SUSTAINABLE ATTRIBUTES IN PROJECT FEASIBILITY STUDY TOWARDS IMPLEMENTATION OF SUSTAINABLE CONSTRUCTION

TAN KAH LING

UNIVERSITI TEKNOLOGI MALAYSIA

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DEDICATION

Deepest gratitude to ***my beloved father, mother, brother and sister***
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ABSTRACT

Feasibility study plays the most important role before commencing the project design and construction. The effectiveness in considering sustainable attributes in feasibility study will directly influence the success of a project. However, many developers have not embraced the sustainable attributes in project feasibility study. Thus, this research is carried out to investigate the sustainable attributes to be considered in the process of feasibility study towards implementation of sustainable construction. This research utilised quantitative approach where questionnaires were distributed among developers. The questionnaire was divided into three main parts which are the sustainable attributes taken into consideration in feasibility study, barriers in considering sustainable attributes in feasibility study and the ways to overcome the barriers. The data collected was analysed using SPSS 16.0 and Microsoft Excel. The findings revealed that economical performance attributes are given more concerns than that given to the social and environmental performance attributes in conducting feasibility study. Besides, results also shown that the barrier of more preference to practice conventional or non-sustainable than trying out new or sustainable method hindered the considering of sustainable attributes in feasibility study. The findings had suggested the need for providing education and training to improve the awareness and equipping the construction parties with the sustainable knowledge is essential to overcome the barriers.

ABSTRAK

Kajian kemungkinan memainkan peranan yang penting sebelum memulakan reka bentul projek dan pembinaan. Keberkesanan dalam mempertimbangkan ciri-ciri mampan dalam kajian kemungkinan akan mempengaruhi kejayaan sesuatu projek. Walau bagaimanapun, ramai pemaju masih belum merangkumi ciri-ciri mampan dalam kajian kemungkinan. Oleh itu, kajian ini dijalankan untuk mengkaji ciri-ciri mampan yang perlu dipertimbangkan dalam kajian kemungkinan ke arah pelaksanaan pembinaan mampan. Kajian ini menggunakan pendekatan kuantitatif di mana soal selidik telah diedarkan kepada pemaju. Soal selidik ini dibahagikan kepada tiga bahagian utama iaitu ciri-ciri mampan yang dipertimbangkan dalam kajian kemungkinan, halangan-halangan dalam mempertimbangkan ciri-ciri mampan dalam kajian kemungkinan dan cara-cara untuk mengatasi halangan-halangan tersebut. Data yang dikumpulkan telah dianalisis dengan menggunakan SPSS 16.0 dan Microsoft Excel. Hasil kajian menunjukkan bahawa ciri-ciri prestasi ekonomi diberi lebih perhatian daripada ciri-ciri prestasi sosial dan alam sekitar dalam menjalankan kajian kemungkinan. Keputusan kajian juga menunjukkan bahawa situasi yang lebih memberi keutamaan kepada amalan konvensional daripada mencuba kaedah baru atau kaedah mampan akan menghalangi pertimbangan ciri-ciri mampan dalam kajian kemungkinan. Hasil kajian telah mencadangkan bahawa pendidikan dan latihan perlu disediakan untuk meningkatkan kesedaran dan menambahkan pengetahuan pihak pembinaan dalam kemampanan supaya dapat mengatasi halangan-halangan tersebut.

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ABBREVIATIONS		FULL NAME
CIDB	-	Construction Industry Development Board
HVAC	-	Heating, Ventilation and Air Conditioning
IRR	-	Internal Rate of Return
NPV	-	Net Present Value
REHDA	-	Real Estate and Housing Developers' Association
RIBA	-	Royal Institute of British Architects
ROI	-	Return on Investment
SPSS	-	Statiscal Package for Socail Science
TPL	-	Triple Bottom Line
WCED	-	World Commission on Environment and Development

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CHAPTER 1

INTRODUCTION

1.1 Introduction

Buildings and structures enable people to meet social requirements for shelter, to meet economic needs for investment and to satisfy corporate objectives. However, the satisfaction of these requirements is come with a high price that brings damage to the environment. According to Zainul Abidin (2010), the impacts of some global issues such as global warming and ozone depletion have increased the pressure on the need to achieve sustainability (Said, et al., 2009). In Malaysia, the issues of environmental dissatisfaction with construction projects are normally seem in newspaper headlines. This initiates a realisation on the significance to improve our conventional way of development into a more responsible approach which can fulfil people's requirements without bringing detrimental effects to the environment.

There has an opportunity for improvement when a new philosophy called "sustainable development" is introduced in 1987 in Brundtland Report (Abidin, 2010). Since that, many progressive countries had taken initiatives to increase the awareness on environment and many sustainability agendas such as Rio Earth

Summit 1992, Kyoto Conference on Global Warming 1997, Johannesburg Earth Summit 2002 and DOHA Climate Change Conference 2012 are executed. The 5th Prime Minister of Malaysia has urged that Malaysian should not ignore the importance of managing and utilising its natural resources in a sustainable manner and developers are reminded to ensure that environment must not be sacrificed for the sake of economic development.

Although many construction practitioners agreed with sustainability principles, many have still not grasped their meaning and even fewer have translated sustainability into action. Abidin (2010) asserted that the developers are aware of the rising issues on sustainability, but little efforts are generated from them in implementing it. Due to limited understanding and the concern about cost, many developers are reluctant to pursue sustainability in their projects. Besides, the importance of incorporating sustainable development principles into project feasibility study is still not effectively understood by project stakeholders (Shen, et al., 2010). As a result, the sustainable movement is still at its infancy and the sustainable projects are mostly at the pioneer stage. Therefore, it is essential to shift the traditional approach of project feasibility study to a new approach that embraces the principles of sustainable construction. More endeavours are required to boost this shifting and further stimulate strategies towards a sustainable built environment.

Feasibility study is the first and most important thing before implementing project design and construction. It has the potential to influence the success of a project. Thus, incorporating the sustainability principle in conducting project feasibility study is prominent. Sustainability concerns the relationship among ecological, social and economical systems. The promotion of sustainable construction practice is to achieve a balance among economical, social and environmental performance.

1.2 Problem Statement

Construction industry is important for the development of every society, but it is also considered as the main factor causing the depletion of natural resources and pollution (Said, et al., 2009). About 30 – 40% of the total natural resources used in industrialised countries are exploited by the construction industry. Almost 50% of energy flow is used for heating and cooling in buildings; 40% of the world's consumption of materials converts to the built environment; and about 30% of energy used is due to housing (Kamar, et al., 2010). This industry is also influences the climate change and environmental threats. As a result, the sustainable construction is difficult to be achieved. Therefore, it should look into the principles of sustainability to achieve sustainable construction (Said, et al., 2009).

In the Construction Industry Master Plan (2005 – 2015), the issue of sustainability is highlighted as a significant aspect for the Malaysian construction industry. The Malaysian government is committed to address sustainability issue and meet its target and obligation in this regard (Kamar, et al., 2010).

According to Shen et al. (2010), some studies have reviewed that it can gain profit by infusing sustainable principles in the process of implementing construction projects. It is especially more important to include the principles in conducting project feasibility study. However, the importance of incorporating sustainable development principles in conducting project feasibility study is not effectively understood by project stakeholders, and the environmental impact assessment is normally conducted on the preliminary stage of the project if required (Haapio & Viitaniemi, 2008).

Construction industry is always recognised as environmental polluters and some studies shown that there have significant adverse impacts of construction business on environment. It also demonstrated that the tradition of emphasising on

controlling cost, time and quality but less attention to environmental and social performance in implementing construction projects. For the reason of the environmental aspect is widely reflected recently as the construction organisations are environmental polluters, this realisation of the impacts had led to the growth of studies on solutions for practising sustainable construction in a project life cycle (Tam, et al., 2002).

The importance of sustainable construction is realised, nevertheless the effectiveness of the implementing methods has been limited in practice. This limitation is partly due to profit-driven culture in the industry where cost, quality and schedule have been the factors in ensuring maximum benefits of the construction business (Shen, et al., 2010). Besides, developers are ranged from big and well-established companies to new and small companies. The big companies of professional developers were aware of sustainability and they are beginning to take heed towards sustainable implementation in their projects. Although medium and small-sized developers might be aware of sustainability, due to constraints such as cost, they preferred to produce a building which satisfied criteria set by regulations (Zainul Abidin, 2010).

In order to move towards sustainable construction, more efforts are needed and should be directed towards achieving the green agenda of the industry. The government has persuaded the professional parties and developers to take proactive actions to promote the sustainable construction and be responsive to the need for better environmental and social protection. However, the embarking of sustainable construction only be possible if all the relevant parties take part and support in the implementation (Zainul Abidin, 2010).

Therefore, this research aims to investigate the sustainable attributes to be considered in the process of feasibility study towards implementation of sustainable construction.

1.3 Aim and Objectives of the Research

The aim of this research is to investigate the sustainable attributes to be considered in the process of feasibility study towards implementation of sustainable construction.

The objectives of this research are:

1. To identify the sustainable attributes taken into consideration in feasibility study.
2. To investigate the barriers in considering sustainable attributes in feasibility study.
3. To identify the ways to overcome the barriers in considering sustainable attributes in feasibility study.

1.4 Scope of the Research

This research is to investigate the sustainable attributes to be considered in the process of feasibility study towards implementation of sustainable construction. In order to achieve the aim of this research, the scope of this research is confined to developers in Malaysia. In implementing a construction project, developer is the one who initiates the project, thus developer is the suitable respondent for this research.

1.5 Significance of the Research

As current construction method and material used had contributed to pollution and environment degradation, thus sustainable development should be highlighted in order to provide a better quality of life for the next generation. Generally, project feasibility study is conducted before undertaking the construction, thus the effectiveness in considering sustainable attributes in feasibility study will influence the success of a project. Therefore, it is important to incorporate the sustainable attributes when conducting project feasibility study for the purpose to gain a better understanding for facilitating gaining better sustainability in the process of implementing construction project. In conclusion, this research will bring benefits not only to the construction stakeholders, but also to the public as sustainable construction will bring less harm to the environment, beneficial to the social and profitable to the construction stakeholders.

1.6 Brief Research Methodology

Methodology is the vital part in achieving the objective of the research. The main purpose of this research is to investigate the sustainable attributes to be considered in the process of feasibility study towards implementation of sustainable construction. This section will provide a guideline to attain the objective, whereby the instruments and procedures used will be described.

Data collection is divided into 2 types which are desk study approach and fieldwork research. Conference paper, articles, journals, internet sources and books will be used to collect secondary data. Besides, the research approach for this research is quantitative research methodology. Thus, in this research, fieldwork

research will involve the research instrument of questionnaires in collecting the primary data.

Once all the data have been collected, the result will be analysed to determine the research finding. The collected data is analysed through Statistical Package for Social Science Version 16.0 (SPSS – Version 16.0) and Microsoft Excel 2007 with discussion and explanation on findings. A summary of the result will be created to highlight the main trends.

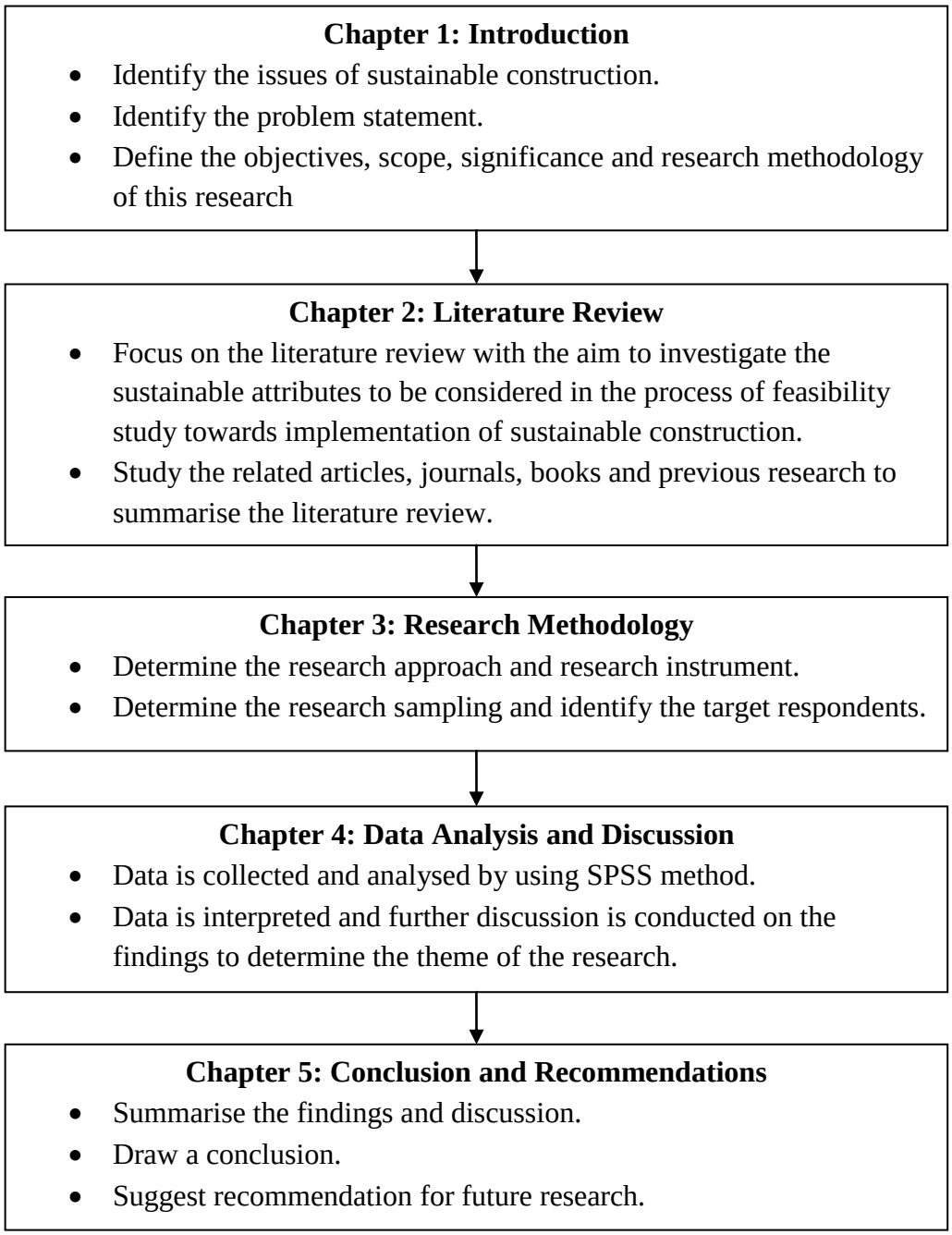

Figure 1.1: Research flow chart

1.7 Summary

Feasibility study plays the most important role before commencing the project design and construction. The effectiveness in considering sustainable attributes in feasibility study will influence the success of a project. Thus, the aim of this research is to investigate the sustainable attributes to be considered in the process of feasibility study towards implementation of sustainable construction. The objectives are sustainable attributes taken into consideration in feasibility study, barriers in considering sustainable attributes in feasibility study and the ways to overcome the barriers. The selected respondents are developers and quantitative approach is used where questionnaires were distributed among the respondents. This research is significant in order to incorporate sustainable attributes in feasibility study for the purpose to gain a better understanding for facilitating gaining better sustainability in the process of implementing construction project. Besides, a brief research methodology has been identified.

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