, renewable energy and lower greenhouse gas emissions
- iv. Conservation and the reuse of materials and resources, and
- v. Improved health and indoor environmental quality

Nowadays in Malaysia, green building represents one of the most significant and exciting opportunities for sustainable growth on both a national and a global scale. The design of our built environment impacts us all, as well as our economies and the natural environment, and Green Building Index are driving its transformation towards sustainability. Why Green Buildings is so important:

- a. Green buildings are designed to save energy and resources, recycle materials and minimise the emission of toxic substances throughout its life cycle
- b. Green buildings are able to sustain and improve the quality of human life whilst maintaining the capacity of the ecosystem at local and global levels.
- c. Green building harmonise with the local climate, traditions, culture and the surrounding environment
- d. Green buildings make efficient use of resources, have significant operational savings and increases workplace productivity
- e. Building green sends the right message about a company or organisation – that it is well run, responsible, and committed to the future



### 1.3 Problem Statement

Malaysia, now is very intensive to build green building and together with other developing countries to promote sustainable development. The current issue with the availability of guide lines and reference of assessment to green building is very limited. Green Building Corporation (GBC) has developed the Green Building Index (GBI) as a tool to assess the building for the green certification. However, there are few things that always ponder the developer to build green building:

1. Why is the developer has to embark or invest on green building development?
2. Are consultants aware of green building and well versed about it?
3. What are the benefits, opportunity and potential area in developing green building?

Based on the ambiguity on green building and question above, the interest is to know more about green building and what should be done as a responsible developer towards sustainable development. As a first step, Imperia Apartment project and Perling Apartment project are chosen as the subject of my case study. Based on the above, the following questions arise to inspire the research problem:

- a. What is the driver or motivation factor in developing green building?
- b. What are the definition and characteristics of green building?
- c. What are the benefits of green building to developers, stake holder, occupier, end users and purchasers?

There is always a hesitations from developers whether to embark or invest on green building development. What will motivate them to proceed with this development whereby developers and stakeholders in general see the governance of cost in the investment of green building development.

## **1.4 Aim And Objectives**

The aim of this is to determine the motivation factor for the investor to proceed with green building development. This aim will be supported by the following objectives:

- a. To identify the motivation factor of green building in the residential development.
- b. To demonstrate the provision of common criteria of green building in case study.
- c. To determine relationship of motivation factors and common provision of green building criteria.

## **1.5 Scope of Study**

The questionnaire survey conducted in this study are only distributed to the construction practitioner such as contractor, consultant, developer and government servant in Johor Bahru and Kuala Lumpur only. The survey conducted in this study was not intended to serve as an opinion poll for determining the extent of green building practice in the building professions. Furthermore, the distribution method was not designed to achieve a random or representative sample, and the data were not meant to be subjected to tests of statistical significance. Rather, both the quantitative and qualitative data provide an exploratory look at the views of a group of building professionals who are interested in or are actively practicing sustainable design or construction. This study also concentrate on two apartment project as a subject of case study where one of the project is already certified for Design Assessment (DA) while the other one is in procurement process.

## **1.6 Structure of Thesis**

Structure of thesis for this study consisting of six chapters which cover the overall process of the study. Chapter 1 is for introduction which includes introduction, problem statement, research question, aim and objectives, scope of study, and thesis structure. Chapter 2 is for literature review which consist information for guidance and background knowledge about the research topic through journal, articles, books and other thesis related to the study. Chapter 3 is for research methodology which clarify the strategy to achieve the aim and objectives of the study as stated earlier. Chapter 4 is for result and analysis which provide data from the questionnaires and interview session. Chapter 5 is for discussion which discuss in detail of the finding from results and analysis. Chapter 6 is for conclusion with some recommendation of the overall study which focusing on objectives that has been set to achieve the aim of this study.

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