CHARACTERISTIC OF GREEN TECHNOLOGY FOR SUSTAINABLE RESIDENTIAL PROJECT

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CHARACTERISTIC OF GREEN TECHNOLOGY FOR SUSTAINABLE RESIDENTIAL PROJECT

by

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SPSS	Statistical Package for Social Sciences
GBI	Green Building Index
BREEM	Building Research Establishment Environmental Assessment Methodology
CASBEE	Comprehensive Assessment System for Building Environmental Efficiency
LEED	Leadership in Energy and Environmental Design

CIRI-CIRI TEKNOLOGI HIJAU UNTUK PROJEK KEDIAMAN MAMPAN

ABSTRAK

Penerimaan teknologi hijau untuk kediaman mampan menjadi trend pada masa kini. Pelbagai kebaikan boleh dicapai jika dimulakan dari awal untuk melaksanakan teknologi hijau dan kemampanan bermula dari pemilikan rumah. Permulaan perniagaan dari negara maju seperti Jepun dan Amerika Syarikat dan negara-negara membangun yang lain kini banyak mengambil langkah untuk melaksanakan teknologi hijau dan kemampanan dalam segenap aspek. Teknologi hijau dan kemampanan bukanlah sesuatu yang asing dalam industri pembinaan di Malaysia. Walau bagaimanapun, banyak usaha perlu dipergiatkan agar perlaksanaan teknologi hijau untuk projek kediaman lestari dapat diterima oleh orang ramai. Ini kerana kuasa untuk membeli dan memiliki rumah dengan konsep teknologi hijau dan kemampanan berada di tangan pembeli atau orang ramai. Usaha yang berterusan mampu memastikan kediaman berteknologi hijau dan mampan memenuhi ciri-ciri yang disukai oleh orang ramai, kajian ini adalah mengenai ciri-ciri teknologi hijau dan kemampanan yang diterima oleh orang awam untuk infrastruktur kediaman di Malaysia. Pada masa sama, dapat memastikan semua pihak yang terlibat dalam industri pembinaan sama ada dari pihak berkuasa yang berkaitan , agensi kerajaan, organisasi swasta dan pemaju boleh memainkan peranan penting dalam menyediakan yang terbaik untuk komuniti, negara dan masa hadapan.

CHARACTERISTIC OF GREEN TECHNOLOGY FOR SUSTAINABLE RESIDENTIAL PROJECT

ABSTRACT

Receptivity of green technology for sustainable residential trend featured nowadays. Various advantages can be achieved if it starts from the beginning to implement green technology and sustainability starting from the home ownership. Commencement of business from developed countries such as Japan and the United States and most developing countries now participate strides to implement green technology and sustainability in every aspect. Green technology and sustainability is no stranger in the construction industry in Malaysia. However, many efforts should be intensified so that the implementation of green technology for the sustainable residential project can be accepted by the public. This is because the power to buy and own a home with green technology and sustainability concepts is in the hands of the buyer or the public. Continued efforts ensure that residential green technology and sustainable meet the characteristics favoured by the public, this study on characteristics of green technology and sustainability receptive to public for residential infrastructure in Malaysia. At the same time, it ensures that all parties involved in the construction industry whether from the relevant authorities, government agencies, private organizations and developers can play a key role in providing the best for the community, the nation and the future.

CHAPTER ONE
INTRODUCTION

1.1 General

The characteristic of green technology for sustainability residential project consists of six elements, which are the efficient usage or alternative of resources, community design and planning, natural system, protection and safety, reusing and recycling approach. All the developed countries have their own criteria and their criteria are related to each other. The main purposes of the criteria are to save energy, to use resources in the efficient manner and to conserve the environment (Ismail et al., 2013).

Green buildings technologies are developed with objectives to provide a minimum destruction influence to the environment, healthier spaces in live and work. Increased interest of the construction industry players such as architects, developers, urban planners, contractor, manufacturers and government over the past decade makes green residential buildings is part of a branch of green construction and green building. Green residential infrastructure has focused on resources that can be controlled from being polluted by the environment and emphasis on energy-saving features (Elias et al., 2013).

Nowadays, green building technology plays an extremely important role to encourage community to move towards sustainability. Green building technology is practical solution to achieve economic development and satisfaction of man in harmony with the nature or environment (Osman et al., 2012).

1.2 Problem Statement

In pursuit of the world's current rapid economic growth, providing affordable housing of green technology for sustainable residential project and meeting the needs of consumers remains a key of priority for every country. However, the concept of green technology for sustainable residential project requires better understanding of the effective and sustainable housing in synergy. Malaysia as a developing country need to get the attention about sustainable residential project because it deserves to be implement more efficiently.

Barriers to green building demand, according to Aliagha et al. (2013) states that demand for green buildings must come with some problems and challenges for both commercial and residential, in different countries and regions while moving towards sustainable construction development. A study was conducted in Malaysia by Samari et al. (2013) showed that the main obstacle to the development of green buildings in the country is investment risk, lack of demand, lack of credit resources to cover the upfront cost and higher final price.

Another obstacle to the success of green technology and sustainability for residential project and development are the lack of government support such as lack of incentives, lack of building codes or regulations (policy), lack of strategy to promote green building and lack of public awareness. Besides that, from the point of view of the construction industry showed a higher investment cost, lack of technology, lack of design and construction team, lack of expertise, and lack of database and information are causes of the problem to encourage green technology and sustainability for residential infrastructure in Malaysia.

In order to prevent global warming, there should be a new practice, from the earliest phase of the design phase to the operational phase of the building in an

attempt to improve energy efficiency and energy consumption, so the carbon footprint, global warming potential and ozone depletion potentially can be reduced (Komalasari et al., 2014).

Abidin and Jaapar (2012) also listed a number of obstacles to faster progress in green building technology in Malaysia. These obstacles because there is a lack of public interest and demand in green technology and sustainability to public for residential infrastructure, the status quo in rules and regulations and the lack of local authority enforcement makes many organisation disinterest, high cost for the green appliance and project cost escalation. It causes people less aware that a reduction in energy consumption in buildings is a cost-effective way of reducing greenhouse gas emissions.

The initiative by the Malaysian government and other authorities need to exaggerate sustainable practices in green technology and sustainability to become more active. This is because some large developers begin to implement this concept in construction projects because they have realised the importance of green building technology in their construction projects. However, not all of the concept of sustainable development adopted by the entire construction industry or not industry-wide. For example, many developers, especially small and medium-sized businesses, still can not accept the changes to the concept of sustainability and still reserving themselves. Implementation of green technology and sustainability concept is believed to be weaker and less desirable due to several factors such as lack of knowledge, education, experience, poor enforcement of legislation, and passive culture from the various parties and individuals (Abidin, 2010).

Malaysia still has minimum research on residential infrastructure that is based on the use of green technology for sustainable residential project. The research was

conducted by previous researchers may have been inappropriate use today. For example infrastructure or facilities in the former residential infrastructure is not focused on bike paths and bicycle park, this led to the less populated residential areas using bicycles as vehicles for daily use or cycling as a leisure activity. This is how sustainable landscape architecture practice in residential infrastructure able to convert to a healthy lifestyle.

The next example about the characteristic of green technology for sustainability residential project is a green roofing system that should be used in each residence can reduce the cost air conditioning use during hot weather. In addition, through the use of clean energy technologies, such as solar power at home can help reduce the rate of growth of greenhouse gas emissions. Green technology and sustainability for each type of building construction are important because it takes an intelligent approach to energy, minimises waste and maximises reuse, creates resilient and flexible structures and promotes health and well-being.

From the above statements, shows that a study on characteristic of green technology and sustainability receptive to public for residential infrastructure is important to investigate and to obtain its level of adoption based on the most important characteristics of each residential infrastructure in green technology and sustainability context. This research is important in order to determine the demand and supply to implement the green technology and sustainability for residential infrastructure in the future.

1.3 Objectives

The objectives of this research are listed below:

1. To identify the characteristic of green technology for sustainable residential project.
2. To determine the most important characteristic of green technology for sustainable residential project.

1.4 Analysis Scope

The analysis for the research will be concentrate on characteristic of green technology for sustainable residential project in civil engineering scope. Public were chosen as respondents because they have the right to determine the residents they want to live in. Public were selected as respondent to identify their interest, knowledge and awareness of green residential infrastructure.

Questionnaire forms for data collection for this research were distributed to the public in Northern Malaysia. The study area encompasses three states in northern peninsular Malaysia which is Penang, Perak and Kedah. 400 respondents were targeted in this study, where in Penang with 106 respondents, while Perak were 160 respondents and the rest in Kedah with 134 respondents only to be assessed. In all three states, there are differences in the number of respondents due to the population in each state.

1.5 Significant of Study

This research is the study on characteristic of green technology for sustainable residential project which green technology and sustainability gives potential benefits to environment, human, flora and fauna where green technology and sustainability

are able to reduce the impact on health and other environment issues. The research is able to provide a practical philosophy about the most popular characteristic in perspective of green technology for sustainable residential project. Green technology for sustainable residential project, it is not only specific for green technology and sustainable construction method, but it brings together with green and sustainable design, techniques, materials and technologies which contribute to enhancing environmental performance.

Finally, policy actions in terms of politics, technology, economy and social can make a difference by providing guidelines to the authorities such as Ministry of Urban Well-being, Housing and Local Government to achieve green technology and sustainability for residential infrastructure in future. At the same time, guidelines by the authorities can be as guidance for developer, architect, engineer, contractor and public to implement green technology for sustainable residential project in Malaysia.

1.6. Organization of Dissertation

This dissertation contains five chapters. Chapter one consists of the introduction, problem statement, objectives, analysis scope, significant of study and organization of dissertation. Following this chapter, a comprehensive literature reviews related previous studies and research studies of design and structure of characteristic of green technology for sustainable residential project in chapter two. Chapter three describes the research methodology of this study which includes a detailed analysis of characteristic of green technology for sustainable residential project using Statistical Package for Social Sciences software. The fourth chapter consists of a discussion and comparison of the result of the analysis of characteristic

of green technology for sustainable residential project. Finally last chapter presents the conclusion of the research and suggests recommendation for the future works.

1.7. Summary

This chapter one section discusses the description of the selected research title including sub-topic about general in characteristic of green technology for sustainable residential project. Further description of expression problems statement faced in the present or future and why this study should be undertaken. The objective also described in this chapter so that the study and the result can be carried out properly. Analysis scopes of the study are also discussed to identify the location, type and number of respondents who fit the target for the data collection process. Significant of study is also set out to indicated positive changes if these studies are carried out properly. Lastly, a summary of the entire section has been summarized in organization of dissertation.

CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction

This chapter reviews the literature on characteristic of green technology for sustainable residential project and discusses previous studies related to characteristics. It also explains some concept and definitions of characteristic of green technology for sustainable residential project conducted in the studies.

2.2 Overview

Immediate actions need to be taken to avoid the phenomenon of global warming and climate change which occurs as a result of anthropogenic emissions of greenhouse gases because situations are dangerous for the future generations. Sustainable architecture should be actively and promptly implemented. As an attempt to achieve the goal of these efforts should be made by an architect to control and reduce water and energy consumption of the building and make it through climate responsive designs by inserting elements of green technology, environmentally friendly and renewable energy (Taleb and Sharples, 2011).

Another important barrier of sustainable residential project is a negative perception of the high density housing, poor quality in designs, an emphasis on building demolition and limited resources. Furthermore, it is important for developers to channel resources on the enforcement of building policies or regulations by providing a sufficient social and affordable housing building as well as the social infrastructure is required for sustainable communities in this country with adequate or proper management, maintenance, and modify unsustainable of conventional housing building (Winston, 2010).