

Accelerating Green Procurement for Construction Project Adoption Through The Enhancement of People Capabilities

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Abstract

Unpredictable weather, global warming, and even air pollution result from human activities that harm the ecosystem, whether we like it or not. Since the publication of the Brundtland Report, the adverse effects on the environment have been the focus of discussion by many parties. The Brundtland report highlighted that the current physical development practices have less emphasis on environmental protection while planning physical growth. Since then, the construction sector has gradually embraced many green practices, such as green procurement. The people capability requirements that are crucial for speeding the adoption of green-oriented procurement will, therefore, be highlighted in this paper. This study uses an exploratory technique to uncover the people's capability criteria for green procurement of a construction project. The identification of the criteria is novel. Several focus group discussion sessions were conducted involving stakeholders from various backgrounds who have been involved with green buildings. The results of this study will help the project stakeholders to enhance people capability plans for the project development. The ultimate aim is to ensure all the green project objectives are carried out in line with the urgent need to protect the environment and support government policies.

1. Introduction

Every nation benefit from the construction industry as it greatly contributes to economic development and aids in fostering social growth by providing the essential infrastructure for living and employment (Hossain et al., 2020). Meanwhile, the industry is also tainted and becomes infamous with adverse environmental consequences, such as the usage of higher energy consumption, notably non-renewable energy and resources needed for building, maintenance, and transportation of the building materials. Therefore, the urgent need to adopt a more environmentally friendly approach to the negative environmental consequences of construction operations has been widely recognised (Shurrab, Hussain, & Khan, 2019). As of today, numerous innovative green practices have been introduced to the construction industry.

Green procurement is one of such initiatives introduced in the construction industry to address environmental issues (Khan et al., 2018). Procurement in the construction industry is regarded as an essential tool to ensure the project is well-managed and achieves the project goals. According to Alqadami et al. (2020), "green procurement" integrates and uses environmentally friendly techniques throughout the various phases of the construction project. Positive outcomes such as long-term cost effective and reducing carbon emission level from green procurement have been observed in several nations (Faith-Ell, 2005). Therefore, green procurement should be implemented to improve the sustainability performance of construction projects.

However, adopting green construction or integrating green practices into construction procurement faced some challenges. Among the challenges stands out the lack of acceptance by the stakeholders that have been doing their work based on conventional practices and their level of knowledge to ensure the green practices are well executed (Adham & Siwar, 2012, Vejaratnam et al., 2020, Gadisa & Zhou, 2021). Therefore, this study aimed at identification of factors to enhance people capabilities to accelerating green procurement adoption.

2. Green Procurement for Construction Project

Green procurement has been widely used in numerous nations worldwide and is recognised as an efficient technique to reduce adverse environmental impacts (Adham & Siwar, 2012). The practice of "green procurement" was first introduced in the 1990s, and it has since come to be recognised as an efficient way to reduce the harmful environmental effects of the production and consumption of commodities. Lacroix (2008) defined green procurement as seeking and obtaining goods and services that are anticipated to have a more negligible negative environmental impact.

Although most of the studies on green procurement refer to the green procurement of products and services in principle, the aim of green procurement for construction projects is typically similar. Integrating a green procurement plan as early as the planning phase of the project can have a better impact and be more efficient in terms of project delivery (Chen & Chang, 2012). According to Rais et al. (2018), the significance of green procurement in the construction industry arises from the increasing number of environmental degradation issues within this sector.

In Malaysia, the government has supported the green procurement concept well, and it started with green procurement for government products and services (Adham & Siwar, 2012). Meanwhile, green procurement for the construction industry is at the pilot stage, known as Government Green procurement work (GGP Works). This GGP Work has been mentioned in the Twelve Malaysia Plan (12MP), Chapter 2 under Strategy A5, where GGP Works to encourage the construction sector will be introduced to be a catalyst for change from conventional construction methods towards green construction. Guidelines for stakeholders to guide and nurture interest in green procurement will be developed soon (Abdullah, Zanudin, & Marzukhi, 2022).

The main objective of green procurement is to reduce the negative impact on the environment by procuring products or services that meet the environmental criteria set by organisations that verify green products (Mosgard, 2015). These verification organisations may represent government agencies or independent verification partners to ensure the credibility of green products and services. For example, Malaysia has a portal called MyHijau that supports and recognises the green products and services readily available in the Malaysian market (MGTC, 2023). This recognition system is essential because it guides all stakeholders, including clients, planners and purchasers. Since green procurement in Malaysia is still new, it is essential to ensure that stakeholders are well-guided to ensure the positive effects of this green procurement practice. Case examples can be observed in obtaining building materials with low energy requirements, high-performance characteristics, exceptional durability, and sourcing from nearby locations. These combined attributes reduce energy consumption throughout the material's life cycle, saving valuable natural resources. This phenomenon has been shown by Yang et al. in their study conducted in 2019.

The implementation of green procurement strategies not only produces environmental advantages but also acts as a driver of organisational performance increment (Wong et al., 2016). By integrating sustainable principles into procurement, construction projects can protect the environment while enhancing organisational character and resilience. Apart from moving towards green construction, the construction industry in Malaysia is urged to move towards increasing productivity and efficiency in management (Abdullah et al., 2022). Green procurement

is a communication tool that will help document green requirements early and channel this information to all layers of the project stakeholders and all the construction phases—for example, identifying the extent of green practices to be integrated into the project procurement as early as setting the budget, scoping the work in the inception phase, and finally conveying it to the contractor and site management in the construction phase. The well-informed stakeholders and clear direction to adopt green practices will improve the project performance outcomes. There was a claim that the inefficient procurement planning to procure green buildings would result in higher construction costs and project delays (Gadisa & Zhou, 2021). After all, green practices are always associated with higher costs than the conventional project delivery method. Only those who understand the notion of life cycle costing would understand that saving the project client or the end user would benefit in the long run. Implementing green principles means a binding commitment to provide more benefits to society in terms of protecting the environment.

A significant obstacle hindering the widespread implementation of green procurement is the need to understand its fundamental principles and the accompanying benefits. The need for sufficient information among stakeholders poses a significant barrier to implementing green procurement, as Adham and Siwar (2012) and Fischer (2010) emphasise. According to Benjamin et al. (2016), one of the main challenges in implementing green procurement is the need for more understanding and capabilities building from client and project stakeholders (Refer to Figure 1). Evaluating stakeholders' capabilities is a vital aspect that requires careful deliberation to ensure the successful execution of green procurement. As Shen et al. (2016) stated, achieving successful transformation requires integrating personal and organisational competencies. Assessing stakeholders' capabilities is crucial in shaping individuals' perceptions of environmental protection responsibility. Thus, the stakeholders' interests and commitment influence the enactment of environmental responsibility.

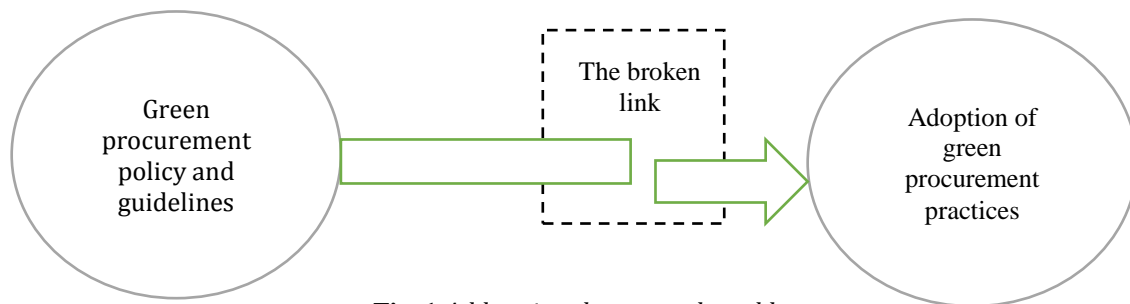


Fig. 1 Addressing the research problem

In the Malaysian context, it is shown in previous research that the introduction of an innovative idea to the sector is a challenging endeavour. The level of acceptance towards an innovation culture is contingent upon the demand and readiness of stakeholders to incorporate novel ideas into their projects (Waris et al., 2014). For example, the introduction of the Industrialised Building System (IBS) requires approximately 40 years before the first IBS strategic plan is developed to encourage stakeholder participation (Rahim & Qureshi, 2018). An additional illustration pertains to the Malaysian government's implementation of green procurement for products and services in 2012. Nevertheless, the available evidence suggests that the resistance of industry participants to embrace change has hindered the effectiveness of Malaysia's green procurement effort (Adham & Siwar, 2012; Vejaratnam et al., 2020). The unwillingness to embrace change can be attributed to a lack of knowledge to grasp the proposed changes (AlNuaimi & Khan, 2019; Alqadami et al., 2020) (Refer Figure 1). Thus, the importance of having a certain set of skills and capabilities in achieving successful transformation has been emphasised in previous research (Shen et al., 2016).

2.1 The People Capability

The beginning of the capability's strategy stems from the fundamental concept of competitive advantage, which holds significant importance for businesses. Achieving outstanding outcomes and acquiring a competitive advantage rely on an organisation's possession of suitable capabilities (Smallwood and Panowyk, 2005). The capability theory does explain how organisational capabilities lead to organisations achieving superior performance, competitive advantage or sustained growth (Sarpin et al., 2016). The organisational competencies can be enhanced by the internal dedication of the organisation and external assistance. The study was conducted by Narayanan et al. in 2009. Shen et al. (2016) underscored the importance of individuals' competencies in effectively helping organisational transformation. These attributes are paramount in facilitating adaptability to change, nurturing innovation, and proficiently tackling intricate problems, particularly within sustainability. Figure 2 illustrates the dimension of organisational capabilities and the capability increment factors such as people, process and material.

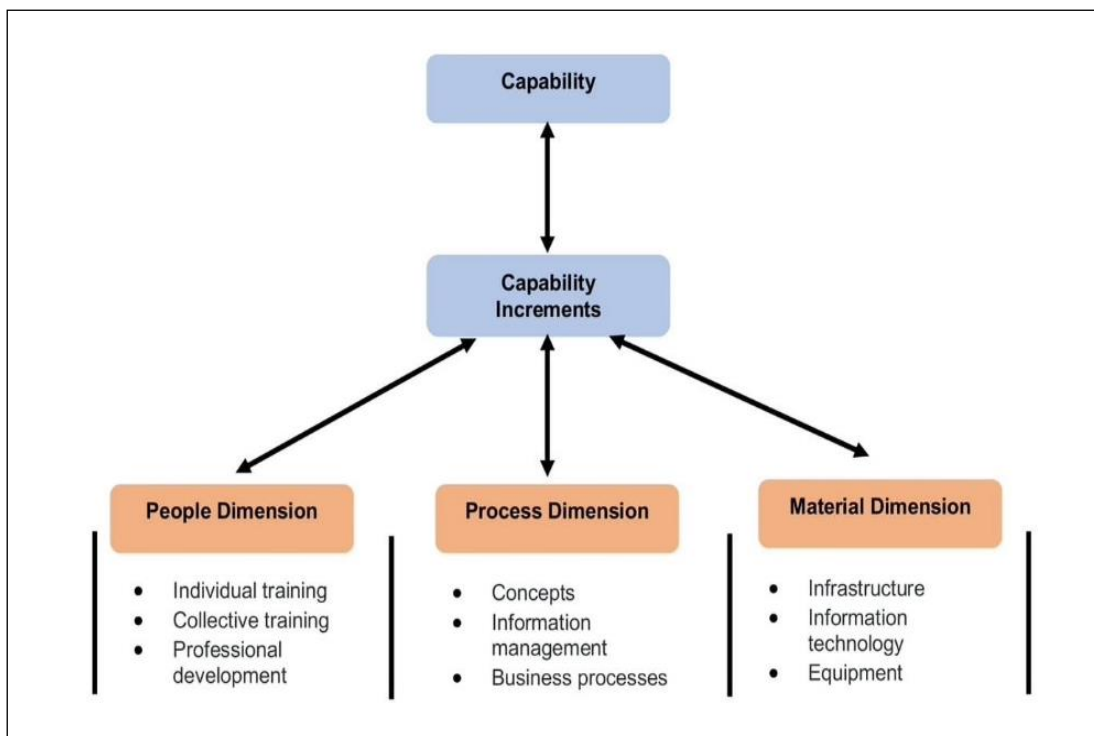


Fig. 2 People capability increment factors (Sarpin et al., 2016)

The research on sustainability places less emphasis on the category of people's capabilities compared to the other two categories (Sarpin et al., 2016). The capabilities of those who work within an organisation are crucial for effectively carrying out their roles, as they can illustrate this by using their resources and expertise in support of corporate endeavours towards sustainability (Ramalho & de Fátima Martins, 2022). The examination of capabilities has been the subject of research studies aimed at improving the implementation of sustainable practices in various industries, including the chemical industries, food industry, manufacturing and construction industries, highlighting the significance of the capability enhancement concept (da Cunha Bezerra, Gohr & Morioka, 2020). The concept of people capability pertains to the aggregation of resources and competencies that an individual holds, facilitating the efficient utilisation of those resources in the execution of their assigned responsibilities (Lessman & Rauschmayer, 2013). Gloet (2006) asserts that the proactive involvement of individuals and the organisational capabilities are essential in facilitating the adoption of sustainable practices and prioritising sustainability principles within management. The primary obstacle hindering progress in this context is the absence of information, which directly and consequential affects various other barriers, including insufficient stakeholder support and the inability to implement environmentally sustainable effective practices for the project (Radebe & Ozumba, 2021).

The construction industry consists of two types of organisations. The project-based organisations (PBO) usually are temporary and permanent (Samimi & Sydow, 2021). Typically, for a construction project, the setting for the organisation is temporary based on the project. The project stakeholders also came from different background organisations that served different functions in the project. The temporary client organisation is established to execute a single project or programme. Here, the project capabilities have to be identified, built, combined and developed specifically for the project (Grabher & Thiel, 2015). Sarpin et al. (2016) highlighted four prominent people's capabilities that must be given attention to building a capability among the stakeholders in sustainability. The capabilities are anticipatory, System thinking capabilities, Interpersonal skills capabilities and Strategic capabilities. People capability is important to build and improve the capabilities of the stakeholders (Ruuska & Brady, 2011). The capability increments are always a process that is simultaneously top-down, where organisational routines support project performance, and bottom-up, where each project contributes to organisational change (Brady and Davies, 2004).

In line with this, the study highlights the importance of people's ability to influence the implementation of green procurement and proposed the conceptual framework for this study (Refer to Figure 3). Further, it identifies the critical capabilities needed that influence the implementation of green procurement for construction projects. Starting from the literature findings, this research continued with a focus group discussion (FGD) phase involving stakeholders involved in the construction industry and having experience with the green agenda in the

construction industry. The FGD is conducted to validate the capability factors identified from literature review based on the actual context.

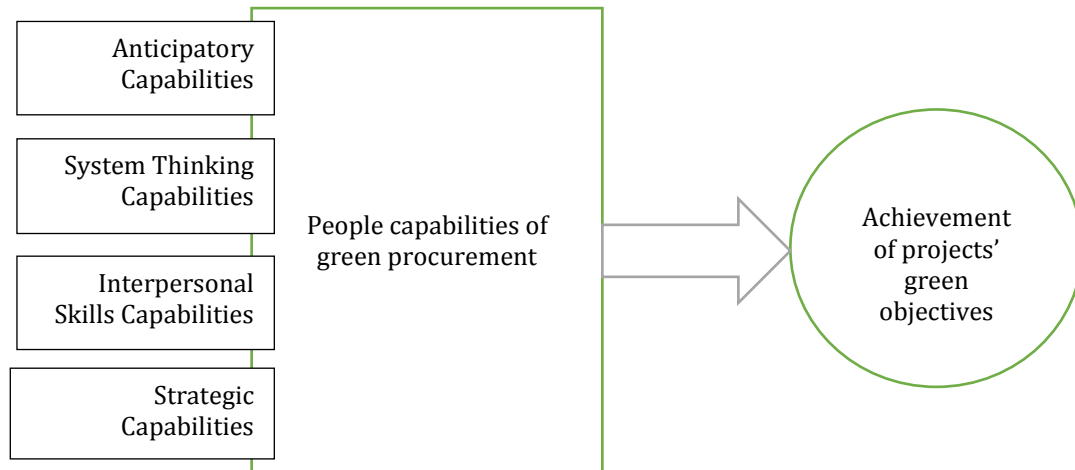


Fig. 3 The proposed people capability for green procurement in the Malaysian construction industry conceptual framework based on the literature review analysis

3. Methodology

Given the predominantly theoretical nature of previous research on individuals' propensity to adopt green procurement practices, it is worth noting that the survey instruments required for the researcher's intended study are not easily accessible. The researchers must conduct an in-depth exploration and acquire comprehensive responses from the participants. According to Connolly and Lang (2013), employing this approach is beneficial when a researcher lacks available instruments and needs to develop and assess one. This particular research methodology aims to acquire comprehensive replies from a limited number of participants. However, the duration of interaction with these persons is much extended (Kumar, Talib, & Ramayah, 2013, p. 72). Despite the reduced number of participants, the researcher possesses more information about each participant. Kumar, Talib, and Ramayah (2013) assert that the qualitative approach demonstrates an inductive orientation, implying that formulating a hypothesis is not always an essential component. This study's qualitative methodology involved focus group discussion as the primary the capability factors identified from literature review.

3.1 Focus Group Discussion

Given the current state of research on green procurement in Malaysia, this study commenced with a comprehensive evaluation of existing literature, subsequently employing a qualitative approach. This study uses the approach of focus group discussion (FGD) to comprehensively comprehend and solicit feedback on the capability factors identified from literature review from various stakeholders within the organisation. The focus group discussion will also gather subjective opinions other capability factors that might be important as derived from personal experiences and ideas, thus enhancing the depth and comprehensiveness of the data (Creswell, 2011). While this approach does not entail the formulation of hypotheses, it involves using research instruments, such as semi-structured questions, to conduct the focus group discussion. The outcomes of this Focus Group Discussion will contribute to comprehending the issues stated within the research context in Malaysia. Additionally, it will aid in the capability factors identified from literature review and participants' personal experience, which can accelerate the adoption of green procurement practices.

A focus group discussion incorporated individuals with expertise and experience relevant to the study's objectives (Kumar et al., 2013). This focus group discussion (FGD) employs a purposive sample method to choose participants who are experienced practitioners and experts in green projects and green building and construction policies. Based on the conducted study, a compilation of potential participants was generated, encompassing pertinent information such as the mailing addresses of individuals, as well as their contact details, including email addresses and phone numbers. The researcher collected data from several sources, which encompassed freely accessible data, web searches, and direct conversations with the key stakeholders of the project. The researcher highlighted that the participant's details and feedback would be highly protected to protect their confidentiality. The participants were selected based on the criteria that have been set to ensure the data collected for the interview is reliable. The critical selection criteria for the participants of this research are as follow:

1. Someone who has been involved in the green building project

2. Individuals who have knowledge of green projects

There are two series of workshops in different locations to ensure that this FGD covers and represents the stakeholder group that will be most impacted by the change based on the stakeholder's role and location factor. According to Hennink, Kaiser & Weber (2019), conducting two groups per section is sufficient to provide a more comprehensive understanding of issues. An effective focus group design typically consists of a membership ranging from eight to twelve individuals. The duration of each session should not exceed two hours, and multiple sessions may be conducted until a consensus is achieved. It is crucial to meticulously select group members and establish well-defined protocols for discussion, data collection, data analysis, consensus building, and moderation (Grudens-Schuck et al., 2004).

The two focus group conversations were done in different sessions at different locations. More participants were invited to join the focus group discussion to ensure each session reached the minimum number of participants, as Grudens-Schuck et al. (2004) recommended. The participants of the focus group discussion (FGD) workshop are notified through electronic mail, including details about the session and the anticipated workshop results. Participants who express their consent will get pre-workshop materials containing a concise questionnaire, a consent form, and supplementary information regarding the focus group discussion (FGD) that took place.

Two focus group sessions have been successfully conducted with eight participants per session. The participants' involvement was voluntary to attend the session on the date, time and location set earlier. Upon starting the session, the moderator conducted a short briefing on the focus group discussion procedure and the research team's expectations. The consent to audio record the whole discussion was granted by all participants. The participants also advised that all the reports would not reveal the identity of the participants and that each participant was assigned unique coding. The participants were also informed that they could withdraw from the discussion session at any time if they felt uncomfortable proceeding with the discussion. The discussion started with an ice-breaking session to ensure the participants were comfortable and could freely express their opinions. During the session, each participant was asked the same two questions as discussed in the focus group discussion:

- (a) How are green procurement practices able to meet the project's environmental objectives?
- (b) Which are the people capability criteria important in implementing green procurement?

Each participant was given the opportunity to give their opinions verbally and respond to any issue raised by the moderator and other participants. The session lasted for one and a half hours, and all eight participants from each session remained until the end of the session. The outcome from the FGD workshop was transcribed verbatim, and workshop participants' statements were coded into predetermined categories and analysed using thematic analysis.

4. Result and Discussion

4.1 Demographic

The present study established two focus groups, as outlined in Table 1 and the demographic of the workshop participants is as follows;

Table 1 Demographic of FGD participants

Focus Group Discussion 1 (FGD1)			
Participant	Current position	Organisation	Role in green project
1P1	Head of Department Environmental Unit	Government	Project Implementor/policy maker
1P2	Structural Engineer	Government	Designer
1P3	Quantity Surveyor	Government	Designer
1P4	Architect	Government	Designer
1P5	Electrical Engineer	Government	Designer
1P6	Structural Engineer	Government	Project Implementor
1P7	Standard Officer	Government	Project Implementor
1P8	Sustainable Manager	Government	Project Implementor
Focus Group Discussion 2 (FGD2)			
Participant	Current position	Organisation	Role in green project
2P1	Assistant Quantity Surveyor	Statutory Body	Project Implementor
2P2	Quantity Surveyor	Private	Project Implementor

2P3	Procurement officer	Government-linked company	Procurer/policy maker
2P4	Architect	Private	Designer
2P5	Mechanical Engineer	Private	Project Implementor
2P6	Quantity Surveyor	Private	Project Implementor
2P7	Quantity Surveyor	Private	Project Implementor
2P8	Procurement officer	Government subsidiary company	Procurer/policy maker

The participants of the focus group discussion was grouped based on the location due to the financial and time restraint factors. The discussion involved the project stakeholders that possessed the decisive power the determining the project direction.

4.2 Findings and Key Discussion from Literature and Focus Group Discussion

This section presents the results of the two focus group discussions. Before delving deep into the people capability criteria in implementing green procurement in the Malaysian construction industry, a brainstorming session was held by both focus groups to highlight the importance of green procurement and its relationship with the people capabilities criteria. After the in-depth discussion, the finalised version of the analysis, after combining the outcomes of the two focus groups, is presented in two sections.

4.3 The Deliberation of Green Procurement for Construction Industry Objectives

The first one on the section of discussion is to answer the question of how green procurement practices can meet the project environmental objectives. Green procurement in the construction industry pertains to the comprehensive consideration of the building's development, encompassing all stages from inception to operational functionality. The term "green" also comprises the viewpoint of environmental management theory, which underscores the importance of assessing the environmental impact of any operations. Fischer (2015) provides a comprehensive overview of green procurement, which involves transitioning from procurement practices that do not consider environmental considerations to a heightened focus on purchasing decisions that prioritise environmental impact.

Therefore, this paper presents a set of seven possible environmental objectives of green procurement attributes specifically designed for the construction sector (Refer to Table 2). These objectives aim to ensure compliance, as supported by previous studies conducted by Grob and McGregor (2005), Ashby, Leat, and Hudson-Smith (2012), Bakir (2015) and Bohari & Xia (2015). The respondents were asked to discuss further how green procurement is able to drive the project team to meet project environmental objectives.

The first attribute is that the project can be responsive to green requirements by the government through the adoption of green procurement. The government has implemented a series of recommendations to accomplish the nation's objective of reducing carbon dioxide emissions. Fai Pun (2006) and Bakir (2015) state that government policy can help form an organisation that practises environmentally responsible operations. Green procurement is the tool to ensure the project's direction towards green is more apparent to all project stakeholders and abides by the government policy and requirements.

The second attribute is to obtain credentials as a recognised green project within the construction sector. The aim is to ensure that the project meets the desired environmental criteria and is able to reduce the environmental impacts throughout the project development and life cycle. The readily available rating and measurement green building tools can help an organisation plan their environmental target, and later, they can claim that their building is recognised as green (Testa et al., 2015). Incorporating the desired environmental criteria in the project contract documents will help to signal to the stakeholders the importance of this mission to the project.

The third aim of green procurement for the construction industry is developing a compliance mechanism with an environmental strategy. Developing a project compliance strategy is important to describe the procedures required to ensure compliance with relevant stakeholders, whether during the development phase or the entire lifetime of the structure. This strategy compliance guide will give a clear picture to project stakeholders of the extent of green practice commitment required for the project (Zhang et al., 2015). Examples of compliance strategies are through terms placed in the specification of materials used and as contract terms (Testa et al., 2015).

The fourth is making purchases to reduce the risk of environmental harm (Bratt, 2011). Green procurement for project construction also involves purchasing environmentally friendly building materials, which involves the entire supply chain from manufacturers, suppliers, and contractors. The procurement of this item should be conducted with consideration for the knowledge and involvement of all relevant stakeholders. This objective is

also closely related to the use of virgin construction materials and the concept of material recycling, where this concept is also seen from the perspective of the circular economy. The eco-labelling mechanism helps the purchaser to make a decision by identifying the green impact of products (Bratt, 2011).

The fifth is developing an internal project mechanism to ensure compliance with green requirements (Fai Pun, 2006). Monitoring and control are the most important processes to control quality performance in construction (Chua and Oh, 2011). Monitoring by developing benchmarks leads to the effectiveness of green adoption that helps to build the reliability of an organisation (Varnas et al., 2009). This is also how the client ensures compliance commitment from each party for the project. The client must assess the project's capacity in terms of cost, time, and expertise while setting up an internal project framework. Each project has different objectives and constraints; thus, these internal mechanisms must not add additional constraints but rather connect the bridges among the stakeholders and the green practices crossing the phases.

The most relevant aspect is the involvement of competent stakeholders in the initiative to adopt environmentally friendly practices. Incorporating green practices into project delivery has significantly changed the approach to project implementation. According to Cole (2005), these stakeholders are anticipated to possess intricate combinations of skills and acquired knowledge to embrace and implement this transformation effectively. Acquiring knowledge and skills might facilitate discovering novel practices about a particular skill or routine (Winter, 2003). According to Qi et al. (2010), it is of utmost importance to have stakeholders who possess competence in environmentally friendly practices within the building business. The presence of capable stakeholders is crucial for attaining the desired outcome and performance and minimising the potential for project failure. The final characteristic relates to actively engaging in voluntary endeavours to promote environmentally sustainable procurement practices within construction projects.

Table 2 Validation of green procurement objectives—an outcome of the Focus Group Discussion and Analysis

Project green objectives	FGD1	FGD2	Participant	Key Points Highlighted—an outcome of the Focus Group Discussion
The project is responsive to green requirements by the government.	Yes	Yes	2P4	<i>So far, I agreed with the points... mandatory for all involve for the green agenda. Government should lead the way including the reduction of carbon footprint mission</i>
			2P2	<i>The need statement from the client is very important and stated want this school to be a green building. Everyone have to work for that one sort of building</i>
Credentials as a green project in the construction industry.	Yes	Yes	1P1	<i>They client targeted for 5 stars, but they awarded with 4 stars,. So the client were e unsatisfied so they are now planning to go for 5 stars</i>
The project developed compliance with an environmental strategy.	Yes	Yes	1P2	<i>The green compliance circular has been released to ensure the compliance by the project team</i>
			2P5	<i>Now we are trying to synchronise all the SOPs for green purchasing at organisation level</i>
Making purchasing to reduce the risk of environmental harm.	Yes	Divided but majority voted Yes	1P7	<i>It will happen if the consumer or client willingness to pay for green products is higher.</i>
			2P2	<i>For the rural areas, to get the solar supplier is very expensive but it is more to provide basic necessities.</i>
Develop internal project mechanisms to ensure green requirement compliance.	Yes	Yes	1P4	<i>R4: But that's not a problem. If the project is a pilot project, we can make PH JKR mandatory.</i>

Involvement of qualified stakeholders in green projects.	Yes	Yes	1P4	<i>We are sending out our engineers to obtain green related training</i>
			2P3	<i>We have scheduled visit this month to relevant green organisations to learn from them. We might engage green facilitator</i>
Involvement in voluntary efforts to promote green procurement for construction projects.	Yes	Yes	2P5	<i>We are looking at the policies that we have right now really benchmark a few countries where the policies being industry driven.</i>

4.4 The Deliberation on The People Capabilities Factors As The Acceleration for Green Procurement Adoption for The Construction Industry

The human factor is widely recognised as a crucial element for the successful execution of construction projects (El-Gohary et al., 2006; Radebe & Ozumba, 2021). Understanding the human factor in the construction industry is vital in considering the recent implementation of green practices. In a study conducted by Samari et al. (2013), the researchers identified a significant challenge in introducing sustainability aspects into projects, particularly the need to comprehend these elements fully by the project team. Consequently, it is imperative to manage the human factor effectively. The human component pertains to the commitment and proficiency of individuals and organisations in adopting environmentally sustainable practices within building project management. According to Bohari and Xia (2015), it is widely acknowledged that both human and organisational capabilities are essential for the successful implementation of green practices in the construction industry. Therefore, it is of utmost importance to establish a platform that enables stakeholders to increase their capacities in implementing environmentally sustainable practices during project execution.

This paper focuses on examining the human factor, namely the capability of individuals to effectively embrace and implement environmentally sustainable practices during the design and execution phases of a green building project. According to the People Capability Maturity Model, the degree of people capability is the foundation for the maturity level of an organisation's operations. This capability must be modified to attain a higher level of organisational capability. People capability development covers developing competence, building culture, and embedding motivation among individuals and organisations. According to the model proposed by Sarpin et al. (2016), there are four distinct sorts of individuals' capabilities, namely anticipatory capability, system thinking competence, interpersonal capability, and strategic capability.

4.4.1 Anticipatory Capability

Anticipatory capability determines how well people can comprehend and evaluate potential sustainability challenges resulting from their actions (Sarpin et al., 2016). The existing body of literature proposed seven elements under the anticipatory capability factor. These elements include stakeholder involvement, stakeholder commitment to change, employee commitment, top management support, stakeholder awareness, decision-making incorporating the green agenda, and far-sighted thinking about green plans. This capability will help form an initial understanding among project stakeholders. This initial understanding is important to avoid rejection and sceptical views that make efforts to integrate these green practices into construction project procurement more difficult.

As mentioned earlier, the anticipatory capabilities hold significance in ensuring that project stakeholders exercise caution in formulating development decisions and adhere to the established project agenda. Clients and stakeholders involved early in project planning need to be more rational in making decisions based on the current state of the project. For example, the financial position of the project is quite limited and green practices can be put into practice in the project. This decision revisits the objectives of the project so that green practices do not become a burden to the stakeholders and the project concerned.

All participants provided favourable feedback for each of the items encompassed under the domain of anticipatory ability. All seven items of anticipatory capability have been verified and will be incorporated into the subsequent phase of this research (Refer to Table 3). Respondent 1P1 also quoted, "Our client is going seriously to obtain international recognition for a green project. That is why they are keen on achieving 5 stars for local green rating". The action by the client described by 1P1 shows the importance of anticipatory capability to make sure green agenda objectives are fulfilled. According to Bal et al. (2013), stakeholder engagement is becoming a common technique in construction projects to achieve an excellent project outcome.

Table 3 Key Points from Literature and Focus Group Discussion on Anticipatory Capability

Key practice	Literature	Key point quoted from FGD participants
Stakeholders' engagement	Effective stakeholder engagement necessitates the establishment of individual team member responsibility and accountability for the delivery of outcomes of exceptional quality.	Ershadi et al. (2021) <i>"the statement by client must be strong and firm urging for green practices and it must communicated to all the agencies that involved to engage everyone."</i> (2P2) <i>"I handle ministry projects like Project S and Project K, so those projects' requirements are to achieve a certain percentage of adopting IBS. The designer, contractor, supplier, and manufacturer need to work together. ."</i> (2P6)
Stakeholders' commitment to change	The active involvement and dedication of stakeholders are essential factors that contribute significantly to the effective implementation of novel tactics, technologies, and procedures designed to advance environmental conservation. The endorsement of the stakeholders involved in the construction project to adhere to the design and construction activities will contribute to establishing an environment conducive to successful environmental protection.	Radebe & Ozumba (2021), Ershadi et al. (2021) <i>"Everything starts with commitment. Stakeholders' commitments are important. Top-to-bottom and vice versa commitment is the primary key."</i> (1P7) <i>"Commitment is important if not all the efforts are useless. The point is if stakeholder does not commit to change, this green procurement will not happen."</i> (1P2)
Employees' commitment	The extent of execution of new practices, and regulations is influenced by the commitment exhibited by employees towards change.	Khodaparasti et al. (2020), Al Nuaimi and Khan (2019) <i>"Of course. It is important to have employees that are very committed about green."</i> (1P2) <i>"Only committed people will be willing to follow these green practices. Therefore, those in the right position (stakeholders) should be committed to the green plan.."</i> (1P6)

Top management support	Providing high-level managerial support is a critical and essential element that guarantees the effective adoption of new practices and policies across the company. The active engagement and commitment of stakeholders play a crucial role in the successful implementation of innovative strategies, technologies, and protocols aimed at promoting environmental conservation. The support and approval of the stakeholders engaged in the construction project to comply with the design and construction activities will play a significant role in creating a favourable setting for effective environmental conservation.	Nandasinghe (2020), Kiesnere and Baumgartner (2019)	<i>“The instruction from higher up help to strengthen the implementation further.” (1P3)</i> <i>“The client of project xx is enthusiastic about getting a 5-star rating for his project, and this shows that stakeholders’ engagement is important.” (1P4)</i>
Stakeholders’ awareness	The existence of awareness among individuals might prompt the desire to prioritise factors that promote the adoption of green practices among individuals and organisations engaged in the building sector. The more aware the stakeholders of green practices, the higher adoption of green practices will be.	Noranarttaku n and Pharino (2021), Ershadi et al. (2021), AlNuaimi et al. (2021)	<i>“Awareness is very essential. This is because even though you have a strong policy on the green if stakeholder does not have green awareness, they will not know how to do it and no interest to learn too.” (1P7)</i> <i>“The designers also has to be aware of green agenda, especially on the design requirement that has been stated in project brief.” (1P3)</i>

Decision-making that is concerned with the green agenda	The decision-making process constitutes the fundamental basis for subsequent actions that will be taken. The statement delineates the primary phases necessary for the effective execution of green development.	Radebe & Ozumba (2021)	<p><i>"The client has the power on whether or not they wanted to involve green practices in their project. It is their investment and they have to be green enthusiast" (1P4)</i></p> <p><i>"As the government can impose this requirement on all the agencies, they will follow, but I find it rather challenging for the implementation side, for example, local contractors local suppliers because they are not well aware." (2P3)</i></p>
Foresighted thinking on the green agenda	The achievement of successful implementation of changes aimed at shifting towards sustainability necessitates the ongoing enhancement of worker efficiency. Foresighted thinking on the green agenda will nurture interest and cultivate innovative thinking.	Lambrechts et al. (2019)	<p><i>"Foresighted thinking is an important capability in sustainability because we cannot see the benefits of green procurement as soon as tomorrow. You need to think afar and believe in this movement" (1P4)</i></p> <p><i>"I agree. We cannot see the positive impact of green yet. That is why stakeholder needs to have foresighted thinking on this green." (1P3)</i></p>

4.4.2 System Thinking Capabilities

System thinking capability refers to assessing complex systems comprising the three pillars of sustainability and spanning multiple phases. Five system thinking capabilities are identified from the literature: knowledge sharing, green knowledge, skills, green training, and technical competencies. Comprehending and achieving successful outcomes in sustainability necessitates a comprehensive comprehension of systems that exhibit enough equilibrium across the three primary pillars of the Triple Bottom Line (TBL). Wiek et al. (2011) claim that having a set of systems thinking abilities plays a critical role in successfully implementing a sustainable transition plan. The key idea for the system thinking capability is to build the capability to embrace green practices among stakeholders and build a platform for sharing knowledge among project teams.

A comprehensive understanding of complex social-ecological systems' internal structure and dynamics is essential to pinpointing intervention points, projecting future trajectories, and staging transition processes. The commitment from stakeholders who have decision-making influence affects the level of capacity development in this category. Success in instilling these capabilities will accelerate the support gained from the stakeholders to adopt the ideas and do their best. For example, understanding construction procurement principles is clear to all stakeholders because it has become the norm in the industry. However, green-oriented procurement is something new and will raise many questions. Incorporation of green specifications into building design and the selection of construction materials will make the project design team have to learn something new, and it takes time. This green specification also needs to be elaborated into tender and contract requirements (Nissinen, Parikka-Alhola, & Rita, 2009) and needs to be understood by contract advisors and construction contractors. The failure of each party in the construction project to understand the green practices and objectives will cause a delay in the completion of the project, or even the cost of the project will increase (Lam et al., 2009).

As quoted by one of the respondents: "When we want to implement green or green procurement, transparency and visibility are important so that people know the meaning and reasons behind green procurement. Lack of green knowledge is what hinders the adoption and implementation of green procurement" (1P7). All five (5) items of system thinking capability have been verified and will be incorporated into the subsequent phase of this research (Refer to Table 4).

Table 4 Key Points from Literature and Focus Group Discussion on System Thinking Capability

Key practice	Literature	Key point quoted from FGD participants
Knowledge sharing	Knowledge sharing among project teams or organisations to build competencies is essential to achieve project objectives. Construction projects involve many stakeholders who have various backgrounds and also from various organisations.	Noranarttakun and Pharino (2021) <i>"Developing manual training guides and active knowledge sharing is important too. Maybe we can have knowledge sharing among regions as we had in the institute" (IP7)</i> <i>"Our organisation has many stakeholders. Therefore, knowledge sharing among different type of stakeholder may help in collecting important data. If only one party is excited to go for green, it won't happen successfully" (1P2)</i>
Green Knowledge	The acquisition and application of green knowledge are crucial in implementing environmentally sustainable practices. Each project team member must possess knowledge of the practices and principles of procurement and green practices to prevent any misinterpretations and mitigate potential challenges in effectively attaining green targets.	AlNuaimi et al. (2021), Ershadi et al. (2021) <i>"If the stakeholders, especially those who are on-site, do not have green knowledge, we cannot further implement green practices either. They will change the architect specification back to the conventional specification" (1R2)</i> <i>"that's why we need to develop the vendor plan and then to get the supply easily. The client can plan but we faced supplier problem" (1P2)</i>
Skills related to green	The proficiency of individual skills in green practices favours the successful execution of green procurement and attaining project goals. The acquisition of these skills depends upon an individual's inherent abilities and personal motivation to cultivate them.	Ershadi et al. (2021), AlNuaimi et al. (2021), Grandia and Voncken (2019) <i>"To push the implementation of green procurement, we need stakeholders to have sufficient skill in green practise. For example, the design of IBS and the installation. Many projects failed because the designer is now aware" (1P6)</i> <i>"the green initiative was started during construction phase so there was chaos there. We had a lot of variation order, omit every material, and find new green product material. We then seek advice from GBI facilitator". (2P4)</i>
Green training	The organisation's dedication to enhancing individuals' capacity to implement green practices is demonstrated through training. One of	Ershadi et al. (2021), Wang et al. (2020), Stekelorum et al. (2020) <i>"Sustainability training is one of the mandatory trainings in my organisation. Green training is important to educate them (stakeholders) to understand at least basic knowledge on sustainability." (1P7)</i>

	the primary methods for strengthening green practices within an organisation is providing training by qualified experts or internal stakeholders.		<i>"When green procurement is ready to be implemented later, we should call all the project team involved, guide them on elements needed, and create a workshop for them. We must cultivate the interest" (1RP5)</i>
Technical competencies	The level of technical competence exhibited by members of the project team can have a significant influence on the efficacy and productivity of implementing green practices. Projects with a primary focus towards moving to a greener approach will depend on the technical competence of the individual in the project in terms of design, planning and practicality.	Radebe & Ozumba (2021), Pizone et al. (2019)	<i>"For project XX, they have already gotten 4 stars, but they wanted to get 5 stars, so they check on which requirement they did not score.....This is where those have the technical knowledge being called in" (1P1) GBI Facilitator fall under this qualified stakeholder, and we are engaging them to help us to kick off our green project (2P5) For green construction materials, we are dealing with lower class of contractor only G1 or G2. Their level of awareness and knowledge is not there yet. It is very difficult". (2P1)</i>

4.4.3 Interpersonal Skills Capabilities

Interpersonal skills capabilities enable collaborative and participatory resolution (Wiek et al., 2011). These capabilities are essential for effective stakeholder collaboration. For this research, seven (7) items were included in the interpersonal skills capabilities: leadership, teamwork, communication, acquisition ability, motivation, innovation ability, cooperation, and highest effort or role model (Refer to Table 5).

Creating awareness and strengthening knowledge of green procurement offers the best opportunity to adopt green procurement. This may be because most practitioners who manage procurement are unaware of the potential of green procurement for green projects. The lack of familiarity, knowledge and interest among individuals in the project in green procurement related to construction can be a weakness that can cause low support for the sustainability agenda. Individual development involves the development of self-motivation that internal or external factors may drive. Internal factors are the nature of wanting to know or self-awareness regarding the environment and external factors such as government policies, rewards and even recognition. The concept of a collaborative approach is being explored by Bidin et al. (2022) to encourage progressive communication and engagement between government and construction stakeholders involved in the construction sector because the element of collaboration is very important to ensure green practices are successfully implemented. The team member needs to possess teamwork skills for a smooth operation.

Most participants agreed with all the capabilities listed under the interpersonal skills ability. Communication will signal the team member to be in the same direction as the project green objective (Hwang & Ng, 2013). The commitment must come from the individual who has a personal interest. Among the statements most quoted by the participants are as follows:

"We cannot work among architects only, and we have to involve other stakeholders such as engineers, clients, and project team leaders. We can also work with the state government" (R4). Organisations can complete complex projects on time and deliver high customer outcomes by embracing collaboration with project teams (Dhurup et al., 2016).

Table 5 Key Points from Literature and Focus Group Discussion on Interpersonal Skills Capabilities

Key practice	Literature	Key point quoted from FGD participants
Leadership	Leadership in project management is widely acknowledged as a crucial skill that plays a vital role in successfully attaining project goals. The facilitation and affirmation of leadership play a critical role in enabling significant accomplishments and enhancing organisational success. Leadership can establish guidelines and identify novel avenues through which people can contribute to business innovation. Leadership within the construction industry can be attributed to either the project owner or stakeholders who possess authoritative influence over the project's objectives.	Nandasinghe (2020), Ferme, Zuo and Rameezdeen (2018) <i>"The leader should be passionate about this green agenda" (1P2)</i> <i>"We should include the project leader and the client from the start, and the leader should guide their people under it on green" (1P4)</i> <i>"The SO is the leader on-site; they should be stern. Even when the bills of quantity were already mentioned in the tender, but when it comes to management on site, the contractor changed to the normal product on whatever reasons, then the SO agreed, it will be not effective" (1P1)</i>
Teamwork	The attainment of successful project outcomes necessitates establishing effective collaboration among team members from diverse disciplinary backgrounds. A construction project comprises temporary collaborations of various companies and experts who come together to work towards a common objective during a specified timeframe. Therefore, each	Stekelorum et al. (2020), Ferme, Zuo and Rameezdeen (2018), (Tabassi et al., 2016) <i>"As a start, I think we should start to team up with members from our organisation to help us in providing data" (IP2)</i> <i>"We cannot work among architect members only, and we should involve other stakeholders such as the engineers, the client, and the head of the project team. We may also cooperate with the government" (IP4)</i> <i>"The government also should work hand in hand without pushing the responsibilities to other parties" (2P5)</i>

	individual's contribution is crucial to function as a cohesive team and work collectively towards a common goal.		
Communication	The presence of communication flow structures is widely acknowledged as a crucial factor in ensuring the success of a project. Effective communication of information across phases is crucial for preventing information loss and minimising the risk of project failure within the team.	Ferme, Zuo and Rameezdeen (2018), Jha and Iyer (2006)	<i>"...The green agenda must be communicate. The communication cross stages, we should tackle this issue" (2P2)</i> <i>"We should communicate, especially to the green core team, to guide us, the miles stone we need to achieve. A lot of discussion and communication should be done so that the stakeholder know exactly how to execute the goals" (IP6)</i>
Procurer capabilities	To effectively advance environmental enhancement through the implementation of green procurement practices, it is crucial to additionally consider the procurer's capabilities. The term "procurer" in this particular context refers to individuals actively engaged in the decision-making process on the direction of a project, encompassing aspects such as project design, specifications, and implementation.	Rainville (2017)	<i>"Procurers should be educated on green material and requirement. If they don't, and they already supplied that item, we can't change it because to them it involved their money" (IP3)</i> <i>"All the stakeholders must go under training that they must take so that they are familiar with all the regulations especially procurers" (1P7)</i> <i>"we have no idea about what is this green procurement, not even for products and services"(2P2)</i>
Motivation	Motivation catalyses individuals to actively engage and progress towards the objectives of a given undertaking. Inspiration and motivation can be shaped and influenced by various circumstances,	Al Nuaimi and Khan (2019), Rainville (2017)	<i>"The successful implementation of green in construction depends on the motivation of the stakeholders, especially those who work on site. He has to find the Head of the project that is very motivated in doing green" (1P2)</i> <i>"The critical point for this sustainability thing is the motivation of the employees" (IP4)</i>

	including the presence of a reward system and the individual's level of understanding.		
Innovation capability	The organisation's ability for innovation has a favourable impact on implementing environmentally sustainable practices. The level of capability innovation is contingent upon the maturity exhibited by both individuals and organisations in adopting novel and creative methodologies.	Al Nuaimi and Khan (2019), Luzzini et al. (2015)	<p><i>"From time to time, we should improve the guidelines" (IP3)</i></p> <p><i>"The ministry encourages us as government organisation to apply innovation and look into new avenues. One of the innovations now is green procurement in the construction industry" (IP6)</i></p>
Role model	Role models like peers, pioneers, or change agents are essential in breaking non-sustainable behavioural patterns.	Wong et al. (2016)	<i>"As government who leads the country, they should portray a great role model in leading the green agenda. If government find it difficult, then it is difficult to bring it down to further level" (IP5)</i>
Collaboration	Collaboration is a higher level of integration where stakeholders share similar authority and responsibility and work together for a common goal.	Ferme, Zuo, & Rameezdeen (2018)	<p><i>"Collaboration with ISO to develop a new standard for green material" (IP7)</i></p> <p><i>"If we don't collaborate with others, especially for a small department like us, it would be challenging." (IP8)</i></p> <p><i>"so they already practice it, so, company like Company X and Y, they coming in to collaborate with us, as they already established" (2P5)</i></p>

4.4.4 Strategic Capability

Strategic capability refers to the combined capabilities to develop and execute strategies for intervention, the theory of evolution, and transformation to achieve sustainability (Wiek et al., 2011). According to Wiek et al. (2011), this capability also encompasses the ability to effectively navigate real-world contexts and relationships, comprehend political dynamics, adopt strategic positions at opportune moments, resolve logistical challenges, and adhere to government-imposed time constraints. Pursuing sustainability necessitates implementing equally sophisticated transformative techniques that align with a green agenda. In many cases, the construction project is complicated; the project team will forego the green principles due to time pressure and cost constraints (Hwang & Ng, 2013). Thus, the strategic capabilities need to be tightened to effectively and rationally meet the project objectives.

Hence, these capabilities facilitate the conversion of strategic planning into actionable steps. There is a consensus among all participants that the provision of green incentives by governments would enhance the motivation of contractors to embrace environmentally friendly practices. Kiesnere and Baumgartner (2019), da

Cunha Bezerra, Gohr & Morioka (2020) highlighted the corporate responsibility commitment from the organisation to integrate the principles of sustainable development into their operations. As quoted by one of the respondents: *“All stakeholders should be familiar with government policy, especially related to green procurement. In our organisation, sustainability policy is one of the mandatory training”* (1P7). All six (6) items of strategic capability have been verified and will be incorporated into the subsequent phase of this research (Refer to Table 4). Although none of the participants gave strong evidence that corporate responsibility support will help to enhance the people capability factors, the participants agreed to retain this item as the literature strongly supports it. The participants highlighted it could be the practices in the authors’ locality which have yet to be widely adopted in the local context (Refer to Table 6).

Table 6 Key Points from Literature and Focus Group Discussion based on Strategic Capability

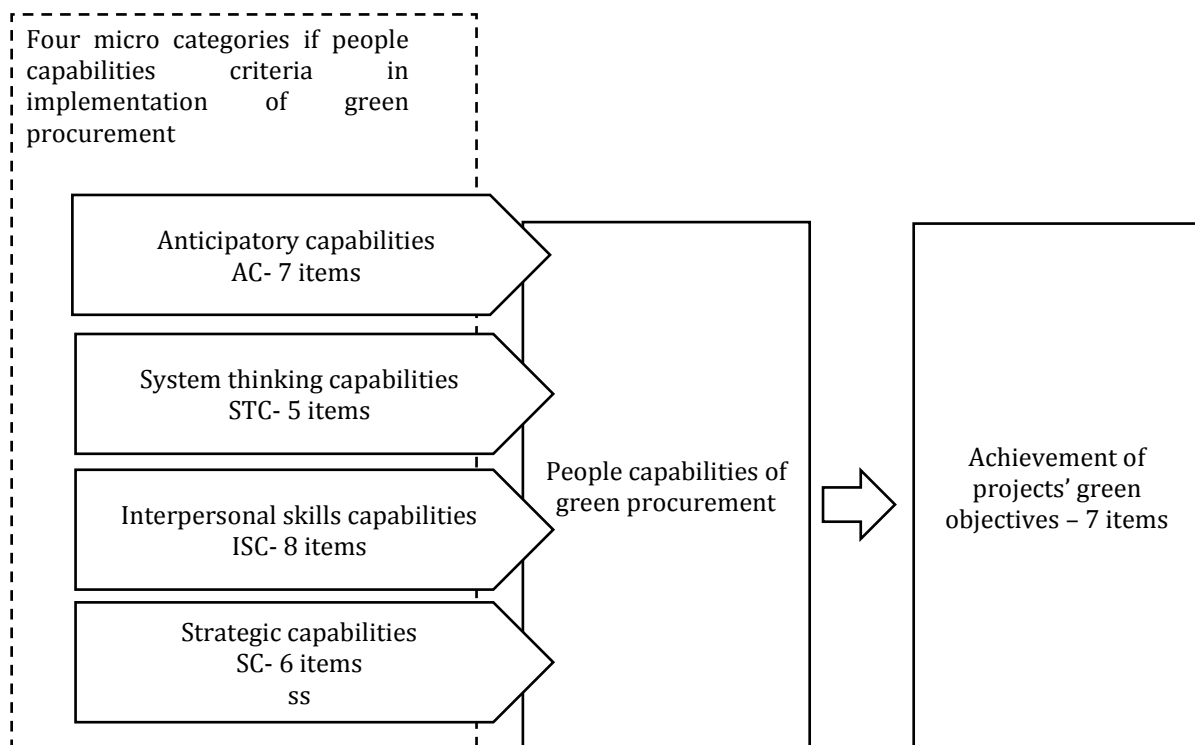
Key practice	Literature		Key point quoted from FGD participants
Early contractor involvement	The improvement of the project lifecycle process flow is achieved by effectively utilising information during the initial engagement of key stakeholders, including the general contractor, specialist consultants, trade contractors, and facilities manager, in the planning and design stages. These stakeholders are the ones who will execute work during the construction stage.	Ferme, Zuo and Rameezdeen (2018)	<i>“We should involve the contractor in green as soon as possible”</i> (1P4) <i>“Maybe we should already have certification for the green contractor so that during the tendering for a green project we could go for green contractor”</i> (1P1)
Internal green policy	Green procurement policies and targets should be propagated throughout the supply chain before further changes are made.	Liu et al. (2022)	<i>“As a government organisation, I think we could make the green requirement for our project mandatory as long as there are guidelines from the authority”</i> (1P4) <i>Kind of decision to put it into a practice and then they have their own internal green procurement system, maybe this things that we can follow”</i> (2P5)
Green Incentives	Incentivising green procurement practices for the public sector can help boost its implementation.	Ershadi et al. (2021), Bidin et al. (2020), Ahsan and Rahman, (2017)	<i>“Unless there are subsidies or discounts provided by the government when they want to adopt green”</i> (1P3) <i>“Maybe the ministries should give incentives to those who are willing to adopt green so that it will help to push the acceptance of green procurement”</i> (1P7) <i>“government provide the grant or incentives for the contractor and surely they will go for it”</i> (2P2)
Life cycle cost awareness	One of the most significant barriers to the widespread use of life cycle costing in the building industry is the	Gopanagoni & Velpula (2020)	<i>“During the initial stage, we should be aware of the client, especially on the life cycle cost of green concept”</i> (1P3)

	lack of understanding of its methodology and application.		<i>"There should be a lot of awareness on green costing" (1P1)</i>
Familiar with government policy related to environmental regulation	Government policy and industry guidelines have raised awareness among construction stakeholders and encouraged public and private project clients to pursue green projects.	Liu et al. (2022)	<i>"All stakeholders should be familiar with government policy, especially related to green procurement. In our organisation, sustainability policy is one of the mandatory training." (1P7)</i>
Corporate responsibility benefits	Corporate social responsibility is a framework that companies can use to integrate the principles of sustainable development into their operations.	Kiesnere and Baumgartner (2019), da Cunha Bezerra, Gohr & Morioka (2020)	

5. Key Findings and Summary

Green procurement is the communication tool that can integrate all the green practices available in the construction industry and achieve a green project mission. However, no empirical data is available and presented as this research is still exploratory. When analysing the variables for the people capabilities in the context of green practices in the construction industry, this research started with a literature search and conducted the FGD to grasp the opinions from the experiences of participants in green projects in the context of local industry in Malaysia. The revised model for green procurement implementation in the Malaysian construction industry is presented in Fig. 4.

Fig. 4 The revised people capability for green procurement in the Malaysian construction industry conceptual framework—an outcome of the Literature review and Focus Group Discussion Analysis



This study has explored the literature from Malaysia and other countries to establish the factors determining green procurement orientation. Meetings with experienced practitioners in the construction industry and green building projects were conducted to explore current practices in the Malaysian construction industry and confirm findings from the literature. The research acknowledges the need to adopt green procurement as a project deliverable to achieve better results from project green performance. In the view of the construction management concept, construction projects are temporary organisations formed by stakeholders from different permanent organisations with different skills. These stakeholders are important, as they are vital to leading the process. There should be continuous training to ensure consistency and persistence in terms of commitment and to improve knowledge and skills to form a more efficient project team. However, an in-depth study regarding people's capability has not been carried out in the construction industry, and the human factor is the basis for carrying out activities in the construction industry. This human factor can determine whether or not the project is successfully carried out as planned. The framework derived from this study has an impact on the literature in the field of green procurement for construction projects.

6. Future Research and Recommendation

The present study is grounded in focus group talks conducted with small groups within the construction industry in Malaysia. The focus group discussion centred on the human factor, specifically, individuals' capability to embrace green procurement practices. The evolving perspective is supported by existing research investigations, providing solid validation. Nevertheless, the size of this group is insufficient for formulating proposals that can yield a substantial influence. The perspective on sustainable development may vary considerably between Malaysia and other Southeast Asian countries actively pursuing sustainable development initiatives.

Moreover, it is worth noting that there can exist variations in green development ideas across countries, even when they share geographical proximity and cultural similarities. This component is additionally influenced by the prevailing economic conditions and the impact of the country's leadership direction. When examining countries such as Singapore, water usage is a prominent aspect of environmental assessment methods; meanwhile, it is the energy efficiency in Malaysia and Vietnam. Due to the nascent nature of green procurement research within the construction sector in Malaysia and other Southeast Asian nations, the majority of studies conducted thus far have adopted an exploratory approach to assess its potential. It is essential to undertake empirical investigations to enhance the effectiveness of recommendations. A potential avenue for research involves doing a comparative analysis of the preparedness levels, in terms of both capabilities and resources, among several Southeast Asian countries that share similar demographic characteristics and financial standings. To establish benchmarks, it is advisable to conduct a comparative analysis of developed nations that have implemented green procurement practices in the context of this construction project. These proposed discoveries have the potential to facilitate the development and expansion of research within this sector, thereby contributing to the existing body of knowledge.

7. Conclusion

This study examines the factors on people's capabilities that may impact the effective implementation of green procurement. Two focus groups were established to investigate this subject matter using comprehensive group talks. Both focus groups systematically identified and categorised the people capabilities, drawing upon the participants' experience and knowledge. The focus group discussion (FGD) participants express that the four areas of people capabilities; that are anticipatory capabilities, system thinking capabilities, interpersonal skills capabilities and strategic capabilities, hold significant relevance. The results mentioned above were given, and the inquiries employed for the focus group discourse were posed.

Nevertheless, the participants expressed a necessity for enhancing the capabilities of all stakeholders involved in the project development supply chain. The formulation lacks optimism in light of the empirical findings from previous studies conducted within the sustainable construction sector. Hence, further research endeavours should be undertaken to corroborate this formulation's mapping to evaluate its validity. Further testing is necessary to determine this empirical formulation's validity. A more comprehensive range of relevant measures is needed to enhance confidence in the industry and promote sustainable development. The concept of green procurement, as outlined in the national financial policy RMK-12 and the construction industry policy, holds significant relevance in providing stakeholders with the opportunity to consider the human factor and develop the necessary skills to support the implementation of green construction projects.

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