WHAT MOTIVATES THE MALAYSIAN HOMEBUYERS TO GO GREEN?

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Abstract

There are various factors influencing purchase intention to invest in commercial green buildings, however, less discussion found on motivations to invest in green residential properties. The rigorous and extensive literature review identified three main motivations for a green residential property investment, namely, environment, social, and economic concerns. The data was collected by distributing questionnaires through survey methods to the green residential owners or residents in Penang and Selangor, Malaysia. The relative importance index is adopted to analyse the data from a sample of 171 respondents through a judgemental sampling. Based on the result, the researcher found that environmental concerns were ranked as the main motivating factor influencing green homebuyers' decisions. This was followed by the social and economic benefits of minimising cost and maximising financial return. The result could lead to a greater demand for future sustainable development of residential properties, and future investment.

Keywords: Green Building, Green Residential Buildings, Homebuyers, Motivation

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INTRODUCTION

Green buildings focus on three main uses of energy, water and material to increase the efficiency of resources and reduce the building's impact on the health and environment. Green buildings, particularly in residential property sales, have experienced growth in house ownership based on the 2020 property market report. Ajibola et al. (2019) stated that green real estate investment is poised for persistent growth in the coming years and is supported by the increasing trend of certified green building projects. Locally, 389 green building projects have achieved Green Building Index (GBI) certification in the construction sector with 13 green residential townships (PropertyGuru, 2021). A green or sustainable township must be designed and built with efficient resources that commonly address environment, social, and economic issues (Green Building Index, 2020). GBI, one of the green rating systems in Malaysia, guides developers to incorporate sustainability elements into their development. Six main criteria need to be fulfilled for a residential building to be certified as green: energy efficiency, indoor environmental quality, sustainable site planning and management, materials and resources, water efficiency, and innovation (Green Building Index, 2020). The increasing trend in local green real estate projects in Malaysia reflects the growing number of ownerships of investor-owned green buildings. This reflects homebuyers' and investors' increased awareness of the importance of sustainability and green residential buildings.

Several studies have recorded the growth in purchasers' demand for green residential buildings in Malaysia since 2012. Chau et al. (2010) revealed that green apartment owners were willing to purchase green real estate for investment purposes with the idea of embracing sustainable development. According to new research, green real estate has considerable benefits to building occupiers (Zhang & Dong, 2010), such as attention restoration, health improvement, reduced maintenance cost and utility consumption, as well as improved indoor air quality. Aman (2014) found that reducing energy and water consumption and using recycled materials were significant drivers in applying the green practice in Malaysia. To acknowledge buildings as green, they must be constructed and maintained with efficient resources that address environment, social, and economic issues (Green Building Index, 2020). Kim et al. (2020) indicated that green real estate is a sustainable building with the efficient use of resources required to reduce building impacts on the environment and well-being. In addition, prioritising efficient energy and water consumption will result in low-carbon or sustainable development.

Despite the abundance of literature on green building concepts, awareness and benefits, past studies have yet to probe the motivations for green real estate investment from the perspective of homebuyers. It is important to determine the motivations for green real estate investment from the purchasers' views, which could lead to a higher demand for green building development.

More projects of green building development will result in low carbon emission development, reducing greenhouse gases that directly will facilitate Malaysia to achieve the 4th strategy thrust of the 11th Malaysia Plan, which is related to green growth, which is pursuing development to be more sustainable. As a corollary, the research aims to bridge that gap in the literature through exploring the key factors for green residential motivations.

LITERATURE REVIEW
Motivation to Go Green
A change in human behaviour from investing in conventional buildings to sustainable buildings refutes the notion of a motivation to go green. Several studies interpret motivation as a notion of human conviction for the performance of a decision or action. The dimensions of motivation could come from an individual acting out of volition or an individual or a group of people's efforts to avoid something negative, as elicited from the self-determination theory (Olanipekun et al., 2018). Various underlying motivations have been found that will influence purchase intention to invest in green real estate, particularly in the residential sector. Zhang et al. (2019) stated that motivation to go green may be persuaded by the benefits of green buildings like energy consumption and restorative indoor environment or concern about environmental impact. Further, Chuweni et al. (2022) found the main factors influencing the green attributes which are location factors followed by financial and neighbourhood as well as housing certification from the Malaysian Green Building Index.

Green Residential Buildings Motivation Variables
Following recent research by Chuweni, Saraf, & Fauzi (2022) four variables have been identified as motivation variables for property buyers or investor-owned green residential properties. These variables concern environmental degradation, financial returns, cost-saving, and social and environmental benefits. While research by Kim et al. (2020) has revealed that investor-owned certified green buildings have tendencies that benefit the environment. Environmental concerns change an individual's purchase intent. The intensification of climate change awareness and rising energy costs have also increased the market attractiveness for green buildings (Xiao & Yuan, 2017). One of them includes renewable energy since the exploration of new renewable energy will contribute significantly to less dependency on non-renewable energy (Omer, 2014) and it can reduce the impact on the environment (Balramdas et al., 2016; Roper & Beard, 2009). Another element is reducing environmental pollution due to sustainability involvement since it commonly aims to reduce co2 emissions (Razali, 2018) and adverse environmental impacts (Shaikh et al., 2019).

Environmental benefits from green buildings have indirectly affected the social motivation of the building users, particularly on health benefits. The

health benefits are good indoor air quality, stress reduction, attention restoration and building user productivity. In other aspects of social benefits, green buildings provide more green space. Besides contributing to reducing carbon emissions, these buildings offer a more significant buffer zone (Kim et al., 2020).

Meanwhile, prevalent studies on sustainable development find that economic aspects contribute to green real estate motivation for construction and investment purposes. For instance, minimising the cost factor is recognised as one of the main motivations for green real estate investment (Ajibola et al., 2019; Deng & Wu, 2013; Kim et al., 2020). Research by Mangialardo et al. (2019) revealed that green buildings could save ⅓ of the total energy consumption. Integrating green technology into air conditioning reduces energy consumption by 10% to 15% (Fan & Zhou, 2019). Additionally, (Gluszak et al. (2019) highlighted that one of the drivers for the increase in the demand for sustainable buildings is lower operating costs and energy consumption. Besides, with energy-efficient and water-efficient elements in a building, residents can reduce their utility bills, especially energy costs (Chau et al., 2010).

Further, another aspect of economics revealed by Fauzi et al. (2021) is the maximising value factors. Various studies in green building projects, especially commercial and mixed development, have shown that green buildings have higher rents, high demands, and maintain good occupancy status than non-green buildings. The returns come from rents and lower operating costs. Evidence shows that financial returns are influenced by the level of green certification (Chen et al., 2019; Mangialardo et al., 2019). The higher the level of green certification, the higher the returns on investment. In a nutshell, investors and investors-owned show motivation in financial returns to purchase or invest in green buildings. Supply and demand for green real estate have been expanding over the years due to the frequent emphasis by the government and environmentalists on the adverse impacts of uncontrolled development in the construction industry.

RESEARCH METHODOLOGY

This study applied quantitative research methods, and data was gathered from an online questionnaire through email, *Facebook* private groups and *WhatsApp*. The web-based survey allows flexibility and coverage to wider respondents (Evans & Mathur, 2005). The questionnaire has performed comprehension validity and amended according to the academician acceptance of the designated questions. A reliability test of Cronbach's Alpha (α) was conducted to ensure the reliability of the constructs. The items were highly reliable, with a 0.90 reliability coefficient value (Bolarinwa, 2015).

Data Collection
This study applied quantitative research methods, and data was gathered from an online questionnaire through email, Facebook private groups and WhatsApp. The web-based survey allows flexibility and coverage to wider respondents (Evans & Mathur, 2005). The questionnaire has performed a comprehension validity and amended according to the academician acceptance of the designated questions. A reliability test of Cronbach's Alpha (α) was conducted to ensure the reliability of the constructs. The items were highly reliable, with a 0.90 reliability coefficient value (Bolarinwa, 2015).

Data is collected from greenhouse residents using a judgmental sampling in Penang and Selangor, Malaysia, particularly certified green residential schemes, namely Ashton of Eco Horizon; Bandar Rimbayu; Residence of Ken Rimba; and Eco Majestic. The selected residential schemes are chosen as case studies as they received green certification from GBI. 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 115 (23 x 5). Therefore, a sample of 171 respondents was sufficient to analyse the data. Respondents received a Google form link that contained the questionnaire. 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". The five Likert scale is commonly used in research where the midpoint in the five Likert scale usually represents neutrality to avoid coercion in giving a choice of response (Youn et al., 2017).

Data Analysis
The data collected from the online questionnaire were 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. As cited in Rooshdia et al. (2018), five important levels are transformed from important values. They begin with high (H) ($0.8 \leq RI \leq 1$), high medium (H–M) ($0.6 \leq RI \leq 0.8$), medium (M) ($0.4 \leq RI \leq 0.6$), medium-low (M-L) ($0.2 \leq RI \leq 0.4$) and low (L) ($0 \leq RI \leq 0.2$). The highest ranking refers to the highest RI value. Waidyasekara & Silva (2016) also mentioned that a low RII indicates that the factor is less applicable and less relevant, whereas a high index indicates higher applicability, agreement, and relevance.

RESULTS AND DISCUSSION
There are four main elements of the results, namely 1) environment, 2) social, 3) economic (maximising value) and 4) economic (minimising cost). Table 1 depicts the overall ranking and importance of each attribute towards the motivation of

the greenhouse. 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.

Table 1: Motivation for green residential investment

Motivation Element	RII	Rank	Importance Level
Environmental Concern	0.9233	1	High
Social Benefits	0.9073	2	High
Economic (Minimising Cost)	0.9064	3	High
Economic (Financial Returns)	0.8816	4	High

The researcher found that environmental concern ranked first (RII=0.9233), followed by social benefits (RII=0.9073), economic benefits of minimising cost (RII = 0.9064), and economic benefits of maximising financial returns (RII=0.8816). These revealed that the main motivation for green residential investment is due to the environmental concern as found in Rameezdeen et al. (2019), while at the same time, the residents can improve their social lifestyle and contribute to economic sustainability. In other words, our result indicates that sustainability goals of environmental concerns are the main motivation for greenhouse residents or owners to purchase green certification residential properties investment in Malaysia. Similar results were found when Chau et al. (2010) revealed that green apartment owners were willing to purchase green real estate for investment purposes with the idea of embracing sustainable development.

Table 2: Environmental benefits

Environment	RII	Rank	RII Group
Reduce dependence on non-renewable energy	0.9345	1	
Reduce pollution to the environment	0.9287	2	
Reduce the global warming problem	0.9205	3	0.9233
Can provide clean air to the occupants	0.9193	4	
Increase opportunities for environmental control	0.9135	5	

Table 2 further shows the RII score for environmental concerns for green residential investment. Results indicate that environmental concern attributes, particularly the usage of solar energy provided in green residential properties, could reduce the dependence on non-renewable energy. Other attributes such as reducing pollution to the environment, reducing the global warming problem, providing clean air to the occupants and increasing opportunities for environmental control are important for the motivation of green residential investment. These correspond with the findings from Kim et al. (2020); Omer (2014), who found that green real estate as a sustainable building with the efficient use of resources would likely reduce building impacts on the

environment. Therefore, the building should be developed to reduce pollution to the environment. A global warming problem reduction element is equally significant by which the building development has to incorporate zero CFC equipment that directly contributes to reducing ozone depletion and global warming issues (Balramdas et al., 2016).

Table 3: Social benefits

Social Benefits	RII	Rank	RII Group
Maintain the temperature and supply fresh air	0.9146	1	
Control the flow of temperature, airflow and humidity in the building	0.9123	2	
Indoor environmental quality	0.9111	3	
Filter and reduce noise interference	0.9064	4	0.9073
Improve health condition	0.9064	5	
External green view	0.9064	6	
Interacting with nature	0.9041	7	
Reduce chemical exposure to the occupants	0.8971	8	

Regarding social benefit, the highest RII score (RII=0.9146) was found in greenery attributes, particularly the plants planted around the residential areas as well as in their greenhouse that can maintain the temperature and provide fresh air as in Table 3. This is in line with a study by Nizarudin et al. (2011), which determined that natural resources and landscaping are important and should remain untouched to preserve a sustainable environment. Oyewole et al. (2019), agreed that those landscaping and landscape ecology elements should be considered for sustainable buildings, as these contribute to natural, healthy oxygen supply and scenery to the occupants in that building. Social attributes such as indoor air, environmental quality, and health improvement are found to be at a high level of importance. Our findings were corroborated by Zhang and Dong (2020), who stated that green real estate has considerable benefits to building occupiers, such as attention restoration, health improvement, and improved indoor air quality. Taylor (2013) also indicated that occupant comfort and health are some of the benefits of sustainability. Furthermore, communities also benefit from health enhancement, quality of life and well-being improvements, and occupant comfort (Gou & Ma, 2019; Shurrab et al., 2019).

Table 4: Economic minimising cost

Economic: Minimising Cost	RII	Rank	RII Group
Reduce the electricity consumption from optimal penetration of natural light	0.9099	1	
Reduce utility costs through solar energy installation	0.9088	2	

Reduce electricity costs through energy-saving electrical appliances	0.9076	3	0.9064
Contribute to the efficient use of energy resources	0.9064	4	
Reduce the water consumption cost	0.9029	5	
Reduce the use of air conditioning system	0.9029	6	

For economic benefit, following Fauzi et al. (2021), (2020), the researchers applied breakdown analysis in which the data were divided into two categories for a more robust result. Economic benefits for motivation to invest in green real estate investment, particularly the greenhouse, are likely due to cost-saving motivation or maximisation of financial return in the future. Table 4 illustrates the ranking of economic benefits of minimising the cost. It is apparent from the results that green residential design could reduce the electricity consumption cost due to the optimal penetration of natural light with an RII score of 0.9099. The results of cost saving in Table 4 are also in line with previous research when minimising the cost could be likely considered as one of the main motivations for economic benefits in investing in green real estate (Ajibola et al., 2019; Deng & Wu, 2013; Kim et al., 2020; Mohd Adnan et al., 2017).

Table 5: Economic benefits: maximising financial return

Economic (Maximising Financial Return)	RII	Rank	RII Group
Enjoy lower financing from the bank	0.9181	1	
Will be in higher demand in the future	0.9099	2	0.8816
Provide higher market value in the future	0.8994	3	
Guarantee higher rental returns in the future	0.7988	4	

The result of the RII score for economic benefits in terms of maximising the return is depicted in Table 5. Evidence shows that financial returns are influenced by the level of green certification (Chen et al., 2019; Mangialardo et al., 2019). It was found in this study that the highest RII score (RII = 0.9181) was when the respondents were eligible to enjoy lower financing from the bank with the purchase of their green residential properties. This was followed by the higher demand anticipated in the future for green residential properties (RII=0.9099) and an appreciation in value for capital or market value (RII=0.8994). Interestingly, the attribute of higher rental value was found to be at a high-medium level of importance when it produced the lowest RII score not only for economic benefits but also for overall attributes (RII=0.7988). This shows that having a green certification for residential properties is perceived by the respondents as unable to guarantee higher rental returns in the future.

CONCLUSION
Based on the overall RII score, all three dimensions of environment, social and economic benefits were found to be the top attributes for these motivations,

implying the importance of these three sustainability goals to be adopted in future residential development. The data is collected through a survey by distributing questionnaires to selected green residential owners or residents in Malaysia, particularly the residential scheme which received green certification. The relative importance index is applied to data from 171 respondents through a judgemental sampling. Environmental concerns were ranked as the main motivation in influencing the green homebuyers' decisions, followed by social and economic benefits (minimising cost and maximising financial return). These three dimensions of environment, social and economic benefits imply the significance of sustainability goals for future residential development. An informed decision on the benefits received, especially for green residential properties, could affect the resident's motivation towards purchasing certified residential properties, encouraging more demand for green development in the future.

By addressing the importance of sustainability implementation, this study establishes the need for the stakeholders and policymakers to promote environmental practices while contributing to the economic and social development of more green residential schemes. For the property development industry, specifically for green residential building development, this study could provide the best indicator for buyers' motivation which could be embedded in their development. For instance, we found that the main environmental benefit of investing in green residential properties is to reduce dependence on non-renewable energy. This could be done by selecting materials, processes, design, and construction of these green residential properties. Moreover, this research intends to facilitate related parties and organisations to provide appropriate incentives, recognition and take the correct action to increase the investors' and buyers' awareness of green residential buildings. Further development of empirical models could be developed and tested in other countries and on other types of green buildings. This could further facilitate more interest in green and sustainable residential property development and investment in the future.

ACKNOWLEDGMENTS

REFERENCES

Ajibola, M. O., Oluwunmi, A. O., Kabiamaowei, A. I., Owolabi, D. R., &Akinwale, O. M. (2019b). Green Economy: The Role of Estate Surveyors and Valuers. Journal of Physics: Conference Series, 1299, 012016.

Aman, N. U. (2014). The implementation of green lease practices for commercial buildings. University of Malaya, Kuala Lumpur.

Bolarinwa, O. (2015). Principles and methods of validity and reliability testing of questionnaires used in social and health science research. Nigerian Postgraduate *Medical Journal, 22*(4), 195-201.

Balramdas, Meher, P., Behera, S., Rath, B., Dash, S., & Choudhary, P. (2016). A comparison between normal buildings and green buildings- A case study approach. *International Research Journal of Engineering and Technology (IRJET)*, 03(05), 51–54.

Chau, C. K., Tse, M. S., & Chung, K. Y. (2010). A choice experiment to estimate the effect of green experience on preferences and willingness-to-pay for green building attributes. *Building and Environment, 45*(11), 2553-2561.

Chen, Q., Kamran, S. M., & Fan, H. (2019). Real estate investment and energy efficiency: Evidence from China's policy experiment. *Journal of Cleaner Production*, 217, 440–447.

Chuweni, N.N., Mohamed Saraf, M.H., & Fauzi, N.S. (2022). Motivations for green real estate investments in residential properties: A review. *Pertanika Journal Social Science and Humanities, 30* (3), 1003-1016.

Chuweni, N.N., Mohamed Saraf, M.H., Fauzi, N.S., Che Kasim, A., (2022) Factors determining the purchase decision of green residential properties in Malaysia. *Planning Malaysia Journal*. 20. 272-282.

Chyung, S. Y., Roberts, K., Swanson, I., & Hankinson, A. (2017). Evidence-based survey design: The use of a midpoint on the Likert scale. Performance Improvement, 56(10), 15-23.

Deng, Y. and Wu, J. (2013) Economic returns to residential green building investment: The developers' perspective. *Regional Science and Urban Economics* 47, (July 2014), 35-44.

Evans, J.R. and Mathur, A. (2005), "The value of online surveys", Internet Research, 15(2), 195-219.

Fan, J. S., & Zhou, L. (2019). Impact of urbanization and real estate investment on carbon emissions: Evidence from China's provincial regions. *Journal of Cleaner Production*, 209, 309–323.

Fauzi, N.S., Johari, N., Zainuddin, A., Chuweni, N.N, (2021), The Importance of Sustainability Implementation for Business Corporations, *Planning Malaysia Journal of the Malaysian Institute of Planners, 19*(3), 237-248.

Fauzi, N.S, Johari, N., Chuweni, N.N, Mohd Ali, S.N., Arshad, H. and Ahmad, N.A (2021), The Crossfire of Corporate Real Estate Sustainable Management with Corporate Sustainable Objectives in Malaysia, *Planning Malaysia Journal of the Malaysian Institute of Planners, 19*(2), 186-198.

Green Building Index (2020). Resources. https://www.greenbuildingindex.org. Retrieved August 1, 2021, from https://www.greenbuildingindex.org/resources/

Gluszak, Gawlik, &Zieba. (2019). Smart and Green Buildings Features in the Decision-Making Hierarchy of Office Space Tenants: An Analytic Hierarchy Process Study. *Administrative Sciences, 9*(3), 52.

Gou, Z., & Ma, N. (2019). Human Factors in Green Building. (January 2019), MDPI.

Hair, J.F., Black, W.C., Babin, B.J., Anderson, R.E. and Tatham, R.L. (2010), Multivariate Data, 7th Edition, Prentice Hall, Upper Saddle River.

Kim, K. H., Jeon, S. S., Irakoze, A., & Son, K. Y. (2020). A Study of the Green Building Benefits in Apartment Buildings According to Real Estate Prices: Case of Non-Capital Areas in South Korea. *Sustainability, 12*(6), 2206.

Mangialardo, A., Micelli, E., &Saccani, F. (2018). Does Sustainability Affect Real Estate Market Values? Empirical Evidence from the Office Buildings Market in Milan (Italy). *Sustainability, 11*(1), 12.

Nizarudin, N. D., Hussain, M. R. M., &Tukiman, I. (2011). The green building index (GBI): An innovation in landscape architecture. Self-Organizing Latency-Aware Resources Ensemble (SOLARE) 2011, 1–7.

Olanipekun, A. O., Xia, B. P., Hon, C., & Darko, A. (2018). Effect of motivation and owner commitment on the delivery performance of green building projects. *Journal of Management in Engineering, 34*(1), 04017039-1-14.

Omer, A. M. (2014). Energy use and environmental impacts: A general review. *Journal of Renewable and Sustainable Energy*, 053101(2009) 053101-1-29.

Oyewole, M. O., Ojutalayo, A. A., &Araloyin, F. M. (2019). Developers' willingness to invest in green features in Abuja, Nigeria. Smart and Sustainable Built Environment, 8(3), 206-219.

PropertyGuru. (2021, March 18). Experience these 13 GBI-Certified townships for yourself, Retrieved August 1, 2021, from https://www.propertyguru.com.my/property-guides/gbi-certified-townships-malaysia-23287

Rameezdeen, R., Zuo, J., Paniagua, J. O., Wood, A., & Do, P. (2019). Ensuring environmental performance in green leases: the role of facilities managers. *Facilities, 37*(9/10), 527-549.

Razali, M. N., & Hamid, M.Y. (2018). Assessing green property management implementation among commercial buildings in Malaysia. WIT Transactions on Ecology and the Environment, March, 226, 827-835.

Rooshdia, R. R. R. M., Majid, M. Z. A., Sahamir, S. R., & Ismail, N. A. A. (2018). Relative importance index of sustainable design and construction activities criteria for green highway. *Chemical Engineering Transaction*, 63(2007), 151–156.

Roper, K. O., & Beard, J. L. (2009). Justifying sustainable buildings: Championing green operations. *Journal of Corporate Real Estate, 8*(2), 91–103.

Shaikh, P. H., Shaikh, M. S., Kumar, M., Shaikh, F., Uqaili, M. A., & Bhatti, I. (2019). Environmental assessment of green buildings, Reference module in Materials Science and Material Engineering, 1–6.

Shurrab, A., Hussain, M., & Mehmood Khan. (2019). Green and sustainable practices in the construction industry: a confirmatory factor analysis approach. Engineering, *Construction and Architectural Management, 26*(6), 1063-1086.

Taylor, B. M. (2013). Sustainability and Performance Measurement: Corporate Real Estate Perspectives. *Performance Improvement, 52*(6), 36–45.

Waidyasekara, K. G. A. S., & Silva, L. De. (2016). Water use efficiency and conservation during construction: drivers, barriers and practices, 6(5), 553–566.

Xiao Y., Lu, Y., Guo, Y., & Yuan, Y. (2017). Estimating the Willingness to Pay for Green Space Services in Shanghai: Implications for Social Equity in Urban China. *Urban Forestry & Urban Greening*, 26, 95-103.

Zhang, X., & Dong, F. (2020). Why Do Consumers Make Green Purchase Decisions? Insights from a Systematic Review. *International Journal of Environmental Research and Public Health, 17*(18), 6607-1-25.

Zhang, J., Li, H., Olanipekun, A. O., & Bai, L. (2019). A successful delivery process of green buildings: The project owners' view, motivation and commitment. Renewable Energy, 138, 651–658.