

Review Article

Motivations for Green Real Estate Investments in Residential Properties: A Review

Nor Nazihah Chuweni*, Mohamad Haizam Mohamed Saraf and Nurul Sahida Fauzi

Department of Built Environment Studies & Technology, Faculty of Architecture, Planning and Surveying, Universiti Teknologi MARA, Perak Branch, Seri Iskandar Campus, 32610, Perak, Malaysia

ABSTRACT

Green residential buildings benefit their owners economically, socially, and environmentally. However, it is not known whether the buyers know the benefits that will be gained when they purchase this green residence: it could also be that they are just following the current trend. Therefore, this review was conducted to identify the motivations for green real estate investments in residential properties and propose a conceptual framework for future validation. In relation to that, both past empirical and conceptual studies were reviewed. A total number of 277 articles were found in several e-databases, searched with the following keywords: ‘green residential,’ ‘green real estate,’ ‘green building,’ ‘sustainable building,’ ‘driver,’ and ‘motivation.’ After the filtration phase, 26 full-text articles that are pertinent to the study were selected for review. The review revealed four variables that motivate property buyers or investor-owned to invest or purchase green residential property. These variables concern environmental degradation, financial returns, cost-saving, and social and environmental benefits. Therefore, an informed decision on the benefits received, especially for green residential properties, could affect the resident’s motivation towards the certified residential properties, encouraging more demand for green residential in the market and spurring more green and sustainable development. For further research, the proposed conceptual framework could be tested for model testing and validation.

ARTICLE INFO

Article history:

Received: 15 June 2021

Accepted: 16 March 2022

Published: 06 July 2022

DOI: <https://doi.org/10.47836/pjssh.30.3.04>

E-mail addresses:

norna692@uitm.edu.my (Nor Nazihah Binti Chuweni)

moham8841@uitm.edu.my (Mohamad Haizam Mohamed Saraf)

nurul839@uitm.edu.my (Nurul Sahida Fauzi)

* Corresponding author

Keywords: Drivers, green real estate, green building, green residential, motivation

INTRODUCTION

Conveyed to the Malaysian property market report 2020, green buildings have seen an increase in house ownership,

notably in residential property sales. Green residential buildings show rapid growth from time to time because they are known as the current trend of choice by many purchasers and investors. Investing in green real estate, particularly in the residential sector, is influenced by various underlying motivations. The notion of a motivation to go green is based on a shift in human behavior from investing in conventional buildings to sustainable buildings. As defined by numerous research, motivation refers to a sense of human conviction for executing a decision or action. The elements of motivation could stem from an individual's voluntary activity or a group of people's voluntary action to avoid something undesirable, as evoked by the self-determination hypothesis (Olanipekun et al., 2018).

Since 2012, several studies have documented an increase in the demand for green residential structures in Malaysia. New research shows that green real estate benefits building occupiers (Zhang & Dong, 2020). Furthermore, Chau et al. (2010) cited that life events can influence a person's decisions, and more than half of the inhabitants were aware of the green concept and willing to incorporate it into their homes. Frequent emphasis by environmentalists on adverse impacts of uncontrolled development and urbanization around the globe (Myeda et al., 2016). 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 real estate development.

Their willingness shows they treasured their green living experiences (Chau et al., 2010) and the benefits of green residential development. Other research also indicates that increasing sustainability awareness impacts property prices (Meins et al., 2014).

Despite the variety of literature on green construction concepts, awareness, and benefits, early literature has yet to investigate purchasers' motivations for green real estate investment. Research from Alsulaili et al. (2019) found that 78% of participants were unaware of the concept of green building with different variations of the green concept, with 52% relating green building with plants. Locally, Shafie et al. (2016) found that Malaysians' awareness of the benefits of green is average, and they have limited knowledge of socio-economic benefits. It is inconsistent with Aman (2014), who mentioned that green awareness in Malaysia is still in its infancy, but it must be inculcated. Understanding the purchaser's motivation for green real estate investment is critical since it could increase demand for green building development. The development of more green building projects will result in a reduction in greenhouse gases that will directly facilitate Malaysia to achieve the fourth strategy thrust of the 11th Malaysia Plan related to green growth, which is pursuing sustainable development. Further, advancing green growth is essential to achieving economic growth, environmental sustainability, and social integration. Therefore, as a corollary, the research aims to bridge that gap in the literature on the key factors in green real estate motivations.

Both Conventional and Green Residential Buildings have Their Strengths

Previous research shared that both conventional and green residential buildings have their benefits (Chau et al., 2010) that encourage investors and potential homebuyers to have more choices for their residential investment. The green residential development could provide facilities that promote social contact and interaction for the residents and a clean and safe residential environment. Furthermore, they also prefer to own houses with better soundproofing and greater green areas (Myeda et al., 2016). Furthermore, Suratman et al. (2018) identified almost half of the home buyers' priorities as energy-saving through natural lighting and ventilation when buying property. Therefore, the energy consumption of residential buildings is found to be lower than that of conventional buildings. Other than that, Wira et al. (2013) point out the most desirable green features are indoor environmental quality, energy efficiency, and greenery because they can bring more benefits to the owners. Various advantages offered by these green residential buildings help shape a more significant perception of the status of green (Aman, 2014). However, it was revealed that there were no significant differences between investors' and potential homebuyers' preferences for conventional and green residential buildings in conserving energy or water, improving air quality, and reducing indoor noise (Chau et al., 2010).

In developed countries such as New Zealand, the awareness of greenhouses

is growing, with price, location, and construction type as the main factors influencing a homebuyer's purchase decisions (Eves & Kippes, 2010). In most cases, the number of bedrooms is an important factor for the buyer as it could influence the energy efficiency savings or reduce the damages made to the environment (Eves & Kippes, 2010). Moreover, the green residential owners were not willing to pay more for their landscaping area compared to those in conventional buildings (Chau et al., 2010). Therefore, green residential developments could not attract environmentalist homeowners (Chau et al., 2010). It is supported by Eves and Kippes (2010). They found various demography of homebuyers, such as young, older, retired, high-income, low-income, and middle-income buyers willing to buy a green residential building.

Nevertheless, homebuyers found several elements to consider apart from landscaping and physical activity for their green residential properties. It includes water and energy consumption, indoor noise level, air quality, and the fee imposed (Chau et al., 2010). In addition, Aman (2014) found that reducing energy and water consumption and using recycled materials were significant drivers in Malaysia's green practice. Razali and Adnan (2015) and Samari et al. (2013) added that besides energy efficiency and indoor quality, other environmental elements also include controlling waste and pollution, maintenance, and the house's environmental impact. Moreover, good lighting and illumination should also be

considered (Meins et al., 2014). Besides, Bezzina and Laiviera (2016) mentioned that the water issue had been considered over recent years, with the presence of hydrological mismanagement and pervasive groundwater abstraction. Abidin et al. (2013) indicated that the investors and homebuyers highly demanded a green residential building with access to green space and public transportation must be constructed with higher quality material. Apart from that, the energy efficiency design of the dwelling is important for homebuyers. According to Meins et al. (2014), the safety and security measures related to people continue to gain significance as the public becomes more aware of the issue. Investors and homebuyers should consider preferences to ensure the developers invest in green features, focusing on their clients' financial constraints and lifestyles (Wira et al., 2013). Therefore, in developing the concept and design for the green homes in Malaysia, Said et al. (2012) suggested that housing developers should note that the green homes that will be developed in the future should consider the needs of house buyers. By considering house buyers' needs, developers will be able to reduce the uncertain effects in the future (Said et al., 2012).

Environmental Sustainability in Malaysia

The publication of the Brundtland Commission report accentuated the sustainability concerns among legislators and policymakers. Sustainability covers

a range of social, environmental, and economic matters, which is referred to as triple bottom line (TBL) sustainability (Royal Institution of Chartered Surveyors [RICS], 2011). Brundtland (1987) defined sustainable development as 'development that meets the needs and aspirations of the present without compromising the ability of future generations to meet their own needs. Therefore, socio-economic development goals must be defined in terms of sustainability. Other leading international professional bodies include the Vancouver Valuation Accord (VVA), which is committed to embedding sustainability within valuation practices and thereby 'mainstreaming' sustainability (RICS, 2011).

In Malaysia, on September 27, 2021, the Malaysian government tabled the country's 12th Malaysian Plan (2021–2025), advancing sustainability as one of the three key themes. The 12th Malaysia plan's dimensions include environmental sustainability, the blue economy, green technology, renewable energy, and climate change adaptation and mitigation. Among the key performance indicators is a reduction of up to 45% greenhouse gas emissions intensity to GDP by 2030 in line with the Paris Agreement and renewable energy to account for 31% of Malaysia's total installed capacity by 2025. Furthermore, the focus will be on developing instruments for climate action, including the introduction of carbon pricing, such as carbon tax and Emission Trading Scheme, in line with the aspiration to become a carbon-neutral nation (Economic Planning Unit, 2021)

Green Rating System in Malaysia

Many developed countries have implemented the green building concept. According to the World Green Building Council (2021), there are 56 lists of rating tools that are administered by the World Green Building Council, which include LEED and Energy Star in the United States, BREEAM in the United Kingdom, Green Star in Australia, BOMA-Best in Canada, Green Mark scheme in Singapore, and Green Building Index (GBI) in Malaysia have been developed to evaluate the environmental performance of buildings. The different adoption of building guidelines and rating systems are influenced by the location’s climate, economy, and culture. In Malaysia, Green Building Index (GBI) is the green rating system that evaluates the environmental design and building performance. The rating system was developed in 2009 by Pertubuhan Arkitek Malaysia (PAM) and the Association of Consulting Engineers Malaysia (ACEM) to lead the Malaysian property industry toward becoming more environmentally friendly. GBI guides developers in incorporating sustainability elements into their residential and commercial development. For green residential buildings, GBI rating systems focus on energy efficiency, indoor environmental quality, sustainable site planning and management, materials and resources, water efficiency, and innovation (GBI, 2020). Table 1 shows the elements and maximum points for residential new construction (RNC) criteria.

Table 1
Assessment criteria for Residential New Construction (RNC)

No.	Item	Maximum Points
1	Energy Efficiency (EE)	23
2	Indoor Environmental Quality (EQ)	12
3	Sustainable Site Planning and Management (SM)	33
4	Material & Resources (MR)	12
5.	Water Efficiency (WE)	12
6.	Innovation (IN)	8

Source: GBI (2020)

If the criteria of the sustainability elements have been fulfilled, then the GBI would issue green certification. Some of the approved projects have been certified as green townships. A green or sustainable township must be designed and built with efficient resources that address environmental, social, and economic issues (GBI, 2020). Six core categories have been developed to address the delivery of a more sustainable township. The categories are Climate, Energy & Water, Ecology & Environment, Community Planning & Design, Transportation & Connectivity, Building & Resources, and Business & Innovation.

Table 2 depicts several completed green residential townships in Malaysia. By having a certification, homebuyers could verify the sustainability elements in their house, which then could assist them in deciding whether the certified green residential property investment is sound. The increasing trend of green real estate investment also reflects the increasing ownership of investor-owned green buildings.

Table 2
Green real estate township in Malaysia: Residential

	Project	Types of Property	Location	Green Certification*
1	Leisure Farm Resort Central Farm	Townhouse Semi-detached house Bungalow Villa	Iskandar Malaysia, Johor	Certified
2	Eco Horizon	Terrace House Bungalow Semi-detached house Super-link house Garden house	Bandar Cassia, Penang	Certified
3	Eco Ardence	Semi-detached house Bungalow Link house Terrace House Townhouse	Shah Alam, Selangor	Certified
4	Eco Majestic	Apartments Terrace House Semi-detached house Cluster house Bungalow	Semenyih, Selangor	Certified
5	Ken Rimba	Condominiums Pool Villas Double-storey terrace house Commercial	Shah Alam, Selangor	Certified
6	Bandar Gamuda Gardens	Terrace house Serviced Apartments Link Semi-detached house Super-link Terrace house Rumah Selangorku Apartments	Kuang, Selangor	Silver
7	Bandar Rimbayu Township	Double-storey terrace house Semi-detached house Apartments Serviced Apartment Shoplot	Telok Panglima Garang, Selangor	Silver
8	Sunway Resort City	Condominiums Commercial Office Tower Hospital Educational Institution	Bandar Sunway, Selangor	Silver
9	Marvelane Homes By The Lake	Condominiums Semi-detached houses Bungalows Cluster houses Townhouses	Subang Jaya, Selangor	Platinum

Source: Property Guru (2020)

Note: GBI classification: Platinum (86-100 points), Gold (76-85 points), Silver (66-75 points), Certified (50-65 points)

RESEARCH METHODOLOGY

The study adopted a methodical literature review following Anzagira et al. (2019) to explore the motivations for green real estate investment. The process includes the inclusion and exclusion criteria in the database search to exclude any unrelated topic of the study. Through discussion, this paper discusses the concept of green real estate. The benefits obtained from adopting the green certification in the residential township, and the drivers of the real estate investment. Figure 1 illustrates the review procedures used in this study.

A preliminary desktop search resulted in 277 articles identified in several electronic databases. Past research papers published in both empirical and conceptual studies were reviewed. The study starts with an

initial identification of relevant and eminent electronic research databases that include Scopus, Emerald Insight, Science Direct, Google Scholar, and ResearchGate to retrieve the articles. The descriptors used in the search engine included the synonyms to enhance the number of related and relevant searches toward the subject area. The descriptors include ‘green residential,’ ‘green real estate,’ ‘green building,’ ‘sustainable building,’ ‘driver,’ and ‘motivation.’ A filtering process was undertaken afterward when 26 full-text relevant articles were extracted from the initial research. The filtration was done through abstract and main context reviews to determine the relevance of a particular article. A matrix table was developed to highlight the green real estate determinant (see Table 3). The

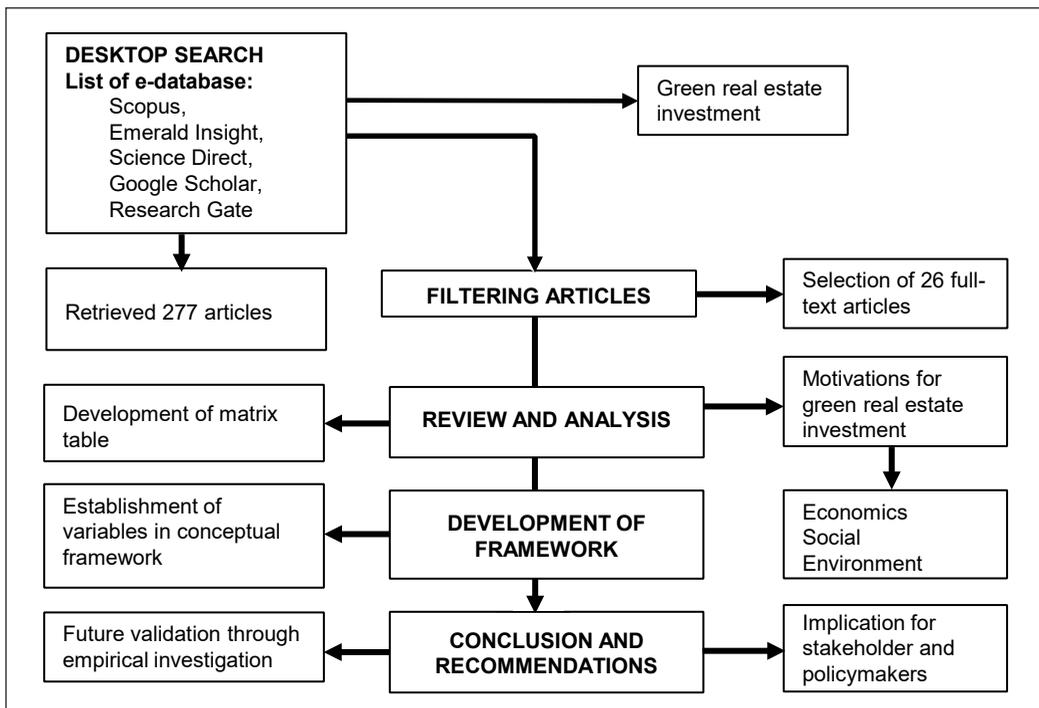


Figure 1. Flowchart of review procedures

development of the proposed framework is based on these filtered papers (Figure 1). The selected articles were critically reviewed and analyzed to explore green real estate investment and its application to residential properties. The identified motivations are categorized into economics, social, and environment. Next, these variables are illustrated in the conceptual framework (see Figure 2). Conclusion and recommendations towards stakeholders and policymakers are included as future research is needed to test the proposed conceptual framework.

RESULTS AND DISCUSSION

Green real estate or green building is a sustainable building that is designed, constructed, operated, and maintained with the efficient use of resources such as energy, water, and materials to reduce building impacts on the environment and human well-being (Kim et al., 2020). Embodied in this definition are the ideas of prioritizing efficient energy and water consumption and satisfying environmental considerations

from building impacts. Correspondingly, the United Nations Environment Program (UNEP) clarifies the idea of green in real estate as the total commitment to both the social and environmental aspects that will result in low carbon development or sustainable development (UNEP, 2011). Furthermore, the literature has documented that green real estate investment is poised for constant growth in the coming years, supported by the increase in green real estate development projects since 2009 based on the increasing trend of the certified number of green building projects (Ajibola, 2019).

The Conceptual Framework of Motivations of Green Real Estate Investments in Residential

From the literature review, three dimensions motivate property buyers or investor-owned to invest in or purchase the green residential property: economic, environmental, and social. The four determinants that have been established from the matrix table (see Table 3) are in line with three sustainability

Table 3
Matrix of green real estate investment determinants

Author(s)	Kim et al.	Duan et al.	Ajibola et al.	Chen et al.	Mangialardo et al.	Gluszak et al.	Fan & Zhou	Deng & Wu	Xiao et al.	Frequency
Year of Publication	2020	2020	2019	2019	2019	2019	2019	2014	2017	
Motivation										
Concern for Environmental Degradation	√		√				√		√	4
Financial Returns	√	√		√	√	√				5
Cost Saving	√		√	√	√	√	√	√		7
Social and Environmental Benefits	√	√	√		√	√	√	√	√	8

development objectives which cover different aspects of social development, environmental protection, and economic growth. For sustainable development to be achieved, these three core elements need to be prioritized and interconnected for the well-being of the residents and society. Therefore, the matrix of green real estate investment determinants is developed based on these three sustainability objectives. However, for economic benefit, following Fauzi et al. (2021), the researcher applied breakdown analysis in which the data were divided into two categories for a more robust result. Economic benefit for motivation to invest in green real estate investment, particularly the greenhouse, could likely be due to cost-saving motivation or maximization of financial return in the future.

Environmental Concern. The first motivation bonds to the rising concern of climate change, particularly for environmental degradation (Ajibola et al., 2019; Fan & Zhou, 2019; Xiao et al., 2017). Recent research by Kim et al. (2020) has revealed that investors-owned have tendencies to own certified green buildings, which benefits the environment. In addition, the intensification of climate change awareness and rising energy costs have also increased the market attractiveness of green buildings (Xiao et al., 2017). However, the energy efficiency of buildings may vary under different conditions, especially during extreme weather and haze episodes when buildings tend to operate at full

load (Agarwal et al., 2017b). Therefore, an informed decision on the level of energy efficiency, especially for residential properties, could affect the resident's motivation toward the green certified residential properties. Fujisawa et al. (2020) investigated the effect of different types of labels on energy conservation decisions in Japan. They found that informing consumers about the energy efficiency level of the house could motivate them to choose housing with lower energy consumption levels. It indicates that the residents who are greatly concerned about the environment are easily motivated toward housing with a high energy efficiency level. Similarly, in Singapore, buildings with a basic level of the green label (GM-certified) in the public housing market are, on average, relatively more energy-efficient than buildings without a green label (Agarwal et al., 2017a).

Economic: Financial Returns. Green buildings lease up faster, at higher rents, and maintain higher occupancy levels than conventional buildings (Ajibola et al., 2019; Deng & Wu, 2014; Duan et al., 2020; Fan & Zhou, 2019; Mangialardo et al., 2019). For instance, Deng and Wu (2014) found that green-certified dwellings are 4.2% more expensive than comparable non-certified dwellings. In addition, the development of green buildings in the UK increases the value of nearby conventional buildings (Chegut et al., 2014), implying positive externalities towards the neighborhood area from green certification.

Several empirical studies reliably report that the investor-owned is willing to buy green buildings for higher rental income (Duan et al., 2020; Gluszak et al., 2019; Kim et al., 2020). Duan et al. (2020) reported that with the increase in green residential investment, the urban green space in Shaanxi city had been gradually expanded. The green space expansion reflects the demand for green residential investment. In addition, Mangialardo (2019) pointed out that the green buildings with higher certification show higher returns on investment compared to other green buildings with lower green certification. Also, certified green investments guarantee higher revenue values and rents (Chen et al., 2019). In terms of the house price, Agarwal et al. (2017a) found that the green mark certification increases house prices by 1.61% relative to building without the certification in Singapore. Financial returns regarding real estate values and rents reflect the investors' particular appreciation and the investors-owned green building market.

Economic: Costs Saving. The next motivation is the low operational and maintenance costs (Ajibola et al., 2019; Deng & Wu, 2014; Kim et al., 2020). Robust research has recognized that green buildings can save 30% of energy savings compared to conventional buildings (Mangialardo et al., 2019). Fan and Zhou (2019) indicated that the green technology of the air conditioning system alone could reduce up to 15% energy consumption, depending on the total floor area. Consumers who believe in the

cost-saving of green buildings value green certification and are willing to pay a premium for green building features (Matisoff et al., 2016). Additionally, research by Gluszak et al. (2019) highlighted that lower operating costs and energy consumption are drivers of the increase in the demand for sustainable buildings. Besides, with energy-efficient and water-efficient elements in a building, residents can reduce their utility bills, especially the energy cost (Chen et al., 2019).

Social and Environmental Benefits.

Motivation for green buildings can also be driven by social and environmental benefits (Gluszak et al., 2019). From an investor's point of view, social factors could be just as influential on value as environmental factors in the case of green residential properties. For example, suppose the occupier or tenant of a green residential property benefits from comfort and safety and has access to desirable amenities, particularly green space. In that case, they are more likely to choose this property. The research found that green real estate could enhance social interaction and increase health benefits. For instance, green design attributes can improve the occupant's productivity, health, and well-being (Xiao et al., 2017). Similar results could also be found when green design features improve indoor air quality for society's well-being (Deng & Wu, 2014). Empirical research by Duan et al. (2020) revealed that green real estate development could increase 0.899km² of urban green space. Also, 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 the driven criteria, investors and investors-owned will eventually shift from conventional to greener buildings.

Similarly, research by Kim (2020) pointed out that green space reduces greenhouse gas emissions and provides a buffer zone. Therefore, environmental benefits from the green real estate could also indirectly affect the social aspect of the occupants.

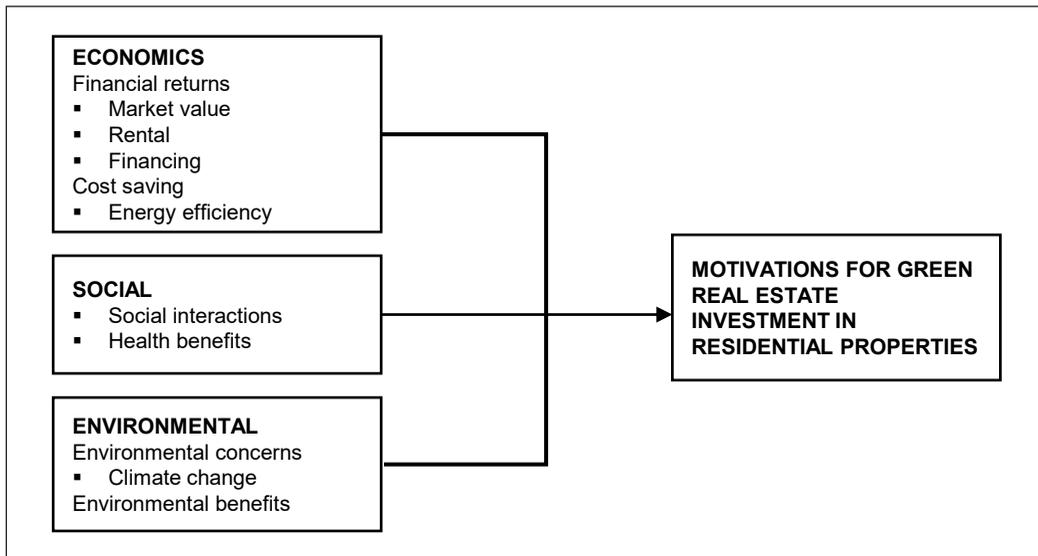


Figure 2. The conceptual framework
Source: Authors' construct

CONCLUSION

The motivation factors for green real estate investment in residential properties can be seen in three aspects: environmental, economic, and social benefits. This paper reviews the literature on green real estate investment and the need to establish the framework for green residential properties. The developed conceptual framework in this paper and the future empirical finding could contribute to the sustainability of residential properties.

The findings from this research could offer valuable benefits in supporting and facilitating Malaysia's medium to long-term

goals of green technology, as mentioned in the 11th and 12th Malaysia Plans. The government could consider various incentive schemes, namely grants and funding for green infrastructure and construction, in line with the 2030 Agenda for Sustainable Development. In moving toward a low-carbonation, promoting green and resilient cities and townships should be more focused on by the government.

Furthermore, this research is crucial to convey the message to the real estate industry, specifically to the property developer, in developing green residential schemes, reducing any uncertainties and

risks in the future. Exploring the motivations for green real estate investment, particularly the benefits of choosing a particular level of green certification, estimates not only the economic benefit of either maximizing return or cost minimization but also socio-environmental benefits which can contribute to the decisions of developers and investors to encourage more green-certified residential and township development in the future. Moreover, this research intends to facilitate related parties and organizations to provide incentives, recognition, and actions to increase the awareness of the investors and buyers related to the green residential building. Finally, this research will contribute to filling the gap in the previous research and encourage future research in the green residential building development industry, either locally or internationally. The development of the conceptual framework in this study could be further tested and validated. The validated model then could promote more green real estate development, particularly in the emerging market of Malaysia.

ACKNOWLEDGEMENT

The Geran Khas Insentif Penyelidikan Perak (GKIPP) supported this research. The authors want to thank anonymous reviewers for their helpful comments and suggestions.

REFERENCES

- Abidin, N. Z., Yusof, N., & Othman, A. A. E. (2013). Enablers and challenges of a sustainable housing industry in Malaysia. *Construction Innovation*, 13(1), 10-25. <https://doi.org/10.1108/14714171311296039>
- Agarwal, S., Sing, T. F., & Yang, Y. (2017a). Are green buildings really “Greener”? Energy efficiency of green mark certified buildings in Singapore. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.3088895>
- Agarwal, S., Sing, T. F., & Yang, Y. (2017b). *Risk-avoidance and environmental hazard: Effects of the transboundary haze pollution in Singapore* (Research Paper No. 2942096). Georgetown McDonough School of Business.
- Ajibola, M. O., Oluwunmi, A. O., Kabiamaowei, A. I., Owolabi, D. R., & Akinwale, O. M. (2019). Green Economy: The role of estate surveyors and valuer. *Journal of Physics: Conference Series*, 1299(1), 012016. <https://doi.org/10.1088/1742-6596/1299/1/012016>
- Alsulaili, A. D., Al-Matrouk, M. F., & Al-Baghli, R. A. (2019). Environmental and economic benefits of applying green building concepts in Kuwait. *Environment, Development and Sustainability*, 21(2), 3371-3387. <https://doi.org/10.1007/s10668-019-00352-1>
- Aman, N. U. (2014). *The implementation of green lease practices for commercial buildings*. University of Malaya.
- Anzagira, L.F., Duah, D., & Badu, E. (2019.) A conceptual framework for the uptake of the green building concept in Ghana. *Science African*, 6, 1-11, <https://doi.org/10.1016/j.sciaf.2019.e00191>
- Bezzina, F. H., & Laiviera, I. S. (2016). Exploring rainwater harvesting opportunities in Malta. *Management of Environmental Quality: An International Journal*, 27(4), 390-406. <https://doi.org/10.1108/MEQ-12-2014-0178>
- Brundtland, G. (1987). *Report of the World Commission on environment and development: Our common future* (document A/42/427). United Nations General Assembly.
- 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. <https://doi.org/10.1016/j.buildenv.2010.05.017>
- Chegut, A., Eichholtz, P., & Kok, N. (2014). Supply, demand and the value of green buildings. *Urban Studies*, 51(1), 22-43.
- 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. <https://www.x-mol.com/paperRedirect/974686>
- Deng, Y., & Wu, J. (2014). Economic returns to residential green building investment: The developers' perspective. *Regional Science and Urban Economics*, 47, 35-44. <https://doi.org/10.1016/j.regsciurbeco.2013.09.015>
- Duan, Z., Jiang, R., & Zhang, T. (2020). Estimating economic benefits from urban green space in Shaanxi province with a Simultaneous Equations Model (SEM). *IOP Conference Series: Earth Environment Science*, 508, 012078. <https://iopscience.iop.org/article/10.1088/1755-1315/508/1/012078>
- Economic Planning Unit. (2021). *12th Malaysia Plan 2021: A prosperous, inclusive, sustainable Malaysia*. https://publication.intan.my/AgendaNasional/Twelfth_Malaysia_Plan_2021-2025/index-h5.html#page=1
- Eves, C., & Kippes, S. (2010). Public awareness of "green" and "energy efficient" residential property. *Property Management*, 28(3), 193-208. <https://doi.org/10.1108/02637471011051327>
- Fan, J., & 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. <https://doi.org/10.1016/j.jclepro.2018.10.201>
- 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., Ali, S. N. M., Arshad, H., & 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.
- Fujisawa, M., Takemura, K., Funaki, Y., Uto, N., & Takahashi, R. (2020). An experimental study of the effect of energy label design on the correct evaluation of buildings' energy performance and promotion of energy saving. *International Real Estate Review*, 23(1), 733-762.
- Gluszak, M., Gawlik, R., & Zieba, M. (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. <https://doi.org/10.3390/admsci9030052>
- Green Building Index. (2020). *Resources*. <https://www.greenbuildingindex.org/>
- Kim, K. H., Jeon, S., Irakoze, A., & Son, K. (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. <https://doi.org/10.3390/su12062206>
- Mangialardo, A., Micelli, E., & Sacconi, D. (2019). Does sustainability affect real estate market values? Empirical evidence from the office buildings market in Milan. *Sustainability*, 11(1), 12. <https://doi.org/10.3390/su11010012>
- Matisoff, D. C., Noonan, D. S., & Flowers, M. E. (2016). Policy monitor — Green buildings: economics and policies. *Review of Environmental Economics and Policy*, 10(2), 329-346.
- Meins, E., Wallbaum, H., Hardzewski, R., & Feige, A. (2014). Sustainability and property valuation:

- A risk-based approach, *Building Research & Information*, 38(3), 280-300. <https://doi.org/10.1080/09613211003693879>
- Myeda, N. E., Kamaruzzaman, S. N., Zaid, S. M., & Fong, Y. P. (2016). Sustainable housing: Demographic analysis of customers. *Journal of Building Performance*, 7(1), 116-124.
- 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. [https://doi.org/10.1061/\(asce\)me.1943-5479.0000559](https://doi.org/10.1061/(asce)me.1943-5479.0000559)
- Property Guru. (2020, February 20). *12 GBI certified townships in Malaysia*. <https://www.propertyguru.com.my/property-guides/12-gbi-certified-townships-malaysia-23287>
- Razali, M. N., & Adnan, Y. M. (2015). Sustainable property development by Malaysian property companies. *Property Management*, 33(5), 451-477. <https://doi.org/10.1108/PM-02-2014-0008>
- Royal Institution of Chartered Surveyors. (2011). *Sustainability and residential property valuation*. <https://www.bathnes.gov.uk/sites/default/files/sitedocuments/Planning-and-Building-Control/Planning-Policy/Evidence-Base/Sustainability/Sustainabilityandresidentialpropertyvaluation.pdf>
- Said, I., Ibrahim, F. A., Omran, A., Mohd, W., & Mohd, S. (2012). The housing development process: Green homes in Malaysia. *Manager Journal*, 16(1), 98-111.
- Samari, M., Godrati, N., Esmacilifar, R., Olfat, P., & Shafiei, M. W. M. (2013). The investigation of the barriers in developing green building in Malaysia. *Modern Applied Science*, 7(2), 1-10. <https://doi.org/10.5539/mas.v7n2p1>
- Shafie, F., Wan Yusoff, W. Z., & Al-Edrus, S. M. D. (2016). Islamic real estate management: Review on issues and challenges in managing inheritance property in Malaysia. In *25th International Business Information Management Association Conference- Innovation Vision 2020 From Regional Development Sustainability to Global Economic Growth- IBIMA 2015* (pp. 3684-3696). International Business Information Management Association, IBIMA.
- Suratman, R., Samsudin, S., Ibrahim, H., & Ahli, N. (2018). Energy saving in residential buildings: Resident's effort and awareness, *International Journal of Real Estate Studies*, 12(2), 43-60.
- United Nation Environment Programme. (2011). *Toward a green economy: Pathways to sustainable development and poverty eradication*. <https://www.unep.org/resources/report/towards-green-economy-pathways-sustainable-development-and-poverty-eradication-10>
- Wira, M., Shafiei, M., Samari, M., & Ghodrati, N. (2013). Strategic approach to green home development in Malaysia-the perspective of potential green home buyers. *Life Science Journal*, 10(1), 3213-3224.
- World Green Building Council. (2021) *The benefits of green buildings*. <https://www.worldgbc.org/benefits-green-buildings>
- 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. <https://doi.org/10.1016/j.ufug.2017.06.007>
- 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. <https://doi.org/10.3390/ijerph17186607>