UNLOCKING THE IDEAL HOME: EXPLORING USER PREFERENCES AND SUSTAINABLE GREEN RESIDENTIAL HOUSE FEATURES FOR SMART BUYERS

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ABSTRACT

With an increasing emphasis on environmentally friendly lifestyles, buyers are increasingly attracted to green factors when purchasing a house. However, many residential houses fail to meet the characteristics of green buildings, resulting in environmental pollution. This research aims to identify buyer preferences when buying a house and determine the desired characteristics of green residential buildings. Factors such as price, location, neighbourhood, structural design, and lifestyle considerations influence buyers' decisions. Additionally, the research examines specific features of green residential buildings, including green building certification, sustainable materials, waste management and recycling, native landscaping, and passive design strategies. In this paper, the research methodology uses quantitative data. The findings revealed that a significant number of buyers prioritise green features for residential properties when making a house purchase. This sheds light on the factors that influence consumer choices and emphasises the need for sustainable housing options in the real estate market. This research offers valuable insight for policymakers, developers,

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and industry professionals seeking to align housing offerings with the growing demand for green and sustainable living.

Keywords: *Green Residential House, User Preferences, Green Building, Home Buyer*

INTRODUCTION

As sustainability becomes an increasingly important consideration for homeowners, the demand for green residential properties has been on the rise (Hansen and Patnaikuni, 2014). Contemporary homebuyers exhibit a dual concern, wherein they prioritise not only the acquisition of their ideal residential property but also the pursuit of choices that are congruent with their personal values and contribute to the advancement of a sustainable future. This article examines user preferences and investigates the primary green building features that discerning buyers prioritise when seeking their desired residence. In light of the increasing global emphasis on sustainable living, it is imperative for developers, architects, and policymakers to possess a comprehensive understanding of the preferences and expectations of prospective homebuyers. Through the identification of key features that elicit strong positive responses from buyers, stakeholders are able to enhance their strategic alignment with market demands. This enables them to develop residential properties that effectively satisfy both aesthetic preferences and sustainability criteria. This paper presents the results of an extensive study that examined the preferences of individuals looking to purchase homes with regards to features related to sustainable building practises. The study aimed to investigate the sustainable features that are most highly valued by a diverse group of knowledgeable homebuyers, through the use of a comprehensive survey. The study investigates various sustainable attributes of environmentally-friendly structures. The objective of this study is to provide insight into the characteristics that render a residential property genuinely sustainable and attractive within the contemporary market. The results of this study offer significant insights for professionals in the industry, aiding them in the development and marketing of residential properties that cater to the changing preferences of environmentally aware homebuyers. The primary objective of this study is to make a scholarly contribution to the existing body of knowledge on sustainable housing by investigating

the preferences and priorities of informed consumers. This research aims to serve as a source of inspiration and information for stakeholders in the real estate industry, encouraging them to harness the potential of green building features. By doing so, they can develop homes that not only cater to the preferences and requirements of homebuyers but also contribute to the advancement of a sustainable and resilient future.

LITERATURE REVIEWS

Ideal Home

The word 'ideal home' refers to the notion of a perfect or dream house that fulfils an individual's or family's personal wishes, requirements, and preferences (Mallett, 2004). It reflects the ideal living environment, which meets both practical and emotional needs. Because it is extremely subjective and affected by individual choices, lifestyles, and priorities, the notion of an ideal house may vary widely from person to person (Chapman and Hockey, 2002). While sustainability refers to practises that minimise negative environmental impacts and promote long-term ecological balance (Kuhlman and Farrington, 2010), when it comes to creating an ideal home, it includes not only meeting personal preferences but also incorporating environmentally friendly features and practises (Abidin, 2010; Akadiri et al., 2012). As a result, an ideal house seeks to minimise its carbon footprint, decrease resource consumption, and create a living environment in the framework of sustainability.

Buyer Preference and Its Impact on Purchasing Decision Making

Regarding the decision-making process for purchasing a sustainable property, buyer preferences have a significant impact. Sustainable housing is defined as homes that are planned and built with an emphasis on environmental responsibility, energy efficiency, and a low carbon footprint (Liu et al., 2022). Understanding buyer preferences and their impact on the choice to purchase a sustainable home is critical for sellers and real estate agents attempting to meet the rising demand for environmentally aware living. The focus on energy efficiency is a crucial part of customer preferences for sustainable housing (Khahro et al.,2021). The buyer often

prioritises buildings with renewable energy sources such as solar panels, energy-efficient appliances, and insulation that reduces heat loss. Energy-efficient features should ideally not only decrease environmental impact but also lead to long-term economic savings for homeowners (Wilson et al., 2015; Zancanella et al., 2018; Kumar, 2020).

Another factor that consumers should examine is the usage of ecologically friendly materials and building practises. Eco-friendly elements such as recycled or salvaged materials, low-VOC (volatile organic compound) paints, and sustainably produced timber are often used in sustainable homes. These options correspond to customer desires for lower environmental impact and better indoor air quality (Mardani et al., 2020). Water efficiency elements are also important to buyers looking for environmentally friendly homes. Water-saving devices such as low-flow toilets and faucets, rainwater harvesting systems, and landscape designs that reduce water use are examples (Md. Lani et al., 2018). Water efficiency is a major challenge, particularly in areas prone to water shortages or where sustainable living is prioritised.

Furthermore, the location of a sustainable home impacts buyer preferences. Proximity to public transport hubs (Pinthong et al., 2018), such as MRT, LRT, Electric Train Service (ETS), and Komuter, as well as walkability and access to bike lanes, are frequently sought after by environmentally conscious buyers (Kenndy-Cuomo, 2021; Jaber,Abu Baker, & Csonka, 2022). Living in locations with established infrastructure and less dependence on private automobiles is consistent with sustainable living choices. Buyer choices are also influenced by the safety of the area, the quality of the schools, and the general community environment (ECP, 2014). Buyers' choices for environmentally friendly homes are impacted further by criteria such as certification and eco-labelling. LEED (Leadership in Energy and Environmental Design) and ENERGY STAR certifications assure purchasers that the property fulfils particular sustainability criteria (Khan, 2019). These certifications may boost buyer confidence and raise the market attractiveness of a sustainable home.

Sellers and real estate agents should explicitly emphasise the eco-friendly characteristics and advantages of the property in order to properly satisfy customer preferences for sustainable dwellings. This includes

displaying energy-efficient appliances, renewable energy systems, water-saving fixtures, and environmentally friendly building materials. Sustainable living should be promoted for its long-term financial savings, environmental advantages, and increased quality of life. In summary, by matching customer preferences, sellers and developers can fulfil the rising need for sustainable housing while also contributing to a more sustainable future.

METHODOLOGY

The quantitative research approach was used in this study, with numerical data being used to aid interpretation by interested parties and the firm. A questionnaire was sent to the people of Bandar Meru Raya, Ipoh, as the major study tool. The perceptions and values were then numerically examined owing to population size restrictions and time constraints. The sample size in this study is determined by elements such as efficacy, credibility, the capacity to complete the research within a certain deadline, and available resources. The sample size in this research was estimated using an equation based on a population size of 1500, yielding a sample size of 306 for distributing the questionnaires.

The acquired data was analysed using SPSS software for data analysis. SPSS software was selected as the data analysis tool because it is frequently used for quantitative data analysis and provides a broad variety of statistical procedures, making it appropriate for the research. Furthermore, the recorded results offered data about the respondents, such as the number of respondents, frequency, and percentages. The analysis sought to define demographic data and research aspects in order to facilitate the discovery of correlations between variables. As a result, the analysis was carried out after the data was collected, resulting in a full review of the data, which serves as the most final type of data analysis.

ANALYSIS AND FINDINGS

Demographic Profiles

This section presents the demographic profiles of the respondents. The

results from the data collection revealed that most of the respondents are male: 215 males (70.3%) and 91 females (29.7%), as depicted in Figure 1. Meanwhile, the ages of the respondents were between 20 and 40 years old, which was the majority of the respondents for this research.
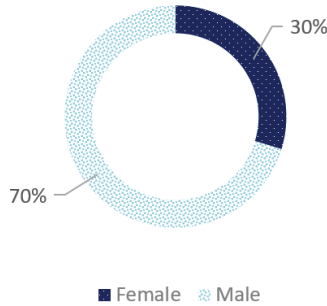

Figure 1. Respondents' Gender

Source: Author

The reasons for choosing this range of ages are due to the fact that this target sample of the population is at its peak growth stage and is seeking physiological necessities such as shelter, in accordance with Maslow's hierarchy of needs. In relation to that, major respondents (20–30 years old) are still young and looking for a house to stay in (44%), as illustrated in Figure 2. Respondents between the ages of 31 and 40, on the other hand, had the most experience with residential dwellings (56%).

Following that, marital status has a significant impact on a house's purchase potential. According to the statistics, the majority of them (147 respondents) are married, while 81 remain single. In terms of occupation, the majority of respondents in this study (65%) are teachers who work in the schools where the survey was disseminated. Based on the findings, there should be a lot of schools around the study site. According to Masri et al. (2016), accessibility to the city centre, commercial or office areas, shopping malls, township facilities such as mosques, health providers, schools, and nearby municipal services is the primary indicator of quality location.
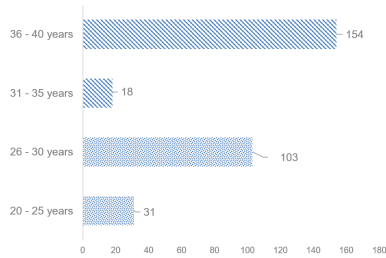
Figure 2. Respondents' Age Distribution

Source: Author

User Preferences in Buying a House

This section discusses the elements that consumers consider when purchasing a home. As shown in Figure 3, economical green housing is unquestionably a crucial consideration in consumer preferences when purchasing a green residential dwelling, with the largest number of respondents agreeing (87%). As a result, there are various reasons for this consideration. Affordable green housing offers homeowners the potential for considerable long-term cost reductions. Furthermore, decreased maintenance and running expenses contribute to overall affordability, enabling homeowners to direct their financial resources elsewhere. Sustainable landscaping and security (76%), on the other hand, were the second-most agreed upon by respondents, owing to the fact that security is a critical issue for homeowners when acquiring a property. By properly arranging trees, bushes, and fences, it helps to improve seclusion and security by incorporating sustainable landscaping.
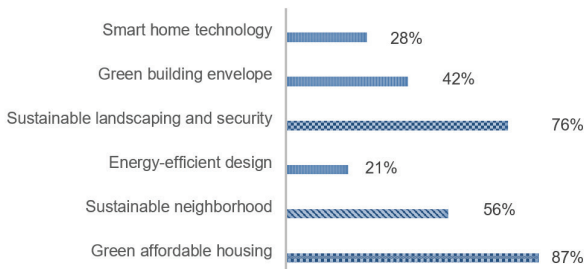

Figure 3. User Preferences in Buying a House

Source: Author

Furthermore, well-designed landscapes may act as natural barriers, deter trespassing, and provide a feeling of remoteness. Homeowners also cherish the peace of mind that comes with having a safe and private outside place for their children. Furthermore, ecological landscaping may improve the health and well-being of homeowners. We enhance air quality by filtering pollutants and delivering oxygen by adding green areas, trees, and plants (Szaraz, 2014). Nature and greenery have been associated to lower stress levels, better mental health, and general well-being. As a result, it becomes a solid reason for purchasers to choose this feature, as they see the value of establishing a living environment that encourages a healthy lifestyle and a connection with nature, all while providing a suitable assurance of protection.

The sustainable neighbourhood was identified as the third element by respondents, with 56% stating that it is a crucial aspect in encouraging them to purchase a property. Ideally, this component, which is quality of life, gives its own compelling grounds for pushing homeowners to consider purchasing a property. According to Parhizgar (2013), sustainable communities often provide people with a higher quality of life. Ideally, the presence of plenty of green space, parks, and walking paths promotes an active and healthy lifestyle. Furthermore, having access to nature and outdoor facilities fosters well-being and a feeling of community in the neighbourhood. In summary, homeowners value the improved living experience and the ability to live a healthy and sustainable lifestyle in their communities. Furthermore, Banner et al. (2010), Opoku & Abdul Muhmin (2010), and Mang et al. (2020) all said in their study that the neighbourhood is a significant factor to consider when making a property buying choice.

According to Dehghanmongabadi and Hoskara (2014), sustainable communities are more adaptable to environmental issues such as severe weather events or resource constraint. Developers often include climate-resilient design elements, green infrastructure, and systematic water management systems. As a result, homeowners choose to appreciate the long-term worth of adapting to environmental changes, lowering possible dangers while enhancing property value. This discovery also suggested that sustainable communities are becoming more popular (Lie et al., 2022), as more respondents emphasise sustainable living. Homeowners who take the initiative to invest in a property in a sustainable neighbourhood are making

a sound investment since these areas are likely to keep their attraction and value over time. Finally, it guarantees that the property stays appealing to future purchasers, offering stability and the possibility of a return on investment.

Preferred Sustainable Features in the Green Residential Properties

In this section, the findings reveal the preferred sustainable features for green residential properties. Ideally, in the questionnaires, the respondents were required to indicate the preferred features that they were looking for in selecting a green residential house. At the beginning of the section, the knowledge of green residential houses was gauged by the respondents. Accordingly, the findings in Figure 4 show that the majority of respondents (79%) are familiar with green residential houses in terms of definition, understanding, examples of green features, and characteristics of sustainable houses.
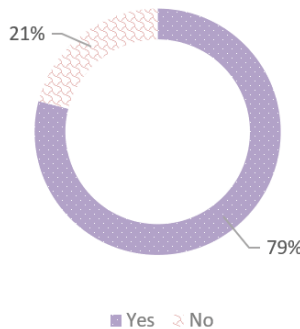

21%

79%

■ Yes � No

Figure 4. Awareness of Green Residential and Sustainable House
(Source: Author's Illustration)

Figure 5, on the other hand, depicts the respondents' (buyers') selected sustainable qualities for green residential structures. According to the data, 80% of respondents picked renewable energy sources as the primary characteristic they wanted in their green house. Solar power, wind energy, micro-hydro power, and hybrid systems are ideal examples of renewable energy sources. The majority of purchasers feel that adding renewable energy sources into a home would give homeowners with some energy independence. Furthermore, producing their own power minimises their dependency on conventional energy sources and the accompanying

expenditures. Typically, customers are drawn to the potential long-term cost benefits of solar panels or other renewable energy installations, which may balance or even eliminate their power expenses. As a result, over time, this may result in considerable financial savings as well as protection against growing energy costs. The results are also consistent with study by Bahruddin and Mohd (2019), which emphasises green housing technology, which is connected to renewable energy resources, as described in the preceding cases.
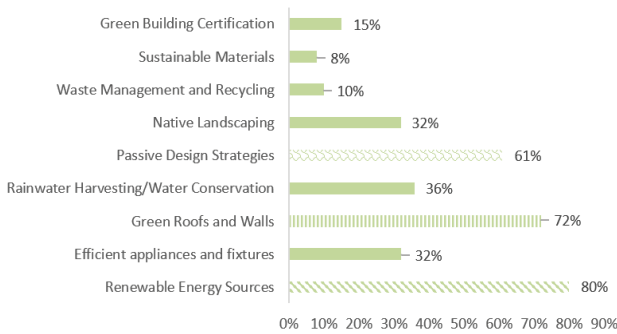

Figure 5. Preferred Sustainable Features for Green Residential Properties
Source: Author

Additionally, 72% of respondents favour green roofs and walls as a sustainable feature for green residential structures. Green roofs and walls, in theory, improve both beauty and well-being. Green roofs and walls enhance a property's natural beauty and aesthetic appeal. Plants and leaves help to create a quiet and soothing atmosphere that promotes relaxation and well-being. Furthermore, living near greenery has been related to lower stress levels, better mental health, and an overall feeling of fulfilment. Green roofs and walls, according to Renterghem (2018), operate as effective sound barriers, reducing noise pollution from the surrounding environment. The plants and soil absorb and block sound waves, giving residents with a calmer and more serene living environment. Meanwhile, passive design tactics are the third characteristic with 61%. Passive design solutions, in theory, focus the creation of pleasant living areas that enhance well-being (Butters, 2015).

These measures assist maintain ideal interior temperatures, prevent draughts, and improve overall indoor air quality by including characteristics such as adequate insulation, natural daylighting, and efficient ventilation (Zoure, 2023). This aspect makes homeowners' living environments healthier

and more pleasant, hence boosting their quality of life. Furthermore, passive design ideas often contain elements that improve a home's resilience and self-sufficiency. Incorporating factors like rainwater collection systems, sun orientation, and natural ventilation, for example, may lessen dependency on external resources and utility infrastructure. These considerations may be especially appealing to homeowners wanting more independence, particularly in areas prone to interruptions in electricity or water supplies. According to Daud's (2020) research, passive design solutions should be used to boost a building's energy efficiency.

Besides, native landscaping (32%), which includes native plants and landscape designs that need less water and upkeep, is one of the most appealing aspects for eco-conscious purchasers. Native landscaping contributes to the preservation of local biodiversity, decreases the demand for artificial fertilisers and pesticides, and conserves water resources. Landscapes were incorporated as an essential part of the green house idea, according to Alias et al. (2010), which also offers improved ventilation and improves interior air quality in the surrounds. Then (36%), water saving or rainwater collecting was implemented. Water conservation is critical in sustainable homes, where purchasers will enjoy amenities such as low-flow fixtures, dual-flush toilets, and water-efficient appliances. Furthermore, the incorporation of rainwater harvesting systems enables homes to collect and utilise rainwater for a variety of reasons, lowering their dependency on freshwater sources even further. Rainwater harvesting systems were placed 21st, while water-efficiency sanitary fixtures and fittings were ranked 17th as the preferred green house features among Sarawak purchasers, according to Wong et al. (2022).

Aside from that, respondents felt that other sustainable residential construction components play an important role in contributing to a sustainable, green residential dwelling. Green Building Certification (15%): For example, some homebuyers value properties with green building certifications such as Leadership in Energy and Environmental Design (LEED-H) for Homes, Green Building Index (GBI), Green Real Estate (GreenRE), Comprehensive Assessment System for Building Environmental Efficiency (CASBEE), and British Research Establishment Environmental Assessment Method (BREEAM) that are currently available in Malaysia (Abu Bakar et al.). The certifications assure that the building satisfies

certain environmental performance requirements, such as energy efficiency, indoor air quality, and material sustainability. According to Abdullah et al. (2017)'s study assessment, green certification and awards optimally boosted the property price by 3.46% and 6.61%, respectively. Furthermore, in terms of sustainable materials (8%), homeowners place a high value on the use of sustainable materials in construction, such as recycled or locally produced materials, renewable resources, and low-emission items. These materials lessen the building's environmental effect and support resource conservation. According to Patel and Patel (2021), using sustainable green materials in buildings encourages sustainable development by lowering pollution and addressing current difficulties and environmental concerns caused by construction operations.

CONCLUSION

In summary, this research paper examined the desired sustainable attributes for environmentally friendly residential properties among prospective home purchasers. The results of the study indicated a distinct inclination towards specific sustainable attributes, with renewable energy emerging as the most prominently favoured aspect. Homebuyers acknowledge the significance of transitioning towards clean and renewable energy sources as a means to mitigate carbon emissions and decrease reliance on non-renewable resources. Green roofs and walls are considered the second most desirable feature due to their ability to provide various advantages. These features contribute to improved insulation and enhanced aesthetics, while also supporting biodiversity and mitigating the urban heat island effect. In addition, homebuyers demonstrated a strong preference for passive design strategies, thereby attributing significant value to this particular feature. Passive design strategies, including adequate insulation, utilisation of natural ventilation, and strategic positioning of windows, are employed to enhance energy efficiency. Consequently, these measures lead to decreased energy consumption and diminished utility expenses. The results of this study indicate a growing trend among homebuyers to prioritise sustainable features when making residential property investments.

The findings also underscore the increasing recognition and significance of sustainable living practises, including the utilisation of renewable energy, the implementation of green roofs and walls, the adoption of passive design

strategies, and the promotion of native landscaping, which have emerged as crucial focal points. Gaining an understanding of these preferences can assist developers, builders, and policymakers in aligning their endeavours with the demands of homebuyers, thereby fostering a market conducive to sustainable residential development.

By incorporating these desired attributes into environmentally friendly residential properties, stakeholders can fulfil consumer demands, augment property worth, and contribute to the overarching objective of establishing sustainable and ecologically conscious communities. Therefore, given the aforementioned research findings, it would be beneficial for future investigations to further explore the motivations and perspectives of individuals purchasing homes with sustainable features. Qualitative research methods, such as interviews or focus groups, have the potential to yield valuable insights regarding the underlying factors that influence individuals' preferences. Furthermore, conducting longitudinal studies that monitor the long-term contentment and experiences of individuals who reside in environmentally-friendly residential properties could yield significant insights into the tangible advantages and difficulties associated with sustainable living.

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AUTHOR CONTRIBUTIONS

The authors confirm the contribution of the paper as follows: conception of the research, data collection, and data analysis of the study was undertaken by Muhammad Naseh Mohd Tarmizi. The design of the research, data analysis, data cleaning, interpretation, drafting, and write-up of the articles was undertaken by Siti Nur Aishah Mohd Noor. A review of the articles was

undertaken by Mohd Khairul Amri Ramly and Nurul Akmam Naamandadin. All authors have read and approved the final manuscript.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

REFERENCES

Abdullah. L, Ab Rashid. W.N.A.W and Mohd. T (2017). Impact of Green Certification on Residential Property Market: A Review, *Postgraduate Seminar in Technology and Built Environment 2016 Series of GoGreen Conference*, Volume 2.

Abidin, N.Z. (2010) Investigating the awareness and application of sustainable construction concept by Malaysia developers, *Habitat International,* 421-426.

Abu Bakar. A.H, Cheen. S. and Abu Hassan. R. (2011) Sustainable Housing Practices in Malaysia Housing Development: Towards Establishing Sustainability Index. *International Journal of Technology,* 2910:84-93

Akadiri, P.O., Chinyio, E.A., & Olomolaiye, P.O. (2012). Design of a Sustainable Building: A Conceptual Framework for Implementing Sustainability in the Building Sector. *Buildings, 2*(2), 126-152, MDPI AG.

Alias. A, Sin. T.K., and Aziz. W.N.A.W.A (2010). The Green Home Concept-Acceptability and Development Problems. *Journal of Building Performance, 1*(1),130 - 139.

Bahruddin. N. A., Mohd. T., (2019) Enabling Factors for Green Housing Projects. *Malaysia Journal of Sustainable Environment, 6*(2), 95-115.

Banner, M. G., White Berheide, C., & Ross Greckel, F. (2010). *Housing Preferences in Louisville.* A Feminist Critique of the Suburban Environment, Housing, and Society, 9(2), 94-110.

Butters, C. (2015) *Enhancing Air Movement by Passive Means in Hot Climate Buildings*, ELITH Research Program, Energy and Low-income Tropical Housing, Warwick University, UK.

Chapman. T., and Hockey. J (2002) *Ideal Home? Social change and domestic life*. Routledge, Taylor & Francis Group. London and New York.

Daud, B. (2020). Tropical Sustainable Architecture: Passive Design Strategies in Green Building, *Journal Online Jaringan Pengajian Seni Bina*, 17. Politeknik.

Dehghanmongabadi, A. and Hoskara, O.S (2014) Introduction to Achieve Sustainable Neighbourhoods, *International Journal of Arts and Commerce, 3*(9).

Enterprise Community Partners, Inc (2014). *Impact of Affordable Housing Families and Communities: A review of the Evidence Base,* Knowledge, Impact and Strategies.

Hanse. H and Patnaikuni. I. (2014) Design of Sustainable House for Reducing Energy Use. *3rd World Conference on Applied Sciences, Engineering & Technology,* 27-29 September 2014, Kathmandu, Nepal

Ismail. M. and Rashid, F. A (2014). Malaysia's Existing Green Homes Compliance with LEED for Homes, *Procedia Environmental Sciences,* 20, 131-140.

Jaber, A., Abu Baker, L. & Csonka, B. (2022) The Influence of Public Transportation Stops on Bike-Sharing Destination Trips: Spatial Analysis of Budapest City, *Future Transportation*, 293, 688-697.

Kennedy-Cuomo, C. (2021) *The Case for Sustainable Urban Transportation for Malaysia, Jeffrey Sachs Centre on Sustainable Development*, Sunway University, Malaysia.

Khahro, S.H., Kumar, D., Siddiqui, F.H., Ali, T.H., Raza, M.S., & Khoso, A.R. (2021). Optimizing Energy Use, Cost and Carbon Emission through Building Information Modelling and a Sustainability Approach:

A Case-Study of a Hospital Building, *Sustainability, 13*(7), 3675, MDPI AG

Khan, S. J., Zakaria, R., Shamsudin, S. M., Abidin, N.I.A., Sahamir, S.R. Abbas, D.N. & Aminudin, E. (2019) Evolution to Energence of Green Buildings: A Review, *Administrative Science, 9*(1), 6, MDPI AG

Kuhlman, T., and Farrington, J. (2010) What is Sustainability? *Sustainability, 2*(11), 3436 – 3448.

Kumar, M. (2020) *Social, Economic, and Environmental Impacts of Renewable Energy Resources*, Wind Solar Hybrid Renewable Energy System, IntechOpen.89494.

Liu, T., Chen, L., Yang, M., Sandanayake, M., Miao, P., Shi, Y., & Yap, P.S. (2022) Sustainability Considerations of Green Building: A Detailed Overview on Current Advancement and Future Considerations. *Sustainability, 14*(21), 14393. MDPI AG.

Mallett. S, (2004) Understanding Home: A Critical Review of the Literature, T*he Sociological Review, 53*(1), Sage Journal.

Mang. J.S, Zainal. R. and Mat Radzuan. I.S. (2020) Factor Influencing Home Buyers' Purchase Decision in Klang Valley, Malaysia. *Malaysia Journal of Sustainable Environment, 7*(2), 77-90.

Mardani, A., Streimikiene, D.,Rostami, R.,Ismail, M., Mohamad Zin, R., Khoshnava, M. (2020). The Role of Green Building Materials in Reducing Environmental and Human Health Impacts. *International Journal of Environmental Research and Public Health,* 17, 2589, MDPI AG.

Masri, M.H.M., Nawawi, A.H. & Sipan, I. B (2016). Review of Building, Locational, and Neighborhood Qualities Affecting House Prices in Malaysia, *Procedia-Social and Behavioural Science*.

Md Lani, N. H., Yusof, Z. & Syafiuddin, A. (2018). A Review of Rainwater Harvesting in Malaysia: Prospects and Challenges. *Water, 10*(4), 506,

MDPI AG.

Opoku, R. A., & Abdul- Muhmin, A.G. (2010). Housing Preferences and Attribute Importance Among Low-Income Consumers in Saudi Arabia. *Habitat International.* 3492, 219-227.

Parhizgar, S. (2013). *Towards a Sustainable Neighbourhood: Turning the Vision into Reality*, Independent Thesis Advanced Level, Department of Earth Science, Uppsala University.

Patel. P. and Patel, A. (2021). Use of sustainable green materials in the construction of green buildings for sustainable development, *IOP Conference Series: Earth and Environmental Science,* 785, 012009

Pinthong J., Limsuwan, K., & Stitmannaithum, B. (2018) Green transportation system to promote a sustainable lifestyle in Chulalongkorn University, *E3S Web of Conferences,* 48, 07001.

Renterghem, T. V. (2018), *Green Roofs for Acoustic Insulation and Noise Reduction,* Chapter 3.8, Nature-Based Strategies for Urban and Building Sustainability, pp 167- 179.

Szaraz, L (2014) The impact of urban Green Spaces on Climate and Air Quality in Cities, *Geographical Locality Studies, 2*(1)326-354.

Wilson, C., Crane, L. & Chryssochoidis, G. (2015) Why do homeowners renovate energy efficiently? Contrasting perspectives and implications for policy, *Energy Research & Social Science*, 7, 12-22

Wong, S.Y., Wong, S.S., and Anak Palis, P., (2022). Preferred green home features by potential buyers in Sibu, Sarawak. *IOP Conference Series: Earth and Environmental Science*, 1067, 012019.

Zancanella, P., Bertoldi, P., and Boza-Kiss, B. (2018) *Energy efficiency, the value of buildings and the payment default risk*, JRC Science for Policy, European Commission, Italy.

Zoure, A.N. (2023) Implementing natural ventilation and daylighting strategies for thermal comfort and energy efficiency in office buildings

in Burkina Faso, *Energy Reports*, 9, 3319-3342

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