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Environmentally Sustainable Construction Implementation in Ghana: Perspective of Professionals Working with Contractors

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ABSTRACT

The study was conducted to determine the professionals' perceptions of contractors providing design and construction solutions utilising sustainable construction practice standards. The core motive was to drive and enable SME construction firms to have the adaptive capacity to deliver construction projects in an environmentally sustainable manner to contribute to global sustainable development goals. A qualitative research approach complemented by face to face and virtual interviews were adopted. The data obtained brought out the meaningful and socially salient findings to benefit adaptive capacity. Interviewees included professionally registered members from the Ghana Institution of Engineering working with contractors, the Ghana Institution of Surveyors working with contractors, and the Ghana Institute of Architects. The findings of the interview survey revealed that the overall construction teams believe in having education and training and a centralised information hub with government support to ensure environmentally sustainable construction. It is recommended that the government, corporate, and professional institutions' desire to preserve the country's ecosystem be guided by this study's adaptive capacity implementation guidelines.

Keywords: Adaptive capacity, Environmentally sustainable construction, Small and medium-sized firms, Sustainable development

INTRODUCTION

The general idea of environmentally sustainable construction (ESC) is developed based on the principles of sustainable development (SD). Kibert (1994) first identified the essential qualities of ESC as a discovery with suitable reasonable means to accomplish a built environment based on productive of desired effects and ecological principles. Du Plessis (2002) discovered and set forth the meaning of SC on the principles of SD. It goes by the application to the whole construction cycle from the mining of raw materials, through

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the planning of projects, design and construction of the buildings itself and other infrastructure, until their final deconstruction stage and the handling of resultant waste (Olusegun et al., 2019). The explanation implies that the complete system aims to put back in an existing state while creating esteemed and encouraging economic fairness. Thus, SC is based on the principles of SD and ESC is equally based on the principles of SD. As is popularly known, "sustainable development should meet the needs of the current citizenry without compromising the ability of future generations also to meet their needs" (World Commission on Environment and Development, WCED, 1987:43). Therefore, achieving environmental sustainability in construction is highly necessary to reaching the goals of SD throughout the whole construction cycle, from "cradle" to "grave". Achieving the goals of SD is driven by the three broad traditional pillars of sustainability; economic, environmental and social. Environmentally sustainable delivery of construction projects stands out as being foundational to a holistic pursuit of sustainable development goals (Dosumu and Aigbavboa 2020).

Literature Review

The environmental management capacity of SME construction firms is critical for adaptation and performance, and their attention is needed to adapt to sustainable construction. Having SME construction firms' environmentally sustainable construction (ESC) policies apart from governmental support regulations may be a practice enabler for sustainable construction (SC). However, Mensah (2017) reports that SC in developing countries is yet to be established. Therefore, SME's construction firms may not have their organisational policies to ensure environmental sustainability. Global Reporting Initiatives, GRI (2011) also points out that SME construction firms must be open for their performances to enhance the chances of complying with relevant environmental regulations. The question remains: 'would the majority of SME construction firms in developing countries be able to assess their sustainability performance and report on it?' Zhou et al. (2013) emphasise the growing trend towards measuring adaptive capacity. Experts in adaptive capacity should be present within organisations to carry out such duties. However, Adegbite et al., (2012) report that such experts may lack construction in some developing countries. Even if the GRI standard is used, other barriers may exist for organisations reporting sustainability performance. Danku (2020) observed some of these barriers as (1) lack of interest from local stakeholders, (2) unclear cost-benefits of projects, (3) increased information management and excessive corporate exposure. Agyekum et al. (2021) conducted research and reported that there seems to be no government support for private business collaborative efforts in developing countries. Adegbite et al. (2012) revealed that construction companies in Nigeria had initiated SD programmes to improve corporate social responsibilities. Yet, the government has no efforts to support SD adaptive capacity. According to Opoku and Fortune (2011) and Shi et al. (2013), the overall construction teams believe in having the view that high cost is associated with ensuring sustainable development. Sultan and Alaghbari, 2021) also

think a lack of steering mechanisms and client understanding for SD could be barriers against SC being practised reasonably. Moreover, Arthur and Mensah (2006), Adegbite et al. (2012) and Debrah et al., 2021 have opined that there is a need for human resources required to ensure sustainability in various sectors of an economy, which is also lacking. Furthermore, among the few professionals in the construction industry, there seems to be a low level of awareness of the benefits of ensuring sustainability in construction (Mensah and Ameyaw, 2012), which could also be a potential barrier. Djokoto et al. (2014). Identified four primary categories from their literature believed to be the main potential barriers confronting the construction industry: cultural, financial, steering, and professional obstacles. Meanwhile, there seems to be a lack of guidelines and policy enforcement makers' involvement to reduce these barriers. The benefit of having increased competitive performance by SME construction firms has also been relayed by Tan et al. (2011), Testa et al. (2011) and Mensah (2017). The realisation of the benefits would be difficult, if not impossible, without SME construction firms in developing countries gaining the needed awareness, education and capability to practice sustainable construction. However, little has been done to investigate these SME construction firms' barriers, enablers, and drivers of adaptation to sustainable construction.

Methodology

A semi-structured interview was conducted amongst professionals working with contractors. The qualitative data interpretation consists of conceptualising and transcribing the interviews and all opinions from the open-ended questionnaires relevant to the topic under investigation. Interviewees included professionally registered members from the Ghana Institution of Engineering, Ghana Institution of Surveyors, and Ghana Institute of Architects members working with contractors in SME construction firms. It was established that the professionals for SME construction firms who provide design and construction solutions utilising environmentally sustainable construction standards were better suited to identify the main challenges confronting adaptive capacity implementation. Case studies were conducted on four construction firms to gain in-depth knowledge regarding the environmentally sustainable construction practice in the construction industry. One respondent was selected from each firm bringing the total number of respondents interviewed to four. The approach gave the participants a more significant opportunity to respond in their own words to bring out their actual understanding of the subject under study. Participants were not forced to choose from fixed responses, as in the case of closed-ended questions typology. An interview was chosen first-hand, and a cover letter and the interview questions were forwarded to participants through WhatsApp recording and Zoom application online platforms while Covid-19 safety protocols were observed. Therefore, data obtained possess the qualities of being rich and explanatory and brings out the meaningful and socially salient points to a participant. Content analysis was used to analyse the data. Tembo and Akintola (2021) acknowledge the content analysis and explain that it can be adapted to

Table 1. The layout of the interview protocol.

Theme number	Theme	Question
1	The SMEs approach in promoting the global goal of sustainable development	1
2	The sustainable construction information shearing among SME firms	2
3	The envisaged role of government in facilitating adaptive capacity for best practices in construction delivery	3
4	The strategic way of making clients knowledgeable on environmentally sustainable construction projects	4
5	The attributes that need to encourage adaptive capacity among SME construction firms	5

analyse the questions in a state of peaceful happiness. Amadi (2021) postulates that the content analysis approach enables the researcher to omit irrelevant words and terms by paraphrasing and summarising accounts. Table 1 below illustrates the layout of the interview protocol.

INTERVIEW, RESPONSES AND DISCUSSIONS

Promoting the Global Agenda of Sustainable Development in the Construction Industry

This section examines interviewees' opinions concerning promoting sustainable development agendas in the construction industry through delivering construction projects. The responses of the interviewees are presented below.

Responses:

The professionals working with contractors in SME construction firms affirmed that they consider the overall global agenda.

"*… our firm is not doing bad in a sense that we are keener on the material selection that lasts for a considerable amount of years which are environmentally sustainable….*"

"*…we are aware of the environmental footprint when it comes to material selection; therefore, we embrace the green building technology or concept from design, construction and maintenance, which we integrate the approach in our deliveries….*"

"*…we have identified that in making the stated application, it contributes to the increase and efficiency of energy. It also provides an economic aspect of the construction, which is a magnificent phenomenon….*"

"*… on some occasions, we do train our workforce through workshops and seminars….*"

Based on the respondents' opinions, it can be concluded that the majority of the professionals working with SME construction firms are aware of the global agenda for sustainable development goals. This suggests that the professionals working with contractors have hands-on knowledge concerning sustainable construction and sustainable development. The majority of the

professionals were involved in new projects, which indicates that the innovation has soared recently and that the sustainable development agenda is gaining momentum in the SME construction firms in Ghana. A crucial environmentally sustainable construction measure that emerged from the interview results was the need for SME construction firms to introduce sustainability departments within their firms. Respondents perceived sustainability issues in the construction industry to be very broad. Thus, demand for a new and separate department within a construction firm to handle environmentally sustainable construction planning and execution effectively was suggested by the respondents.

Sharing Sustainable Construction Information with Other Small and Medium-Sized (SME) Construction Firms in Ghana

This section was aimed to establish how individual firms share sustainable construction information with other SME construction firms in Ghana. The responses of the interviewees are presented below.

Responses:

The professionals working with contractors in SME construction firms shared their opinion as captured as follows:

"…it is not our plan to be sharing, but normally we give out sub-contract works, and that is where we follow up to ascertain the right approach for sustainable construction. We do not have a policy of sharing sustainability practises…."

"…there is no such a process in Ghana here where there is a collaborative link or a centralist communication hub…."

"…it is not easy to share what we have with others, but if you care, then you share. We know that access to new resources of knowledge is one of the most important aspects of social capital, we build interactions within the firm, and this has been made possible through knowledge transfer…."

"…it depends, we cannot share information with our competitors or our opponents, but in a few occasions we do have workshops, seminars but by and large we do something in our small way…."

Furthermore, as the professionals' claim, information sharing does not exist among SME construction firms in Ghana. The scenario spelt the points raised by Zhu and Liu (2010), which line with social network communication, inter-organisational relationships, ecological information sharing, dissemination of information, the capacity to control information, social interaction, and so on end lead to a centralised information hub. There must be a mutual understanding, as suggested by Rogers (2003; communication is a process in which information is exchanged between firms within the construction industry to circulate among themselves. The professionals working with contractors expressed varying opinions on what happens. Although their views were different, there seems to be a correlation among their factors of adaptive capacity. Consequently, if sustainable construction information is kept within individual SME firms, which is vital to the survival of the adaptation process, there is more to be done as an organisation to achieve the global SDG goal.

Envisageable Role of the Government in Facilitating Adaptive Capacity for Best Practices in Construction Delivery

This section aimed to understand the government's role in facilitating adaptive capacity for best practices in construction delivery. The responses of the interviewees are presented below.

Responses:

The professionals working with contractors in SME construction firms affirmed that they consider the following factors.

"…government is the number one entity with all regulatory bodies under its care; it can facilitate the adaptive capacity…."

"…government is the largest employer; it should try as much as possible to bring up development policies…."

"…participating decision making and implementation has always been a problem, the policies are there, but the willingness to implement is the challenge…."

"… the government empowers SME construction firms elsewhere but over here it is completely different, which is the main issue…."

In conformity with the Environmental Community and Local Government of Ireland (2015), the government of Ghana existing regulations will not sufficiently solve the problem. The country's appointed supervisors are vital to making progress through innovation from their commitment. Sustainable construction practices have advanced in most developed countries without doubt, as postulated by HM Government (2011). The professionals working with the contractors emphasised that changes to the regulatory framework are considered the most effective means for a behavioural shift in transforming the construction industry's sustainable construction agenda, hence the SME construction firms. However, the need for a progressive, sustainable construction policy is achievable through establishing, for example, the performance standard for appraising environmentally sustainable construction performance, identifying enforcement problems and developing more effective enforcement mechanisms, and simplifying the requirements for environmental impact assessment certification. The professionals further express an opinion that motivational factors coupled with grounds of expectations derived during the forethought process by the government will significantly influence SME construction firms to commit and decide to venture into innovative/new practices such as sustainable construction. The professionals working with contractors indicate that government, as a major client of the construction industry, need to have a strategic plan towards achieving sustainability in the construction industry at the national level. Such a plan would drive SME construction firms to regulate their environmental management plans at the project and the construction industry levels.

The Strategical Approach Informs the Firm's Clients About Environmentally Sustainable Construction Projects and Practices

This section was aimed to determine individual firms' initiatives to inform their clients about environmentally sustainable construction projects and practices. The responses of the interviewees are presented below.

Responses:

The responses to the question have been expressed as follows:

"…we don't have a firm policy on a strategy towards sustainability; however, most of the things we do are specialist in nature…."

"…most of the time our client comes to us for the application of some materials, we also take the advantage and talk about sustainable products and aspects…."

"…we have flyers in our offices that our clients come to pick and read, we also create awareness through site visitation…."

Professionals working with contractors confirm that our client awareness of what we do helps. In the knot shell, economic sustainability tends to: enhance productivity; ensure constant growth in terms of profit margin; increase client satisfaction; reduce defects; minimise time overruns and decrease project costs, and provide services that offer the best value to clients as well as focusing on evolving business that wealth while to consider. Therefore, their participation in what we do counts. In line with this assertion, the professionals working with contractors categorically stressed that the performance of SME construction firms has usually been seen by a section of clients as an abhor firm. It is prudent to engage knowledgeable professionals to execute projects in an environmentally sustainable manner. However, clients' knowledge about the benefits of sustainable construction is essential. The adoption methods for sustainable building requirements, sustainable tools and equipment handling, and overall adaptive capacity development are sometimes shared when the need arises.

Other Factors Encourage the Adaptive Capacity Among SME Construction Firms in Ghana

This section was to obtain extra information from the respondents if there were any further contributions to encourage the adaptive capacity among SME construction firms in Ghana. The responses of the interviewees are presented below.

Responses:

The responses to the question have been expressed as follows:

"…sustainable construction is relatively new agenda in Ghana; there has to be serious among the construction organisation…."

"…there should be more education and awareness organised by various professional bodies through workshops and seminars…."

"…the tertiary institutions and service providers should provide sustainable construction training opportunities for all stakeholders…."

"…there must be a databank of relevant developing country studies relative to sustainable constructions…."

Construction firms in Ghana are ok when it comes to the input of materials for the work itself. They are critical during cost control and material management, but sustainability issues are lacking. Education and training is a problem; a centralist information hub for awareness is also not there; government support is also lacking. It appears the client is not pushing a sustainable agenda. The professionals working with contractors remarked

that the government needs to establish a compulsory training scheme for all SME construction firms before issuing operational certification on sustainable construction. Similarly, the professionals emphasised that the central government must endeavour to build the adaptive capacity for SME construction firms through mandatory training workshops before government projects can be awarded to those firms. Again, SME construction firms need financial support from the central government and other financial institutions to sustain environmentally sustainable construction.

CONCLUSION

The core aim of the study was to seek the views of the professionals working with contractors to deliver construction projects in an environmentally sustainable manner to achieve the global agenda of sustainable development to improve Ghanaians' lives, the African region and globally. This study's results have theoretical, methodological and policy values because respondents for the interview survey included professionally registered members working with contractors, also had a good working knowledge of the issue being investigated. The study results inform governmental, corporate, and professional institutions and policy-makers to plan adaptive capacity implementation programmes to enhance SMEs' construction in Ghana. The overall construction teams believe in having education and training and a centralised information hub with government support to ensure environmentally sustainable construction. It is recommended that the government, corporate, and professional institutions' desire to preserve the country's ecosystem be guided by this study's adaptive capacity implementation.

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