Guidelines for Facilitating Stakeholders Roles in Community Engagement in Green Social Infrastructure Development

Md Asrul Nasid Masrom[1,2]*, Chukwuka Christian Ohueri[3], Ajlaa Najihah Azman[4], Melissa Chan[5]

[1] Centre of Sustainable Infrastructure and Environmental Management (CSIEM), Faculty of Technology Management,
Universiti Tun Hussein Onn Malaysia, Parit Raja, Batu Pahat, 86400, Johor, MALAYSIA

[2] GreSafe Research Group,
Universiti Teknologi MARA (UiTM), Perak, MALAYSIA

[3] Faculty of Technology Management,
Universiti Tun Hussein Onn Malaysia, Parit Raja, Batu Pahat, 86400, Johor, MALAYSIA

[4] Department of Construction Management, Faculty of Technology Management,
Universiti Tun Hussein Onn Malaysia, Parit Raja, Batu Pahat, 86400, Johor, MALAYSIA

[5] College of Engineering and Science,
Victoria University, Melbourne, Victoria, 3011, AUSTRALIA

*Corresponding Author: asruln@uthm.edu.my
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Abstract

Green social infrastructure development is crucial for fostering environmentally friendly and socially inclusive communities. Stakeholder-community engagement integrates diverse perspectives, local knowledge, and cultural values into green social infrastructure, reflecting the community's identity. However, stakeholders do not adequately engage the community in decision-making processes during the green social infrastructure development, primarily due to the lack of clear and comprehensive guidelines. The aim of this study is to develop guidelines to enable stakeholders to adequately engage with communities during the development of green social infrastructure. An in-depth interview was conducted with 10 construction stakeholders in Malaysia and the data gathered were analyzed using Thematic Content Analysis. The findings reveal that stakeholders' integration with the community, involvement of the community in all project phases, and provision of adequate healthcare services for the communities are among the most effective guidelines that will facilitate stakeholder role in community engagement in the development of green social infrastructure. As a result, recommendations were made for effective stakeholder community engagement such as conducting a socio-economic study in the target area and preparing a petition box for the communities to communicate with stakeholders. The outcome of this research provides insight to stakeholders on their roles in incorporating sustainable practices that aligns with community needs, which in turn

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foster a sense of ownership, thereby paving the way for a greener and more resilient future in Malaysia.

1. Introduction

Green social infrastructure refers to the creation of sustainable and inclusive public spaces that enhance the quality of life while minimizing the environmental impact (Woods & Thomsen 2021). Countries like Malaysia with rich natural resources and diverse communities are increasingly recognizing the importance of incorporating green social infrastructure into the process of sustainable construction strategies. This is paramount to addressing pressing environmental challenges, enhancing the well-being of its citizens, and promoting a sustainable and inclusive community (Varma and Palaniappan, 2019). Stakeholders play vital roles in engaging the community in green social infrastructure development. According to Hassen and Kaufman (2016); Tanguy et al., (2020), the engagement of the community by the stakeholders in the development of green infrastructure fosters the harnessing of local knowledge and expertise, social cohesion, and project acceptance and legitimacy. Besides, it ensures the projects are community-driven, sustainable, and align with the specific needs and aspirations of the dwellers (Everett et al., 2021).

However, Varma & Palaniappan, (2019) opined that the green social infrastructure development process is expert-driven, and stakeholders have not actively engaged the diverse voices of the community in the planning, design, and implementation of green infrastructure. This has resulted in the lack of adequate information to make critical decisions, inaccessibility to the project site, and backlash (Campbell-Arvai and Lindquist, 2021). This is evident in the disapproval of several construction projects by communities in several countries. In Malaysia for instance, in 2021, The Star-News - an online newspaper in Malaysia reported that residents in Brickfields protested the construction of a 38-story office block and threatened to take legal action against Kuala Lumpur City Hall (DBKL) and the Housing and Local Government Ministry due to safety concerns. On another occasion, 3000 people from Gua Musang signed a petition against the construction of a hydroelectric dam due to the adverse effect on the lives of the inhabitants. Inadequate community engagement in green infrastructure development, installation, and maintenance may trigger the community workforce to boycott the construction works which leads to delays in the project's progress, and unbudgeted cost of importing foreign construction workers to fill the labor shortage gap (Zamora & Carballo, 2018).

To address the aforementioned issues, studies such as Holloway and Parrish, (2015); Klinenberg, (2018); Hamdan et al., (2021) have provided insight into stakeholders' roles in promoting community engagement with a focus on conventional infrastructures. Ferreira et al., (2020) explored the current state of the art regarding citizen and stakeholder participation in nature-based solutions. Parker and Simpson, (2018), conducted a systematic quantitative review of how public green infrastructure contributes to city livability. Everett et al. (2021) proposed a set of generic template principles for greater community co-production of blue-green buildings. Yusoff and Darus (2012) emphasize the relationship between stakeholders and communities in Malaysia. However, the aforementioned studies still lacking of clear guidelines to facilitate stakeholders' roles in community engagement in green social infrastructure development, particularly in Malaysia (Baba-Nalikant et al., 2023). Hence, this study aims to develop concise guidelines to enable stakeholders to adequately engage with communities during the development of green social infrastructure. Furthermore, recommendations are provided for effective stakeholder community engagement. The outcome of this research provides insight to stakeholders on new roles that applies the emerging information communication technology for a better engagement with the community to meet community needs, foster a sense of ownership, and pave the way for a greener and more resilient future in Malaysia.

2. Community Engagement in Green Social Infrastructure

Green social infrastructure refers to the creation and development of sustainable and environmentally friendly public spaces and amenities that enhance the well-being and quality of life of communities (Romanovska et al., 2023). Additionally, it encompasses the design, construction, and management of physical infrastructure, such as parks, churches, mosques, gardens, urban forests, green roofs, community centers, and recreational facilities, with a focus on ecological sustainability, social inclusion, and community benefits. Chatzimentor et al. (2020) reiterated that green infrastructure provides numerous benefits, including improved physical and mental health, enhanced social cohesion, reduced urban heat island effect, biodiversity conservation, and stormwater management. Besides, it creates harmonious and sustainable urban environments and resilient cities that support ecological processes, enhance environmental sustainability to address climate change, and meet the diverse needs and aspirations of communities (Ying et al., 2022).
The development and maintenance of green social infrastructure require the involvement of various stakeholders, including local communities, government agencies, non-profit organizations, private sector entities, and academic institutions. Community engagement is of utmost importance in the development of green

social infrastructure globally. in Malaysia, community engagement is critical in ensuring that projects are relevant, socially inclusive, and environmentally sustainable. By involving the local community in decision-making processes, green social infrastructure initiatives can effectively address the specific needs and aspirations of the community, leading to better outcomes and increased project acceptance (Barclay and Klotz 2019; Casey 2005). According to Kambites and Owen (2006); Mullenbach et al., (2019) key benefit of community engagement is that it brings diverse perspectives to the table, allowing for a more comprehensive understanding of the community's priorities and concerns. Furthermore, community engagement promotes social inclusivity by ensuring that the voices of marginalized groups are heard and considered.

From an environmental perspective, community engagement in green social infrastructure development enables the identification of sustainable solutions that align with local environmental values and priorities (Agarchand and Laishram, 2017). This can lead to the preservation and enhancement of natural resources, the integration of green technologies, and the promotion of sustainable practices in the design and management of the infrastructure. However, excluding community voices from the decision-making process can have significant drawbacks. It can lead to a lack of project relevance, as the infrastructure may not meet the actual needs and aspirations of the community (Bednarska-Olejniczak, et al., 2019). Exclusion can also result in a lack of trust and resistance from the community, leading to project delays, conflicts, or even abandonment. Additionally, excluding certain groups from participation can perpetuate social inequalities and undermine the overall sustainability and effectiveness of the infrastructure. Therefore, it is paramount that the stakeholders apply an approach considering the technological advancements in digital communication and information exchange, to adequately relate with the community for a common interest.

3. Stakeholders' Role in Community Engagement in Green Social Infrastructure Development

Stakeholders play a crucial role in engaging the community in the development of social green infrastructure projects. Their expertise, knowledge, and skills are essential in ensuring effective communication, collaboration, and community involvement throughout the project lifecycle. Hamdan et al., (2021) suggested that the crucial step in community engagement is the stakeholders' integration into the community to become part of the community. It is necessary to research the community culture and peruse communities' governing documents (e.g., by-laws, articles of incorporation, rules, and restrictions) (Molla, 2020). In addition, locating these documents and perusing them enable the stakeholders to have firsthand information about the community. Also, Liaising with the community's municipal council and conducting meetings using various effective communication approaches is pivotal. Afterward, various mediums of communication ought to be implored to interact with the host community. According to Teo and Loosemore (2017), effective communication that facilitates clear and transparent information sharing between project stakeholders and the community must be applied, thereby ensuring that project plans, objectives, and progress are effectively communicated to the community, addressing their concerns as regards the infrastructure development. The needs, preferences, and aspirations related to the social green infrastructure project can be identified by conducting needs assessments, surveys, and focus group discussions with the community (Becker, 2015).

Smith et al., (2020) postulated that stakeholders can actively engage the community by organizing meetings, workshops, design charrettes, and collaborative sessions with local communities, government agencies, non-profit organizations, and other relevant parties. Then the valuable insights gathered due to this procedure can inform the design and implementation of the project, ensuring it meets the specific requirements of the community. Apart from that, this approach will foster dialogue, address conflicts, and ensure the active participation of stakeholders in decision-making processes throughout the infrastructure development phases (Smith et al., 2020). Notably, community engagement strategies tailored to the specific project and community context must be developed by the stakeholders. This may include organizing community events, public consultations, and educational campaigns to raise awareness, build trust, and encourage community participation during the design, construction, and post-construction of social green infrastructure (Nour, 2011). Hussain et al., (2023) suggested that the community should continuously be engaged even after the completion of the project. In this regard, post-construction evaluations and surveys are used to gauge community satisfaction and monitor the long-term impacts of the green social infrastructure on the community (Bakalian and Wakeman 2009; Yulianto et al., 2021). This ongoing engagement helps nurture a sense of ownership, sustainability, and continued community involvement.

Scholars such as Yulianto et al., (2021); Ohueri et al., (2022) have reiterated the importance of institutional support in promoting green infrastructure. Thus, it is paramount for stakeholders including government agencies, non-profit organizations, and private entities to provide services and alternatives for the health and comfort of occupants; and essential resources such as funding, technical support, materials, and equipment for green social infrastructure projects. Also, stakeholders ought to work with the government and other NGOs to empower the community as it meets the demands of social sustainability. Stakeholders can serve as mediators

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and facilitators, fostering constructive dialogue and collaboration between different community members, organizations, and interest groups. They help bridge gaps, address conflicts, and promote inclusive decision-making processes, ensuring that diverse perspectives are heard and respected. Local labor ought to be encouraged and motivated by providing incentives, and introducing favorable economic policies as regards increase wages and payment for overtime (Ohueri et al., 2018). Previous studies on the roles of stakeholders in community engagement in infrastructure development, including green social infrastructures are reviewed and summarised as depicted in Table 1 below.

Table 1 *Roles of Stakeholders' Engagement in Infrastructure Development*

No.	Roles	Sources
1	**Advocacy and Representation**: Stakeholders advocate for the community's interests and ensure their perspectives are heard during the development process.	Lau et al., (2020)
2	**Resource Provision**: Stakeholders contribute financial and technical resources to support community engagement and project implementation.	Goodman, et al. (2020)
3	**Capacity Building:** Stakeholders provide training to empower community members to actively participate in decision-making.	Alam et al. (2022)
4	**Information Dissemination**: Stakeholders use emerging technologies to efficiently share project information and encourage community awareness.	Hamdan et al., (2021)
5	**Inclusive and Transparent Communication:** Stakeholders foster open and transparent channels for feedback and concerns.	Smith et al., (2020)
6	**Conflict Resolution:** Stakeholders mediate conflicts and facilitate dialogue among stakeholders and the community.	Molla, (2020).
7	**Innovative Solutions:** Stakeholders explore and introduce sustainable approaches for community development.	Mullenbach et al., (2019)

Based on Table 1, it shows that the stakeholders' roles that facilitate community engagement by providing a more inclusive, sustainable, and community-driven approach to infrastructure development.

4. Guiding Principles Leading to Effective Community Engagement Interventions

The importance of engaging the community in green infrastructure projects has warranted many publications in the domain. However, there is still limited of a cohesive approach that critically examines in-depth, the best practices of the principles that can guide stakeholders when engaging communities in green social infrastructure projects. Thus, this study reviews previous studies to identify the guiding principles leading to successful community engagement interventions. This is highlighted in Table 2.

Table 2 *Summary of Guiding Principles Leading to Successful Community Engagement*

No.	Principle	Source
1	Ensure staff provides supportive and facilitative leadership based on transparency. ● Provide public access to all relevant resources. ● Implement two-way communication with the public. ● Facilitate the public's understanding of the topic.	Chan & Benecki, (2013); Yulianto et al., (2021)
2	Provide a safe & trusting environment to enable communities to provide input. ● Invest resources in the building of trusting relationships with communities. ● Tailor strategies to the public's needs and preferences. ● Hold meetings outside the organizational sphere. ● Adjust meetings and activities according to the public's needs. ● Have the public to co-run the chair boards. ● Hire staff with diverse cultures and demographics to better reflect and connect with the communities.	De Freitas & Martin, (2015); Bakalian and Wakeman (2009)
3	Ensure the public's early involvement. ● Discuss with them the stage at which they want to be involved. ● Align organizational and citizens' health definitions and priorities. ● Include the public in early assessments and identification of priorities.	Carlisle, (2010); Hussain et al., (2023)
4	Share decision-making and governance control with the public. ● Including the diverse team in the decision-making process ● Place citizens in leadership and decision-making positions. ● Share relevant resources and tools with an engaged community.	Durey et al., (2016); Smith et al., (2020)

5	Consider both community's and the organization's motivations. ● Be flexible and allow the public to focus only on those issues that interest them. ● Be transparent about organizational motivations and requirements. ● Be open and receptive to communities' negative service-usage experience.	De Freitas & Martin, 2015); Romanovska et al., 2023).

Table 2 summarizes the guiding principles leading to successful stakeholders' community engagement in green social infrastructure. This provides a guide to the researcher and prompts further in-depth investigation to identify the new roles of stakeholders in engaging the community infrastructure project, considering the social, economic, and environmental aspects of sustainability, and advancement in information and communication technology. The method applied in actualizing the research aim is presented below.

5. Research Methodology

This study aims to develop guidelines that enable stakeholders to adequately engage with communities during the development of green social infrastructure. To actualize the research aims, firstly, comprehensive review of related literature was conducted. A literature review involves the analysis of previous scholarly articles, books, and other sources regarding a particular topic, to have an overview of current knowledge, allowing the research to identify relevant theories, methods, and gaps in the existing research (Hiebl, 2023). The literature review conducted in this study provided insights into the new roles of stakeholders in community engagement and generic guiding principles for enhancing stakeholders' roles in community engagement in green social infrastructure. Then, a qualitative research method was adopted in this study to deeply explore stakeholders' perspectives and experiences in community engagement, primarily to establish guidelines for facilitating stakeholders roles in community engagement in green social infrastructure development, and recommendations for effective stakeholder community engagement. This aligns with Islam and Aldaihani's (2022) study that defined qualitative research as a method that focuses on understanding and interpreting the meaning and experiences of individuals or groups within their natural context, providing in-depth insights into complex phenomena. There are a number of data collection methods available for a qualitative researcher, including interviews, observations, focus group discussion (FGD), textual, and visual analysis (Creswell and Poth, 2018). In this study, a widely accepted in-depth interview was used as the means and instrument for conducting the qualitative research. An in-depth interview is a powerful qualitative research method that allows researchers to explore complex issues and gain rich insights (Lungu, 2022). Additionally, it facilitates the establishment of personal connections with participants, making it an effective and valuable approach for this study's context. Precisely, a semi-structured interview was adopted in this study. Compared to structured and unstructured interview, the semi-structured interview is more flexible and creates two-way communication between the interviewer and interviewee; therefore, open-ended responses can be taken, which allow the former to gather more in-depth information relating to the research topic or issue (Lungu, 2022; Islam and Aldaihani, 2022).

The research population was mostly stakeholders with community engagement experience. Through purposive sampling technique, 10 stakeholders were selected based on their availability, and their willingness to provide quality information that will enrich the findings of this research. This in line with Struwig and Stead's (2007) assertion that the purposive sampling technique is adopted in qualitative based on the availability and accessibility of respondents. Online interview was conducted due to limited resources to travel across Malaysia to interview the professionals. The Interview data were recorded by a recording device, as the interviewees gave their consent. The essence of recording interview data is to reduce the chances of information misinterpretation that can jeopardize the authenticity of this research. Creswell and Poth (2018) argued that the strength of interviews lies in the technique applied in analyzing the data. Therefore, the recorded interview data were transcribed using thematic content analysis. According to Sekaran and Bougie, (2016), content analysis involves a descriptive presentation of qualitative data by familiarizing with the data and generating initial codes and themes in line with the research topic. Additionally, content analysis is flexible and thorough in terms of coding information and representing it in clear terms for easy understanding and communication (Neuendorf, 2018). Via content analysis interview data collected were carefully analyzed and presented accordingly. The thematic content analysis process is shown in Figure 1.
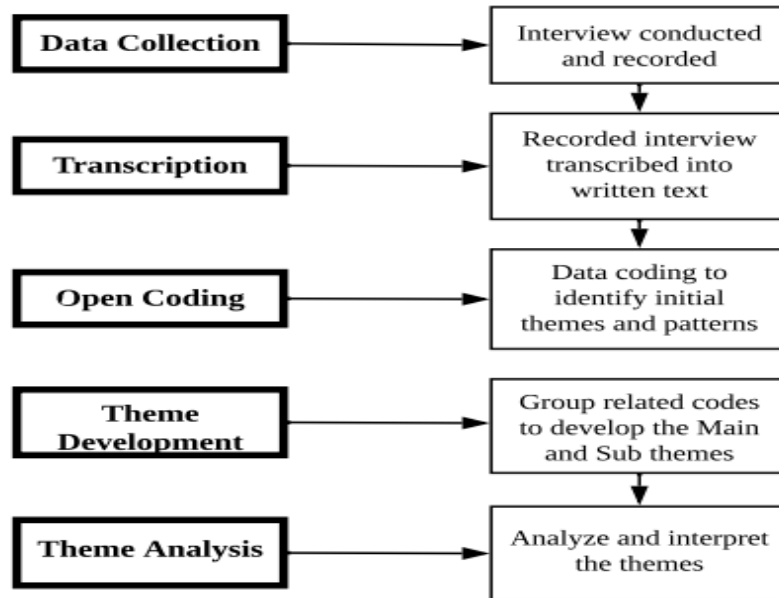
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Fig. 1 *Thematic Content Analysis Process*

Figure 1 depicts the thematic content analysis process for analyzing the interview data which aligns with previous studies on thematic content analysis such as Neuendorf, (2018); Sekaran and Bougie, (2016).

6. Data Analysis and Discussion

Interview data were analyzed using content analysis to develop guidelines to enable stakeholders to adequately engage with communities during the development of green social infrastructure; and provide recommendations for effective stakeholder community engagement

6.1 Demographic of Respondents

The first section of the interview was structured to capture the background of the stakeholders being interviewed to ensure that the respondents have the required background experience on the research topic. The information collected includes their education level, position, working experience, community engagement experience, and type of project involved. Table 3 shows the demographic information of the respondents.

Table 3 *Background of Respondents*

Respondent	Position	Academic level	Working experience	Experience in community engagement	Types of projects involved
R1	Senior Project Executive	Bachelor's Degree in Architecture	7 years	5 years	Buildings
R2	Assistant Manager	Bachelor's Degree in Architecture	8 years	3 years	Buildings
R3	Architect	Master's Degree in Architecture	9 years	9 years	Infrastructure
R4	Quantity Surveyor	Bachelor's Degree in Quantity Surveying	10 years	4 years	Buildings
R5	Construction Manager	Bachelor's Degree in Building Technology	10 years	6 years	Infrastructure
R6	Project Manager	Master's Degree in Project Management	10 years	9 years	Infrastructure
R7	Urban	Bachelor's Degree in	15 years	10 years	City Planning

	Planner	Urban Planning			
R8	Architect	Master's Degree in Architecture	20 years	15 years	Buildings
R9	Project Manager	Bachelor's Degree in Civil Engineering	18 years	10 years	Roads
R10	Consultant	Bachelor's Degree in Estate Management	10 years	4 years	Estates

The demography of the 10 respondents represented with R1 to R10 is shown in Table 3. Mostly, the respondents have been involved in the sustainable construction of buildings, urban and regional planning, real estate, roads, and other infrastructures. For instance, Respondent (R8) has been an Architect for 2 decades and has been involved with community engagement for about 15 years. His response as regards green social infrastructure cannot be overlooked. Also, R4, R5, R6, & R10 have 10 years of experience with green social infrastructures, and years of experience with community engagement varying from 4 years to 6 years. R7 & R9 have been involved with community engagement for a decade. The background information reveals that experienced stakeholders participated in the interview, which is necessary for the delivery of quality and well-informed research (Esechie et al., 2021).

6.2 Transcription of Interview Data

Section 2 of the interview was used to achieve the aim of this study. The recorded interview was transcribed and grouped into themes to determine the most frequently occurring responses. The outcome of the thematic content analysis is tabulated below.

Table 4 *Thematic Content Analysis of Transcribed Interview Data*

Guidelines for Facilitating Stakeholders Roles in Community Engagement in Green Social Infrastructure Development	
Main Theme	**Sub Theme**
Integrate with the community.	- Conduct social research to learn more about the community. - Observe the norms and cultures of the community. - Liaise with the community's municipal council. - Conduct meetings with community chiefs. - Locate and peruse important documents.
Involve the community throughout the phases of green social infrastructure development.	- Difficult to get people involved in this phase and mostly depends on buyers. - Depends on what governing authorities and development need. - Communicate with communities' youths to address conflict and foster dialogue. - Conduct meetings using various effective communication approaches, especially during the design and planning phase.
Provides services and alternatives for the health and comfort of communities.	- Research what facilities exist and improve them. - Based on the socio-economic study, expand the facility, and improve to reduce waste. - Get community feedback and build facilities as per their requests. - Provision of incentives to motivate local workers
Buildings and infrastructure impact people's daily activities	- Sustainable facilities impact occupants' quality of life positively. - Higher productivity of occupants - Facility and social infrastructure promote occupants' comfort greatly.
Includes occupants in all stages of construction to avoid dysfunctionality and opposition	- No involvement of occupants only complies with the requirements of authorities. - Get full support from the community to prevent dysfunctionality. - Engage community representatives in decision-making.
Achieving a socially sustainable project	- Adhere to sustainability criteria, established standards, and building regulations. - Follow government and future development needs. - Ensure occupants' opinions are represented to address their

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Recommendations for Effective Stakeholder Community Engagement in Green Social Infrastructure	
Main Theme	**Sub Theme**
Transparent leadership	● Do social research beforehand that complies with the regulations. ● Provide public access to all relevant resources. Implement two-way communication with the public. ● Facilitate the public's understanding of the topic.
Enabling an environment that fosters communication	● Tailor strategies to the public's needs and preferences. ● Adjust meetings and activities according to the public's needs. ● Have the public to co-run the chair boards. ● Hire staff with diverse cultures and demographics to better reflect and connect with the communities. ● Prepare a petition box for the community to give feedback.
Early engagement of the community in decision-making and governance.	● Liaise with the municipal council. ● Share decision-making and governance control with the public. ● Including the diverse team in the decision-making process ● Place citizens in leadership and decision-making positions. ● Share relevant resources and tools with an engaged community.
Communicating the environmental and socio-economic benefits	● Ensure that natural resources within the community are reserved. ● Adopt strategies that will reduce the carbon emission of green social infrastructure. ● Consider the aesthetics of the green infrastructure to reflect the community's beliefs. ● Create employment for the community.

Table 4 shows the themes of coded interview transcripts that focused on actualizing the overarching research aim. It also shows that frequently occurring themes and sub-themes during the thematic content analysis of the interview data. As shown in the table, the guidelines for facilitating stakeholders roles in community engagement in green social infrastructure development consist of 6 main themes and 22 sub themes. On the otherhand, recommendations for effective stakeholder community engagement encompasses 4 main themes and 17 sub themes. This is further elaborated upon in subsequent section below.

6.3 Findings and Discussion: Guidelines for Facilitating Stakeholders Roles in Community Engagement in Green Social Infrastructure Development

The respondents, R1 to R10 reached a consensus that stakeholders integrating with the community is among the major roles of stakeholders in community engagement in green social infrastructure. Precisely, the respondents suggested that stakeholders ought to conduct social research to learn more about the community's culture and norms. Also, the respondents insinuated that it is paramount to locate and peruse important documents and conduct meetings with community chiefs to facilitate cordial relationships that will lead to the success of the infrastructure development project.

According to R5, "*The first thing anyone should do in a new community is to learn more about the community and show a keen interest in terms of communication and interaction.*"

The findings correspond with previous studies on stakeholders' integration with host communities. For example, Hamdan et al., (2021) suggested that the crucial step in community engagement is the stakeholders' integration into the community to become part of the community. Molla, (2020), cited that perusing communities' governing documents like by-laws, articles of incorporation, rules, and restrictions will facilitate cordial integration into the community.

Another major theme highlighted by the respondents is the involvement of the community throughout the phases of green social infrastructure development. Respondent 1 (R1) opined that the need to engage the community youths to address conflicts and foster dialogue cannot be overemphasized. This aligns with Smith et al., (2020) study that stakeholders can actively engage the community in green social infrastructure through

effective communication approaches, especially during the design and planning phase. Stakeholders ought to evolve with communication skills, considering the recent advancement in the use of information communication technology. Using various interactive and educative mediums to exchange information effectively is key to community engagement in project development (Hussain et al., 2023).

However, R9 has a contradictory opinion that "*it is difficult to engage people in infrastructure development, and the move depends on the client, and policies of governing authorities.*"

Thus, the stakeholders must liaise with community leaders, to inquire about incentives that can attract the youth to participate in infrastructure development in their community. Also, it is necessary to organize community events, public consultations, and educational campaigns to raise awareness, build trust, and encourage community participation during the design, construction, and post-construction of social green infrastructure (Nour, 2011).

The Respondents also reached a consensus that the provision of services and alternative health and recreation facilities is a proven approach that attracts the community to the development of green social infrastructure. Accordingly, this could be achieved via surveys and assessments to understand the pressing demands of the community; collaborating with the government to provide some of the basic amenities lacking in the community, and provision of monetary incentives, and training as a form of empowerment even after completion of the infrastructure. Thus, Hussain et al., (2023) reiterated that the stakeholders ought to contribute to the development of the host communities, to promote community engagement even after the completion of the project. In this regard, post-construction evaluations and surveys are conducted to gauge community satisfaction and monitor the long-term impacts of the social green infrastructure on the community (Bakalian and Wakeman 2009; Yulianto et al., 2021).

On the contrary, Respondent (R4) argues that "*community development is not part of the project goals, and there may be insufficient budget to sponsor such projects.*"

Thus, collaboration with the government is paramount to community development in the aspects of basic amenities, and health facilities.

The majority of the respondents agree that the infrastructure should meet the social, economic, and environmental needs to improve the occupant's quality of life positively. It will also enhance the community's livelihoods. Apart from that, it gives the community a sense of belonging.

According to R7 "*Stakeholders are obliged to enlighten the community on the social, economic, and environmental benefits of green social infrastructure, to understand the significant importance of participating in the projects.*"

Notably, community engagement strategies tailored to the specific project and community context must be developed by the stakeholders (Nour, 2011). The benefits of green social infrastructure to the community have been established in several published papers. For instance, Ohueri et al., (2022) cited that green project development provides economic benefits like reducing operating costs and optimizing the life-cycle economic performance; environmental benefits such as reducing greenhouse gas emissions, improved quality of air and water, reduction of the waste stream, and conservation of natural resources; and social benefits that require the enhancement of the comfort and health of occupants, heightening aesthetic qualities, minimizing strain on local infrastructure, and improving the overall quality of life. Thus, creating awareness of the benefits of the ongoing projects enlightens the community and enables them to fully support the project (Tanguy et al., 2020). The proposed guidelines is illustrated in Figure 2.
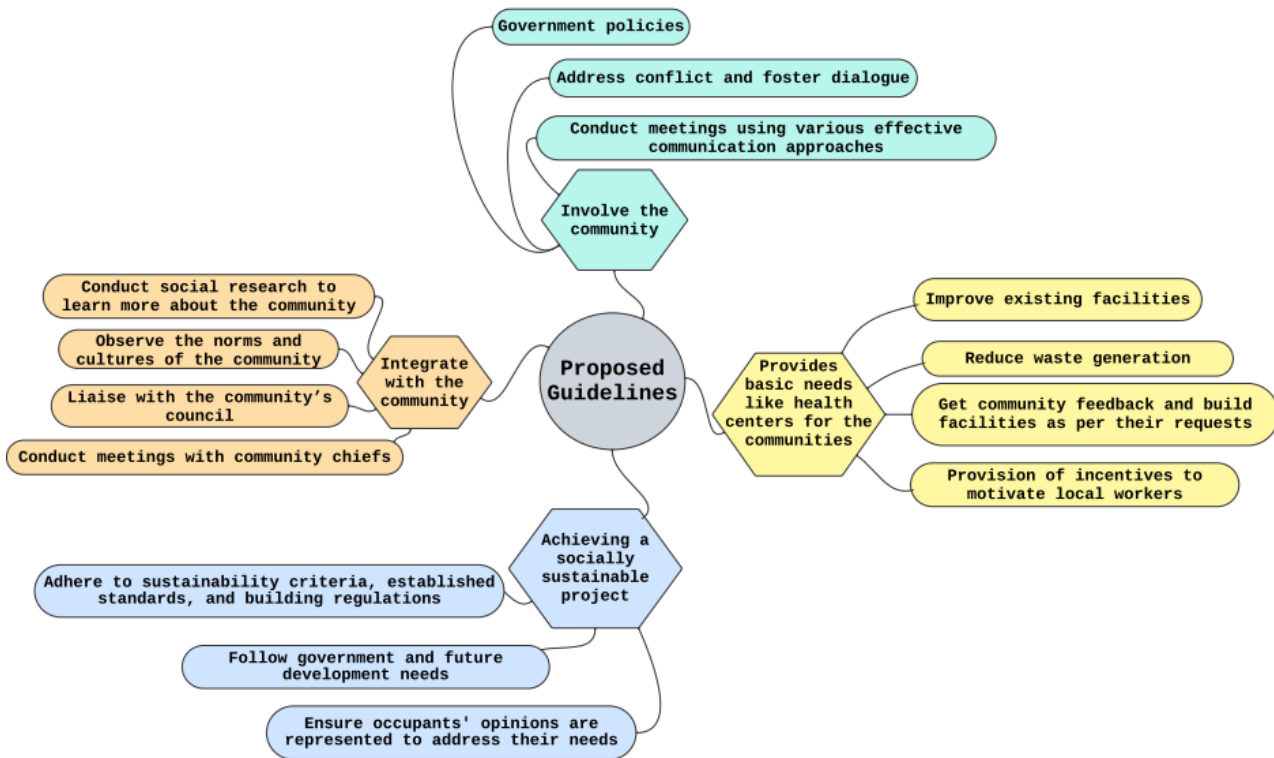
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Fig. 2 *Proposed Guidelines for Facilitating Stakeholders Roles in Community Engagement in Green Social Infrastructure Development*

The proposed guidelines highlighted in Figure 2 will facilitate stakeholders' role in community engagement in the following ways:

- Integrating with the community provides the stakeholders ample opportunity to adequately advocate and represent the community based on first-hand information on the specific needs and demands of the host community.
- Involving the community throughout the phases of green social infrastructure development provides an opportunity for the stakeholders to provide necessary incentives such as training, and payment of wages.
- Infrastructure provided for the community such as for health care facilities ensures adequate healthcare for the workers in case of site accident, thereby reducing death, which might lead to stoppage of work or clashes between construction experts and victims' family members.
- Stakeholders' mediation on conflicts provides the community leaders with an ideal approach to settle issues that may arise during the green social infrastructure, thereby ensuring the safety of construction experts on site, and fostering a peaceful community for dwellers.
- The sustainable infrastructure provided by the community helps to preserve natural resources, reduce emissions of harmful greenhouse gas, to safeguard the health of both the construction workforce and the community at large.

6.4 Recommendations for Effective Stakeholder Community Engagement in Green Social Infrastructure

The perceptions of the respondents were sought as regards improvement strategies or recommendations for stakeholders' community engagement in green social infrastructure. In line with the responses of the interviewees, four major themes frequently reoccurred.

Firstly, the respondents suggested that stakeholders should ensure that the leadership is as transparent as possible to eliminate any form of bias.

Respondent (R1) believes that "*one significant approach towards transparent leadership is the provision of petition box to enable the community to easily give feedback to help improve any facilities or show their disagreements towards any construction works.*"

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As opined by Valdes-Vasquez (2012), receiving feedback is an important aspect of leadership that attracts the community to project development.

Respondent 10 in his words viewed that, "*transparency in the distribution of resources, communication, and employment of local workers is necessary to inculcate the spirit of togetherness, trust, and love between the stakeholders and community.*"

This is in line with studies conducted by Chan & Benecki, (2013); Yulianto et al., (2021) which postulated that transparency and genuine intentions of stakeholders as regards community development create a solid conviction for community leaders to engage in the development of infrastructures without bias.

Secondly, the respondents viewed that stakeholders ought to provide an enabling environment that fosters communication via collaborative decision-making, and regular meetings with all communities' representatives.

An excerpt from the transcription of interview data from Respondent 2 is provided as follows: "*the stakeholders must be willing to co-run the affairs of policymaking with the community chiefs, so the project output reflects the needs and history of the community.*"

As stipulated by scholars such as De Freitas & Martin, (2015); Bakalian and Wakeman (2009), the most important aspect of attracting the community to participate in green infrastructure development is by ensuring that strategies are tailored towards the community's needs and preferences. In addition, the employment of labor should be done equitably, considering the diversity of host communities, thereby eliminating the marginalization of minority groups.

Thirdly, the respondents reached a consensus that early engagement of the community in decision-making and governance is key to engaging the community in green social infrastructure development.

R2 viewed that "*it is pivotal to liaise with the municipal council and share decision-making and governance control with the public.*" Also, R6 postulated that "*local community practitioners should be placed at the forefront of the leadership position for viable decision-making that will benefit the project's progress and community development.*"

This corresponds with previous studies such as Carlisle, (2010); Hussain et al., (2023) emphasize the all-inclusive approach for decision-making in green infrastructure projects is of utmost importance. This is one of the key strategies for enhancing community engagement in projects.

Fourthly, respondents agree that communicating the environmental and socio-economic benefits of green social infrastructure provides the community with the conviction needed to actively engage in the project development.

R4 opined that "*stakeholders should ensure that the strategies for the conservation of natural resources should be communicated to the community.*" In the same vein, R3 cited "*that infrastructure aesthetics ought to reflect the community heritage.*" Similarly, R6 suggested that "*the economic importance of the infrastructure should be provided with evidence.*"

The need for adequate awareness of the benefits of sustainability practices in fostering a viable community cannot be overemphasized. However, lack of awareness of the numerous benefits of sustainability practices remains a pressing issue among many community leaders. Thus, Ohueri et al. (2022); Hussain et al., (2023) have reiterated that awareness and education are the main approaches to enlightening communities on the benefits of sustainable construction practices. The stakeholders should demonstrate to the community how the green social infrastructure will benefit the community in terms of adding money to their pockets, enhancing their productivity and comfort, and reducing environmental degradations and emissions of toxic greenhouse gases (Yulianto et al., 2021).

Hence, in line with the respondents' perception, the following recommendations are drawn, for effective stakeholder community engagement in the development of green social infrastructure:

- Transparent leadership which involves implementing transparent practices, such as setting up a petition box to facilitate community engagement with stakeholders.
- Conducting a comprehensive socio-economic study in the target area to essentially gain valuable insights into the community's urgent concerns.
- Effectively communicating the environmental and socio-economic advantages, such as generating employment opportunities, minimizing environmental impact, and enhancing infrastructure aesthetics, is crucial in fostering support and understanding within the community.

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7. Conclusion

This study conducted quantitative research to actualize the aim of this study. Precisely, the interview was conducted with 10 respondents to establish guidelines to facilitate the roles of stakeholders in community engagement in green social infrastructure development. In addition, recommendations were provided for effective stakeholders' community engagement in green social infrastructure development. The research output provides insight to stakeholders on their roles in incorporating sustainable practices, that aligns with community needs and necessity, which in turn foster a sense of ownership, thereby paving the way for a greener and more resilient future in Malaysia. This study would be beneficial for promoting the importance of community engagement in Malaysian project development that is in line with government policies and plans. However, this study is limited to qualitative research in the Malaysian context. Thus, future studies may focus on the quantitative approach to identify the correlation between the identified roles of stakeholders in community engagement in the social infrastructure of any other region part from Malaysia.

Acknowledgement

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