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Encumbrances of integrating sustainability concepts and practices in rural community buildings: empirical evidence from Ghana

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Abstract

Purpose – Sustainability is a critical consideration in the construction industry, but its implementation faces numerous hurdles. This research paper explores the challenges associated with implementing sustainability practices in rural community buildings in the context of Ghana. It aims to identify and understand the obstacles that hinder the integration of sustainable practices and enrich the knowledge base in sustainable development.

Design/methodology/approach – An extensive literature review was conducted to identify the challenges of integrating sustainability concepts and practices in rural community buildings. The study employs a quantitative approach with a sample size of 63 construction professionals in Ghana. Data analysis involved descriptive statistics and one-sample *t*-tests to assess the significance of challenges.

Findings – The findings indicate specific challenges construction professionals face in integrating sustainability concepts in rural community buildings. Twenty-one challenges were considered significant by professionals, including limited technology access, inadequate stakeholder collaboration, low community interest, innovation deficiencies, data acquisition complexities, high initial capital requirements and limited availability of sustainable materials.

Practical implications – This research has both theoretical and practical implications. Theoretical implications stress the importance of considering the social aspects of sustainable development and stakeholder collaboration in the construction industry. Practical implications provide insights for practitioners and policymakers to address these challenges and promote sustainable development in rural communities.

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Originality/value – This study contributes to the understanding of challenges related to sustainability in rural community buildings, emphasising the importance of holistic approaches and stakeholder involvement. The research adds original insights to the existing knowledge in sustainable development.

Keywords Sustainability challenges, Rural community buildings, Construction professionals, Sustainability, Sustainability concepts, Rural

Paper type Research article

Introduction

It is projected that by the year 2050, the share of the world's population in urban regions will have increased to 68% (Ren *et al*., 2023; United Nations Department of Economic and Social Affairs (UN DESA), 2018). According to Lehmann (2011), urbanisation has been accelerated by rapid industrialisation, novel technological breakthroughs such as vehicles, and the availability of cheap land and cheap fossil fuels. Regardless of this upsurge in urban population, a significant world population exists in rural areas, characterised by rural buildings constructed by various traditional or vernacular architecture. Buildings in rural areas look and function quite differently from urban ones (Zhang *et al*., 2018). Most rural buildings are conventional one or two-storey structures with courtyards erected on communal land for farmers (Liu *et al*., 2014), while urban buildings are mostly high-rise condos (Evans *et al*., 2014). Across the globe, urban areas are encountering rapid change because of a solid cycle of urbanisation, and this rapid change has enormous ramifications for the natural and urban environment, infrastructure requirements, and the social composition of the urban society (Costa *et al*., 2008). This has led to a significant neglect of sustainable development in rural areas. Various authors have paid attention to buildings amidst pollution, environmental impact and energy usage. The effects of buildings resulting from rural-urbanisation have been perused in extant literature (Wang *et al*., 2020; Xu *et al*., 2018; Yuan *et al*., 2018). Extant literature has focused more on the development of sustainable urban buildings (Hong *et al*., 2020; Rahmayanti *et al*., 2019); critical success factors of green building projects (Li *et al*., 2019), demographic drivers of sustainable urban development (Akrofi *et al*., 2019), among others. Buildings in rural areas look and function quite differently from urban ones (Zhang *et al*., 2018). For the most part, buildings in rural areas have been erected throughout the years with more reliance on personal experiences than statutory building codes (Zhang *et al*., 2018). As a result, the level of quality that goes into the design and construction of buildings in rural areas is lower than that of their urban equivalents (Huang *et al*., 2013). Despite the growing interest in sustainable buildings, little attention has been paid to studies focused on rural ones. In addition, even with the increasing importance of sustainable development in the built environment, construction professionals face various obstacles that hinder the successful implementation of sustainability measures. Understanding these challenges is vital to addressing and overcoming them, ultimately fostering sustainable development in rural communities. This study is posited to bridge the research gap in advancing a sustainable rural environment. This study aims to examine the challenges to the integration of sustainability concepts in rural community buildings.

The concept of sustainability

The Earth's resources are under tremendous strain due to rising populations and economic expansion, and as a result, sustainability has become a focal point for countries around the globe (Ebekozien *et al*., 2022). Mensah (2019), however, observes that even though the concept is becoming a dominant development paradigm, there is still a lack of clarity about the idea, meaning, and what it entails. The ambiguity and lack of clarity surrounding the concept of sustainability tend to hinder the operationalisation of the concept, generate contradictory discourses on the matter, and may affect the validity of the studies (Salas-Zapata and Ortiz-Muñoz, 2019). Nevertheless, many authors have described "sustainability" in different ways. Basiago (1998) defines sustainability as maintaining an entity, outcome, or process over time. It is a never-ending process of meeting human needs in a limited manner,

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which ensures that the ecosystem is not negatively affected (Shafii *et al.*, 2006). Yılmaz and Bakış (2015) also define sustainability as using natural resources so that they do not decay, deplete, or become unrenewable and are passed on to future generations by developing them. What is common in most of the explanations of "sustainability" is that it seeks to ensure that the needs of today are met in a way which ensures that adequate resources are available to meet the environmental, social and economic needs of future generations. Additionally, many research studies have used three interconnected pillars to describe sustainability, which encompasses environmental, social, and economic (Purvis *et al.*, 2019; Stephen *et al.*, 2024).

The environment's quality has become one of the leading sustainable development goals to achieve in the coming years (Ridzuan *et al.*, 2020). The concept of environmental sustainability has stimulated transformational changes for the built environment, with reductions in the levels of energy consumption and natural resource depletion that have been required in traditional building life cycles (Wong and Zhou, 2015). Environmental sustainability seeks to sustain global life-support systems indefinitely ("this refers principally to those systems maintaining human life") (Goodland, 1995). Social sustainability is aimed at poverty reduction, job creation, promotion of cultural differences and an improvement in the interaction between humans and the natural environment, which is a part of the corporate social responsibility to the client of a project (Oyebanji *et al.*, 2017; Ikediashi *et al.*, 2014). Social sustainability is centred around social growth, recognising everyone's needs. The social aspect of sustainability emphasises the importance of equitable treatment irrespective of gender and race, access to essential healthcare, workplace safety regulations, adequate food standards, exposure to artistic and cultural experiences, recreational opportunities, personal happiness, the absence of human exploitation, and other related factors (Herremans and Reid, 2002). Economic sustainability refers to practices that support long-term economic growth without negatively impacting the community's social, environmental, and cultural aspects. Economic development spans rural and urban contexts developed and emerging economies, and local, regional, and national scales (Hammer and Pivo, 2017). Environmental sustainability could be defined "as a condition of balance, resilience, and interconnectedness that allows human society to satisfy its needs while neither exceeding the capacity of its supporting ecosystems to continue to regenerate the services necessary to meet those needs nor by our actions diminishing biological diversity" (Morelli, 2011, p. 5).

Sustainability concepts in rural buildings

Over the past few decades, the world has witnessed numerous environmental threats such as global warming, depletion of resources, rapid population growth, land degradation and globalisation (Ikuabe *et al.*, 2024). These issues sparked the debate for sustainability, indicating the need to integrate sustainability in how people live, act, use resources, and build. More importantly, sustainable architecture must be considered to make a human habitat comfortable to live in and meet human needs. Sustainable architecture denotes the interrelationship between natural, cultural, social and economic resources to create an optimum relationship between people and their environments (Amiri and Vatandoost, 2017). Today, vernacular architecture is seen as a paradigm for sustainable architecture, and the principles that underpin sustainable construction are taken from components and characteristics of this style (Tawayha *et al.*, 2019; Fernandes *et al.*, 2014). In this design architecture, local materials such as clay, grasses, and bamboo are the primary building materials utilised to meet local climatic conditions; clay is used to form adobe walls to adequately control temperature between the interior and outside due to the hot, humid climates (Auwalu and Dickson, 2019). In Ghana, buildings' most commonly used vernacular materials are timber/lumber, bamboo, grass/thatch, laterite and clay. Until recently, timber/lumber was one of the widely accessible natural resources in Ghana (Agyekum *et al.*, 2020). As a versatile material with desirable features, existing timber structures in Ghana have survived some conventional ones (Baiden *et al.*, 2005). Among these, the Nzulezu Stilt Village is noteworthy. This village is situated over a lagoon on wooden stilts. The tropical and subtropical parts of the

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globe, such as Ghana, have an abundance of bamboo as a traditional construction material (Agyekum *et al*., 2020). According to van der Lugt *et al*. (2015), it is adaptable, strong, and lightweight. For example, in the northern area of Ghana, it is a typical wall-building material (Agyekum *et al*., 2020). Adobe construction/Sun-dried brick walling, timber-framed construction, Wattle and Daub, Rammed Earth Construction, and Pile Dwellings are the vernacular building techniques used in Ghana. The Adobe construction, also referred to as "earth construction" or "sun-dried brick walling", is the oldest building practice known (Mauricio *et al*., 2021; Salih *et al*., 2020; Agyekum *et al*., 2020) with several cost-effective and eco-friendly benefits (Costa *et al*., 2008). A notable structure in Ghana constructed using this technique is the Larabanga Mosque, built in the Sudanese architectural style in the village of Larabanga in the West Gonja District of the Savannah Region of Ghana. The use of local materials and the harmonisation with the local environment and climate contribute to every area's distinct architectural identity (He *et al*., 2014). According to He *et al*. (2014), accelerating the development of rural building energy efficiency has strategic meanings to improve people's living levels, reduce energy consumption, improve environmental quality, and even promote economic growth. Vernacular material selection, compatibility, embodied energy, application of passive energy and design environmental strategies in waste and technology management concerning environmental impacts are all concepts that are part of a sustainable building design (Vakili and Boussabaine, 2006).

Research methodology

This research adopts the positivist philosophical stance to provide empirical evidence through systematic observation and data analysis. The positivist approach objectively examines sustainability challenges in rural community buildings and supports identifying empirical patterns and trends. To begin with, existing literature about the field of research was critically reviewed. A comprehensive literature review on the challenges to integrating sustainability concepts was conducted. This was to identify various challenges addressed in existing literature. The next stage was to collect, analyse, and interpret the data. Survey research was adopted, and the quantitative approach was used in collecting primary data. The questionnaires were used to collect primary data for analysis. The variables obtained from the literature were used to design and structure the questionnaire. Both self-administered and interview-administered questionnaire types were deployed. The questionnaire consisted of two main parts, PART I and PART II. Part I covered the demographic data of the respondent. Part II of the questionnaire consisted of variables that sought to address the objective of this study. Respondents were expected to tick and rank on a five-point response scale in this part. They were allowed to either rank (1) "not critical", (2) "less critical", (3) "averagely critical", and (4) "critical" or (5) "very critical" the challenges of integrating sustainability concepts and practices in buildings in rural communities. The questionnaire was designed to encompass 21 sustainability challenges, which participants were asked to assess based on their perceptions. Both online surveys and face-to-face interactions were employed as data collection methods. The population for the study consisted of construction professionals (specifically, construction managers, quantity surveyors, architects, engineers, project managers, estate managers, and lecturers) in Ghana, most of whom have been directly involved in rural community building projects. The choice of this population stems from their expertise and practical insights into the challenges faced in integrating sustainability concepts and practices. Selected respondents were identified using a purposive, convenient and snowballing sampling approach. This was because it was difficult to determine the exact population size of the construction professionals. Additionally, purposive sampling was used to involve participants with experience and knowledge in the subject area of this study (Rowley, 2014). Also, the questionnaire used closed-ended questions. Out of the one hundred and three (103) questionnaires administered, a total of sixty-three (63) responses were received, which amounts to 61% response rate. The collected data were subjected to rigorous quantitative analysis. The one-sample *t*-test, mean score ranking

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and Relative Importance Index were used to analyse the data. This was done after the Cronbach's alpha was used to test the scale's internal consistency. An alpha value of 0.940 was derived from the Cronbach's alpha test. Thus, affirming the validity and reliability of the research instrument as recommended by Adekunle *et al*. (2024) and Ibrahim *et al*. (2024).

Findings

Demographic information of respondents

Regarding the position in the company/profession, the participants' roles are distributed across various segments of the construction and sustainability practices within rural community buildings. Architects constitute around 14.3% of the sample. Academics, including lecturers and researchers, accounted for 7.9% of the participants, providing a scholarly perspective. Construction managers, Quantity surveyors are engineers who make up 28.6%, 39.7 and 9.5% of the sample. In terms of academic qualification, participants' educational backgrounds are as follows: 7.9% hold a Higher National Diploma (HND), 42.9% have attained undergraduate degrees, signifying. Nearly 39.7% have achieved master's degrees, and 9.5% of participants hold a Doctor of Philosophy (PhD). The sample group's diversity in positions and educational backgrounds underscores the study's comprehensiveness. Insights provided by professionals from various sectors and with different academic qualifications enhance the study's findings, making them more applicable and robust within sustainability challenges in rural community buildings. This varied range of perspectives will be instrumental in identifying and addressing the multifaceted challenges associated with integrating sustainability concepts and practices in this context.

Data analysis

The data collected in this study were analysed using the Statistical Package for Social Sciences software version 26, employing descriptive statistical techniques. A one-sample *t*-test was utilised to compare the means of both challenges. In this study, the population sample mean was compared to a hypothesised mean of 3.5, as suggested by prior research (Kissi *et al.*, 2023). In line with existing literature, the study identified challenges that impeded sustainability practices in rural communities and established the ranking of these attributes based on their perceived severity by the respondents. The mean, standard deviation, Relative Importance Index (RII), and standard error for each variable were calculated to enhance the comprehensibility of the survey's findings. In a case with more than one criterion having the same RII, the criterion with the lowest standard deviation was assigned the highest significance ranking (Ayarkwa *et al*., 2022).

As shown in Table 1, "Lack of government support" was considered the most critical challenge by the respondents, with an RII of 0.870. It received a mean score of 4.35, suggesting its substantial impact. The standard deviation was 1.003, indicating some variation in responses. "Lack of occupants' interest" emerged as another prominent challenge, with an RII of 0.854. It received a relatively high mean score of 4.27, signifying its critical nature. The standard deviation was 0.653, indicating agreement among respondents. Respondents ranked "Lack of importance attached to sustainability by community leaders" as the third major challenge, with an RII of 0.842. It had a mean score of 4.21, indicating its significance. The standard deviation was 0.786, suggesting some diversity in responses. The least ranked variables are "Fiscal inequality/financial constraints" emerging as a noteworthy challenge with an RII of 0.778, mean score of 3.89 and SD of 1.049), "Poor planning and design" (RII of 0.768, with a mean score of 3.84 and SD of 0.846) and "Lack of sustainable rural building measurement database and design tools" (RII of 0.758, a mean score of 3.79 and a SD of 1.152).

One-sample t-*test*

To ascertain the significance level of the challenges of integrating sustainability practices and concepts in rural community buildings. A one-sample *t*-test is a statistical method used to

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Table 1. Ranking of the identified challenges of integrating sustainability concepts and practices in rural community buildings

SN	Challenges	Mean	Std. deviation	Skewness	Kurtosis	RII	Rank
1.	Lack of government support	4.35	1.003	−1.950	3.537	0.870	*1st*
2.	Lack of occupants' interest	4.27	0.653	−1.056	2.933	0.854	*2nd*
3.	Lack of importance attached to sustainability by community leaders	4.21	0.901	−1.520	3.299	0.842	*3rd*
4.	Lack of interest and market demand in the community	4.21	0.786	−1.209	1.883	0.842	*4th*
5.	Resistance to change from the use of traditional technologies	4.19	0.913	−0.918	−0.018	0.838	*5th*
6.	High initial capital cost	4.11	0.863	−0.841	0.238	0.822	*6th*
7.	Limited availability of sustainable materials	4.10	0.837	−0.866	0.515	0.820	*7th*
8.	Unaware of the benefits of sustainability	4.08	0.789	−1.160	1.818	0.816	*8th*
9.	Lack of awareness of sustainability concepts in rural areas	4.06	0.878	−1.605	3.782	0.812	*9th*
10.	Lack of sustainability expertise/skilled labour	4.06	0.931	−0.624	−0.588	0.812	*10th*
11.	Lack of coordination among stakeholders	4.06	1.045	−1.705	2.922	0.812	*11th*
12.	Unfamiliarity with sustainability	4.05	0.991	−1.228	1.530	0.810	*12th*
13.	Lack of innovation	4.05	1.084	−1.038	0.441	0.810	*13th*
14.	Lack of regulatory framework for sustainable urban developments	4.02	0.907	−1.238	2.379	0.804	*14th*
15.	Low level of expertise amongst professionals	4.00	1.016	−1.144	1.118	0.800	*15th*
16.	Lack of sustainability technological training	3.98	0.975	−1.045	1.231	0.796	*16th*
17.	Lack of technology	3.94	1.030	−1.334	2.067	0.788	*17th*
18.	Difficulty in acquiring data on existing building	3.92	1.112	−1.295	1.228	0.784	*18th*
19.	Fiscal inequality/financial constraints	3.89	1.049	−0.984	0.513	0.778	*19th*
20.	Poor planning and design	3.84	0.846	−0.841	0.444	0.768	*20th*
21.	Lack of sustainable rural building measurement database and design tools.	3.79	1.152	−0.757	−0.424	0.758	*21st*

Source(s): Authors' own work (2025)

determine if the mean (average) of a sample of data significantly differs from a known or hypothesised population mean (Francis and Jakicic, 2023). It is a standard statistical test used to assess whether the sample for a study differs from a population mean known or hypothesised. It is essential to elucidate the one-sample *t*-test analysis's key aspects, including the significance level set at a 95% confidence interval. Practically, any variable with a *p*-value less than 0.05 is deemed statistically significant. The *p*-value represents the statistical probability of observing a t-statistic as extreme as the one calculated for a given variable under the null hypothesis. Consequently, the null hypothesis is rejected if the probability is less than 0.05. The hypotheses set for this study are as follows: Null hypothesis (Ho): "The mean value is not statistically significantly different", whilst the Alternative hypothesis (Ha): "The mean value is statistically significantly different". For each variable, the null hypothesis was that the variable was not a significant factor (Ho: $U = Uo$). *Uo* represents the critical rating above which the variable is considered necessary. All the challenges with a *p*-value less than 0.05 were significant to the study, implying that the means of these variables are not significantly different from the hypothesised mean of 3.5. This indicates that all challenges with a *p*-value

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less than 0.05 were not statistically significant for the study. This suggests that the means of these variables significantly differ from the hypothesised mean of 3.5. As shown in Table 2, all the challenges had *p*-values less than 0.05. Hence, the null hypothesis was rejected. This suggests that all the difficulties identified were significant to the study.

Discussion of findings

The study identified several key barriers to integrating sustainability practices and concepts in rural community buildings. Notably, the lack of government support was deemed the most critical challenge, emphasising its substantial impact on the sustainable development of rural communities. This finding aligns with numerous studies (Golić *et al*., 2023; Aghimien *et al*., 2019), which highlight the indispensable role of government backing in driving sustainable initiatives. Lack of occupants' interest emerged as another prominent challenge, emphasising the importance of engaging building occupants in sustainability initiatives. The essential role of occupants in effectively integrating sustainable practices in rural community structures has been highlighted in literature (Ayarkwa *et al*., 2022; Aghimien *et al*., 2019). Consistent with literature, the lack of importance attached to sustainability by community leaders and the lack of a regulatory framework for sustainable urban developments were also identified as significant challenges, reflecting the need for leadership commitment and regulatory structures to support sustainable initiatives (Adamowicz and Zwolińska-Ligaj, 2020). Other challenges include: unawareness of the benefits of sustainability and a lack of awareness of sustainability concepts in rural areas, emphasising the need for education and awareness-raising in rural communities (Zhang and Guo, 2023; Ayarkwa *et al*., 2022; Golić *et al*., 2023;

Table 2. One-sample *t*-test of the identified challenges of integrating sustainability concepts and practices in rural community buildings

Test Value = 3.5 (95% confidence level)				
SN	Challenges	*t*	*p*	(Null hypothesis) remarks
1.	Lack of awareness of sustainability concepts in rural areas	5.097	0.000	Rejected
2.	Lack of importance attached to sustainability by community leaders	9.362	0.000	Rejected
3.	Unfamiliarity with sustainability	4.515	0.000	Rejected
4.	Lack of sustainability expertise/skilled labour	4.804	0.000	Rejected
5.	Difficulty in acquiring data on existing building	6.223	0.000	Rejected
6.	Lack of sustainability technological training	7.132	0.000	Rejected
7.	Lack of occupants' interest	4.387	0.000	Rejected
8.	Lack of technology	3.365	0.001	Rejected
9.	Resistance to change from the use of traditional technologies/	6.001	0.000	Rejected
10.	Low level of expertise amongst professionals	4.279	0.000	Rejected
11.	Lack of regulatory framework for sustainable urban developments	5.645	0.000	Rejected
12.	Lack of innovation	5.618	0.000	Rejected
13.	Lack of interest and market demand in the community	3.940	0.000	Rejected
14.	High initial capital cost	4.010	0.000	Rejected
15.	Lack of government support	6.723	0.000	Rejected
16.	Lack of coordination among stakeholders	3.906	0.000	Rejected
17.	Lack of sustainable rural building measurement database and design tools.	2.023	0.047	Rejected
18.	Poor planning and design	2.943	0.005	Rejected
19.	Unaware of the benefits of sustainability	5.828	0.000	Rejected
20.	Limited availability of sustainable materials	3.200	0.002	Rejected
21.	Fiscal inequality/financial constraints	3.004	0.004	Rejected

Source(s): Authors' own work (2025)

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Aghimien *et al*., 2019). Aghimien *et al*. (2018) mentioned that the limited understanding of the benefits of sustainable construction poses a challenge in adopting sustainable construction practices. Lack of sustainability expertise/skilled labour identified as a challenge highlights the importance of a qualified workforce (Golić *et al*., 2023; Kavga *et al*., 2021). Lack of technology has also been recognised as a significant challenge, indicating the need for technological advancements to support sustainability efforts (Aghimien *et al*., 2019).

Furthermore, a lack of sustainability technological training was identified as a challenge. This suggests a gap in the knowledge and skills required for implementing sustainable technologies in rural areas. The significance of training is supported by studies by Ayarkwa *et al*. (2022) and Kavga *et al*. (2021), emphasising the role of education in overcoming sustainability challenges. According to Ayarkwa *et al*. (2022), the successful execution of practices within the built environment relies on the knowledge accessible to the individuals responsible, which is influenced by their training and education. Fiscal constraints have been widely recognised as a barrier to sustainable development (Golić *et al*., 2023), and the resistance to change from traditional practices is in line with findings from Aghimien *et al*. (2019).

In integrating sustainability practices in rural community buildings, the lack of technology emerges as a pivotal challenge. Aghimien *et al*. (2019) emphasise the lack of technological advancements in supporting sustainability initiatives, highlighting the need for rural communities to adopt and leverage technological innovations. The lack of coordination among stakeholders underscores the importance of effective collaboration. This challenge resonates with Golić *et al*.'s findings (2023), which stress the significance of cooperation among various stakeholders in ensuring the success of sustainability projects in rural settings. Generating community interest and demand for sustainable practices is another paramount concern, as indicated by the community's lack of interest and market demand. This aligns with the research of Golić *et al*. (2023), Aghimien *et al*. (2019), and Aghimien *et al*. (2018), emphasising the need to cultivate awareness and enthusiasm within rural communities for embracing sustainable development.

Addressing the lack of innovation is of utmost importance, with several studies (Aghimien *et al*., 2018; Aigbavboa *et al*., 2017; Babalola *et al*., 2015). Innovation is regarded as a means to surmount existing obstacles and bring fresh perspectives to sustainability practices in rural areas (Darko *et al*., 2017). An often-underestimated challenge is the difficulty in acquiring data on existing buildings. This challenge spotlights the necessity of robust data collection and management for well-informed decision-making, resonating with the research conducted by Aghimien *et al*. (2019). To understand the cost advantages of sustainability, one must adopt a long-term perspective that considers both the project's initial expenses and continuous costs. It is therefore not surprising that high initial capital cost emerged as a noteworthy challenge in the study, reflecting the financial demands of sustainable buildings. This challenge is consistent with findings by (Golić *et al*., 2023; Ayarkwa *et al*., 2022; Aghimien *et al*., 2019), highlighting the financial complexities associated with sustainability in rural communities. The construction of a sustainable building involves a significant upfront investment, irrespective of the specific building methods employed (Wu *et al*., 2019). Equally critical is the challenge of the limited availability of sustainable materials. This challenge underscores the need for accessible and eco-friendly building resources, aligning with research conducted by Golić *et al*. (2023) and Aghimien *et al*. (2019). Finally, Poor planning and design emerged as another prominent challenge, with high agreement among respondents, indicating its critical nature. Similar observations are found in the work of Zhang and Zhang (2020), stressing the significance of effective planning and design in the success of sustainable buildings.

Implications of the study

This study advances the theoretical understanding of impediments to integrating sustainability practices within rural community buildings. This research enriches the knowledge base within

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the sustainable development domain by identifying these challenges. It provides a deeper understanding of the obstacles that must be addressed to promote sustainable practices in rural communities. The study accentuates the significance of stakeholder collaboration in sustainability initiatives. This makes it evident that sustainable development transcends mere technicalities, encapsulating intricate social dimensions. Researchers and scholars can draw from this insight to develop more holistic theories and models that consider the social dynamics involved in sustainable practices.

Practically, this study holds substantial value for practitioners and policymakers. It provides insights into specific challenges that need to be addressed in rural community building projects. By recognising these challenges, practitioners can make more informed decisions when planning and implementing sustainable initiatives. The research underscores the imperative nature of multi-stakeholder engagement in sustainable projects. In a practical sense, this underscores the critical importance of inclusive efforts involving community members, professionals, governmental bodies, and other pertinent stakeholders for project success. Moreover, the findings emphasise the significance of education and training programs about sustainability. Organisations and institutions engaged in rural community development can formulate training initiatives to address the identified challenges. These initiatives will empower individuals and professionals with the knowledge and competencies to overcome these barriers. The implications provide a foundation for future research and guide real-world efforts to overcome the identified barriers and promote sustainable development in these communities.

Conclusion and limitations

In the pursuit of sustainable development, rural community buildings represent a critical frontier where the principles of sustainability can profoundly impact people's lives. However, this endeavour has its challenges, as this study has illuminated. A literature review identified various obstacles to serve as a foundation for developing a questionnaire for data collection. A one-sample *t*-test and RII were used to determine the significance of the variables and rank them. Exploring various challenges to implementing sustainability practices in rural community buildings has provided valuable insights. The findings from this research shed light on the multifaceted nature of these barriers. The successful integration of sustainability practices in rural settings is contingent on addressing various interconnected challenges. While these challenges might appear daunting, they also offer meaningful change and progress opportunities. The study revealed that all twenty-one (21) challenges identified were considered significant by the respondents.

One notable limitation of this study is related to the specific demographic of the respondents, who are construction professionals in Ghana. While their expertise in the construction industry is unquestionable, their perspectives may be influenced by factors unique to Ghana, such as regional, cultural, economic, and regulatory aspects. As a result, the findings may not be universally applicable to different contexts and regions. To enhance the generalisability of the results, future research could consider conducting similar studies with diverse groups of professionals from various geographic locations and evaluating the broader influence of cultural, economic, and regulatory differences on sustainability challenges in rural community buildings. Additionally, the study primarily focused on the viewpoints of construction professionals. While their insights are invaluable, this study did not include the perspectives of other key stakeholders, such as community members, government officials, and non-governmental organisations. Incorporating a wider array of perspectives in future research could provide a more comprehensive understanding of the challenges and opportunities related to sustainability practices in rural community buildings and yield a more holistic view of the subject.

The study's sample size of 63 participants, while sufficient for quantitative analysis, may present limitations in terms of broader generalisability. The findings are based on the responses

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of this specific group of construction professionals in Ghana, and the study's quantitative nature may not capture the full depth and diversity of perspectives related to sustainability challenges in rural community buildings. A larger sample size could provide a more comprehensive understanding of these challenges and yield statistically significant results, especially when considering subgroups or specific variables. While valuable for statistical analysis, it is essential to acknowledge that quantitative methods may not fully capture the qualitative nuances and contextual factors that influence sustainability practices. In-depth qualitative research, such as interviews or focus groups, could complement the quantitative findings by providing richer insights into the experiences, perceptions, and contextual intricacies of sustainability challenges in rural community buildings.

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