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**SUSTAINABLE BUILT  
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ENVIRONMENT**

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# THE CHALLENGES OF IMPLEMENTING THE GREEN BUILDING CONCEPT AMONG CONSTRUCTION INDUSTRY PLAYERS IN THE EAST COAST REGION

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## ABSTRACT

*The green building maximises resource efficiency, minimises environmental damage, and enhances human health. Despite the advantages, green building concepts must be implemented amid financial restrictions in Malaysia's construction industry. This research aimed to identify the challenges of implementing the green building concept among construction industry players in the East Coast Region. This research focuses on the East Coast Region because few green buildings are being constructed there, and greater awareness is needed from the general public and those involved in the construction of green buildings to make implementing this concept grow more rapidly. The research methodology used to gather the data is a structured interview conducted among the construction players involved in the green building project in the East Coast Region. The data gathered will be analysed using a qualitative data analysis tool, ATLAS.ti. The findings show several challenges to implementing the green building concept, such as financial constraints, a lack of awareness and a shortage of specialists. The findings may help achieve one of the 17 Sustainable Development Goals and the 12<sup>th</sup> Malaysia Plan.*

**Keywords:** *Green building, Green building concept, Challenges, Green Building Index, Sustainable Development Goals (SDG)*

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## INTRODUCTION

The idea of green building construction has evolved to maintain balance for the ecosystem and save the environment. One of the ways to realise this matter is by implementing the green building concept in our country. The green building concept is a concept where the main focus is to conserve energy, help balance the ecosystem and improve the quality of our lives. Green Building is a concept where it focuses on maximising the efficiency of resources like water, energy, and materials (Yee Sin et al., 2021). Implementing this concept can help us achieve one of the 17 Sustainable Development Goals (SDG), the 9<sup>th</sup> goal, Industry, Innovation and Infrastructure. Green construction is not just for the present but also for the future generation and they must be made durable and adaptive in the face of the shifting climate worldwide (World Green Building Council, 2022). Besides that, this study can also be related to the policies that have been implemented in the 12<sup>th</sup> Malaysia Plan and the National Green Technology Policy (NGTP), which is advancing towards green growth for sustainability and resilience and to boost the national economy and advance sustainable development by implementing green technology.

Even though it is easy to say that implementing the green building concept in our lives can help reduce the environmental impact, this concept was considered hard to implement, as it might be related to a lack of knowledge, skills, materials, etc. However, all that has changed; as stated by Yudelson, J. (2007), the United States is the first country that led the green building evolution and how it has spread throughout the world. This is the turning point where people acknowledge the concept and realize the benefits of implementing this concept in our lives.

Nonetheless, even with the current development of the construction industry in Malaysia nowadays, implementing green buildings still takes much work to implement due to many issues arising in implementing this concept. According to Fateh et al. (2021), a study shows that financial problems in the construction sector continue to this day. This is supported by Abidin (2010), where the financial problem was revealed as the main reason that hindered the application of green building construction. Furthermore, according to a study by Nordin et al. (2017), the degree of awareness and comprehension of green buildings among construction players and the general public is moderate to low.

This is because only a few green buildings are being implemented on the East Coast, and there needs to be more awareness from both the public and construction players to increase the development of green buildings. Besides that, according to the executive summary of the Green Building Index (2022), as of 30 September 2022, Pahang has 11 registered green buildings, whereas Kelantan and Terengganu each have 2. While Pahang has 4 number of rated green buildings, Kelantan and Terengganu only have 1 in each state.

This shows us that the number of green buildings is still lacking in the East Coast Region, and because of that, the implementation of the green building concept is a must to help conserve the environment and help preserve the ecosystem balance. Therefore, this research focuses on identifying the challenges of implementing the

green building concept among construction industry players in the East Coast Region.

## LITERATURE REVIEW

Implementing the green building concept is one way to reduce resource or material waste and any negative effects on the environment, human health, and safety during construction. Green buildings are difficult to define because they can be recognised in many ways (Zhang et al., 2019). In addition, Ayarkwa et al. (2022) emphasised that the project management team should concentrate on activities that are significantly different from their typical practices during sustainable building, such as technology and other standard procedures like managing stakeholders and organisational structure. The definition of a "green" or "sustainable" building has undergone several attempts in Malaysia, but they have all been founded on the same objectives that have an impact on the environment, resource and energy use, human impact, financial impact, and global impact (Esa et al., 2011).

**Table 1: Literature Review Matrix**

|  |   |                                 |                            |                          |                           |                          |                  |                  |                         |  |                                       |                             |                              |                           |                           |
|--|---|---------------------------------|----------------------------|--------------------------|---------------------------|--------------------------|------------------|------------------|-------------------------|--|---------------------------------------|-----------------------------|------------------------------|---------------------------|---------------------------|
| <p><b>The Challenges in Implementing the Green Building Concept Among Construction Industry Players in the East Coast Region</b></p> | <p>Lack of demand and information from stakeholders/manager</p> | <p>Lack of public awareness</p> | <p>Lack of information</p> | <p>Lack of knowledge</p> | <p>Lack of experience</p> | <p>Lack of resources</p> | <p>High cost</p> | <p>High risk</p> | <p>High uncertainty</p> | <p>Lack of performance information</p> | <p>Lack of communication and data</p> | <p>Lack of coordination</p> | <p>Lack of collaboration</p> | <p>Lack of leadership</p> | <p>Building ownership</p> |
|--|---|---------------------------------|----------------------------|--------------------------|---------------------------|--------------------------|------------------|------------------|-------------------------|--|---------------------------------------|-----------------------------|------------------------------|---------------------------|---------------------------|

|                                | k | d |   | r | w |   |   |   |   | t |   |   |   |   |   |
|--------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|                                | e | i |   | s | l |   |   |   |   | a |   |   |   |   |   |
|                                | t | n |   |   | e |   |   |   |   | b |   |   |   |   |   |
|                                |   | g |   |   | d |   |   |   |   | a |   |   |   |   |   |
|                                |   |   |   |   | e |   |   |   |   | s |   |   |   |   |   |
|                                |   |   |   |   |   |   |   |   |   | e |   |   |   |   |   |
| Kalyana et al. (2022)          | / |   |   |   |   |   | / | / |   | / | / |   |   |   |   |
| Ayarkwa et al. (2022)          |   | / | / | / | / | / | / | / | / | / | / | / |   |   |   |
| Tran & Huang (2021)            |   | / | / | / | / | / | / | / | / | / | / | / |   |   |   |
| Ong et al. (2021)              | / | / | / | / | / | / | / | / | / | / | / | / | / |   | / |
| Masia et al. (2020)            |   | / | / | / | / | / | / | / | / | / | / | / | / |   |   |
| Onubi et al. (2020)            |   |   |   |   | / |   |   |   |   |   |   | / |   |   |   |
| Yee et al. (2020)              | / | / | / | / | / | / | / | / | / | / |   |   |   |   |   |
| Ha et al. (2020)               | / | / | / | / | / | / | / | / | / | / | / | / | / |   |   |
| Ahmed et al. (2020)            | / | / | / | / | / | / | / | / | / |   | / | / |   |   |   |
| Zhang et al. (2019)            | / |   | / | / |   |   |   | / |   | / | / | / |   | / |   |
| Hoxha & Shala (2019)           | / |   |   | / | / | / | / | / | / | / |   |   |   |   | / |
| Nur et al. (2019)              |   | / | / |   |   | / | / |   |   | / | / |   |   |   |   |
| OLA et al. (2018)              | / | / |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Saleh & A.A. Faieza (2018)     |   | / |   | / | / | / | / |   |   | / |   |   |   |   |   |
| Balaban & Puppim (2017)        | / | / | / | / |   |   | / |   | / |   | / |   | / |   | / |
| Rumaizah et al (2017)          | / | / | / | / | / | / | / | / |   |   |   |   |   |   |   |
| Ling (2016)                    | / | / | / | / | / | / | / | / | / | / | / |   |   |   |   |
| Qian et al. (2015)             |   |   | / |   | / | / | / | / |   |   |   | / |   |   |   |
| N. Zainul Abidin et al. (2012) | / | / | / | / | / | / | / | / |   |   |   |   |   |   |   |
| Esa et al. (2011)              | / | / | / | / | / | / | / | / |   | / |   |   |   |   |   |

Based on Table 1, there are a few challenges in implementing the green building concept among the construction industry players, such as a lack of demand from stakeholders/markets. According to Hoxha & Shala (2019), there is less demand for green construction because consumers value location more than sustainable structures' energy-saving and environmental benefits. Lack of knowledge and awareness of the project stakeholders and the dispersed strategies and isolated practices employed to promote green infrastructure and structures (Alqadami et al., 2020). In addition, it was found that the current incentives are insufficient to encourage construction companies to participate in green building projects, stated Yee et al. (2020). This is because they are unable to afford the high cost of building green structures.



According to Abidin et al. (2012), there is a need to update some of the existing laws, rules, and regulations to safeguard the environment from construction-related activities better. Saleh & Faieza (2018) claim that the absence of widespread marketing in Malaysia makes green building supplies less widely available than traditional building materials. Besides, Yee et al. (2020) state that because green building projects are challenging and require careful planning, monitoring, and execution, in addition to the potential for cost overruns, developers are unwilling to put them into practice when they lack the necessary expertise and understanding. On top of that, green construction projects may have higher initial costs and require more knowledge of change management, communications, and integrated design than conventional ones due to the more advanced, pricey, unproven, and technical nature of the technology and processes used (Tran & Huang, 2021). Based on Yee et al. (2021), creating a green building could cost up to 25% more than building one using conventional architecture.

Furthermore, Chakravarthy et al. (2022) noted that investments in green buildings are typically higher than conventional ones. Due to the considerably higher startup costs, transaction costs (TCs), and heightened investment risks they represent, potential stakeholders still find it challenging to enter the green building industry freely (Qian et al., 2015). Abidin et al. (2012) believe that changing from a conventional to a sustainable approach requires changes at all levels of the industry, from the individual to the organisational to the industry level and that this process requires time. In addition, Niig (2016) noted that challenges are frequently encountered during the design stage due to the complexity of green building design and construction as well as the availability of data regarding the environmental performance of green buildings and green materials, but these data are frequently insufficient or difficult for contractors to understand.

Besides that, because green building solutions are more expensive and take longer to pay off, some businesses opt for the conventional approach because they lack the financing means to fund capital expenses (Ahmad et al., 2019). In addition, green building will be challenging to adopt if built environment stakeholders cannot grasp its necessity and are not particularly interested in incorporating green features into their daily operations (Onubi et al., 2020). Furthermore, green building is a long-term investment, and it is difficult to predict whether it will be profitable (Ametepey et al., 2015). Besides, Zhang et al. (2019) claim that although occupant behaviour has little bearing on overall building performance, it significantly affects the architectural performance of specific homes or offices due to internal factors like user behaviour, building management, including technology use. Additionally, as mentioned by Yee et al. (2021), their respondents claimed that making any changes or improvements is difficult since they must first request and receive permission from the owner to do so since the building is rented and not their own property.

## **RESEARCH METHODOLOGY**

A qualitative method was used for this study to clarify the data, thus giving a better explanation. The interview will take place over the phone, the conversation will be audio-recorded, and the notes will be taken to analyze and interpret further without

missing any crucial aspects. The data gathered and processed from the conducted interview can be used to develop the research findings that are intended as a goal, to achieve the research aim. Purposive sampling was used to choose the respondents for the structured interviews. Participants involved in this research study included a landscape consultant, an architect, a developer, a project manager, and a quantity surveyor. The study population comprises five stakeholders involved in the construction project of green buildings in Kelantan.

As a result of the interview sessions, a significant amount of material was gathered; hence, all of the information will be reviewed and discussed in greater depth. After the interview session has concluded, the data will be analyzed and interpreted based on the findings from both the data obtained from the interview and the literature study. Utilizing ATLAS.ti qualitative analysis software is the most appropriate strategy for analyzing this qualitative data. Because it will consider the result of the individual who can provide the finest information on the research, this sort of sampling is the most suitable with the qualitative approach.

## ANALYSIS OF FINDINGS

**Table 2: Demographic of the Participants**

|                           | <b>Stakeholder</b>  | <b>Position</b>      | <b>Years of Experience</b> |
|---------------------------|---------------------|----------------------|----------------------------|
| <b>Participant 1 (P1)</b> | Landscape Architect | Landscape Consultant | 12                         |
| <b>Participant 2 (P2)</b> | Architect           | Architect            | 9                          |
| <b>Participant 3 (P3)</b> | Developer           | Developer            | 10                         |
| <b>Participant 4 (P4)</b> | Contractor          | Project Manager      | 9                          |
| <b>Participant 5 (P5)</b> | Quantity Surveyor   | Quantity Surveyor    | 10                         |

According to the data presented in Table 2, the individuals who participated in the interview session were from various organizations. Only one representative from each organization was selected to participate in the interview. Different stakeholder and respondent position was chosen to participate in the interview session. As a result, the reliability of the data obtained was ensured by the fact that it was collected from the most relevant individuals. The degree of perception heavily depended on the experience one had working in the construction sector. Because of this, one may conclude that despite the number of years spent working in the construction industry that might fall anywhere on a spectrum, every single one of them is qualified because they have adequate engagement in this field.

**Table 3: The Challenges in Implementing the Green Building Concept**

| <b>Challenges</b>                       | <b>Details</b>  |
|---|---|
| <b>Codes and Regulation</b>             | Lack of building codes and regulations [1:13]; No guidelines from the state government [3:19]   |
| <b>Lack of Information and Database</b> | Hard to get information to settle down the project [4:13]   |
| <b>Individual Environment Behaviour</b> | Individual preference in choosing the place they want [3:4]; People's way of living [4:10]  |
| <b>Demand</b>                           | Based on what the owner wants [1:9]; Lack of demand from client [1:16]; [2:17]  |
| <b>Awareness</b>                        | Not many people appreciate green benefits [1:18]; Not many people are aware of it [1:8]; Lack of public awareness [3:8]; Lack of acknowledgement from the people [4:2]    |
| <b>Financial</b>                        | Limited budget [1:14]; Green products can be a bit pricey [1:2]; The cost is not realistic in Kelantan [2:13]; High initial cost [3:15]; Lack of capital [3:17]           |
| <b>Incentives</b>                       | Lack of incentive compared to Terengganu [1:14]; Lack of rebates from the government [3:18]   |
| <b>Limited Specialist</b>               | Has to import installer [1:4]; Has to import specialist from KL [1:5]; Lack of landscape contractor [1:6]; Lack of experienced professionals in green construction [4:12] |
| <b>Investment Risk</b>                  | Long-term profit return [3:14]; High investment cost [3:16]; High investment risk [4:8]   |
| <b>Lack of Interest</b>                 | Lack of interest from the client [1:10]; Lack of interest from the management [3:13]  |
| <b>Limited Material and Technology</b>  | Material has to be imported from other states [2:19]; Lack of green product factories [2:20]; Market barrier [5:4]  |
| <b>Logistic</b>                         | The location is far from the company and suppliers [1:7]; High transportation costs [2:21]  |

Based on Table 3, the responses have summarized several challenges related to implementing the green building concept faced by the construction industry player in the construction project. The first and most mentioned challenge is the financial issue, as stated by Participant 1 in Quotation 1 (P1:Q1) and supported by (P1:Q2), (P2:Q13), (P3:Q15) and (P3:Q17). The second challenge is the lack of awareness from the public and construction players mentioned by Participant 1 in Quotation 8 (P1:Q8) and was supported by (P1:Q18), (P3:Q8) and (P4:Q2). The third issue regarding the challenges in implementing this concept is limited specialist presence, where Participant 1 in Quotation 4 (P1:Q4) has mentioned it and was supported by (P1:Q5), (P1:Q6) and (P4:Q12).

Besides that, lack of demand is one of the challenges in implementing this concept, according to Participant 1 in Quotation 9 (P1:Q9) and was supported by (P1:Q16) and (P2:Q17). The lack of demand does not only cause by the high cost of the construction project but is also caused by the lack of knowledge from the public. Other

than that, Participant 3 in Quotation 14 (P3:Q14) mentioned that risk in investing in a construction project that implements this concept is one of the challenges and was supported by (P3:Q16) and (P4:Q8). Lacking green materials and technology in Kelantan is one of the reasons why implementing this concept is a challenge, as provided by Participant 2 in Quotation 19 (P2:Q19). This claim was then supported by (P2:Q20) and (P5:Q4). Other than that, building codes and regulation is important to ensure the minimum requirements for design and construction that are necessary to assure the safety and durability of structures. So, if there is a lack of building codes and regulations, as Participant 1 in Quotation 13 (P1:Q13) mentioned, implementing the concept supported by (P3:Q19) will be quite a challenge.

Individual environmental behaviour is one of the challenges mentioned by Participant 3 in Quotation 4 (P3:Q4) and was supported by (P4:Q10). Providing incentives is one of the important ways to help the construction industry player, especially the contractor, to help financially, as stated by Participant 1 in Quotation 14 (P1:Q14), which (P3:Q18) supported. Furthermore, as mentioned by Participant 1 in Quotation 10 (P1:Q10), it will be challenging to implement the green building concept if the clients or management are not interested in doing so, which was supported by (P3:Q13). Besides that, Participant 1 in Quotation 7 (P1:Q7) mentioned that logistic issues are one of the challenges in implementing this concept and was supported by (P2:Q21). Last but not least, according to Participant 4 Quotation 13 (P4:Q13), lack of information and database is the challenge that they find in implementing the green building concept in their construction project.

According to Participant 1 in Quotation 16 (P1:Q16), the house either has low demand or is difficult to sell the house because when the cost of constructing the building is high, the price to sell the building automatically increases because no project wants to face losses. Participant 1 in Quotation 7 (P1:Q7), indicated that the location of the building project is quite far from the supplier of the material and that it will be necessary to import the materials from another state, which will cause an increase in the cost of transportation and this was supported by (P2:Q21). Aside from that, Participant 3 in Quotation 4 (P3:Q4) talked about the difficulties that came with individual environmental behaviour and was supported by (P4:Q10). Participant 1 in Quotation 14 (P1:Q14) also claimed that compared to Terengganu, Kelantan does not have that many incentives to implement green building, while (P3:Q18) mentioned that there is a lack of rebates from the Government on green building.

## **DISCUSSION OF FINDINGS**

The findings show that there are several challenges in implementing the green building concept among the construction industry players in construction projects. Some similarities are parallel with the previous studies by other researchers. The high initial cost is one of the reasons why implementing this concept is quite challenging. This was backed up by Niig (2016), who mentioned that the fact that a conventional building is expected to have an initial project cost of 1% to 20% lower than a green building, whose construction will cost more in terms of time and money.



Lack of awareness was also quite challenging in implementing this concept in Kelantan, where most of the public and parts of the construction industry player either do not know the benefit of green building or are unaware of the green building concept. However, according to Abidin et al. (2012), although demand from the buyer side is currently limited, it has the potential to grow as public awareness grows and successfully continues to receive widespread attention, for instance, when the public is aware and supportive, sustainable development policies, strategies, and actions have a better chance of being implemented.

Besides that, the findings also showed that the lack of experienced professionals in green building was one of the challenges; as stated by Yee et al. (2021), most professionals are restricted to conventional buildings and have little to no experience with green construction, it can be difficult for employers to locate an expert to handle the job associated with green projects. Besides that, Ayarkwa et al. (2022) mentioned that one of the top ten obstacles to sustainable construction had been identified as a high risk of investment. This was supported by Hoxha & Shala (2019), where they have stated that the major economic and financial investment risk associated with integrating sustainability in buildings is greater initial expenses.

According to Ha et al. (2020), it is challenging for developers, contractors, and subcontractors to obtain all the necessary materials and technologies for the construction of green buildings because they are still hard to come by. Besides that, as confirmed by Abidin et al. (2012), some of the existing laws, rules, and regulations need to be modified in response to calls for better environmental protection from construction activities.

Although incentives are needed to encourage organizations in Malaysia to develop or adopt new technologies and procedures, they will not be as effective if construction companies do not have the knowledge and experience necessary for green development (Ha et al., 2020). In addition, Niig (2016) stated that the government had expressed great interest in adopting green buildings because Malaysia still lags behind other Asia Pacific countries in developing green buildings. Lastly, Zhang et al. (2019) stated that there will be issues that could impede the operational performance of green building construction if there is insufficient information about how to operate green buildings.

## **CONCLUSION**

It can be concluded that there are challenges that construction industry players in the East Coast Region have to face to implement the green building concept in their region. For some people, even if this concept of green buildings brings many benefits to individuals and the environment, they still need to overcome the challenges they encounter regarding awareness and money, making it difficult for them to put the concept of green buildings into practice. According to the findings, the participants' primary challenge is one of a financial nature. However, this challenge can be overcome or minimized if the government offers increased financial incentives to those working in the construction industry, particularly those prioritizing utilizing environmentally friendly components, and this research can also help achieve one of

the 17 Sustainable Development Goals (SDG). Nevertheless, there is still room for further improvement which can be achieved in future research; for instance, in future research, it is recommended that the researcher use mix-method to gather the data needed to be more accurate compared to this research which only uses one method to gather the data.

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Surat kami : 700-KPK (PRP.UP.1/20/1)

Tarikh : 20 Januari 2023

Prof. Madya Dr. Nur Hisham Ibrahim  
Rektor  
Universiti Teknologi MARA  
Cawangan Perak



Tuan,

**PERMOHONAN KELULUSAN MEMUAT NAIK PENERBITAN UiTM CAWANGAN PERAK  
MELALUI REPOSITORI INSTITUSI UiTM (IR)**

Perkara di atas adalah dirujuk.

2. Adalah dimaklumkan bahawa pihak kami ingin memohon kelulusan tuan untuk mengimbas (*digitize*) dan memuat naik semua jenis penerbitan di bawah UiTM Cawangan Perak melalui Repositori Institusi UiTM, PTAR.

3. Tujuan permohonan ini adalah bagi membolehkan akses yang lebih meluas oleh pengguna perpustakaan terhadap semua maklumat yang terkandung di dalam penerbitan melalui laman Web PTAR UiTM Cawangan Perak.

Kelulusan daripada pihak tuan dalam perkara ini amat dihargai.

Sekian, terima kasih.

“BERKHIDMAT UNTUK NEGARA”

Saya yang menjalankan amanah,

**SITI BASRIYAH SHAIK BAHARUDIN**  
Timbalan Ketua Pustakawan

*nar*

*Setuju.*

*27.1.2023*

PROF. MADYA DR. NUR HISHAM IBRAHIM  
REKTOR  
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