An Investigation into the Determinants of Sluggish Green Building Adoption in Ipoh, Perak, Malaysia

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DOI: https://doi.org/10.47772/IJRISS.2026.100400298

Received: 09 April 2026; Accepted: 14 April 2026; Published: 07 May 2026

ABSTRACT

Global concerns regarding energy conservation, climate change, and the depletion of non-renewable resources have catalysed a worldwide shift toward sustainable architecture. Despite the clear societal benefits, green building remains an uncommon practice in Malaysia due to unique market barriers prevalent in developing nations. This disparity is particularly pronounced in Ipoh; as the capital of Perak, Ipoh trails behind other Malaysian cities in Green Building Index (GBI) certifications, failing to set the necessary precedent for regional sustainable development. This study employs a qualitative methodology to investigate the factors hindering green building adoption in Ipoh. Primary data was gathered through interviews with experienced property managers and validated by two GBI-certified informants to ensure a correlation between academic literature and real-world conditions. The findings identify high material costs—driven by an insufficient local supply chain—and a shortage of specialized labour as primary "sluggishness" factors. Furthermore, the research compares theoretical demand drivers such as cost savings and prestige against practical field insights such as owner awareness and aesthetic structural design. The results confirm that the obstacles identified in the literature are deeply rooted in the practical reality of Ipoh's property sector. By bridging the gap between theory and practice, this study provides a framework for improving green building implementation, offering valuable insights for real estate stakeholders and supporting government efforts to mitigate the environmental impact of urban development.

Keywords: Green Building, Sustainable Development, Green Building Sluggish

INTRODUCTION

The global construction and property sectors are experiencing an unprecedented surge in demand, driven by the necessity to enhance human quality of life through modernized economic and social infrastructure. In Malaysia, this trend is evidenced by a robust pipeline of developments across residential, commercial, and industrial sectors. According to the National Property Information Centre (NAPIC, 2020), existing residential supply stood at 5.77 million units with nearly 1 million units in future supply, while commercial and industrial sectors showed similar upward trajectories. However, this expansion poses significant environmental risks. Despite the ecological necessity of green developments, market penetration remains inhibited by perceived high capital costs compared to conventional construction methods (Azis et al., 2023).

While urbanization is a prerequisite for modernization, the built environment remains a primary driver of resource depletion. Buildings currently account for approximately 70% of total electricity consumption and 30% to 40% of global energy usage (Pandey & Kumar, 2021). Furthermore, the construction sector is responsible for over 38% of global carbon dioxide emissions, contributing significantly to climate instability and the degradation of local biodiversity (Elias et al., 2021). Previous research indicates that a single conventional residential unit can emit between 10 to 30 tons of carbon annually, further exacerbating the frequency of abnormal weather events and natural disasters (Omar et al., 2022).

To mitigate these impacts, the Malaysian government has proactively championed environmental conservation through the National Green Technology Policy (NGTP) launched in 2009. This legislative foundation paved the way for a diverse ecosystem of Green Building Assessment Systems (GBAS), including the Green Building Index (GBI), GreenRE, and MyCREST. These frameworks are designed to establish standardized benchmarks for sustainability, encouraging integrated design, energy efficiency, and waste reduction (Zainul Abidin et al., 2022).

Despite these national initiatives, regional implementation—specifically within the state of Perak—remains inconsistent. While policies such as the Tenth and subsequent Malaysia Plans aimed to elevate public awareness and market readiness for green technology, actual adoption rates remain suboptimal. Most contemporary developments in Perak still fail to align with core green building principles (Myeda et al., 2021). While developers increasingly acknowledge the long-term economic benefits of sustainable materials—such as reduced waste and enhanced indoor environmental quality (IEQ)—the transition away from conventional structures continues to face systemic challenges, ranging from financial constraints to a lack of technical expertise in the local market (Fadzil et al., 2024).

PROBLEM STATEMENT

To mitigate the ecological degradation associated with rapid urbanization, the implementation of Green Building (GB) has emerged as a critical strategy for reconciling development with environmental preservation. GB frameworks facilitate a transition toward sustainable development by optimizing the consumption of finite resources—including water, land, and energy—while enhancing environmental safety (Zuo et al., 2021). As noted by early proponents of the movement, the broader objectives of sustainable development remain unattainable without the integration of sustainability principles into the residential, commercial, and industrial property sectors (Ahmad et al., 2023). Consequently, the primary goal of sustainable construction is to maintain an ecological balance that fosters social and economic success while safeguarding natural resources for future generations (Ghazali et al., 2022).

The Malaysian government formalized its commitment to this agenda through the National Green Technology Policy (2009) and the subsequent establishment of the Malaysia Green Building Council (MGBC). Central to this initiative is the Green Building Index (GBI), a rating tool designed to incentivize developers, architects, and engineers to adopt energy-efficient and environmentally responsible practices. While the GBI provides a robust framework for reducing the carbon footprint of the built environment, its adoption remains hindered by a lack of awareness among key stakeholders and a general disinclination among clients to bear the perceived premium costs of green features (Wong et al., 2021).

A critical disparity exists in the regional distribution of green-certified buildings in Malaysia. According to GBI statistics, while urban hubs such as Kuala Lumpur and Selangor recorded 211 and 187 certified projects respectively by 2021, the state of Perak remains notably inactive. Specifically, Perak saw a negligible increase from three certified projects in 2016 to only seven in 2021—representing a sluggish growth rate of only four projects over five years. This stagnation suggests that despite national-level momentum, regional implementation in Perak is severely underperforming. Given that Ipoh serves as the primary administrative and developmental capital of Perak, it is imperative to identify the systemic barriers preventing a more robust adoption of green features. Therefore, this research aims to investigate the factors contributing to the slow implementation of Green Building practices within Ipoh, Perak.

OBJECTIVES

This study synthesizes finding from the research

a) To determine the reason for sluggish implementation factors of Green Building development Ipoh, Perak.

b) To determine the factors of demand for green building development projects in Ipoh, Perak.

LITERATURE REVIEW

Determinants of Sluggish Green Building Adoption in Malaysia

The transition toward sustainable construction in Malaysia has been characterized as "sluggish" despite the introduction of the National Green Technology Policy and the Green Building Index (GBI) (Zakaria et al., 2024). While awareness of environmental degradation is moderate to high among construction stakeholders, the actual rate of implementation remains low compared to regional counterparts (Chong et al., 2026). Recent studies identify three primary categories of determinants for this slow uptake: financial constraints, technical/knowledge gaps, and policy-related barriers.

Economic factors remain the most significant deterrent. Research consistently highlights the high initial capital investment required for green materials and energy-efficient technologies as a primary barrier (Yeo, 2026). Contractors and developers often perceive green building as a "luxury" endeavour due to the high cost of specialized components, many of which are imported, leading to longer payback periods that discourage profit-driven stakeholders (Mahat et al., 2022). Furthermore, the lack of sufficient financial resources and the absence of aggressive, accessible green financing models further hinder small-to-medium enterprises (SMEs) in the construction sector from adopting these practices (Chong et al., 2026).

The "sluggishness" is also attributed to a persistent shortage of skilled professionals and specialized technical expertise. Even as of 2026, many project teams in Malaysia lack the necessary training in green procurement and sustainable design procedures (Yeo, 2026). This is compounded by a lack of public awareness and end-user support; without a strong market demand from homebuyers, developers are reluctant to bear the risks associated with green innovation (Zakaria et al., 2024). In regional hubs like Ipoh, the adoption is further slowed by a reliance on conventional construction methods and a "cut-and-paste" approach to design that ignores localized tropical sustainability requirements (Zakaria et al., 2024; Mahat et al., 2022).

The institutional frameworks have been criticized for being insufficient or bureaucratic. While policies exist, there is often a lack of coordination between local authorities and the federal government, leading to licensing delays and policy contradictions (Zakaria et al., 2024). Stakeholders have identified that the current incentive structures—such as tax breaks—are often not substantial enough to offset the perceived financial risks (Chong et al., 2026). The absence of mandatory green standards for all building types across all states means that adoption remains largely voluntary and concentrated in high-tier urban areas like the Klang Valley, leaving states like Perak behind (Yeo, 2026; Zakaria et al., 2024).

Economic barriers remain the primary catalyst for the sluggish adoption of green building technologies (GBT) in Malaysia. While green buildings are often associated with long-term operational savings—estimated at 14% to 19% due to reduced energy and water consumption—the initial capital premium remains a deterrent (Yeo, 2026). For developers in the Perak region, the incremental cost of achieving GBI or GreenRE certification typically ranges from 1% for Bronze to as high as 8% for Platinum ratings (Mahat et al., 2022; GreenRE, 2026).

Furthermore, the "payback period" paradox creates a disconnect between developers and end-users. Developers often bear the upfront "green cost," while the financial benefits of lower utility bills accrue to the tenants or buyers. Without robust secondary market premiums or higher resale values in secondary cities like Ipoh, developers struggle to justify these costs to shareholders (Zakaria et al., 2024). Although green financing and low-interest "green loans" have grown by 25% nationally in the past year, their penetration in the Perak property market remains limited compared to the Klang Valley or Johor (Chong et al., 2026).

Regional Challenges: The Ipoh Context

In Ipoh, the sluggish implementation is exacerbated by localized market dynamics and a lack of aggressive sub-national incentives. While the Perak Sejahtera 2030 roadmap outlines a vision for sustainable development through the "Doughnut Economics" model, practical execution at the municipal level faces hurdles (Perak State Legislative Assembly, 2026). Key regional factors include:

Supply-Demand Mismatch: There is a notable "wait-and-see" approach among Ipoh developers. While industrial sectors (such as the redevelopment of the Wah Seng Warehouse) are starting to embrace green specs to attract multinational tenants, the residential sector lags due to a perceived lack of "green demand" from the local population (MGTPC, 2026).

Technical Migration: Much of the specialized expertise required for green certification—such as GBI facilitators and energy auditors—is concentrated in Kuala Lumpur. This leads to higher consultancy fees for projects in Ipoh, further inflating the "sluggishness" of local adoption (Zakaria et al., 2024).

Incentive Gaps: Unlike local councils in Selangor or Penang, which offer density bonuses or assessment rebates for certified green buildings, Ipoh's local government framework has yet to implement comparable, high-impact financial triggers to offset the initial investment (Chong et al., 2026)

Stakeholder Perspectives on Green Adoption in Ipoh

For contractors in Perak, the transition from conventional to green construction is fraught with operational risks. Recent studies indicate that Grade 7 (G7) contractors—the largest category in Malaysia—demonstrate "moderate awareness" but face significant compliance costs and a lack of specialized training (Chong et al., 2026). In Ipoh, many contractors rely on traditional supply chains; switching to green-certified materials often requires sourcing from the Klang Valley, which adds logistical costs and delays.

Furthermore, the "learning curve" for green technology—such as integrating Building Information Modeling (BIM) or advanced HVAC systems—is steep. Without local capacity-building programs, Ipoh-based firms often view green projects as high-risk ventures that might lead to "unproductive implementation" due to potential technical errors and extended project timelines (Zakaria et al., 2024).

On the demand side, there is a notable paradox in the Ipoh market. While potential homebuyers in Perak are generally aware of the "green home" concept and its potential to improve quality of life, their understanding is often limited to environmental benefits (e.g., more plants or solar panels) rather than long-term socio-economic gains like improved indoor air quality or high resale value (Zaini, A. A., Yaakub, Z. A., Tang, A. J. S., Hisham, N. K. K., & Aziz, N. N. A. (2025).

This "moderate to low" depth of comprehension means that while the public supports the idea of sustainability, they are often unwilling to pay the green premium—the additional cost associated with eco-friendly features. Consequently, developers in Ipoh are hesitant to supply green units because they perceive a lack of genuine "willingness to pay" from the local community, creating a stalemate that keeps implementation sluggish (Chong et al., 2026; Mahat et al., 2022).

While the Ipoh City Council (MBI) has launched ambitious initiatives like the "Ipoh Low Carbon City and Walkable City 2030," the actual translation into building incentives for private developers has been slow (Perak State Government, 2022). As of early 2026, the focus has remained largely on public infrastructure—such as pedestrianizing heritage lanes and installing solar panels on government buildings—rather than providing the tax rebates or density bonuses necessary to stimulate the private green residential market (Perak Sejahtera, 2026; The Star, 2026). Based on the findings from the literature review and the stakeholder challenges identified, the following policy recommendations are designed to bridge the gap between Ipoh's current "sluggish" state and its 2030 Low Carbon City aspirations.

The Role and Impact of Green Building Implementation

The conceptualization of green buildings centres on structures designed to minimize environmental degradation compared to conventional construction. According to Lop et al. (2016), these buildings emphasize resource efficiency—specifically regarding water, energy, and materials—while simultaneously mitigating adverse effects on human health and the natural habitat throughout the building's lifecycle. This aligns with the Green Building Index (2024), which defines green buildings as high-performance, sustainable structures designed for

long-term viability. By integrating eco-centric design and operational features, these developments significantly reduce the ecological footprint of the built environment.

Environmental Consequences of Urbanization

Rapid urbanization and large-scale developments often result in severe ecological disruptions, including habitat destruction, increased air pollution, water wastage, and the general degradation of ecosystems (Kai et al., 2013; Nazirah et al., 2012). Furthermore, Elias and Lin (2015) argue that immoderate development triggers systemic shifts in societal, economic, and natural landscapes. To counteract these negative externalities, the implementation of green building standards is posited as a primary strategy for fostering sustainable living and protecting public health (Addae-Dapaah et al., 2009).

Challenges in the Malaysian Context

Despite the early establishment of green policies in Malaysia, the adoption of green assessment practices remains relatively low due to systemic barriers (Ezanee & Chong, 2015). A primary challenge is the lack of awareness among key construction stakeholders, including clients, consultants, and contractors (Abidin, 2009). Consequently, it is imperative for all industry participants to prioritize sustainable practices to ensure national development does not come at the expense of natural resource preservation.

Green Demand Factors

Quest for cost savings

Good life cycle assessment, integrated building design, effective commissioning, operation and maintenance complement to guarantee continuous cost savings (Aliagha, et al; 2013). In Bertand (2010) research, he studied on green building construction ‘s benefit and found out the real estate developers can productively less their cost and risk in obtaining green building authorization. Similarly, Kats et al (2003) stated that California Stated owned Education Headquarters Building which was LEED Gold certified was saving the taxpayers $500,000 a year in energy cost alone.

Quest for higher building value

Study that carried by Halim (2012), stated that green office building usual higher rental rates in Malaysia which is around RM 0.50-RM 2.25 per square feet while operating cost saving around RM 0.164 per square feet. If we look further at Australia and United States studies had found that implementation green building able to help landlord obtain higher values, high rental rates and higher occupancy rates compare to non-green building (Chong, 2010).

Quest for high quality internal building environment

In China, occupant or owner of the green building are more satisfied with temperature comfort and air ventilation quality in their workspace (Gou et al; 2013). On other studies conducted by Syazwan et al (2009), they stated that there will be potential reduction in the sick building syndrome (SBS) when ventilation costs per individual among normal workplace structures increases. In addition, green residences use low volatile natural compound paint with reduction in fitness related troubles and this offers higher indoor air pleasant compare to the traditional residences

Quest for environmental sustainability

As building sustainability gathers momentum in conjunction with developing environmental awareness and recognition there are signs and symptoms that Malaysian workplace workers, tenants and prospective new home buyers are creating pro-environmental beliefs that may additionally be attributed to altruistic or non-public moral norms and values. Some may additionally be buying green building not solely because it saves power and money, but because of their altruistic faith that climate exchange and its consequences on man and the surroundings are real and they can act to reduce these effects. If altruistic norms and non-public ethical norms permeate deep into

Malaysia green consumerism, sustainability will be front and centre problems no longer only for these looking for new housing or office space but additionally for these renovating and retrofitting their building. Invariably this well make bigger demand for green building.

Quest for Branding and Prestige

Aliagha et al, (2013 sited in Kato et al, 2009) mentioned that building managers are glad for being Green Star-rated office constructing which gave them an aggressive advantage as a sustainable leader in the industry. Result on that, it provides a lease premium, lower emptiness allowance, reducing threat and slower depreciation are all in favour of a price top class for green structures. At the same time, an estimation of increasing demand or request for green building become reality since operating cost of for green property was lower than others. In addition, the impact of green features on property market would be available positively in next five to ten years (Kuiken, 2009). Therefore, all these attributes have effective influence on the company brand and on the image of the building owner which include the tenant of green buildings

Factors That Affecting Sluggish Green Building Implementation at Ipoh, Perak

Lack of awareness

The request for sustainability is identified as “always there” however the implementation is very negative because there is a lack of recognition amongst client, consultants and contractors (Ofori, 2000). Landman argues that lack of public awareness is barrier of inexperienced constructing application. Even though the cognizance of sustainable improvement has been aroused, yet the training for the exercise is nevertheless deficient. The higher phase of the companions frequently disregards the significance of the green concept to be linked into improvement and henceforth it is every day that these ideas will be adverse regularly. As mentioned by (Landman, 1999), without fitting instruction, the hobby for maintainable enhancement will now not be getting.

Another barrier of enforcing sustainable development is the absence of know-how and knowledge (William and Dair, 2007). The best components of events in development do not have any information in sustainable

constructing design. Moreover, the shortage of experts collectively with tradesman with suited qualification, experiences and competencies in this place can be viewed as different motives behind implementing sustainable development.

Insufficient supply of green product or manufacture

There is announcing about the provider of green constructing product is no longer as handy to attain compared to the traditional building substances due to the fact it has now not been extensively promoted in the country. In most of the country whereby the traits of inexperienced structures are nonetheless in initial stage, most of the green technologies and green product have but to form a mature system for the consumer (Landman, 1999).

Sustainable improvement in housing is lacked of sustainable materials, approach and technologies (Shafii et al., 2006). In spite of the reality that the authorities advance sustainable housing improvement in Malaysia, but a portion of the sustainable substances and the technology utilized as a phase of a sustainable residence cannot be received in Malaysia. Case in point, technology used to accumulate low-stream water shape and gray water reusing shape is all obtained from overseas (Alias et al., 2010). These sustainable substances are anticipated to be foreign from far flung nations. This can necessarily construct the price of a sustainable residence if distinction and traditional house.

Confidence of Sustainable Options

The reliability of the inexperienced constructing product is but to be observed. For the green approaches such as the utilization of renewable energy, it is stated to be fluctuating performance due to the fact it has to remember on the seasonal fluctuations and weather, which is past the human’s manipulate (Jaafar et al., 2003). Aside from that, there is nevertheless the requirement for folks to exchange their ways of life and acknowledgement to matters that are more environmental-friendly. The altering of mind-set to be eco-cognizant must be ceaseless.

There have to be a purposeful exertion for human beings to gather and to society earlier than we can have a full "green" cycle.

Lack of technical understanding

Due to the inexperienced utilized sciences that being delivered are always something innovative, it will motive the lack of understanding of the personnel in the constructions concerning the technical specifications and operation of the technologies. Undoubtedly, it would make a contribution a greater hazard that error and lengthen will appear for the length of the building system due to unfamiliarity of the intelligence possessed (Zhang et al., 2011).

The big majority of the players in the development enterprise has no mastery in Sustainable development outline. Also, some other motive is the shortage of experts and tradesman with the becoming skills, credentials and experience in this sector. Another barrier of executing sustainable development in housing is scarcity of sustainable materials, technique and procedures (Shafii et al., 2006).

Perception of Higher Cost

It is frequent that there is usually the appreciation that the cost required for green building options are usually greater than the conventional constructing method. This is due to the fee of a building is often measured in terms of the construction value instead of the lifestyles cycle cost. It has been stated that the value efficient will eventually benefit the owner, however not the developer. Generally, the developer will continually emphasize of the instantaneous payback instead than the return in a lengthy run. The additional fee can be incurred from many aspects, it can be the greater buy cost, the mastering curve cost, employing knowledgeable labour and the distinct plan work programme for the assignment (Zhang et al., 2011).

Sustainability is nevertheless a typically new thought in most developing nations, along with Malaysia. The majority of the enterprise partners, for example, contractors, builders and architects do now not recognise the profits of sustainable development; accordingly, the using of its usage in the constructing industry is therefore restricted. Shortage of know-how and mastery is consequently an alternate obstacle to actualize sustainable enhancement (William and Dair, 2007).

In conclusion, the literature indicates that green building implementation in Malaysia has evolved from a nascent policy-driven initiative into a sophisticated discourse cantered on operational performance, technological integration, and long-term economic resilience. While the national strategic framework has expanded significantly through the maturation of green technology master plans, the transition from policy to widespread practice remains inconsistent across the built environment.

The current landscape reveals a significant paradox: while the total volume of green-certified square footage has grown, these achievements remain highly centralized in major metropolitan hubs, leaving a vast majority of the national building stock under conventional, less efficient standards. This uneven distribution is primarily sustained by persistent economic deterrents, notably the high initial capital expenditure and extended payback periods that continue to discourage private sector developers. Furthermore, the industry faces a critical knowledge deficit; although high-level awareness exists, there is a distinct shortage of specialized technical expertise required for complex retrofitting and the management of advanced sustainable systems.

Despite these challenges, the drivers for adoption are shifting toward a holistic value proposition. Modern sustainability efforts are increasingly motivated by organizational readiness, where the focus has expanded beyond simple compliance to include enhanced facility management, superior occupant health, and substantial resource efficiency. Evidence suggests that the integration of passive design and renewable energy systems provides measurable reductions in utility consumption, while green retrofitting is emerging as a vital strategy for asset appreciation. Ultimately, for Malaysia to achieve its sustainability targets, the industry must bridge the gap between urban centers and regional states, moving beyond voluntary participation toward a more integrated, technically proficient, and economically transparent green building ecosystem.

METHODOLOGY

The methodologies to be employed in conducting to achieve a higher perception of the study's issue. Qualitative approach will and interviews be used for this find out about to get the individuals perceptions; behaviour related to this issue. Targeted informants will be the real property administration which is property manager and human resource department analyst that have the knowledge and experience involving the issue.

This study utilized semi-structured interviews to identify the factors contributing to the sluggish implementation of green building in Ipoh, Perak. The qualitative data were processed and interpreted using content analysis to determine the primary impediments to sustainable development and the significance of each interview question. Furthermore, NVivo software was employed to facilitate the systematic coding and analysis of the interview transcripts. The primary data was collected through semi-structured interviews with property managers and human resources departments from various property development organizations in Ipoh. This format was selected to ensure a consistent line of inquiry based on the research objectives while allowing the flexibility to explore emerging ideas and detailed responses. The study involved a total of ten professionals experienced in managing property development and green buildings in Ipoh. Following the sessions, all audio recordings were transcribed and subjected to rigorous analysis.

The study area for this research namely Ipoh in Kinta District. Ipoh was known as capital state of Perak since all affairs was meeting and referred at there. Ipoh also be the centre of problem solving in different sector. Compare with other district or city in Perak, Ipoh city was more progressive and advance compare with others in term of population, job opportunities, building development, accommodation, got potential in economic sector and many more. Result on that, property development in Ipoh rapidly develops due to provide demand toward the existence of population at there. In addition, Ipoh be the one urban that develop green building compare to other cities in Perak.

The semi-structured interviews with the professional respondents asking ten questions to Synthesis of Green Building Implementation in Ipoh, Perak covering the objectives of this study such as the transition toward sustainable urbanism in Ipoh begins with a foundational understanding of the green building concept, emphasizing resource efficiency and reduced environmental impact throughout a structure's life cycle. As the capital of Perak, Ipoh’s involvement in green development is pivotal to the state’s Perak Sejahtera 2030 goals; however, the progress remains characterized as sluggish. Seeking their opinion on how this slow momentum is largely attributed to several common issues, including high initial capital expenditures, a lack of local technical expertise, and a "cut and paste" design mentality that fails to account for local tropical conditions.

From a market perspective, the researcher seeking their opinion on the green demand factors—such as rising ESG (Environmental, Social, and Governance) awareness among investors and long-term operational savings—provide some encouragement, yet the satisfaction with the current level of involvement remains tempered by the imbalance between demand and supply. While there is an emerging interest in sustainable housing and industrial facilities, the supply of certified projects is not yet robust enough to match the pace seen in other states. Ultimately, the unproductive implementation in Ipoh, when compared to more advanced hubs like Kuala Lumpur or Penang, can be traced back to a lack of aggressive local incentives, lower public awareness, and a persistent perception among developers that green technology is a luxury rather than a necessity.

Background Information of Respondent

All the respondent were coded as R1 to R10 (ten respondents), The example identities and relevant data for the two respondents are provided hereafter.

(R1) Property Manager)

The first informants is a property manager. She was graduated in year 2004, Bachelor in Property Management at University of Technology Malaysia (UTM). She has worked in property manager sector for over 16 years with different companies. She began her career at Kuala Lumpur with different companies such as JL Facilities Management, Ong Maju Property Management Sdn. Bhd, RPH Global Property Management Sdn. Bhd, Knight

Frank Malaysia and others. Finally, she planned to move in Ipoh due it was her hometown and decide to find new company that manage property at Ipoh. For now, she worked as Property manager at 3S Centre by Ban Hoe Seng (Auto) Sdn Bhd that manage Malaysia's first green Honda Showroom.

(R2) Property Manager)

She also a property manager. Noor Azura began her study at University of Technology Mara (UiTM), where she earned a Diploma in Estate Management and proceed a Bachelor's Degree in Property Management at University of Technology Malaysia (UTM). After graduating, she worked for 4 years at IM Global Property Consultants Sdn Bhd managing various property at Kuala Lumpur especially high-rise building (mix development) and decide to move in Ipoh after married. She started worked with Haven All Suite Resort Ipoh started on 2015 until now. She responsible on managing residential and resort together in term of management and maintenance.

Semi-structured interview question

Part 1: Informants' profile

Question 1: Tell me about yourself. What would like us to know about you?

Question 2: Can you tell me about your education background?

Question 3: Can you tell me about your years of professional experience in this real estate field?

Part 2: Factors That Affecting Sluggish Green Building Implementation at Ipoh, Perak.

Question 1: From your point of view, can you tell me about green building concept?

Question 2: How about the green building development involvement in Ipoh, Perak as capital of state?

Question 3: What are the common issues arising towards the development of green building at Ipoh, Perak?

Question 4: From your point of view, what are green demand factor that encourage green building development built at Ipoh, Perak?

Question 5: At which level your satisfaction of green building involvement at Ipoh, Perak?

Question 6: What do you think about the demand and supply side in the area?

Question 7: From your observation, can you list out several factors that contribute toward unproductive green building implementation at Ipoh, Perak compare to other states in our country?

Part 3: Conclusion and Recommendation (solution)

The interview provides the relevant information the case study. The question was analysed in order to make data collecting cleaner and more straightforward. The method includes removing the idea from the respondent and categorising it, after which the researcher will draw conclusions from the notion.

RESULTS

This is the statement from respondents' opinion;

"I think green building or green features was a revolution of building industries that receive concern on environmental matter in effort to reduce pollution in this world. A lot of urbanization across the world will produce pollution from as the advancement of the industries increase. There are a lot of definition of its but the purpose always same at the end of result."

"According to what I understand, a green construction concept is the use of ecologically responsible methods and the pragmatic conviction that certain people can transform the environment from the existing state of global pollution."

"Based on my understanding, green development at Ipoh was at low level compare to other city from develop state such Selangor and Wilayah Persekutuan. I guess Perak especially Ipoh will remain the same in few 5-10 years ahead."

"There are not enough awareness and investment in developing green building project however the current green development project in Ipoh is well maintain and preserved due to having a great maintenance management team. This is what we do at our premises to ensure this green building award will sustain in future and act as example toward others."

"Mostly, the property that have green features have a higher price compared to non-green development projects. For me, at this difference of value between green building and normal property will result in prospective property buyer to choose the least-pricier of property."

"Based on my observation, there is lack of public awareness and knowledge about green building concept especially in Ipoh, Perak and exist of low demand on market due to target market not viable for low-income household."

"From my observation and several knowledge about green demand, awareness from company owners and contractor towards safety of surrounding environmental from being a part of cause pollution at Ipoh, Perak. I would recommend this demand factor be the most encouragement factor compare to other but it's not simple as said."

"Okay then, I give three advantages of Green Building which are provide high quality air ventilation, sustainable living choice and provide aesthetic structural design."

"From my justification, green involvement at Ipoh, Perak very not satisfied level due to Ipoh region still generated a small volume of green building."

"At this moment, I don't think everyone satisfied with green building involvement at Ipoh, Perak. This because there is no change in the volume of certified green building at Ipoh, Perak."

"Based on my observation, I see that demand and supply of green features very low due to not enough exposure about green building construction at Ipoh."

"I got two opinion which are low supply because there is no currently available of affordable housing scheme under government initiative such as Greens Residency that targeted middle income household. Besides that, I can said whereby exist of low demand because the profitability of green project does not meet the baseline cashflow for developer in Ipoh, Perak."

"I will list out three based on my ranked, the first one is high cost of green building material, second one is not enough specialized labour in constructing and handling green building project and lastly unavailability material for green building construction due to some of material not produced locally."

"Okay then, the first one is low transaction volume because the marketability of green building project targets a small population that is conscious of their environment, second one is perception of old lifestyle that preferred affordable housing and last one investor afraid to invest in green property due to low margin of return in future."

"From my opinion, I got two main recommendations which are exist developer and construction industries at Ipoh region need to adapt to new construction of green building and change philosophy of green development project. Next is a need to have green development initiative by the government aggressively."

"I think government should do something effective approach like Ministry of Housing and Local Authorities held an awareness campaign to boost knowledge toward public perception on how important green project to environment."

Through the interpretation from the data analysis, the researcher identified the core concepts of green building held by industry professionals. The consensus among respondents is that sustainable construction offers substantial environmental benefits and serves as a key tool in reducing pollution. The analysis reveals that green building involvement in Ipoh remains limited. Respondents highlighted a significant lack of awareness as a primary barrier to progress. However, it was noted that existing green buildings in the city are well-maintained and effectively preserved.

The analysis identifies several critical issues specific to the Ipoh region. Interviewees noted that green residential units carry a price premium due to higher construction costs, leading potential buyers to favour conventional projects to minimize loan commitments. This behaviour aligns with standard consumer preferences for lower-cost options. Furthermore, a lack of public awareness contributes to the rejection of sustainable housing. Socioeconomic factors also play a significant role; approximately 80% of Ipoh's population falls into the low-to-medium income bracket, which sits outside the target market for premium green homes. Consequently, demand for green residential property remains stagnant.

This analysis examines the demand drivers for existing green buildings in Ipoh, Perak. The participants provided varying justifications based on their specific case study experiences. One primary driver identified was the environmental consciousness of owners and contractors regarding site safety and ecological impact; however, the study notes that this is not universal, as some developers prioritize profit margins over pollution mitigation. Conversely, other findings suggest that demand is driven by the intrinsic benefits of green properties, such as superior ventilation, aesthetic appeal for commercial use, and the promotion of sustainable urban lifestyles. These value-added features serve as a catalyst to encourage other industry stakeholders to adopt sustainable development practices.

Based on this analysis, the researcher concludes that the adoption of green building practices in Ipoh, Perak, remains significantly low. Both interviewees expressed dissatisfaction with the current status quo, emphasizing that rigorous intervention and strategic efforts are required to address these challenges before the situation deteriorates.

This analysis examines both the demand and supply dynamics within the Ipoh property market. Most interviewees concurred that green building activity remains minimal due to several critical factors. Respondents attributed this stagnation to a lack of exposure regarding green construction, noting that many contractors and developers remain indifferent toward sustainable practices. Other respondents, however, highlighted supply-side deficiencies, specifically the absence of government-led affordable green housing schemes. Furthermore, the analysis indicates that the profit margins associated with green projects often fail to meet the expectations of conventional developers, further suppressing market demand.

Through this data analysis, the researcher identifies several factors contributing to the stagnant implementation of green building in Ipoh, Perak. The interviewees each provided three logical indicators of this sluggish development. Primary barriers include the high cost of sustainable materials, a shortage of specialized labour capable of managing green projects, and the limited availability of components that are not manufactured locally. Furthermore, the second respondent noted low transaction volumes, attributing this to a niche market of environmentally conscious buyers, a traditional preference for conventional affordable housing, and investor hesitation due to perceived low margins of return. These factors provide a rational reflection of the current market realities in Ipoh."

In this analysis, respondents provide several recommendations for relevant authorities and stakeholders to stimulate green building development in Ipoh, Perak. These suggestions serve as a strategic foundation for improving future implementation. Respondents urge developers and contractors to evolve their corporate philosophies by adopting modern sustainable construction methodologies. Furthermore, they emphasize the need for the government to provide comprehensive green initiatives specifically tailored to the construction industry.

They also suggest that the Ministry of Housing and Local Government (KPKT) should proactively launch awareness campaigns during property exhibitions to educate the public on the environmental health benefits of sustainable living in the modern era.

DISCUSSIONS

This study had found two objectives from interview session. Below are the outputs from the research objective that the researcher had achieved for this study which are to determine the reason for sluggish implementation factors of Green Building development Ipoh, Perak and to determine the factors of demand for green building development projects in Ipoh, Perak.

To achieve the first research objective, which seeks to identify the causes behind the sluggish implementation of green building projects in Ipoh, Perak, the researcher developed a structured interview framework based on factors identified in existing literature. The results of the interviews with property managers revealed a strong alignment between theoretical barriers and the practical challenges present in Ipoh. Specifically, both the literature and the respondents identified high material costs as a primary obstacle; the literature attributes this to an insufficient local supply chain, which forces a reliance on expensive imports. Similarly, a consensus was reached regarding the labor market, where a lack of specialized workers capable of handling green construction mirrors the technical knowledge gaps highlighted in academic studies. While some additional factors mentioned in the interviews did not directly link to the literature, they were nonetheless identified as significant contributors to the slow progress of sustainable development in the region.

To address the second research objective—determining the demand factors for green building projects in Ipoh, Perak—the researcher developed interview questions based on established literature. The findings reveal that while the local context in Ipoh shares similarities with global trends, there are distinct nuances in how demand is perceived. According to the literature, green demand is driven by five primary motivations: cost savings, increased property value, superior indoor environmental quality, environmental sustainability, and branding or prestige. In contrast, local property managers identified practical drivers such as contractor and owner awareness regarding environmental safety, high-quality air ventilation, and the use of aesthetic structural designs for commercial appeal. While the two data sources only partially overlap, the researcher concluded that the theoretical factors identified in the literature are not merely abstract concepts but are corroborated by the real-world conditions currently shaping the Ipoh property market.

Based on this finding, the following recommendations are proposed for the Perak state government and Ipoh City Council:

1) Establish a Green Building Technical Training Centre at local institution or polytechnic to address the shortage of specialized labour.

2) Create centralize green materials distribution hub in Ipoh to reduce reliance on imports from Klang Valley and lower material costs.

3) Introduce density bonuses or assessment rebates for certified green buildings, similar to incentives already available in Selangor and Penang.

4) Launch public awareness campaigns during property exhibitions to educate potential homebuyers on the long-term social-economic benefits of green homes.

5) Mandate green building standards for all new government buildings and publicly-funded housing projects to demonstrate leadership and built market confidence, and

6) Develop a green financing facility targeted specifically at small-to-medium enterprises SMEs in construction sector, with reduced interest rates for certified green projects.

These recommendations provide actionable insights tailored for policy development and professional practice.

RECOMMENDATIONS FOR FUTURE RESEARCH

Based on this study that provide a general knowledge of reason for sluggish implementation factors of Green Building development and the factors of demand for green building development project that give benefit toward green construction technology in future. These two objectives in this research will help other researcher to explore more regarding on green building issue on other states that got similar problem which is that state in Malaysia produce small volume of green building. On others hand, this research will help those researchers who want to establish a conceptual framework of green building implementation in Ipoh, Perak and Malaysia due to in this study provide barrier of implementation of green building and green demand factor. From that, those researchers able to create sustainable green project and succeed in their plan due to already know what the barrier that can be settle down and what green demand factor will encourage it involvement in new type of development and construction industries in Malaysia.

CONCLUSION

This research successfully identifies the critical factors contributing to the slow adoption of green building practices in Ipoh, Perak, while simultaneously highlighting the specific drivers of demand within the local market. The findings reveal a significant synergy between academic literature and real-world application; specifically, the high cost of implementation is directly linked to a localized shortage of green materials, and the lack of technical expertise among the workforce remains a primary barrier. Furthermore, the study identifies that while global demand is often driven by branding and prestige, the demand in Ipoh is uniquely characterized by a focus on aesthetic design, safety, and high-quality air ventilation. Ultimately, these results confirm that the "sluggish" implementation in Ipoh is not merely a theoretical issue but a practical consequence of resource and knowledge gaps. By addressing these barriers and leveraging local demand factors, stakeholders in the Malaysian real estate industry can develop more effective frameworks to promote sustainable development, ensuring that Ipoh evolves into a leading example of environmental preservation through innovative construction practices.

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