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Moses, Emmanuel Kobina ; Lawani, Kenneth; Hare, Billy

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CASE STUDY (Presented at 2023 GhIE Annual Conference & AGM)

A framework to improve sustainable practices in government construction projects in Ghana: an exploratory study interviewing industry experts

Emmanuel Kobina Moses*[1], Kenneth Lawani[1], Billy Hare[1]

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Abstract
This study seeks to develop a framework that improves sustainable practices in government construction projects in Ghana, specifically housing or building projects when the nation is required to meet the United Nations Sustainable Development Goals (UNSDGs), targets, and indicators. This study used semi-structured and open-ended exploratory interviews as qualitative methods to discover and obtain understanding of the subject matter by engaging six (6) industry experts. This study assisted in probing answers provided by the experts. Although the main study addresses seven research objectives, this exploratory study focused on the first three objectives and therefore addressed the first three research questions of the main study accordingly. Ghana's government has made efforts to increase awareness of sustainable development goals (SDGs) amongst stakeholders, but there is room for improvement. This study identified six environmental, eleven social, and six economic factors that can promote sustainable practices in government construction projects in Ghana concerning UNSDGs 8, 9, 19, 11 and 12. The government of Ghana also has to do more to utilise a database system required by the United Nations to provide details on achievements attained on the UNSDGs 8, 9, 10, 11 and 12 targets in different sectors, including the construction sector. This study engaged six industry experts, making generalisation of findings not possible. Many more diverse stakeholders are required to ensure this study is more representative across the country. The practical implications for this study are to increase SDGs awareness amongst stakeholders, utilise some provided environmental, social, and economic factors to promote sustainable practices, and improve the usage of database system in government construction projects in Ghana.

Keywords: Framework, Construction, Sustainable Development, Sustainable Practices, Government Projects, United Nations

Introduction

The construction industry contributes immensely to all areas of sustainable development and Ghana is no exception to this development. Ghana, like most other countries attempt to uphold sustainable construction practices by confronting its challenges and barriers. Despite this, the United Nations requires the Ghanaian government to have the primary responsibility to follow up and review their progress at the global, national, and regional levels in terms of implementing the United Nations Sustainable Development (UNSD) Goals and targets from 2015 to 2030 (United Nations, 2015). The expectation is that government construction projects in Ghana through sustainable practices should contribute immensely towards her sustainable development relevant to some set UNSD goals and targets; specifically, goals 8 on decent work and economic growth, 9 on industry, innovation, and infrastructure, 10 on reduced inequality, 11 on sustainable cities and communities, and 12 on responsible consumption and production.

Akotia (2014) notes that the significance and awareness of sustainable practices have become a growing concern globally over the last decade; noting that the needs of humans are not static. As a result, the decisions that bring about sustainability today are likely to require a certain level of modification in the future to address the change in aspirations and needs of the people. Thomson and El-Haram (2014) suggest that "a fundamental rethink is required around the way sustainability is approached during the management of construction projects" to guarantee the delivery of sustainability objectives. That is significant because there has been an increase in the awareness and meaning of sustainability, but this commitment is from a few individuals (Shebli, 2016) because most individuals do not understand the underpinning principles of sustainability.

*Corresponding author's email: emmanuel.moses@gcu.ac.uk

[1]Glasgow Caledonian University, Cowcaddens Road, G40BA, Scotland

The construction industry adopts in different ways the three dimensions of sustainability, which are social, economic, and environmental, and these reflect the UNSDGs (Adetunji *et al*., 2003). For the Ghanaian construction industry to adopt and implement sustainable practices, stakeholders within the industry need to become conscious and knowledgeable about them so that they can identify pertinent challenges with their implementation (Ametepey *et al*., 2015). Wiafe (2016) did suggest that construction practitioners in Ghana are aware of sustainable construction practices but do not have evidence of their implementation in the country. That is because there are barriers to sustainable development that have been identified, such as scarcity of information and lack of clarity on environmental legislation, limited development of the ecological supply sector, high cost of environmental services /technologies, difficulty derived from competitive pressure, and rigidity of law and bureaucratic complexity (Murillo-Luna *et al*., 2011). Williams and Dair (2006) also noted that the lack of sustainability measures by stakeholders, and lack of demand by the client are a commonly recognized barrier. These barriers are considered to negatively impact sustainable construction practices (Wiafe, 2016) and Hiller and Connel (2016) suggests that these barriers can be internal factors (awareness, knowledge, misconceptions, and attitude towards sustainability) or external factors (green products, finance, and availability of technology).

A sustainable development policy framework that is thorough and well-balanced can propel the sustainability plans towards achieving tangible and lasting results (Akotia 2014). Although many key industry players seem to have accepted the concept of sustainability in principle, implementing the policies and objectives of sustainability, however, becomes very challenging (Van Bueren and De Jong, 2007). This emphasises that there are barriers to implementing sustainability policies and demonstrates the difficulty and the lack of effectiveness inherent in the policy systems. It is therefore imperative that sustainability policies address practical problems, and the integration of sustainable development policies and strategies has not

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achieved their desired goals due to the inconsistencies in policies and ad hoc application approaches adopted by policymakers. There is significant body of knowledge on policy and practice of sustainable development, but much of this available information is fragmented and presented in a form that is not easy for policymakers and practitioners to understand and implement (United Nations, 2010).

The United Nations (2015) details some primary responsibilities of member nations regarding the usage of the database system. The first of these responsibilities is member nations to follow up and review progress attained in implementing these goals and targets. These fifteen year (2015 – 2030) goals and targets are to cover the global, national, and regional levels (United Nations, 2015). During this period, they will provide an organized follow-up and reviews as set out in Addis Ababa Action Agenda and Agenda 2030. This exercise is to ensure governments are accountable to its citizenry (United Nations, 2015). Another primary responsibility of member nation is intensifying their effort to strengthen their statistical capacities (ability to collect, analyse, and disseminate high quality data), specifically with all the developing countries - least developed countries, landlocked developing counties, small islands developing states, and middle-income countries (United Nations, 2015).

In most developing countries in Africa, government policies on economic, environmental, spatial planning, and housing affect sustainable development (Esezobor 2016), with implications for the construction industry. According to Esezobor (2016), these policies are on poverty alleviation, job creation, capacity building, quality, etc. and whether the methods adopted to enact these policies enhance the objectives of sustainable construction is highly debatable. Adebayo (2002) notes that sustainable construction has not received sufficient attention in Africa, even though it is an essential aspect of broader sustainable development. Aghimien *et al*. (2019) also note that in most developing countries, construction has been pronounced to be unsustainable, adjudging from the three sustainability dimensions of economy, social and environment. The United Nations, through Agenda 2030 expects all member nations to implement sustainable construction projects. In this regard, clients, owners, design teams, and other stakeholders involved in government construction projects must focus on achieving environmental, social, and economic sustainability to ensure that the triple bottom line is addressed accordingly (Aigbavboa *et al*., 2017).

Ghana implements two Agendas, United Nations Agenda 2030 for sustainable development and Africa Union Agenda 2063. The 2020 SDGs report provided a progress update on these two agendas based on the 2018 baseline report and the maiden Voluntary National Review (VNR) Report (NDPC, 2020). The 2020 National Development Planning Commission (NDPC) report highlighted good practices and drew attention to areas that required improvement. The government of Ghana is embarking on some economic, social, and environmental intervention programs which require the formulation of policies. One of these priority interventions falls under the Coordinated Programme of Economic and Social Development Policies (CPESDP). The government has its vision as "an optimistic, self-confident and prosperous nation, through the creative exploitation of our human and natural resources, and operating within a democratic, open and fair society in which mutual trust and economic opportunities exist for all (Akufo-Addo, 2017)." According to Akufo-Addo (2017), implementation, monitoring and evaluation arrangements will confirm the role of specific government agencies in charge of the stated aspects of the program. Akufo-Addo (2017) also notes that these agencies will undertake specific activities to ensure that programmes and policies are incorporated in the district and sector plans and implemented effectively. According to Akufo-Addo (2017), public sector organizations must be ready to promote the timeous implementation of the projects and programmes.

This vision of the government of Ghana aligns seamlessly with the world leaders' declaration in September 2019, which noted the period between 2020 and 2030 as a decade of Action for Sustainable Development Goals (Ghana 2022 VNR). Regrettably, a few months after this declaration, the world was hit by the Covid-19 pandemic. It is evident how the pandemic has had distressing effects on businesses, global supply chains, lives, and livelihoods and most significantly eroded development gains over the past decades. The study acknowledges that the pandemic has made it more challenging for the prospects of attaining SDGs in Ghana between 2020 and 2030. According to Asante and Mills (2020), Ghana and other nations of the globe have felt the impact of COVID-19 across its length and breadth; however, the government is no way giving up on its vision.

It on this background that this study focuses on developing a framework to improve sustainable practices in government construction projects in Ghana. In order to develop this framework, this study reviewed the literature on these frameworks: a conceptual framework for sustainable management of social (public) housing estates (Ihuah, 2015), a theoretical governance framework which reflects the requirements for sustainable development in the built environment sector of developed and developing countries (Gilham, 2010), a framework for implementing sustainable practices in SMEs in the United States (Natarajan and Wyrick, 2011) and strategic framework for managing transformational change towards sustainability in Abu Dhabi public sector organization (Shebli, 2016). Other frameworks considered were the framework for assessing the sustainability benefits of landfill gas clean development mechanism (Muvundikor, 2015), the sustainability assessment framework for the residential construction sector in the UK (Franca, 2012), multi-dimensional sustainability framework for service organizations in the GCC countries (Al Kaabi, 2014) and a framework for social and economic sustainability benefits evaluation of sustainable regeneration projects in the UK (Akotia, 2014).

The construction sector in Ghana needs to recognize and apply the sustainable practices required to meet the UNSDGs, targets, and indicators. This study defines sustainable practice in government construction project as implementing activities in line with the UNSD goals to attain given targets and relating achievements with given indicators. The objectives of this study were to: (1) evaluate through interviews the awareness of UNSD goals, targets, and indicators amongst key stakeholders in the construction sector of Ghana, (2) develop sets of social, economic, and environmental sustainability criteria from the interviews with the sustainable development experts that will ensure effective, sustainable practices in Ghana government construction projects with regards to UNSDGs 8, 9, 10, 11and 12, and (3) establish current available baseline records on sustainable practices in Ghana government construction projects that have contributed to the national progress made on UNSDGs 8, 9, 10, 11 and 12 targets. This study involved a participant from the following regions of Ghana: Greater Accra (GAR), Central (CR), Western (WR), Eastern (ER), Volta (VR), and Ashanti (AR) as shown in the study area map (Figure 1).

Method

In reviewing literature to assist in developing a framework to improve sustainable practices in government construction projects, there were no existing studies that focussed on the subject matter. It aligns with the assertion that in a situation where in-

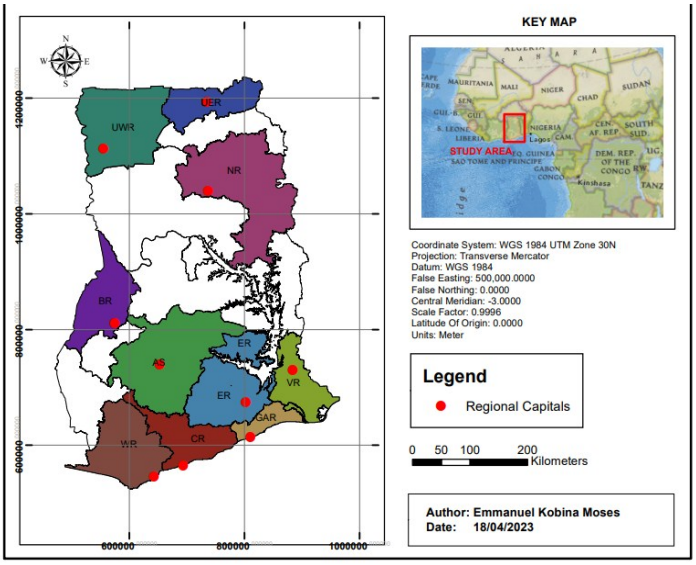

Figure 1 Study area map

formation about a research is scant, it is most appropriate to use the exploratory study approach (Wilson, 2010; Bryman and Bell, 2011). Saunders *et al*. (2007) suggests that adopting the exploratory research approach is suitable when there is not enough information about a phenomenon and when a problem is not clearly defined, and this is the case with the subject matter. According to Shebli (2016), an exploratory research must explore different ideas pertinent to the subject matter under investigation to identify the issues and components associated with it. The exploratory study will not provide the final and conclusive answers to the research questions but will explore the research topic with varying levels of depth (Shebli, 2016; Brown, 2005). The qualitative method is useful in exploring the depth of meaning about concepts and measures for concepts can be adapted to specific context (Srijumpa *et al*., 2004). This study therefore used qualitative exploratory study to discover and obtain understanding of the subject matter.

Sampling

This study adopted a purposive non-probability sampling technique of the target population and guided by performance audit report on the government of Ghana's preparedness to implement SDGs, (Ghana Audit Service, 2018), engaged participants willing to share their experiences on sustainable development and practices in the government construction projects (Creswell and Creswell, 2018; Creswell and Poth, 2017). This technique made it possible to choose specific participants that helped the study meets its goals. This exploratory study engaged six participants that shared similar characteristics as prospective participants for the main study (Turner, 2010). The criteria used for the selected participants were as follows; to have at least ten (10) years of experience in a relevant field of work and to be involved with sustainable development programmes or projects. Participation in the study was voluntary, and strictly adhered to the Data Protection Act 2018, General Data Protection Regulation (GDPR) 2018 and the Ghana's Data Protection Act 2012 (Act 843). Details on participants are as shown in Table 1.

Method of data collection

To explore ways to improve sustainable practices in government construction projects in Ghana, the study tapped into the experiences of participants in that field through semi-structured open-ended interviews. This was done through one-on-one phone interviews with six participants at their preferred locations and at different times. Using this strategy suited the participants, mainly due to convenience. The participants agreed to be part of the exploratory study and for the interviews to be audio recorded. The interview took between thirty-five and forty-five minutes for each of the participants. The Otter App available at https://otter.ai was downloaded and used for recording the interviews and transcribed audio messages to texts. The Basic App delivered about eighty (80) per cent accuracy output in terms of clarity in transcribing audio messages to texts. Another review of the transcribed text was undertaken to ensure the audio to text transcription was verbatim to ensure a good match between the audio and the transcribed texts produced by Otter App, before finalising the interview transcripts.

This study derived three open-ended questions by reviewing sustainability and the UK construction industry: a review (Adetunji *et al*., 2003), a framework for social and economic sustainability benefits evaluation of sustainable regeneration projects in the UK (Akotia, 2014), sustainable construction implementation in Ghana (Ametepey *et al*., 2015), construction professionals perspectives' on drivers and barriers of sustainable construction (Tokbolat *et al*., 2020), and factors affecting the implementation of sustainable construction in Ghana: the Architect's perspective (Wiafe, 2016). This study employed the experiential knowledge of two industry practitioners with over fifteen years' experience to review these questions and advice accordingly. The comments from the advisors were implemented for the three questions and this mitigated any form of ambiguity regarding the interview questions. The questions addressed issues on the following:

- Levels of awareness about the UNSD goals, targets and indicators and how they have influenced decisions made on sustainable practices in government construction in Ghana across project life cycles (RQ1);
- Economic, social and environmental factors considered by key stakeholders to promote effective sustainable practices in government construction projects in Ghana concerning UNSDGs 8, 9, 10, 11, and 12 (RQ2); and

Table 1 Profiles of participants

Item No.	Pseudonym	Gender	Organization	Years of Experi-	Position
1.0	P1	M	Company A Limited	11	Senior Planning Officer
2.0	P2	M	Company B Limited	22	Head of Demographic Statistics
3.0	P3	M	Company C Limited	10	Water Supply & Environmental Engineering
4.0	P4	M	Company D Limited	12	Director of Systems Administration
5.0	P5	M	Company E Limited	20	Chief Executive Officer
6.0	P6	M	Company F Limited	16	Head of Sustainable Development

- How database system has assisted in providing details on achievements attained in Ghana construction sector on UNSDGs 8, 9, 10, 11 and 12 Targets (RQ3).

Method of data analysis

The summative content analysis was used as the method for data analysis after interview transcripts were transcribed verbatim. The analysis identified and quantified certain contents and words based on feedbacks from the participants with the purpose to understand the contextual use of them in answering specific research question (Hsieh and Shannon, 2005). The quantification was done to buttress and identify differences in perceptions of the participants. It also allowed the determination of factors that were of a priority based on the number of highlights from the participants. According to Potter and Levine-Donnerstein (1999), analysing the appearance of a particular content and word in textual material is termed manifest content analysis. The three questions were analysed using different approaches based on the uniqueness of these questions.

Results and Discussions

The six participants answered all three questions. Tables 2 to 5 provide corroborated feedbacks from the six participants, who are designated P1 – P6 accordingly.

How has the level of awareness about the UNSD goals, targets and indicators influenced the decisions made on sustainable practices in government projects in Ghana across project life cycles? (RQ1)

According to P2, the SDGs are not entirely new, as nations have delivered their components in their own ways. The situation is not different from Ghana's as the pre-SDGs era saw major government projects undertaking environment and social impact assessments, sustainable environmental assessments and cost-

Table 2 Corroborated feedbacks (Section 1) from P1-P6 on Q1- Q3

Semi-structured Questions	How has the level of awareness about the United Nations Sustainability Development Goals, Targets and Indicators influenced the decisions made on sustainable practices in government projects in Ghana across project life cycles? (RQ1	What economic, social and environmental factors are considered by key Stakeholders to promote effective sustainable practices in government construction projects in Ghana concerning UNSDGs 8, 9, 10, 11 and 12? (RQ2)	How has the database system assisted in providing details on achievements attained in Ghana construction sector that feed into global progress made on UNSDGs 8, 9, 10, 11 and 12 Targets? (RQ3)
Item No. 1	1. The level of awareness has moderately influenced decisions and is sixty percent (60%) in terms of percentage across the project life cycle (P1). 2. The level of awareness of the SDGs in influencing decisions made on sustainable practices has not been measured quantitatively (P2). 3. Estimated 30% of Stakeholders are aware of the SDGs and they influence the decisions made on sustainable practices in government projects (P3). 4. Awareness at the governance level and with relevant professionals including building regulators is between 75 and 80% (P4). 5. The level of awareness of the SDGs in influencing decisions made on sustainable practices will be between 35 and 40% (P5). 6. Confirmed the influence of the SDGs, Targets and Indicators on decisions made on sustainable practices, and that the level of awareness was appreciable with professionals in the construction sector (P6	List of Social Factors considered: 1. Executing more projects that improve the resilience and sustainability of settlements (P1). 2. Introduction of Corporate social responsibilities as an element to promote social sustainability (P1). 3. Job creation (P1). 4. Use local contents in terms of employment and raw materials (P1). 5. Employment (P2) 6. Infrastructure development for people (P2) 7. Poverty reduction (P2) 8. Reduction and eliminating of Hunger (P2) 9. Support access to training and entrepreneurship skills (P2). 10. Labour issues (P3) 11. Compensation of people (P3) 12. Gender issues (P3, P4) 13. Reducing inequalities at the work place (P4) 14. Introduction of the Zongo and Inner Cities development along the way, which is now defunct (P4). 15. Job creation, specifically green jobs (P5) 16. Poverty reduction - by putting money in people's pockets (P5) 17. Promoting good health. (P5). 18. Labour force migration (P6). 19. Dealing with potential social upheavals between indigenes and migrant workers at project sites environs (P6). 20. Dealing with belief systems (P6). 21. Dealing with social vices - e.g. drug use and abuse, prostitution etc. (P6) 22. Handling the issue of resettlement (P6). 23. Providing social amenities - schools, hospitals, police station etc. (P6).	1. Through the database system, various sectors reports are recorded, monitored and evaluated against the SDGs (P1). 2. The database system has helped with the tracking of progress on the SDGs and allowed evaluation to achieve improved performance (P1). 3. There is an existence of SDGs data but not in the form that is easily accessible to the ordinary people (P2). 4. Not aware of any database system but aware of review reports on the implementation of SDGs, one of the reports was released in 2019 (P3). 5. Expressed doubt over the existing of a database system (dot.db) in the construction sector that records sustainable practices that are reported towards the attainment of SDGs (P4). 6. Confirmed he could not tell the impact of a database system, because has not been involved as much as he should regarding data, however, asserted that data is key to a lot of decision making (P5). 7. Not aware of any database system that collates data and information on the performance or achievements of the construction sector with regards to SDGs (P6).

Table 3 Corroborated feedbacks (Section 2) from P1-P6 on Q1- Q3

Semi-structured Questions	How has the level of awareness about the United Nations Sustainability Development Goals, Targets and Indicators influenced the decisions made on sustainable practices in government projects in Ghana across project life cycles? (RQ1)	What economic, social and environmental factors are considered by key Stakeholders to promote effective sustainable practices in government construction projects in Ghana concerning UNSDGs 8, 9, 10, 11 and 12? (RQ2)	How has the database system assisted in providing details on achievements attained in Ghana construction sector that feed into global progress made on UNSDGs 8, 9, 10, 11 and 12 Targets? (RQ3)
Item No.			
2	1. The concepts of the SDGs is not entirely new as nations have delivered its components in their unique way (P2). 2. Before the introduction of the SDGs, major government projects undertook environmental and social impact assessments, sustainable environmental assessment, cost benefit analysis etc. (P6). 3. Ghana was one of the signatories to the SDGs and has a responsible to deliver accordingly (P1). 4. Involvement of two of our presidents (Mr. John Mahama and Nana Addo Dankwa Akufo-Addo) as co-chairs for SDGs Advocates between the periods of 2016-2018) has helped with the awareness at the governance level (P4). 5. The Sustainable Development goals are integrated into Ghana National Development Planning and Project Planning Framework (P1). 6. Ghana from the onset aligned her National Development Framework with the SDGs, which were aligned with the National Plan (P2). 7. All line Ministries and Local Government Authorities (Metropolitan, Municipal, Districts Assemblies (MMDAs) are aware of the SDGs as the National Development Plan guidelines require them to prepare their development plans for four-year cycle (2018 - 2021) in line with the Sustainability Framework (P2). 8. The SDGs are basically known by Stakeholders. However, details on their Targets and Indicators are not familiar (P3).	**List of Environmental Factors considered:** 1. Insulating elements that harm the environment (P1) 2. Promoting resilience and sustainability of the environment (P1). 3. Execution of projects that enhance environmental sustainability assessments (P1). 4. Integrating design elements that tend to promote natural ecosystem (P1). 5. Emission reduction (P2). 6. Use of renewable energy (P2). 7. Climate adaptation (P2). 8. Water and energy efficiency (P2) 9. Sewage and water collection and treatment (P2). 10. Greening of open spaces (P2). 11. Use and protection of natural resources (P2). 12. Restoration of degraded natural environment (P2). 13. Natural disaster prevention (P2) 14. Drainage and flood prevention and warning systems (P2 15. Limits on emissions (P3). 16. Promoting Green buildings (P5) 17. Use of alternative energy sources - wind and solar (P5) 18. Promoting green infrastructure - harvesting storm water and using it for irrigation purposes (P5). 19. Reduction of carbon footprint (P5). 20. Reducing production energy (P5). 21. Potential impact of the project on the environment and mitigation measures that need to be put in place (P6). 22. Waste management (P6). 23. Managing noise levels (P6).	1. Ghana's first effort to report on SDGs was in 2018 (P1). 2. The SDGs database system was developed by National Development Planning Commission (NDPC), and assisted by Ghana Statistical Services (GSS) (P1). 3. Ghana has produced three (3) reports on SDGs implementation and the latest report is for 2021 (P3 4. Ghana's national medium-term development goals are aligned with the SDGs, simplifying reporting requirements (P1). 5. The localized SDGs data are aligned with the UNSDGs data making reporting internationally easy and consistent (P1). 6. Various sectors have the responsibility to report annually on the SDGs which are collated and reported internationally (P1). 7. Ghana inputs into the global progress on the SDGs through the National Statistics System, which includes Ghana Statistical Services, the Ministries' Departments, Agencies, as well as the District assemblies collating data on a wide variety of development issues (P6). 8. Some of the indicators required for reporting on SDGs 8, 9, 10, 11 and 12, are generated from either the ministries' departments or agencies or through national surveys (P6). 9. The data on road mix conditions are available (P6).

benefit analyses (P6). Two of Ghana's presidents have been involved in the SDGs as co-chairs between 2016 and 2018, helping with its awareness at the governmental level (P4). P1 asserts that Ghana is one of the signatories to the SDGs and therefore has a responsibility to deliver accordingly. Akotia (2014) notes that the significance and awareness of sustainable practices have attained a growing concern globally over the last few decades. That is why Ghana from the onset, aligned her National Development Framework with the SDGs, which aligned with the National Plan (P2). Ghana has also integrated the SDGs into her National Development Planning and Project Planning Framework (P1). Due to the integration, all line Ministries and Local Government Authorities (Metropolitan, Municipal, and Districts Assemblies (MMDAs)) have become aware of the SDGs. The National Development Plan guidelines also required them to prepare their development plans for the four-year cycle (2018 - 2021) in line with the Sustainability Framework (P2).

Shebli (2016) asserts that lately, there has been an increase in the awareness and meaning of sustainability. The situation in Ghana attests to this assertion, with the launching of SDGs awareness sessions by the government. German Development Cooperation Agency (GIZ) have also trained some stakeholders on SDG tools (P4). There are other conditions in place that aid in creating the awareness of the SDGs in Ghana. A few of these conditions are as follows: the usage of the Environmental Impact Assessment (EIA) tool, which assist with the issuance of construction permits, bearing in mind that conditions to the issued permit align with SDG principles (P3); supervision of the

Table 4 Corroborated feedbacks (Section 3) from P1-P6 on Q1- Q3

Semi-structured Questions	How has the level of awareness about the United Nations Sustainability Development Goals, Targets and Indicators influenced the decisions made on sustainable practices in government projects in Ghana across project life cycles? (RQ1)	What economic, social and environmental factors are considered by key Stakeholders to promote effective sustainable practices in government construction projects in Ghana concerning UNSDGs 8, 9, 10, 11 and 12? (RQ2)	How has the database system assisted in providing details on achievements attained in Ghana construction sector that feed into global progress made on UNSDGs 8, 9, 10, 11 and 12 Targets? (RQ3
Item No.	1. There has been launching of SDGs awareness sessions by the government (P4). 2. Involvement of German Development Cooperation Agency (GIZ) to train some stakeholders on SDG tools (P4). 3. The Environmental Impact Assessment (EIA) Tool assist with the issuance of permits for construction works, and these permits come with conditions that are linked with the SDG principles. Some of these conditions are legally binding and some are advisory (P3). 4. The main developmental agencies are the Local Government Authorities, and they are supervised by National Development Planning Commission (NDPC) to ensure that the principles of SDGs are synchronized with most of their development projects (P3). 5. The MMDAs are unable to draw from the Consolidated Fund if their plans do not link with specific SDGs and Targets (P2). 6. The Ghana Building code originally did not incorporate extensively SDGs, however Ghana Building code 2018 captures green building, bringing some form of awareness (P5	**List of Economic Factors considered:** 1. Improve local economy (P1). 2. Affect household incomes positively (P1). 3. To attract businesses and investors to the local area (P2). 4. Facilitate access to information (P2). 5. Improve access to economic infrastructure (P2). 6. Support industrialization (P2) . 7. Support access to finance for businesses, cooperatives and vulnerable groups (P2). 8. Facilitate access to productive assets such as land, water and natural resources (P2). 9. Viability of the project (P3). 10. Economic feasibility (P3). 11. Launching of the Ghana Green Bond (P4). 12. Introduction of lucrative interest rates (P4). 13. Encouraging private sector involvement and entrepreneurship in creating jobs (P4). 14. Introduction of tax incentives (P4) 15. Formation of Special Economic Development Zone (SEDZ) and providing incentives for those works within the zone (P4). 16. Promoting productivity (P5). 17. Cost of the project (P6). 18. Good rate of return (P6). 19. Economic viability (P6).	1. The review reports on the SDGs are based on statistical reports from census obtained from the Ghana Statistical Services (GSS) (P3). 2. Ghana Statistical Service (GSS) and other special agencies report on the implementation of the SDGs in Ghana (P3). 3. The reports/project environmental data received act as tracking system, baseline data and used to revise standards (P3). 4. There is no database system at the local government authorities on the SDGs (P2). 5. At the local authority level, there is the development of metadata to guide data acquisition and dissemination that will ensure consistency and accuracy (P2). 6. At the Regional and National levels, disaggregated data is possible unlike the local/district level (P2). 7. Agreed to the existence of review and audit reports on the SDGs in the Agriculture, Health and Education sectors but not in the construction sector, as it privately driven most of the time (P4). 8. The sectors whose mandate cover the five goals do provide information that they have on for us to assess progress on these goals and they are not able to report on all the indicators that are required for various reasons (P6).

development agencies by NDPC to ensure the synchronization of the principles of SDGs with most of their development projects (P3); the inability of the MMDAs to draw from the consolidated fund if their plans do not link with specific SDGs and Targets (P2); and the incorporation of extensive details on SDGs in the revised Ghana Building code (P5) are some examples. It is imperative to highlight that P3 asserted that Stakeholders are aware of the SDGs and not the details on their targets and indicators.

All six participants gave diverse views on the level of awareness of the SDGs and how it has influenced the decisions made on sustainable practices in government projects in Ghana across project life cycles. P1 noted that the level of awareness has moderately influenced decisions and is about sixty per cent (60 %) in terms of percentage across the project life cycle. According to P2, the level of awareness of the SDGs in influencing decisions made on sustainable practices has not been measured quantitatively and so unable to confirm accordingly. The P3 estimated about 30 % of stakeholders are aware of the SDGs, and they influence their decisions made on sustainable practices in government projects. The P4 asserted that the awareness at the governance level and with relevant professionals, including building regulators is between 75 and 80 %, and they influence their decisions on sustainable practices in government projects. According to P5, the level of awareness of the SDGs in influencing decisions made on sustainable practices will be between 35 and 40 %. The P6 confirmed the influence of the SDGs, targets and indicators on decisions made on sustainable practices and that the level of awareness, was appreciable with professionals in the construction sector. These diverse views reiterate Thomson and El-Haram's (2014) suggestion that "a fundamental rethink is required around the way sustainability is approached during the management of construction projects" to guarantee the delivery of sustainability objectives.

Table 5 Corroborated feedbacks (Section 4) from P1-P6 on Q1- Q3

Semi-structured Questions	How has the level of awareness about the United Nations Sustainability Development Goals, Targets and Indicators influenced the decisions made on sustainable practices in government projects in Ghana across project life cycles? (RQ1)	What economic, social and environmental factors are considered by key Stakeholders to promote effective sustainable practices in government construction projects in Ghana concerning UNSDGs 8, 9, 10, 11 and 12? (RQ2)	How has the database system assisted in providing details on achievements attained in Ghana construction sector that feed into global progress made on UNSDGs 8, 9, 10, 11 and 12 Targets? (RQ3)
Item No.	**Impacts of the SDGs:** 1. The introduction of the SDGs have broadened our focus and made us pay attention to other areas like job creation, climate change, decent jobs, employment and economic growth etc. (P6). 2. The SDGs have added to some of the practices that were already in place, making the construction sector review how they go about them to make them effective and efficient in bringing about development or making projects more sustainable (P6	**Other Factors:** 1. Considering inputs and outputs in construction of projects and their impacts (P1). 2. Improve supply chain for various elements used on the projects (P1). 3. Noted Ministry of Sanitation, NCCE, NGOs and CSOs have embarked on social activities. However, could not confirm details (P4). 4. Noted Environmental Protection Agency being a driver of some environmental activities but details could not be confirmed (P4). 5. Ghana Standards Board introduced the new building code, which had a chapter on Sustainability (P4).	1. The database system to capture data from the Local/District level to the National level is urgently needed (P2). 2. The collation and the accuracy of data has always been a challenge (P3).

The P1 and P3 were exact on how the level of awareness of the SDGs, targets and indicators have influenced decisions on sustainable practices in government construction projects and represented these levels in percentage. The P4 and P5 gave the level of awareness in ranges of percentages (75-80 % and 35-40 %, respectively). The P2 could not quantify the level of awareness and its influence as it has not been measured. P6 noted that the level of awareness and its influence are appreciable without quantifying it in percentage. Participants also mentioned different categories of stakeholders with these levels of awareness and their influence. To ensure clarity and consistency in answering this question, the following modifications will be worth considering:

1. Specify stakeholders - construction/project professionals, local governments (MMDAs, government agencies - regulators, ministries, etc.);
2. Use ranges of percentages: 0 - 19%, 20 - 39%, 40-59%, etc., and
3. The project life cycle should be defined in the interview/ survey guidelines.

It is imperative to highlight some positive impacts that the awareness of the SDGs have brought to Ghana. According to P6, the introduction of the SDGs has broadened our focus and made us pay attention to other areas like job creation, climate change, decent jobs, employment and economic growth etc. P6 also notes that SDGs have added to some of the practices already in place, making the construction sector review existing practices to make them effective and efficient in bringing about development or making projects more sustainable.

What economic, social and environmental factors are considered by key Stakeholders to promote effective sustainable practices in government construction projects in Ghana concerning UNSDGs 8, 9, 10, 11 and 12? (RQ2)

There are other dimensions of sustainable construction aside from the environmental, economic and social. Pawlowski (2008), Valentin and Spangenberg (2000), Persson and Olander (2004), Sjostrom (2001), Hill and Bowen (1997), Ofori (1998), Mitlin and Satterthwaite (1996), Du Plessis (2002) and many more researchers have considered additional dimensions such as legal, political, technical, moral, institutional, cultural, managerial, and community (Gunatilake, 2013). Based on the study question, economic, social and environmental dimensions have been prioritized. However, this study is not oblivious that there are instances that optimization of these various dimensions of sustainable construction is not possible, and that compromise and trade-offs are required (Hill and Bowen, 1997).

Referring to Table 4, the economic, social and environmental factors considered by key stakeholders to promote effective sustainable practices in government construction projects have been enumerated accordingly. The six participants (P1–P6) provided twenty-three (23) social factors, twenty-three (23) environmental factors and nineteen (19) economic factors considered by key stakeholders to promote effective sustainable practices in government construction projects in Ghana concerning UNSDGs 8, 9, 10, 11 and 12. P1, P3 and P5 noted job creation and employment as social factors. The P3, P4 and P6 also noted labour issues, reducing inequalities at the workplace and labour force migration as social factors. The study acknowledged that these factors were either the same or related. The remaining social factors are considered "standalone" factors. There are similar situations with the enumerated environmental and economic factors, where participants noted related factors. Typical examples of environmental factors are P2, P3 and P5 noting emission reduction, limits on emission and reduction of carbon footprint; P2 and P5 noted the use of renewable energy, water and energy efficiency, use of alternative energy resources and reducing production energy. Typical examples of the economic factors are P2 and P4 noted improving access to economic infrastructure, support access to finance businesses, cooperatives and vulnerable groups and launching of the Ghana Green bond; and P3 and P6 noting viability of the project, economic feasibil-

Table 6 Environmental factors

Item No	Environmental factors under principles of environmental sustainability of construction	No of factors associated with the aligned principles	Percentage out of the 23 no. factors (%)
1	**Minimizing damage to sensitive landscape** a. Use and protection of natural resources (P2).	1	4.4
2	**Creating a healthy and non-toxic environment through minimising pollution** a. Emission reduction (P2, P3, P5). b. Sewage and water collection and treatment (P2). c. Managing noise levels (P6). d. Waste management (P6).	4	17.4
3	**Minimising resource consumption (includes water, energy, materials and land)** a. Water and energy efficiency (P2). b. Promoting green infrastructure - harvesting storm water and using it for irrigation purposes (P5). c. Reducing production energy (P5).	3	13.0
4	**The usage of renewable resources in preference to non-renewable resources** a. Use of renewable energy (P2). b. Use of alternative energy sources - wind and solar (P5).	2	8.70
5	**Protect and enhance the earth's bio-diversity and vitality** a. Insulating elements that harm the environment (P1). b. Promoting resilience and sustainability of the environment (P1). c. Climate adaptation (P2). d. Greening of open spaces (P2). e. Restoration of degraded natural environment (P2). f. Natural disaster prevention (P2). g. Drainage and flood prevention and warning systems (P2). h. Promoting Green buildings (P5). i. Potential impact of the project on the environment and mitigation measures that need to be put in place (P6).	9	39.1
6	**Ensure quality in creating the built-environment** a. Consider inputs and outputs in construction of projects and their impacts (P1). b. Improve supply chain for various elements used on the projects (P1). c. Execution of projects that enhance environmental sustainability assessments (P1). d. Integrating design elements that tend to promote natural ecosystem (P1).	4	17.4

ity, economic viability, and rate of return of the project etc. There are also "standalone" environmental and economic factors captured.

Considering the number of social, environmental and economic factors enumerated, it was deemed appropriate to identify the most relevant factors required to develop the framework for improving sustainable practices in government construction projects. This study considered the application of the relative importance index analysis, aligning the various factors with a sustainable construction framework and aligning with the environmental, social and economic sustainability principles of some selected researchers. In this study, the study used the latter, where the enumerated social, environmental and economic factors were aligned with the principles of social, environmental and economic sustainability construction as asserted by Anink *et al*. (1996), Dair and Williams (2006), DETR (2000), Hill and Bowen (1997), Venters *et al.* (2005), Sjostrom (2001) and Gunatilake (2013).

The aligned principles of environmental sustainability of construction used were as follows: minimising damage to the sensitive landscape; creating a healthy and non-toxic environment through minimising pollution; minimising resource consumption (including water, energy, materials and land); the usage of renewable resources in preference to non-renewable resources; protect and enhance the earth's bio-diversity and vitality and ensuring quality in creating the built-environment. Principles like maximisation of resource reuse/recycling, extracting fossil fuels and minerals and producing substances foreign to nature at rates faster than redepositing them into the earth's crust were not considered since the environmental factors (Table 6) noted by participants did not align with them.

The aligned principles of social sustainability of construction used were as follows: ensure there is inter-generational equity; ensure equitable distribution of social costs and benefits of construction; developing human resources; providing sufficient local services and facilities to serve development; promoting and protecting health through a healthy and safe working environment; improve the quality of human life, which includes poverty alleviation; providing for social self-determination and cultural diversity in development planning; uplifting communities; ensure local culture and heritage are conserved; ensure fair treatment and respect of stakeholders and integrating development within the locality. Principles like adhering to ethical standards, capacity building for disadvantaged people through training and skills development, providing high quality, liveable developments and providing structures that meet the needs of users and customers were not considered, as the social factors (Table 7) noted by participants did not align with them.

The aligned principles of economic sustainability of construction used were as follows: ensure there is support for local economic/business diversity; ensure to acquire financial benefits/profits; selecting environmentally responsible contractors and suppliers; the usage of full cost accounting and real cost pricing to set prices and tariffs for goods and services that fully reflect bio-physical and social costs; ensure financial affordability for beneficiaries by minimizing the overemphasis on technical sustainability and promote employment creation and labour- intensive construction in order to keep the financial contribution in local hands. Principles to enhance competitiveness

and efficiency through adopting practices and policies that advance sustainability and investing proceedings from the use of non-renewable resources in human-made and social capitals were not considered as the economic factors (Table 8) noted by participants did not align with them.

The P4 highlighted the following: the Ministry of Sanitation, National Commission for Civic Education (NCCE), Non-governmental Organizations (NGOs) and Civil Society Organizations have all embarked on social activities in Ghana, which were in line with sustainable development goals. However, the assertion fell short of providing specific details to back these claims; that the Environmental Protection Agency (EPA) is the driver of some environmental activities in Ghana in line with the sustainable development goals but could not confirm specific activities; and that Ghana Standards Board (GSB) had introduced a new building code, which had a chapter on Sustainability.

There are many more environmental, social and economic factors that key stakeholders consider in promoting effective sustainable practices in government construction projects in Ghana concerning UNSDGs 8, 9, 10, 11 and 12. However, this study considered the aligned principles of environmental, social and economic sustainability of construction as the relevant factors for sustainable practices in government construction projects in Ghana. These are six (6) environmental factors, eleven (11) social factors, and six (6) economic factors itemised in Tables 6, 7 and 8, and reflected the views of the participants.

Table 6 notes the following: 39.1 % of environmental factors from the participants focussed on the need to protect and enhance the earth's bio-diversity and vitality, 17.4 % focussed on creating a healthy and non-toxic environment through minimising pollution, 17.4 % focussed on ensuring quality in creating the built-environment, 13.0 % focussed on minimising resource consumption, 8.7 % focussed on the usage of renewable resources in preference to non-renewable resources and 4.4 % focussed on minimising change to sensitive landscape. Table 7 notes the following: 21.6 % of social factors from the participants focussed on improving the quality of human life, which includes poverty alleviation, 13 % focussed on ensuring fair treatment and respect of stakeholders, 13 % focussed on providing for social self-determination and cultural diversity in development planning, 8.7 % focussed on ensuring equitable distri-

Table 7 Social factors

Item No	Social factors under principles of social sustainability of construction	No of factors associated with the aligned principles	Percentage out of the 23 no. factors (%)
1	**Ensure there is inter-generational equity** a. Gender issues (P3, P4). b. Reducing inequalities at the workplace (P4).	2	8.7
2	**Ensure equitable distribution of social costs and benefits of construction** a. Introduction of Corporate social responsibilities as an element to promote social sustainability (P1). b. Compensation of people (P3).	2	8.7
3	**Developing human resources** a. Support access to training and entrepreneurship skills (P2).	1	4.4
4	**Providing sufficient local services and facilities to serve development** Executing more projects that improve the resilience and sustainability of settlements (P1).	1	4.4
5	**Promoting and protecting health through a healthy and safe working environment** a. Promoting good health. (05). b. Dealing with social vices - e.g., drug use and abuse, prostitution etc. (P6).	2	8.7
6	**Improve the quality of human life, which includes poverty alleviation** a. Job creation (P1, P5). b. Reduction and eliminating of Hunger (P2). c. Ensure life on land (P2). d. Employment (P2). e. Poverty reduction (P2, P5).	5	21.6
7	**Providing for social self-determination and cultural diversity in development planning** Introduction of the Zongo and Inner Cities development along the way, which is now defunct (P4). b. Dealing with belief systems (P6). c. Handling the issue of resettlement (P6).	3	13.0
8	**Uplifting communities** a. Providing social amenities - schools, hospitals, police station etc. (P6).	1	4.4
9	**Ensure local culture and heritage are conserved** a. Dealing with belief systems (P6).	1	4.4
10	**Ensure fair treatment and respect of stakeholders** a. Dealing with potential social upheavals between indigenes and migrant workers at project sites environs (P6). b. Labour issues (P3) c. Labour force migration (P6).	3	13.0
11	**Integrating development within the locality** a. Infrastructure development for people (P2). b. Use local contents in terms of employment and raw materials (P1)	2	8.7

bution of social costs and benefits of construction, 8.7 % focussed on promoting and protecting health through a healthy and safe working environment, 8.7 % focussed on ensuring there is inter-generational equity, 8.7 % focussed on integrating development with the locality, and 4.4% each focussed on ensuring local culture, and heritage are conserved, uplifting communities, providing sufficient local services and facilities to serve development and developing human resources. Table 8 notes the following: 42.11 % of economic factors from the participants focussed on ensuring there is support for local economic/business diversity, 31.58 % focussed on ensuring to acquire financial benefits/profits, 10.53 % focussed on promoting employment creation and labour-intensive construction in order to keep the financial contribution in local hands, 5.26 % each focussed on selecting environmentally responsible contractors and suppliers, the usage of full cost accounting and real cost pricing to set prices and tariffs for goods and services that help reflect bio-physical and social costs and ensuring financial affordability for beneficiaries by minimising the overemphasis on technical sustainability.

How has the database system assisted in providing details on achievements attained in Ghana construction sector that feed into global progress made on UNSDGs 8, 9, 10, 11 and 12 Targets? (RQ3)

Some efforts are ongoing by Ghana regarding the usage of database system as required by the United Nations. The study focused on five main themes: namely, the database system, reporting from the database system, Ghana's efforts to date on reporting on the UNSDGs 8, 9, 10, 11 and 12 targets including indicators, a few challenges associated with the reporting, the usefulness of the database system and recommendation made on the database system. The diverse responses from the participants (P1-P6) aligned with the selected themes.

According to P1, Ghana's SDGs database system was developed by the NDPC and assisted by Ghana Statistical Services (GSS). The P2 noted that there exist data on SDGs but not in a form that is easily accessible to ordinary people. However, P3 acknowledged not being aware of any database system but confirmed awareness of review reports on the implementation of SDGs, citing that released in 2019. The P4 expressed doubt over the existence of a database system (dot Db) in the construction sector that records sustainable practices towards attaining targets of SDGs. The P6 buttressed this, noting their lack of awareness of any database system that collates data and information on the performance or achievements of the construction sector concerning SDGs. The P2 indicated that there is no database system at the local government authorities on the SDGs. The P5 could not tell the impact of the database system because of less involvement with SDGs data but noted that data is key to decision making.

Ghana's first effort to report on SDGs was in 2018 (P1). According to P3, Ghana has produced three reports on the implementation of the SDGs, and the latest report is for 2021. P3 asserted that Ghana's review reports on the SDGs were based on statistical data from the census obtained from the GSS. P3 noted that GSS and other agencies report on the SDGs in Ghana. P3 also noted that the reports, specifically the environmental data received, are part of a tracking system and baseline data and are used to revise standards. P4 agreed to the existence of review and audit reports on the SDGs in the agriculture, health and education sectors but not in the construction sector, as it is privately-driven most of the time.

The P1 noted that the national medium-term development goals are aligned with the SDGs, simplifying reporting requirements. P1 also noted that the localized SDGs data are aligned with the UNSDGs data making reporting internationally easy and consistent. P1 revealed that various sectors have the responsibility to annually report on the SDGs, which are collated

Table 8 Economic factors

Item No	Economic factors under principles of economic sustainability of construction	No of factors associated with the aligned principles	Percentage out of the 19 no. factors (%)
1	**Ensure there is support for local economic/business diversity** a. Improve local economy (P1). b. Improve access to economic infrastructure (P2). c. Promoting productivity (P5). d. To attract businesses and investors to the local area (P2). e. Facilitate access to information (P2). f. Support industrialization (P2). g. Support access to finance for businesses, cooperatives and vulnerable groups (P2, P4). h. Facilitate access to productive assets such as land, water and natural resources (P2).	8	42.11
2	**Ensure to acquire financial benefits/profits** a. Viability of the project (P3, P6). b. Economic feasibility (P3). c. Introduction of lucrative interest rates (P4). d. Formation of Special Economic Development Zone (SEDZ) and providing incentives for those works within the zone (P4). e. Introduction of tax incentives (P4). f. Good rate of return (P6).	6	31.58
3	**Selecting environmentally responsible contractors and suppliers** a. Improve supply chain for various elements used on the projects (P1).	1	5.26
4	**The usage of full cost accounting and real cost pricing to set prices and tariffs for goods and services that fully reflect bio-physical and social costs** a. Consider inputs and outputs in construction of projects and their impacts (P1).	1	5.26
5	**Ensure financial affordability for beneficiaries by minimizing the overemphasis on technical sustainability** a. Cost of the project (P6).	1	5.26
6	**Promote employment creation and labour-intensive construction in order to keep the financial contribution in local hands** a. Affect household incomes positively (P1). b. Encouraging private sector involvement and entrepreneurship in creating jobs (P4).	2	10.53

and reported internationally. According to P6, Ghana inputs into the global progress on the SDGs through the National Statistics System, which includes GSS, the ministries and MMDAs, collating data on a wide variety of development issues. The P6 highlighted that some of the indicators required for reporting on SDGs 8, 9, 10, 11 and 12 are generated from either the ministries, departments or agencies or through national surveys and confirmed that the data on road mix conditions are available. The P2 indicated that at the local authority level metadata are developed to guide data acquisition and dissemination that provide consistency and accuracy. Also, P2 asserted that at the national and regional levels, disaggregated data is possible unlike the local/district level. According to P6, the sectors whose mandate cover the five goals do provide information that they have to enable the assessment of progress on these goals, and they are not able to report on all the indicators that are required for various reasons.

The P1 indicated that through the database system, various sectors reports are recorded, monitored and evaluated against the SDGs. The P1 also highlighted that the database system has helped track progress on the SDGs and allowed evaluation to achieve improved performance. However, P2 noted that the compilation and use of SDGs data has not been well institutionalized with the local government system. The P3 buttressed this by noting that the collation and the accuracy of data has always been a challenge. According to P2, the database system to capture data from the local/district level to the national level is urgently needed.

Conclusions

Ghana government has made efforts to increase SDGs awareness amongst stakeholders and has integrated SDGs into its national development and project planning framework. The level of awareness of the SDGs and how it has influenced the decisions made on sustainable practices in government construction projects in Ghana varied and were expressed both in qualitative and quantitative statements. Also, the level of awareness related to different group of stakeholders. There have been positive impacts of the SDGs awareness in Ghana, adding to and refining existing practices in the construction industry and delivering some level of sustainable practices. However, the view that stakeholders are aware of the SDGs and not the details of their targets and indicators requires further investigation. Also, a national survey to determine how the level of awareness about UNSD goals, targets and indicators have influenced the decisions made on sustainable practices in government projects in Ghana across project life cycles is recommended.

There are many more environmental, social and economic factors that key stakeholders would consider to promote effective sustainable practices in government construction projects in Ghana concerning UNSDGs 8, 9, 10, 11 and 12. However, this study identified some principles of environmental, social and economic sustainability of construction that constituted relevant factors for sustainable practices in government construction projects in Ghana. These are six (6) environmental factors, eleven (11) social factors and six (6) economic factors. On the environmental factors, priority was given to the need to protect and enhance the earth's bio-diversity and vitality, followed by creating a healthy and non-toxic environment through minimising pollution, and ensuring quality in creating the built-environment. The least considered environmental factor was minimising change to sensitive landscape. On the social factors, priority was given to improving the quality of human life, which includes poverty alleviation, followed by ensuring fair treatment and respect of stakeholders, and providing for social self-determination and cultural diversity in development planning. The least considered social factors were ensuring local culture and heritage are conserved, uplifting communities, providing sufficient local services and facilities to serve development and developing human resources. On economic factors, priority was given to ensuring support for local economic/ business diversity, followed by acquiring financial benefits/ profits, and promoting employment creation and labour-intensive construction to keep the financial contribution in local hands. The least considered economic factors were selecting environmentally responsible contractors and suppliers, the usage of full cost accounting and real cost pricing to set prices and tariffs for goods and services that help reflect bio-physical and social costs and ensuring financial affordability for beneficiaries by minimising the overemphasis on technical sustainability.

The government of Ghana is making efforts to utilize a database system as required by the United Nations to provide details on achievements attained on the UNSDGs 8, 9, 10, 11 and 12 targets in different sectors, including the construction sector and feeding progress made into the United Nations global database system. Some of the efforts made by Ghana to date are as follows: development of a database system; nominated government institutions are responsible for collecting and disseminating data on most UNSDGs; aligning national medium-term development goals with the UNSDGs; creating localized SDGs that align with the UNSDGs data; development of metadata to guide data acquisition and dissemination that provide accuracy and accuracy; through the database system, various sectors reports are recorded, monitored and evaluated against the SDGs, and Ghana using the database system has submitted three reports on SDGs, the first was in 2018 and the latest was in 2021. However, the usage of a database system is not across the entire stakeholders in the country as observed, and even some key stakeholders are unaware of its existence in the construction industry of Ghana. Also, compilation and use of SDGs data have not been well institutionalized with the local government system, specifically at the MMDAs level, causing a challenge with the collation and accuracy of SDG data. The database system to capture data from the Local/District level to the National level is urgently needed.

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Declaration of Conflicting Interest

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