PLANNING MALAYSIA:
Journal of the Malaysian Institute of Planners
VOLUME 20 ISSUE 2 (2022), Page 272 – 282

FACTORS DETERMINING THE PURCHASE DECISION OF GREEN RESIDENTIAL PROPERTIES IN MALAYSIA

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Abstract

This study aims to determine and rank the factors influencing purchase decisions of green residential properties in Malaysia. The quantitative research approach was adopted in this study where the approach includes conducting surveys and analysing the quantitative data within green residential properties owners or residents with green certification mainly located in Penang and Selangor. Relative importance index is applied to data from a sample of 171 respondents through a purposive sampling. The main factors in influencing the green homebuyers' decisions were found to be location factors followed by financial and neighbourhood and housing attributes. This study was the first to include green residential properties owners with green certification from Malaysian Green Building Index which focus only for green residential properties owners in Penang and Selangor as the sample of the study towards factors for influencing the purchase decision of green residential properties. Further development of empirical models could be developed and tested not only in other countries as well as to other types of green buildings. This study could provide best indicators for purchase decisions that could be embedded in the future green residential development. Stakeholders and policy makers could also provide incentive, recognition and take actions to increase awareness related to green development to internalise the medium-and long-term goals of green technology.

***Keywords**:* Purchase decision, green residential, homebuyer, sustainability

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INTRODUCTION

Real estate construction industry has shown a great potential to reduce the carbon footprint (Ott & Hahn, 2018) due to a large number of employed workforce and its resources. The real estate sector is responsible for 80% of global greenhouse gas emissions and consumes 75% of the world's natural resources (Royal Institution of Chartered Surveyors, n.d.) In line with this purpose for environmental sustainability, housing buyers in Hong Kong are expecting that "green" living is increasing and regarded as one of the important considerations while buying a property (Jayantha & Man, 2013). Furthermore, the effort to spread climate change awareness has pushed the green buildings market for investment in both supply and demand sides (Xiao et al., 2017). As a result of the increasing trend in green real estate projects, arithmetic data shows a reduction of 200,000 tonnes of carbon dioxide emission in the Malaysian construction industry (Green Building Index, n.d.). Empirical research conducted by Duan et al. (2020) revealed that green real estate development can increase 0.899km^2 of urban green space. Moreover, it is documented that the increase of urban green space in Shaanxi city benefits the urban residents and creates an additional buffer zone for the city. Given these influential criteria, investors and investors-owned will eventually shift from conventional to greener buildings. In fact, a study from Fauzi et al. (2021a) indicated that property management corporations may focus on green elements especially in human satisfaction management. Similar results could also be found when green design features make indoor air quality better for society's well-being (Deng & Wu, 2013). The 2020 property market report revealed that there is a significant growth in green buildings ownership and property sales in Malaysia. In addition, there are about 400 green building projects that have achieved green building certification. As a key means of achieving more green building ownership, the promotion of green building properties should take a holistic approach that focuses on factors and preferences among the investor-owned and purchasers. Notwithstanding, the mismatch in pricing strategy with the consumers' expectations and property buyers' preferences causes an increase in the number of overhang properties in Malaysia. Hence, it is important to understand the factors and attributes that significantly influence the house buyers' intention and preferences (MOF, 2017). Past literature has examined the purchase decisions determinants for retails and conventional buildings (Fauzi et al., 2021b) yet less has emphasised the green residential properties, specifically in Malaysia. Therefore, this research aims to determine and rank the factors influencing purchase decisions of green residential properties in Malaysia.

LITERATURE REVIEW

Definition of Purchase Decision

In research from Rachmawati et al. (2019), a consumer will have a choice sequence in the event of making a purchase decision. The decision before making a purchase generally includes three phases, specifically problem recognition, seeking information, and evaluation for the final decision. In relation to the purchase decision for green residential properties, research has found that purchasers and real estate investors have the tendency to purchase green residential properties that benefit the environment (Kim et al., 2020). This shows that investor-owned and property owners are concerned about the effect of sustainable development on the environment. Before a decision is made, a consumer, especially the property investor will rely on past purchase experience. Chau et al. (2010) revealed that experiences might change an individual's decisions. He added that more than half of the residents were aware and willing to embrace the green concept in their residential developments. This is evidenced by their willingness to purchase and pay additional expenses to own an apartment in green development. Their willingness shows that they treasured their green living experiences and the benefits of green residential development.

Green Residential Certification

A green building focuses on the efficiency of resources particularly in energy, water and materials during the building lifecycle. The green rating system known as Green Building Index (GBI) was developed in 2009 by Pertubuhan Arkitek Malaysia (PAM) and the Association of Consulting Engineers Malaysia (ACEM) to lead the Malaysian property industry towards becoming more environmentally friendly. Green certification would be issued by the GBI once the sustainability elements have been fulfilled. Apart from the certification, there are also other GBI ratings such as Platinum, Gold and Silver. For residential green buildings, the sustainability elements include energy efficiency, indoor environmental quality, sustainable site planning and management, materials and resources, water efficiency, and innovation (GBI, 2020). As of 18th March 2021, 13 residential townships in Malaysia (PropertyGuru, 2021) have received the green certification from GBI, reflecting the increasing number of green residential properties. These sustainable green elements are then reflected in the development of the questionnaire particularly in the factors determining the purchase decisions supported by previous literature in green residential properties.

Factors Determining Purchasing Decision

The factors determining the purchase of green residential properties could be divided into location, financial, neighbourhood, and housing attributes. Location is one of the purchase decision factors for having any kind of property. According to new research, strategic location and good environmental quality are the most

significant factors that influence occupants to occupy the green certified residential building in Johor Bahru (Azis et al., 2021). Regardless of income levels, buyers still consider that the most important factor in the house purchase decision is the location of the property. Although the awareness of green housing issues and energy efficiency in housing is growing in the residential property market, it is only a major consideration for young and older buyers in the high-income brackets and is only of some importance for all other buyer sectors of the residential property market. Research by Rachmawati et al. (2019) articulated that the location of a residential property is significant to the purchase decision by consumers. Examples are proximity to workspace and basic facilities such as school, commercial centres et cetera.

The next factor determining a purchase decision by a consumer is the financial factor. A research by Tan and Goh (2018) stressed that consumers' purchase decisions are influenced by several factors, most importantly is the financial risk. This can be explained by three attributes. Firstly, house prices. A competitive house price will motivate buyers to make buying decisions (Rachmawati et al., 2019). Recorded in 2015, the demand for green residential was still very low due to an increase in the cost of about 30% compared to the conventional house concept (Elias & Lin, 2015). Secondly, the capability to secure a house loan. The average Malaysian wage is about RM 5,900, the housing buyer was not ready to own a green residential house which is priced up to RM 950,000. Thirdly is the reputation of developers. Research by Elias and Lin (2015) reported that housing developers realised the green residential project and the construction industry faces trouble in extending the green building technologies in Malaysia. Consequently, it will contribute to the delay in implementing green technologies into residential building construction. This will be the consequence of the minimal experience among the developers with green technologies' impact. The developers assisting with green building certification obtain good recognition in the property market (Jayantha & Man, 2013). Thus, the goodwill of the developers will be one of the reasons for buyers to own the "new" residential concept in Malaysia.

The third factor is the neighbourhood and housing features. There are five attributes for this factor. First is the design of the house. Investment in green residential provides healthy indoor and air quality. This motivates purchasers or real estate investors to invest in a healthy house with green technology, especially people who suffer from diseases such as Asthma (Elias & Lin, 2015). Secondly is the land area. In response to the site of the housing, a sustainable site must be incorporated with appropriate land area and size (Adnan et. al, 2013). This is to ensure that the ongoing operation and maintenance of the site could minimise the impact on the environment. The third is privacy. A calm and serene neighbourhood influences a house buyer's purchase decision. Jayantha and Man (2013) reported that noise and indoor issues are two standards that should be

taken into consideration in green building management practice. Zrobek et al. (2015) reported that Poland residential consumers preferred a quiet neighbourhood behind the most important factor other than location. The next factor will be most likely related to the dynamic factors of the green building which can be considered as the building orientation. Based on Maslow's Hierarchy of Needs, the happiness and productivity improvement due to building orientation design and dynamics of the green building brought a means of social engagement (Zhao et al., 2015). The elements for energy efficiency is one of the criteria for green residential building benefits that are ready to motivate consumers to indulge in green initiatives. Good energy performances affect house selling prices positively through installation of green energy features such as usage of renewable energy, implementation of proper construction material waste management with storage, collection and re-use of recycles and rainwater harvesting. This shows that energy efficiency recommendations seem to have an impact on sale price; thus, home buyers seem to require a larger "discount" for more complex types of measures (Högberg, 2013). The environmentally friendly green features create a positive relationship with the residence attraction to buy where more home buyers in Hong Kong are willing to pay a sale price premium ranging from 3.4 to 6.4 percent (Jayantha & Man, 2013). Fifth is the number of bedrooms. The consideration to have a good indoor environmental quality in the building is significantly related to the number of bedrooms provided. Bond (2015) ranks number of bedrooms as the third characteristics most preferred by Californian realtors' that may contribute to the "green" housing. Hence, a good criterion of a room is to have maximum natural light and fresh air that also could embrace the benefits of green elements (Adnan et. al, 2013).

METHODOLOGY

The present study used quantitative research methods. An online questionnaire survey was designed to collect the data via email, Facebook private groups, and Whatsapp application. It was used to collect the relevant data from green home residents in Penang and Selangor, Malaysia, particularly certified green residential schemes. The research instrument has performed a comprehension validity and amended according to the academician acceptance of the designated questions. A cronbach alpha (*a*) was used for a reliability test of the items in the questionnaire. A reliability test was established using a pilot test of 20 respondents not included in the sample. The need of a reliability test is to reduce deviation or error for item measurement accuracy. With a 0.90 reliability coefficient value, the items were highly reliable (Bolarinwa, 2015).

A total of 171 valid respondents have been obtained using the purposive sampling technique. The respondents selected are limited to the green residents' owners only. The variation of the selected sample location is good to generalise the result since all the locations recorded the highest number of green homes in

Malaysia. In this survey, respondents were asked to rate how agreeable they were with the items on a five-point Likert scale, ranging from 1 for "strongly disagree" to 5 for "strongly agree". A Likert scale is the most popular form to measure the level of agreement because it is simple and easy to prepare and interpret by the researcher (Talib, 2013). To determine the optimum number of sample sizes, the researcher used the rule of thumb 5:1 ratio as suggested by Hair et al. (2010), of which five responses should be obtained for each variable. The total numbers of items were 23; hence, the required sample size was supposed to be at least 60 (12 x 5). Therefore, a sample of 171 respondents was deemed sufficient to analyse the data. Respondents received a Google form link that contained the questionnaire.

The data collected from the online questionnaire was analysed descriptively and the relative importance index (RII) was used to assess and rank the attributes towards the motivation to invest in green residential properties. According to Akadiri (2011) in (Rooshdia et al., 2018), five important levels are transformed from importance values as in Table 1 below;

Table 1: Importance Level for RII

RII Values	Importance Level	
$0.8 \leq RI \leq 1$	High	H
$0.6 \leq RI \leq 0.8$	High Medium	H-M
$0.4 \leq RI \leq 0.6$	Medium	M
$0.2 \leq RI \leq 0.4$	Medium-low	M-L
$0 \leq RI \leq 0.2$	Low	L

Source: Akadiri (2011)

The highest ranking refers to the highest RI value. Waidyasekara and Silva (2016) also mentioned a low RII indicates that the factor is less applicable and less relevant, whereas a high index indicates higher applicability, agreement, and relevance. The RII analysis also was adopted by (Fauzi et al., 2021a) in their research of The Importance of 'Sustainability Implementation for Business Corporations' that is almost similar to this research.

RESULTS AND DISCUSSION

Descriptive analysis was used to identify the general demographic characteristics of respondents. The majority of the respondents were male, where the average age was between 36 to 50 years old (46.2%). Most of the respondents were from

the private sector (39.8%) with a household income between RM5,000 to RM11,000 (59.1%) with 101 respondents.

Table 2 depicts the overall ranking and importance of each factor affecting the purchase decisions for green residential investment. Based on the RII score, all attributes were found to be at a high level when RII scores were found to be more than 0.8. The researcher found that the location factor ranked first (RII=0.9310) followed by financial (RII=0.9289), and neighbourhood and housing (RII = 0.9277). These revealed that the main factors for green residential investment are due to their strategic location, in line with Aziz et al (2021) when they also found that location and good environment quality are the most significant factors that influence occupants to occupy the green certified residential building in Johor Bahru.

Table 2: Factors for purchase decision green residential investment

Factor	RII	Rank	Importance Level
Location	0.9310	1	High
Financial	0.9289	2	High
Neighbourhood & housing	0.9277	3	High

Table 3: Top important factors for purchase decision green residential

Attributes	RII	Rank	Factors
Strategic location of the green residential properties	0.9427	1	Location
Developers' reputation	0.9357	2	Financial
The land area	0.9357	3	Neighbourhood and housing
Proximity to basic facilities such as school and commercial centre	0.9310	4	Location
The design of the house	0.9287	5	Neighbourhood and housing
A quiet place in the neighbourhood	0.9287	6	Neighbourhood and housing
Consider taxation imposed by government	0.9275	7	Financial
Building orientation	0.9275	8	Neighbourhood and housing
House price	0.9263	9	Financial

Attributes	RII	Rank	Factors
My capability to obtain loan financing	0.9263	10	Financial
Proximity to my workplace	0.9193	11	Location
The number of bedrooms	0.9181	12	Neighbourhood and housing

The overall RII score with all three factors was found to be in the top 10 attributes (see Table 3), implying the importance of these factors to be adopted in future residential development. A strategic location exhibits the highest score, implying homebuyers consider good accessibility and proximity to communal amenities and facilities such as schools and business centres. Apart from that, the land area of a green-certified house is important for homebuyers' to be considered in their decision making particularly when it involves landed properties. In general, land area is a factor that greatly influences the home purchase decision and it is also dependent on the purpose of the purchase being made (Lamsali et al., 2020). The elements of sustainable site planning could be achieved through selecting appropriate sites with access to open space and landscaping. A quiet neighbourhood and scenic value were regarded as the most important determinants in the group of non-economic factors (Zrobek et al., 2015). This is in line with a study by Nizarudin et al. (2011) who determined that natural resources and natural landscaping are highly important to consider and should remain untouched to preserve a sustainable environment.

It is interesting to note that in terms of the financial aspect, the house price of green residential properties is not an issue. This is because most of the respondents are M40 and T20 when the majority of them have a household income between RM5,000 to RM11,000. However, most homebuyers are more focused on the developer's reputation when they want to purchase a green-certified house. This is agreed by Nursal et al. (2019) that found this decision grew more apparent due to so many negative issues caused by developers. In addition, it is essential to choose a qualified developer especially in developing green homes as it is more complex compared to conventional homes. This is definitely important to avoid project failure and future problems.

CONCLUSION

Three main factors for the purchase decision of green residential properties investment have been identified namely, location, financial, and neighbourhood factors. The data is collected by means of a questionnaire survey method to the greenhouse owners or residents in Malaysia particularly the residential scheme which received green certification. Relative importance index is applied to data from a sample of 171 respondents through a purposive sampling. Location,

financial, and neighbourhood housing display the highest RII implying green residents considered these factors when they purchase their green residential properties. The results indicate the importance of these factors to be adopted in future residential development. Hence, these three (3) factors contributing to the motivations of households to own green residential properties could encourage more sustainable and environmentally friendly development in the future. This study weighs and demonstrates the essence of green residential development factors that potentially allowed the stakeholders and policy makers to move towards green initiatives in green housing schemes.

For the property development industry, specifically for the green residential building development, this study could provide the best indicator for buyers' motivation which could be embedded in their development. This study anticipates the factors that could motivate others to go green by purchasing thus providing an important view for governments' blueprint to equip with the green element in building a sustainable city in the future. While facilitating property developers' meaningful insights in formulating their marketing strategies that could lead to a greater demand for sustainable development of residential properties, signifying the need to establish a model for green residential properties. Future research in terms of development of empirical models could be tested in other states or countries as well as on other types of green buildings. This study could serve to address the gaps by examining all of the stipulated factors that influence the purchasing power of green residential within potential buyers in Malaysia.

ACKNOWLEDGEMENTS

This research was supported by the Geran Khas Insentif Penyelidikan Perak (GKIPP).

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Received: 6th May 2022. Accepted: 15th June 2022