CHAPTER 9

An Investigation into Developers’ Perspectives on Green Building Demand Factors

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Abstract

The green prospects in Malaysia, driven by worldview towards sustainable development and environmental conservation are very encouraging. The pursuit of green technology in the development of this era is not detrimental as it can help to create a strong green economy and industry, in line with the nation's vision as well as the entire world economy. Even with the pursuit of this green technology is not detrimental, but the high cost involved at every start of construction, it is still considered a problem for developers. This study aims to explore and understand the elements of green building and sustainability building. Additionally, with the developers' view of their demand for green building can also help to understand their awareness towards green building. A survey around Johor is a way to investigate the level of awareness of green building among developers in Johor and to understand the developers' perspective on demand factors for green building in Johor. The data collected in this study were obtained from a quantitative method that was represented in the questionnaire survey. A study on the awareness of the green buildings, it will contribute and determine, which of the demand factors of the developers' important views as they have been mentioned such as environmental sustainability, increased productivity, improved internal building conditions, higher building value, cost savings, lower risks, branding and prestige, and high workforce turnover. This study will also help future researchers to have a better understanding and know the needs of factors for each developer on their demand for the green building in Johor.

1. INTRODUCTION

Malaysia is one of the fastest growing nations in utilizing advanced technology in the construction industry. The construction industry in Malaysia has started to implement advanced technology especially utilizing sustainability in constructing buildings for improving the quantity and quality of building construction. In Malaysia, green building
rating system is called Green Building Index (GBI) where the green rating tools are for buildings to promote sustainability in the built environment and raise awareness on environmental issues and responsibilities for future generations. Aliagha et al. [1] mentioned that green building is redefining and revolutionizing building practice and emerging as a response to growing concern over pollution and environmental damage, increasing awareness and acceptance of climate change, decreasing natural resources, increasing energy cost, and increasing demand for sustainability in building design and construction. Sustainable construction, which addresses the ecological, social and economic issues of the building in the context of its society. These buildings are designed and constructed to consume less energy and resources from traditional buildings and aim to minimize the impact on the environment [10]. A building that cares about the importance of green building will increase the efficiency of resources used such as energy, water, and materials while reducing the impact of the building on human health as well as around the area [7].

Buildings that do not have green building characteristics will have an adverse impact on workers' health. Their safety and productivity also will be affected. A building must follow the green aspect so that it follows the growing circulation today. By creating green buildings, not just for eco-friendly. However, it can also help protect the health of the occupants, increase employee productivity, use more natural causes and also reduce the impact of the higher environment today [14]. Steps should be taken so that green aspects can be implemented in every future development project. When the green building is produced, it can reduce waste materials and pollution [14]. By conducting surveys amongst the developers in Johor Bahru, it is a very encouraging step to know the level of awareness of developers towards the green building.

This study is conducted to explore the demand factor developers’ perspective by considering the green building material in construction. It is important to understand how far our local developers are exposed to green building. The expected result of this study will form a better understanding of the green building. It also can help to increase the level of awareness of GBI among developers. The study will increase understanding of factors contributed to adopting green features in building development.

2. LITERATURE REVIEW

This section will discuss the developers’ perspective, sustainable awareness, and green building demand factors as follows:
2.1 Developers’ Perspective

According to Chua & Oh [7], developers have been highlighted as one of the key players in realizing the vision of sustainable construction. Based on Aye et al. [2], the main personal value for developers is that their projects must be commercially viable. Some developers underestimate the benefits of this green building. Unaware of them, it will affect the occupants of the building. That’s because developers do not gain a deep knowledge of sustainability development. For some developers, environmental and social aspects will not be a priority if the completed construction project will be sold as well [15]. Only developers with strong capital, good reputation, extensive experience and expertise and who target high income and foreign investors as potential buyers are interested in the 'green' concept as they are seen to be better quality in design [15].

2.2 Sustainable Awareness

Abolore [3] stated that awareness of green building practices depends on the understanding of the individuals’ actions, quest for knowledge and absolute involvement and commitment to the principles. Developers should be aware that by design a building following this green aspect will help to save energy, reduce negative impacts on the environment, be more people-friendly and reduce lifecycle cost [3]. Large companies with professional developers are very aware of sustainable development and action will be taken immediately to make a proper plan, as well as adequate design and budget allocation [15]. Zainul Abidin Nazirah [15] also stated that 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 the regulations. Alias et al. [4] stated that the demand for a green home is low because Malaysian are lacking in awareness towards a sustainable development. They are more likely to buy a conventional home at a cheaper price if compared with a green home. They are not aware that a green home can help them to save money in the long run.

2.3 Green Building Demand Factors

Green building practices can play a vital role in achieving sustainability in the construction industry and over the last two decades the construction industry has made efforts to develop green building practices [16]. However, green building has demined factors represents eight factors as follows:
2.3.1 Environmental Sustainability

Green building will create a comfortable atmosphere around the room. It's not easy to create such a comfortable situation to be able to last a long time. Addis and Talbot [5] stated that the extraction of natural resources is one of the concerned about environmental sustainability. Taking care of the materials that will be used for a building is important because it can reduce the adverse effects of the environment. Aliagha et al. [1] stated the risk to the environment, society and economy must be minimized in short and long-term to achieve a sustainable future. According to Elkington [8], this sustainable principle can be expressed by considering three important aspects that are economic, social and environmental sustainability. Based on the previous study, most of the respondent from Umar and Khamidi [14] said that environmental sustainability has to be the first things to educate people about the concepts of green building. Apart from that, the real purpose of a building should be achieved by saving on the cost of electricity, energy, and water.

2.3.2 Increased Productivity

A building that has the features of a green building, it helps people to more actively make their daily activities more vibrant. In addition, green building is characteristically a high-performance productivity environment. Based on Haynes [9], there must be a good comfort environmental services to achieve a healthy working environment. Ventilation, heating, natural lighting, artificial lighting, cleanliness, overall comfort, and physical security are the attributes to gain a comfortable office environment.

A good ventilation in a green building provides a lot of benefits when the airspace environment can flow well. Ventilation is important as it is necessary to get rid of indecent, polluting and steam air and bring fresh air to the owner's home [4]. The developer must know that the design of a good ventilation should be a priority that could attract buyers compared to conventional homes. It also helps to maintain a comfortable atmosphere with stable temperatures for workers inside the building. Thus, this results in enthusiastic and healthy workers when performing their respective duties. This can also help them to face their day cheerfully without any easy illness that will infect them while working.

2.3.3 Improved Internal Building Conditions
This is also one of the demand factors that can be from the developer's point of view as it can help improve the mood of the situation in a building. Some studies have been conducted on the effects of closed environmental quality (IEQ) on the health, comfort, and performance of the occupants. While the impact of IEQ on its occupants has become fundamentally important and they have been regarded as attractive to real estate managers while they are also worried about energy consumption. They concluded that the employers were impatient with satisfying their employees by creating comfort to increase productivity, reduce absenteeism and health-related costs, and reduce the risk of litigation [13]. Among the ways can be to improve living standards in a building by decorating fresh plants around the offices. This is very helpful to make us breathe well and calm down. A good ventilation also helps the people in the building. Green homes use low volatile organic compound paint with a reduction in health-related problems and this provides better indoor air quality compared to the conventional homes [4].

### 2.3.4 Higher Building Value

Interesting of a valuable building by following the green building specifications compared to non-green buildings. Based on the previous study from Aliagha et al. [1], it stated that by having a building that contains green aspects, the high price value will be achieved by the owner of the building compared to the building that does not have green aspects building. Compared to a conventional home, the green home has many benefits and advantages that can be discussed.

### 2.3.5 Cost Savings

Sustainable building has been promoted as a building that can save cost due to efficient electricity, energy, and water usage. This is all one of the advantages of buildings with green building features. According to Aliagha et al. [1], a good life cycle assessment, integrated building design, effective accreditation, operation, and maintenance to ensure continuous cost savings. In this case, the lack of knowledge on cost and life-cycle analysis considers not only the design and construction costs but also long-term operations such as maintenance, repair, replacement cost in decision making and equipment procurement are highly likely to translate into higher building costs [1]. Previous studies have proven that green building can help to save a cost. The benefits of building green buildings to property developers have been reviewed previously and found out that developers can effectively reduce their costs and risks in achieving green building accreditation [6]. In addition, material for the construction of green buildings becomes cheaper and the design is getting more and
more while tenants and homeowners are demanding green buildings and have value for these features [12].

### 2.3.6 Lower Risks

Bertrand and North [6], stated that green can be achieved successfully while limiting costs and risks at the same time. Demand for lower risk is for workers working in green buildings. This is because the non-green building makes the workers unhappy with their working conditions. So then, when they go out to find a new job, they will be more likely to find work in green building areas. Here, they can help them motivate themselves when working more excitedly. The risk of being in the green building is diminished and is a bit of a result of the workers who are comfortable working in green buildings. According to Kuiken [11], since studying leases in the environmental building is easier, so the vacancy rate is lower and thus makes it green buildings are less risky and order higher value investments. Based on Zainul Abidin Nazirah (2010), developers are afraid to build high-cost buildings because they are worried about not having buyers. On the demand factor of this developer, campaign awareness must be made to give people an awareness that this green home is much better than a conventional home. Lower risk will be achieved if the community is aware of the importance of these green aspects.

### 2.3.7 Branding and Prestige

This is one of the high demand for a green building. However, it also helps the building to be recognized whether it will get gold, silver or platinum. This recognition is according to the GBI rating tool. In fact, previous studies from Kuiken [11], also stated that building managers are happy for being green star-rated office building which gave them a competitive advantage as a sustainable leader in the industry. In addition, a rent premium, lower vacancy allowance, decreasing risk, and slower depreciation are all in favor of a price premium for green buildings [11]. By raising branding and prestige, the green building will receive compliments from surrounding communities and should also be proud of the accomplishments achieved to bring Malaysia.

### 2.3.8 High Workforce Turnover

By having a building that has been recognized as a green building, it can help employees in the company to do their activities perfectly. This is due to the good environment and to meet the human needs of the GBI. Their workplace is surrounded
by sustainable sources and technology. In addition, employees will be very satisfied with the environment surrounding their workplace. All the worker will now conscious of sustainability and health-related issues could well be motivated by working in a green environment [1].

3 METHODOLOGY

The quantitative research method was applied in obtaining and analyzing data for the study. A quantitative method in this study involving a survey to collect data and a computer software Statistical Package for the Social Science (SPSS) to analyze the data.

3.2 DATA COLLECTION

A survey was conducted by distributing a questionnaire among developers around Johor Bahru. The questionnaire asked questions related to factors contributing to demand green building construction in Malaysia. The questionnaire contains 3 sections which are:

i. Section A: The first section of the questionnaire which asks about the basic information of respondent background.

ii. Section B: This section is related to basic knowledge about green building and indicators of awareness about green buildings.

iii. Section C: Knowing the respondent respond according to the perceptions of the importance of green building demand factor.

The questionnaire has been distributed to a total of 60 developer’s companies in Johor Bahru. 25 completed questionnaires were returned. The area of Johor Bahru was chosen because Johor Bahru is a developed area with the presence of a wide range of facilities and development.

3.3 DATA ANALYSIS

Data analysis is a process of representing data findings of the study in a form that it is easy to understand. A statistical test was used to analyze the data that were obtained for this study with the help of computer software. It can simplify the process of data analysis that was used by producing more accurate statistics by using SPSS software to analyze data collected statistically.
4 RESULTS AND DISCUSSION

The first section of the questionnaire, the questions are all related to the respondent background information. Results have been summarised and shown in Table 1. Most respondent is male respondents compared to female respondents contributed about 60.0% of the total respondents. For the academic qualification, most of the respondents have a degree about 64.0% compared to SPM and diploma holder with 8.0% and 28.0% respectively. Most of the respondents are new to the construction industry around one to five years’ experience as shown in Table 1 account to 64.0% of total respondents.

<table>
<thead>
<tr>
<th>Gender</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>15</td>
<td>60.0</td>
</tr>
<tr>
<td>Female</td>
<td>10</td>
<td>40.0</td>
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<table>
<thead>
<tr>
<th>Academic Qualifications</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPM</td>
<td>2</td>
<td>8.0</td>
</tr>
<tr>
<td>Diploma</td>
<td>7</td>
<td>28.0</td>
</tr>
<tr>
<td>Degree</td>
<td>16</td>
<td>64.0</td>
</tr>
<tr>
<td>Master</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Ph.D.</td>
<td>0</td>
<td>0</td>
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<table>
<thead>
<tr>
<th>Experience in construction</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-5 years</td>
<td>16</td>
<td>64.0</td>
</tr>
<tr>
<td>5-10 years</td>
<td>3</td>
<td>12.0</td>
</tr>
<tr>
<td>10-15 years</td>
<td>2</td>
<td>8.0</td>
</tr>
<tr>
<td>15-20 years</td>
<td>2</td>
<td>8.0</td>
</tr>
<tr>
<td>&gt; 20 years</td>
<td>2</td>
<td>8.0</td>
</tr>
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Data from Table 2 shows that the majority of the respondent have a high level of awareness about green building. It also shows that most of the respondent agreed about the advantages of the green building except for the use of water from bathrooms and sink. Most of the respondent was not sure about the safety of recycling water from bathrooms and sink.
Table 2: Overall analysis of respondents’ knowledge of green building (section B)

<table>
<thead>
<tr>
<th>Indicators of awareness about green buildings</th>
<th>Percentage of Respondents (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maintenance cost for the green building is higher than conventional buildings</td>
<td>Disagree Not Sure Agree</td>
</tr>
<tr>
<td>Green building design has more benefits than using conventional design</td>
<td>8.0 16.0 76.0</td>
</tr>
<tr>
<td>Electricity for green building is less use</td>
<td>0.0 8.0 92.0</td>
</tr>
<tr>
<td>Green building provides better internal air quality in the building</td>
<td>0.0 4.0 96.0</td>
</tr>
<tr>
<td>Green building help to collect rainwater and used for domestic use</td>
<td>4.0 12.0 84.0</td>
</tr>
<tr>
<td>Have sufficient natural lightning for green building</td>
<td>0.0 16.0 84.0</td>
</tr>
<tr>
<td>Used water from bathrooms and sinks is not safe for use in flushing toilets</td>
<td>28.0 40.0 32.0</td>
</tr>
</tbody>
</table>

Based on Fig 1, the results show that the majority of the respondents, accounted for 94% of the total respondents agreed environmental sustainability is the most important factor in green building demand. More than 60% of the respondents also scored cost saving, increase productivity, lower risk and improve internal building environment as the important factors in the demand for the green building. Less than 50% of the respondents scored higher building value and branding and prestige as the demand factors for green building. This demonstrates that the respondents who are among the developers are concerned with the fundamental purposes and benefits of green building in environmental sustainability and human comfort and productivity as the demand factors for sustainable building compared to commercial purposes only.
5 CONCLUSION AND RECOMMENDATIONS

Level of awareness on green building among developers in Johor Bahru is very encouraging. Most of the respondents have good background knowledge on the fundamental of green building elements. The more knowledgeable developers on the green building can help the better development and construction of the green building. The study discovered that there are eight demand factors of green building. The respondents agree that environmental sustainability is the most important demand factor in green building development. The least important demand factor is branding and prestige. This result shows a promising future of green building development. However, the development of the green building does not solely on the responsibility of the developers. It is recommended to expand and share knowledge about the advantages of green building with other construction stakeholders as well as the public. Every useful knowledge should be disseminated to the communities. Awareness of the needs to change from conventional building to green building must be increased because the green building helps to reduce environmental damage that is often the conventional building construction process cause.
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REFERENCES


