

WAY FORWARD FOR GREEN BUILDING IMPLEMENTATION IN MALAYSIA

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ABSTRACT

Recently, there are mounting issues relating the climate change including global warming and deprivation of earth ecosystem caused by high consumption of non-renewable resources particularly in the construction industry. Therefore, green buildings represent design and construction that are sensitive to the environment now and in the future. This study aims to raise the level of understanding regarding the green building concept, together with identifying the factors affecting the implementation of green building and to come out with success factors to implement green building in Malaysia. In this study, quantitative method has been implemented by distributing questionnaire to developers in Klang Valley where data obtained was analyzed by using Relative Importance Index (RII). The results of finding show that the major factors hinder developers to implement green building are the financial factor. Where the most effective method recommended by developers is to improve the municipal factor by providing more incentives and rebates by the government for developing green building.

Keywords: developer, green building, Malaysia

INTRODUCTION

Green Building is building that improve the climate changes by using green materials and green technologies which reduce the whole life cycle cost of a building (Abualrejal et al, 2017). Where the core function of green building is to allocate resources in terms of energy usage, material and water usage. Hence, reducing negative impacts to human by building itself throughout the whole life cycle. (GBI, 2016)

In Malaysia, green buildings concept has been a national focal point for decades, the works and efforts to step towards green movement has been started to ensure better quality of life. In 2009, Green Building Index (GBI) was introduced, it is a recognised green rating tool by Malaysia for construction industry to promote sustainable development and increase awareness among all the parties involved in construction as well as occupants on environmental issues. GBI is introduced specifically for the tropical climate in Malaysia.

Following GBI, Malaysia also launched Skim Penilaian Penaraf Hijau Jabatan Kerja Raya (PH JKR) and Green Performance Assessment System (Green PASS) in 2012, Green Real Estate (GreenRE) by Real Estate and Housing Developers Association (REHDA) in 2013 and the most recent Malaysian Carbon Reduction and Environmental Sustainable Tool (MyCREST) in 2016.

When green building is mentioned, ‘sustainable development’ is always interrelated and it is vital in construction industry. According to the World Commission on Environment and Development (WCED), sustainable development is defined as the development meets present’ needs without jeopardizing future generations’ ability in meeting their own needs (Parr, 2010). Integrating “sustainable” or “green” property practices is also known as “solid financial investment” (Kats, 2003). Green Building brings a lot of advantages in terms of financial such lower energy consumption, less wastage and low maintenance cost as well as less obvious benefits which is increased in health and well-being for occupants. Where water and energy savings are predictable and measurable, constant monitoring is required. (Esa et al, 2011)

THE ISSUES

Scientists pointed out that are natural changes while some believed that human activities are the key driver in causing climatic issues (Radhi, 2009). Studies found that construction industry is the main contributor to these issues arising. The International Energy Agency (IEA) reported global energy-related CO₂ emissions grew 1.7% in 2018 to reach a historical high of 33.1 giga tons CO₂ (IEA, 2019). The use of fossil fuels in building during operational phase contributes large amount of GHGs emission, either in developed and developing countries (Mardiana and Riffat, 2015).

Van der Ryn and Cowan (1996) said that parties involved in construction field should have a certain level of understanding in infusing the design of products, buildings and landscape ecologically. As a result, the idea of building green has started to spread out all over the world and the practice of green and sustainable and has to turned into a requirement in constructing a building (Awang, et al, 2016). The efficiency of energy, materials, land and water is higher when constructing green building compared to traditional building. As more natural light and better air ventilation can be achieved, it helps to improve health and productivity. As green building is said to bring good impact in sustainable development due to its sustainability.

To date, the green building rating for new construction in Malaysia is voluntary instead of compulsory. This empowers the client, primarily developers to be the decision maker over developing a green building or not. This study focuses on developers’ perspective on implementing green building in Malaysia.

This research aim to identify the developers’ perspective on factors affecting the implementation of green building in Malaysia, also to determine the success factors to increase the implementation of green building in Malaysia.

GREEN BUILDING

Green building can be defined in various ways. One of the definition given by Kibert (2008) is “ ... healthy facilities designed and built in resource-efficient, using ecologically based principles”. While U.S Environmental Protection Agency (EPA) (2014) has also defined it is the practice of building structures and using processes that are environmentally responsible and resource-efficient throughout the life cycle of a building from siting to design, construction, operation, maintenance, renovation and deconstruction. While the definition mentioned about life cycle assessment (LCA), where it is a standardised system used to assess potential impacts to environment associated from raw material extraction to the end of its life (ISO, 2006).

SUSTAINABLE DEVELOPMENT

The idea of 'sustainable development' is introduced long time ago, but it only started to become more popular in Malaysia since 1970 when New Economic Policy (NEP) was introduced in 1970 to eliminate poverty and enhance balance of society structure. A report from the World Commission on Environment and Development defined the idea of sustainable development is to meet the needs of the present, without compromising the ability of future generations to meet their own needs. Where this explanation still provides a broad basis for current thinking and practice, based on balancing economical social needs by preserving and enhancing natural resources and ecosystem.

GREEN BUILDING RATING TOOLS

Green building rating tool is a system which measures the satisfaction of a building in compliance with green requirements set in the system. Therefore, the evaluation process must follow the criteria introduced in the system which needs to be acquired to be certified (Illankoon et al., 2017). There are few main rating tools in Malaysia which will be further explained in this section. Green Building Index (GBI) is the first rating system introduced by Malaysia to evaluate the design and performance of a building based on few criteria such as 'Energy Efficiency', 'Indoor Environmental Quality (IEQ)', 'Sustainable Site Planning & Management (SM)', 'Material & Resources (MR)', 'Water Efficiency (WE)', 'Innovation (IN)'.

Next, PH JKR is a green rating tool developed and applied by JKR itself as a purpose to evaluate the sustainability level of each construction project (Hamid et al. 2014). It was built based on the operation of the existing building and also the mandatory requirements set by government projects. Therefore, this rating tool is said to be more friendly to government projects. Green PASS is developed and managed by CIDB (Hamid et al, 2014). According to CIDB, Green PASS was initially based on two existing rating system. Unfortunately, it is not materialized due to some internal issues occurred. It is now merged with PH JKR to form MyCREST which is launched in 2015, with the aim of promoting green building construction (CIDB, 2018). Moving on to MyCREST, it is a special rating tool specifically focus on carbon reduction which aims at improve building impacts by reduction of carbon emissions and environmental implication and also the most important thing which is whole life cycle of a building (EAG, 2013). GreenRE is launched by the REHDA in year 2013, as the key driver to Malaysia moving towards sustainable development. There are two classification in this assessment which are 'Energy Related' and 'Green Requirements'.

BENEFITS OF IMPLEMENTING GREEN BUILDING IN MALAYSIA

There are 4 categories of benefits of implementing green building in Malaysia. The financial benefits of implementing green building can be divided to developers, owner and tenants. While developers bear the high initial cost in the construction phase of a green building, research found that cost can be recovered by increasing sales price and also rental rates (SGS, 2008). In 2016, Leong concluded that in Malaysia, the assets growth, market growth, share price and market capital of sustainable developers grow faster than the industry as a whole.

Next, from the view of buyers, green building also encourages tenant rate, due to the unique end of product of green buildings and their green features that improve the living environment for occupants. In addition, government is also one of the key driver in providing financial benefits to the investors and buyers. For example, buyers can enjoy tax deduction for buying green building (Kubba, 2010). Bfrom 2009 to 2014, the Malaysia government has granted tax exemptions which are equal to the capital expenditure to obtain the certificate to building owners who have been certified the Green

Building Index (GBI). Home buyers who has received the GBI certificate from the property developer will be given stamp duty exemptions on documents of transfer. Therefore, buyers will tend to buy green building where they can pay less in taxation and results in higher return.

Lastly, green building provides a better air quality, better lighting and also higher quality of materials in achieving certain level certification. One of the environmental benefits green buildings offer is to our climate and natural environment (WGBC, 2016). The environmental benefits include conserving natural resources, higher air and water quality and reduce of wastage (Turcotte, Villareal and Bermingham, 2006). In year 2009, LEED buildings estimated almost 2.9 million tons of CO₂ savings per year and about 15 billion gallons of water saved in a year (Yellamraju, 2010). As green building rating tools play an important role as due to their assessment and requirements in certified green building. From the results, it shows that LEED buildings shows a significant improvement in balancing the ecosystem. According to Gou, Lau and Prasad (2013), green building provides greater market demand and higher rental rate than conventional buildings which also agreed by Cotton (2013). For instance, in McGraw-Hill Construction report (2013), revealed that market demand experienced an increment growth for green buildings. As a result, developers can enhance their marketability through investment in green building. A few researches revealed that higher levels of green certification can leads to higher sales premium (WGBC, 2013).

Furthermore, a certified green building also gives a good reputation for marketers. Leong (2016) mentioned, in Malaysia, the revenue of sustainable developers grow faster than non sustainable developer during 2010 to 2014. On the other hand, the rental growth, tenant retention and operating cost savings which will become the key drivers for the market value of certified buildings in longer term. While according to Halim's study (2012), 'green concept' has become the marketing strategy for the rent or lease of building and it is effective which has attracted more tenants especially from international which this point is also supported by Cushman and Wakefield (2009). Experts said that green building brings benefits not only is cost and environment but also social benefits where this can result in social balance and also achieve 'sustainability' (Shah, 2016). A Herman-Miller study found a 7 percent increase in productivities of workers following a move to a green facility (Kats, 2003). Trials have found that plants in classrooms can lead to improved performance in spelling, mathematics and science of 10-14%" (Koru, 2018). It is said that whether a company is building for its own use, or with a view of renting the premises to tenants, the welfare of staff is becoming increasingly pertinent (ProDesign, 2018). Therefore, from the study, higher cognitive function will eventually leads to higher productivity of workers.

FACTORS AFFECTING THE IMPLEMENTATION OF GREEN BUILDING

There are four categories of factors affecting the implementation to green building, namely financial, municipal, technical and social factor. Firstly, financial factor is the major consideration in every phases of a construction project. Where initial project cost and life cycle cost are both main consideration in green buildings to achieve cost effectiveness in a construction (Matthiessen and Morris, 2007). Many players in construction field have misconception in thinking that building a green building is more costly than conventional buildings. Hence, the cost factors are known as the greatest hindrance that leads to small number of green buildings being implemented (Nordin, Halim and Yunus, 2017). Besides that, some developers are being constrained by their own financial capabilities. As developers in Malaysia are mostly small to medium organization, due to the financial constraint, they will normally prevent in taking higher risk project (Abidin, 2010). Other than financial factors, municipal factors also play an important role where ack of building regulation and codes is categorized as municipal factors influencing green building implementation (Samari et al, 2013; Palanisamy, 2011). According to Ling (2016), government is responsible in creating regulation as well as the requirement to encourage and boost the growth of green development (Property Report, 2010). In Malaysia, there

are few incentives being introduced such as tax subsidies and stamp duty fees (ACEM, 2012). However, according to findings, the current incentives given are in low effectiveness to encourage developers to implement green building (Samari et al., 2013). Which means the incentives are insufficient to recover the additional cost incurred. Therefore, most of the contractors and developers are still not practicing green project due to poor regulation and policies (Palanisamy, 2011). Moving on to the technical factors which refer to the availability of green materials and also the lack of information in green building system (Cruz, 2010). According to Pedini and Ashuri (2010), they stated that green building materials tend to be more expensive due to its availability. Hwang and Tan (2012) also pointed that green building development involve complicated method and techniques. Besides that, some of the green technologies are not easy to be compliance with. Despite of the technical aspect makes green building challenging, the study by Abidin (2010) found out that only some large developer companies tend to have certain knowledge and have high level of awareness. Lastly, Zainul Abidin (2009) and Hwang & Tan (2012) quoted that lack of expertise results in low involvement in the implementation of green development. Lastly, social factors. Lack of understanding in green building is also a critical issue that influence the decision in developing green building (Carlisle et al, 2004). In this case, traditional method and technique are said to be outdated and are required to be upgraded with new knowledges. Hence, it is important for parties involved to keep up on date on knowledge of new technologies in order to increase number of green buildings (Sahat, 2012). Public awareness is also crucial in affects in implementing of green building. Where lack of awareness from the public about the green practices and importance of it in improving environmental issues can be hindrance to developers in implementing green building (Abidin, 2009; Palanisamy, 2011; Balaban, 2013; Samari et al, 2013; Sharif et al , 2014; Chan, Lee & Lee, 2014). Balaban (2013) stated public do not have certain understanding on positive impacts on green building which become a reason of why the buyers not demanding on better property to improve life quality (Ling, 2016). In conclusion, social factors can be very complex. Parties involved in a green building development have obligation and positions, especially the developers as initiators.

SUCCESS FACTORS TO INCREASE THE IMPLEMENTATION OF GREEN BUILDING

The high initial cost of green building is the major hindrance to implement green development. Actions should be taken and discovered to encourage more green building implementation. While Matthiessen and Morris (2007) proved that the cost of green building has no huge differences when compared to cost of traditional buildings. They also found that some green building tend to have higher initial costs are usually because of lack of knowledge and inexperienced project team. Furthermore, Chan, Darko and Ameyaw (2017) conducted a study and found that incentives and rebate for green building initiator have a significant level of importance in encouraging players to implement green building. For instance, tax exemption form government bodies can increase developers' interest to consider going green. Therefore, government should distribute and provide financing support and budget for developers in implementing green building in addition ot increase the demand for green building in Malaysia (Sharif et al., 2013). In addition, it would be very effective if green certification is a mandatory requirement as a guideline for parties to increase the implementation of green building. The increase number of qualified experts, knowledge on green building concept should be transferred to all the professionals involved in construction industry. Therefore, workshop or training conducted by authorized bodies should be provided to produce to increase the skills and expertise of an individual. Lastly, Hakkinen and Belloni (2011) found that increasing the level of awareness of clients on investing n green building is one of the method to increase green building as they also act as financial supporter for construction project. When public increase their understanding on impacts of green building and the advantages it brings in the future, this will eventually increase the willingness to pay more for better environment and also as an investment (Zhang, 2015). In conclusion, every player in construction industry as well as public share

a significant influence in promoting green buildings, everyone should be educated on benefits of green buildings and how green buildings help the country in achieving sustainable development goals.

RESEARCH METHODOLOGY

Opinion based information is needed from the decision makers, in this case the developers. The targetted respondents in this study are developers in Klang Valley which are listed in Real Estate and Hosuing Developers Association (REHDA). Hence Quantitative method has been chosen for the purpose of this study because large number of respondents can be collected to represent the population. Questionnaire were sent to developers in Klang Valley, listed in REHDA's data base to collect primary data from the respondents. Section A in the questionnaire collect demographics data of respondents. Section B collects benefits and information on green building implementation in Malaysia, Section C collects information about the factors affecting the decision to implement green building and Section D collects recommendation on success factors and methods to increase the implementation of green building in Malaysia. Total of 501 questionnaires sent, the response rate is 6.4%. To analysed the collected data, categorisation, Relative Importance Index (RII) and ranking are used to determine the relative importance of green buildings benefits, factors affecting the implementation of green building and the success factors to increase green building in Malaysia.

KEY RESULTS

Finding 1: Benefits of Implementing Green Building in Malaysia

Table 1 : Benefits of Implementing Green Building in Malaysia

Major Benefits	Benefits of Green Building Implementation	Respondents' Score					RII	Rank
		Not Important 1	Slightly Important 2	Moderately Important 3	Important 4	Very Important 5		
Environmental Benefits	Reduce Pollution	0	2	4	13	13	0.831	1
	Lower GHGs Emission	0	1	6	15	10	0.813	2
	Improve Climate Changes	0	1	7	13	11	0.813	2
	Improve Protection of the Ecosystem	0	3	4	15	10	0.800	3
Average RII							0.814	1
Market Benefits	Higher Market Value	1	2	5	16	8	0.775	1
	High Return on Investment	0	5	10	10	7	0.719	2
	Attract More Tenant	0	4	11	11	6	0.719	2
Average RII							0.738	2
Financial Benefits	Increase Sale Price	0	1	9	14	8	0.781	1
	Cost saving from reduced waster and waste	2	5	5	10	10	0.731	2
	Price Premium and Capital Benefits	2	2	9	12	7	0.725	3
	Return on Investment (ROI) improvement	0	4	14	8	6	0.700	4
Average RII							0.734	3
Social Benefits	Higher Indoor Environment Quality (IEQ)	1	1	4	16	10	0.806	1
	Balance of Ecosystem	0	3	9	12	8	0.756	2
	Enhance Health and Well-being	1	4	14	10	3	0.663	3
	Increase Worker Productivity	1	5	13	10	3	0.656	4
Average RII							0.720	4

From Table 1.0, it shows that the most important benefits of implementing green building in Malaysia is 'Environmental Benefits' with an average RII of 0.814. Follow by 'Market Benefits' with an average RII of 0.738. For rank 1 benefits, respondents believed that the major benefit of implementing green building is reduce pollution. In addition, as developer, respondents also concerned on the 'Market Benefits' and 'Financial Benefits' being the rank 2 and 3 respectively. Market Benefits has the higher ranking because developers think that higher market value is more important than financial benefits. Where according to the Colliers International Sustainability Advisory Service Report (2013), it is said that developing green certified buildings benefit from free publicity where it also improved the reputation of developers. Lastly, social benefits is ranked as the lowest which means it is not developers' top concerned benefits when implementing green building. This can be said that because

social benefits is more significant to the public and end-user of the certified building. Moreover, it is said that green buildings shows social benefits such as increase in worker's productivity and higher indoor environment quality (IEQ) in a long term basis.

Finding 2 : Factors affecting the decision to implement green building in Malaysia

Table 2 : Factors Affecting the decision to implement green building

Major Factors	Factors affecting the Green Building Implementation	Respondents' Score					RII	Rank
		Not Important 1	Slightly Important 2	Moderately Important 3	Important 4	Very Important 5		
Financial Factor	High Upfront Cost	0	0	0	13	19	0.919	1
	High Construction Cost	0	0	1	12	19	0.913	2
	High Material Cost	0	2	3	12	15	0.850	3
	High Risk of Investment	1	5	11	8	7	0.694	4
	Average RII						0.844	1
Technical Factor	Lack of Expertise to provide Professional Advice	0	2	4	14	12	0.825	1
	Lack of Technical Understanding on part of Project	0	3	4	12	13	0.819	2
	Lack of Awareness of Resources Allocation System	0	4	10	9	9	0.744	3
	Availability of Green Structure Material	1	6	5	13	7	0.719	4
	Average RII						0.777	2
Social Factor	Low Market Demand on Green Development	0	3	8	8	13	0.794	1
	Lack of Public Awareness	1	2	10	9	10	0.756	2
	Lack of Green Database and Information	0	4	9	10	9	0.750	3
	Lack of Education	1	4	9	11	7	0.719	4
	Average RII						0.755	3
Municipal Factor	Organizational Commitment	1	1	7	15	8	0.775	1
	Lack of Government Support and Incentives	2	2	6	13	9	0.756	2
	Lack of Building Code and Regulation	0	3	10	15	4	0.725	3
	Poor Enforcement of Legislation	0	3	10	17	2	0.713	4
	Average RII						0.742	4

The second objective of this study is to identify the factors affecting the implementation of green building. As the target respondents are developers which they are the main player in making decisions of types of building to be implemented. The major factors are also being ranked according to their average index which is shown in Table 2.0. From the ranking according to the average RII of major factors, financial factors with RII of 0.844 are the most dominant factor which means it influence the decision of developers in implementing green building the most. This result is also relevant to a study finding by Shafii, Ali & Othman (2006) where financial factors being the strongest driver in decision making for a construction project. From the factors listed under financial factors, majority of the respondents think that high upfront cost with RII of 0.919 is the common issue that deter them to implement green project. Where green building is said to more expensive due to the materials used, green building certificate application, green building system and also the professional fees which all of the above leads to higher upfront cost. The technical factor with an average RII of 0.777 is ranked second follow by social factor (RII = 0.755). For technical factors, Cruz (2010) said that it refers to the availability of green resources and insufficient information on green building knowledge. As to implement green building, it requires expertise to provide professional advice and opinion in every stage which majority of the respondents where almost half of them agree that lack of expertise is the most important technical factor that influence the green building implementation. It is shown in Table 2.0 where 'Lack of Expertise' have the highest RII among technical factors. Lastly, from the data analysed, municipal factors have the lowest average RII of 0.742 among the four major factors. However, this factor is classified as 'Important' for having an average RII in a range of 0.6 to 0.8. Hence, it is considered important aspect for developers in making decision on implementing green building in Malaysia.

Finding 3: Success factors to increase the implementation of green building

Table 3: Success Factors to increase the implementation of green building

Answer Options	RII	Rank
Government Support and Incentives	0.844	1
Increase Green Building tax incentive	0.831	2
Widening the coverage of Government incentives to include the usage of green products and technologies	0.819	3
Encourage developers' commitment	0.813	4
Educate the public on green issues and their importance in promoting sustainability	0.800	5
Enforce legislation/policy by ensuring green certification for new building	0.769	6
Setting up sustainability goals and systemising green operation	0.763	7
Enhance environmental awareness of stakeholders	0.763	7
Provide trainings and higher education programme in green building	0.756	8
Educating owners on the future benefits of green building	0.750	9
Organise construction tours for the public	0.650	10
Average RII	0.778	

From the results shown in table above, top 3 success factors are all mainly under municipal factors and financial factors. Government support and incentives has the highest agreement level according to their RII of 0.844. This is also consistent with study done by Kingsley (2008) where study found that government's role included reducing green building costs. Next, 'Increase Green Building Tax Incentives' (RII = 0.831) is ranked second as incentives are considered as main tool for government to encourage developers in implementing green building, this statement is also pointed out by Yung and Chan (2002) in previous study. In addition, the social factors are also important in promoting green building. From the result shown in table above, 'Educate the public on green issues and their importance in promoting sustainability' (RII = 0.800) which is classified as 'Most Important' factors. Educating public is important because as when the public have increased their interested in green building, it will leads to higher demand for green building which proved by a previous study done by Sharif et al (2013). Moving on to recommendation by respondents, almost half of the respondents recommend that government support and incentives should be increased in order to encourage green building implementation. Hence, it is shown that government are the key driver to promote sustainable development. Lastly, in the last question of questionnaire, majority of respondents which consist of 71% respondents agreed that green building implementation can help in achieving SDGs which is also known as Global Goal and help Malaysia moving towards sustainable development.

CONCLUSION

In conclusion, the idea of implementing green building moving towards sustainable development is still not gaining popularity in Malaysia. Despite that government have shown efforts in encouraging developers by giving incentives, the involvement of green development in Malaysia are still considerably low. Thereupon, this study is to identify the benefits and factors affecting the implementation of green building and determine the possible method to increase the involvement of developers in practicing green building moving towards sustainable development.

Green building brings a lot of advantages in terms of financial, environmental, market and social. The top 3 benefits are environmental benefits, follow by market benefits and social benefits. Where financial benefits are the least important benefits form the result obtained in this study. From the findings in this research, the major key factors are municipal factor and technical factor where municipal factors also include financial factors. While financial factor is the greatest hindrance for developers that leads to only small number of green building being implemented. These factors are also interrelated with financial factors where government provide more incentives and rebate to reduce the high upfront cost to implement green building. Therefore, this two major key factors should be focus on and further research should be implemented to encourage implementation of green building in Malaysia .

In conclusion, Malaysia is starting to step towards sustainable development but more efforts and public awareness on the importance of green building are vital in encouraging implementation of green building. Despite of the importance level of factors discussed, every parties involved inclusive of end-user and public as 'silent stakeholders' are responsible in improving the sustainability of the country and work together to solve the problem and global issues.

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