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Assessment of Construction Professionals Competence in Implementing Circular Economy Practices in the Nigerian Construction Industry

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Abstract

The Nigerian construction industry faces significant environmental and sustainability challenges, which continue to impede resource efficiency, compromise environmental performance, and constrain sustainable development efforts. The adoption of Circular Economy (CE) practices presents a promising approach to addressing these issues, yet the competence of construction professionals to implement such practices remains underexplored. This study assesses the level of knowledge and the barriers to competence development in CE among Nigerian construction professionals. A quantitative research approach was adopted to carry out the study. Structured questionnaire was distributed to 110 professionals to evaluate self-assessed knowledge of CE principles and assess the barriers to implementation. The results indicated that while professionals show moderate familiarity with basic CE concepts, such as waste minimisation (MS = 3.86) and material reuse (MS = 3.62). However, there is a significant limitation in advanced competencies, such as lifecycle assessments (MS = 2.43) and the integration of CE principles into procurement practices (MS = 2.46). Furthermore, this study identifies the key barriers such as lack of awareness (MS = 4.30), insufficient educational coverage (MS = 4.25), and poor government policies (MS = 4.25), as major constraints to the effective application of CE in the industry. The findings highlight the need for comprehensive training programmes, policy reforms, and greater integration of digital technologies such as Building Information Modelling (BIM) to bridge these gaps. This study provides valuable insights for policymakers, educators, and industry stakeholders to support developing and adopting CE principles in the Nigerian construction industry.

Keywords: Circular Economy, Construction Industry, Sustainability, Professional Competence, Waste Minimization

Introduction

The construction industry is a major driver of economic development in emerging economies, accounting for a significant share of gross domestic product (GDP) and employment opportunities (Alaloul *et al*., 2021). Despite these advantages, the construction industry's reliance on linear resource consumption models, which is characterised by extraction, utilisation, and disposal, has raised concerns about environmental degradation, material scarcity, and long-term sustainability (Barbhuiya and Das,

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2023). As developing countries grapple with rapid urbanisation, infrastructure deficits, and increasing waste generation, there is a growing urgency to transition toward more sustainable construction practices (Bello *et al*., 2024). The circular economy (CE) has emerged as a compelling framework to address these challenges, advocating for closed-loop systems where materials are reused, recycled, and regenerated, thereby minimising resource extraction and environmental impact (Kara *et al*., 2024). CE adoption in construction has been extensively studied in advanced economies, its practical integration in developing economies remains limited and under-researched. Studies such as (Bello *et al*., 2024; Oluleye *et al*., 2023; Osei-Tutu *et al.*, 2023) highlight that, although CE principles such as material reuse and design for disassembly are conceptually recognised in parts of emerging economies, systemic barriers such as limited awareness, inadequate technical capacity, and lack of regulatory enforcement impede widespread adoption.

Among the critical factors influencing CE implementation is the competence of construction professionals. Competent professionals act as key agents in translating circularity concepts into practical project outcomes (Quashie *et al*., 2024). However, existing research in developing countries suggests substantial competence gaps. Akindele *et al.* (2023) found that Nigerian construction practitioners often lack sufficient knowledge of sustainable construction principles, which was further supported by the study of Abdulraheem and Isa (2024) and Omopariola *et al.* (2024), which reported skill deficiencies among professionals in the Nigerian construction industry. Likewise, Idris and Bello (2023) emphasised the importance of professional capacity-building in the Nigerian construction industry to facilitate CE integration. Despite these insights, empirical studies examining construction professionals' competencies for CE practices remain sparse in the Nigerian construction industry. Much of the existing literature focuses broadly on sustainable construction or waste management without isolating the human skill dimension that underpins successful CE transitions. Therefore, there is a critical need to evaluate construction professionals' knowledge, technical skills, and training experiences as determinants of CE adoption in the Nigerian construction industry.

In response to this gap, this study investigates Nigerian construction professionals' competence regarding application of CE principles. Specifically, it examines the extent of their knowledge, practical skills, and formal training related to CE implementation. It also identifies key barriers to competence development. Nigeria presents a representative case due to its rapidly expanding construction sector, persistent environmental challenges, and growing policy interest in sustainable development initiatives. The following research questions guide the study:

i. *How competent are these professionals in applying CE practices on construction projects?*
ii. *What are the barriers that constrain the acquisition and application of CE competencies among Nigerian construction professionals?*

By focusing on the human capital dimension of CE adoption, this study aims to contribute new insights to the knowledge of CE in developing economies. It offers practical implications for capacity-building initiatives, educational reforms, and industry policy frameworks geared toward fostering a more circular construction industry in Nigeria and countries with similar characteristics.

Literature Review

Circular Economy in Developing Countries: Opportunities and Challenges

The transition to a CE presents significant opportunities for developing countries, particularly in promoting sustainable growth, reducing environmental degradation, and creating green jobs. CE

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principles such as reuse, recycling, refurbishment, and design for longevity align well with resource efficiency imperatives in low- and middle-income nations. Several studies (Amudjie *et al.*, 2023a; Ahmed, 2023; Bello *et al.*, 2023) have demonstrated that CE can drive economic diversification and resilience while addressing waste management and urbanisation pressures.

However, despite these opportunities, numerous challenges undermine CE adoption. Developing countries often grapple with weak institutional frameworks, limited technological infrastructure, low awareness levels, and financial barriers (Bello, 2025; Abdulai *et al*., 2024). Additionally, Dabaieh *et al.* (2022) noted that CE initiatives are frequently fragmented, with little integration into mainstream development strategies. Market conditions favouring cheaper virgin materials over recycled options and lacking targeted policy incentives further complicate the transition (John *et al.*, 2023; Idris and Bello, 2023). In emerging economies' construction industry, the lack of structured programs promoting circular principles remains a persistent obstacle. Nonetheless, the strategic implementation of CE practices holds considerable promise for fostering economic sustainability and environmental stewardship.

Competence and Skills for Circular Construction

Competency development is central to advancing circular construction. Circular construction demands a shift from traditional linear thinking towards innovative design, material optimisation, lifecycle thinking, and interdisciplinary collaboration. Quashie *et al*. (2024) emphasised the necessity for professionals to possess skills in sustainable design, operational management, material reuse, waste minimisation, and stakeholder engagement. Furthermore, Akanbi *et al*. (2018) illustrated how specific technical skills, such as design for deconstruction and modular construction techniques, are crucial for enhancing material recoverability and minimising construction and demolition waste. Similarly, Gyimah *et al*. (2024) highlighted the importance of lifecycle assessment skills and knowledge of green building certification systems as key competencies to foster circularity in the built environment.

Despite these emerging skill requirements, the current workforce in emerging economies remains vastly underprepared. This under-preparedness hampers the practical realisation of CE strategies, particularly in construction sectors where traditional practices dominate.

Professional Development and Circular Economy Capacity Building

Recognising the skills gap, scholars have increasingly called for targeted capacity-building initiatives to embed CE principles into professional education and ongoing development programs. Studies such as Otasowie *et al*. (2024a) and Haruna *et al*. (2024) advocate integrating CE modules into higher education curricula, professional certification programs, and vocational training. Capacity building is seen as pivotal for raising awareness and fostering the critical thinking, systems analysis, and technical innovation necessary for CE implementation. Suleman *et al*. (2023a) noted that professional development programs that combine theoretical knowledge with practical exposure,such as site-based learning and internships focusing on circular projects,are more effective at driving competence. Moreover, Kwasafo *et al.* (2024) emphasised the role of government-led initiatives, such as green public procurement policies and industry incentives, to encourage professional participation in CE upskilling. Without structured, large-scale professional development interventions, the potential for CE to transform the construction industry in Africa remains limited.

Barriers to Competence Development in Circular Construction

Despite the recognised need for capacity building, several barriers hinder the development of circular competencies among construction professionals. Financial constraints limited institutional support, and

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low prioritisation of CE in national development agendas have been identified as major impediments (Bello *et al*., 2024). Cultural inertia within the construction sector, where traditional linear practices are deeply entrenched, poses a significant challenge (Ogunmakinde *et al*., 2022; Otasowie *et al*., 2024b). Additionally, the lack of awareness and practical tools for CE implementation, as noted by Dadzoe *et al.* (2024), exacerbates the skills gap. Another notable barrier is the scarcity of interdisciplinary training programs. Many existing programs focus narrowly on environmental management without adequately addressing construction-specific circular practices such as design for adaptability, material passports, and digital technology integration (Eze *et al*., 2024). The absence of national qualification frameworks incorporating CE competencies limits recognition and career progression for professionals pursuing expertise in this area.

Methodology

This study employs a quantitative research design with a descriptive survey approach to assess the competence of Nigerian construction professionals in applying CE principles. A quantitative approach is chosen because it allows for the collection of numeric data (Opoku *et al*., 2016). The survey design is appropriate for gathering information from a large sample of construction professionals, providing insight into their CE competence. Descriptive surveys are widely used in social sciences to quantify attitudes, knowledge, and practices within specific groups, making this approach ideal for exploring the current state of CE in the Nigerian construction industry.

This study targets professionals working in the Nigerian construction industry, such as Architects, Builders, Civil Engineers, Quantity Surveyors, and Project Managers. These professionals are crucial in successfully implementing CE strategies, and understanding their competencies is key to addressing the research questions. Snowball sampling was used to select participants for this study, as it effectively reaches specialised populations (Biernacki and Waldorf, 1981). This method is particularly suited for niche areas where expertise is limited, and participants are known within professional networks (Parker, 2019).

Data was collected from a sample of 110 construction professionals in the North central region of Nigeria across three states: Abuja (48), Kwara (33), and Minna (29). Snowball sampling was employed to identify participants through professional networks, as this technique is well suited for recruiting specialised populations that are not easily accessible through conventional probability sampling approaches (Noy, 2008). This sample size is considered adequate for obtaining reliable and generalisable data. As Krejcie and Morgan (1970) suggested, a sample size of 100 to 150 participants is sufficient to ensure statistical relevance for populations in the thousands. The survey utilised a Likert-scale questionnaire, which ranged from 1 = Strongly Disagree to 5 = Strongly Agree, to assess participants' knowledge and barriers affecting the acquisition of competencies of CE principles.

The questionnaire was distributed online to maximise response rates. The collected data was analysed using descriptive statistics to summarise respondents' knowledge of CE principles and the barriers they encounter. Descriptive statistics (mean score and standard deviation) were used to analyse the data.

Result Presentation

Table 1 shows the respondent's profile comprising a diverse group of Nigerian construction professionals, ensuring broad representation across different industry sectors. Among the respondents, Builders constituted the largest proportion (25.5%), followed by Civil Engineers (23.6%), Architects (17.3%), Quantity Surveyors (19.1%), and Project Managers (14.5%), highlighting the inclusion of

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various professional perspectives. In terms of academic qualifications, the majority (53.64%) held a bachelor's degree, with a notable presence of respondents holding master's degrees (30%) and a doctorate (16.36%), reflecting a mix of educational backgrounds within the industry. Geographically, respondents were distributed across Abuja (43.64%), Kwara (30%), and Minna (26.36%), ensuring diversity in the data. Regarding professional experience, most respondents (40%) had between 11 and 15 years of experience, with significant proportions also falling within the 5-10 years (28.18%) and 16-20 years (20.91%) categories, indicating a generally experienced respondent pool. This diverse and experienced respondent pool strengthens the credibility of the findings, as it reflects perspectives from key professional groups who directly influence CE-related decisions and practices in the Nigerian construction industry.

Table 1: Respondents profile

Respondents Profile		Frequency	Percentage
Profession	Architect	19	17.3
	Builder	28	25.5
	Civil engineer	26	23.6
	Quantity surveyor	21	19.1
	Project manager	16	14.5
	Total	110	100.0
Academic qualification	Bachelor	59	53.64
	Masters	33	30.00
	Doctorate	18	16.36
	Total	110	100.00
Location	Abuja	48	43.64
	Kwara	33	30.00
	Minna	29	26.36
	Total	110	100.00
Years of Experience	5-10 years	31	28.18
	11-15 years	44	40.00
	16-20 years	23	20.91
	21 years above	12	10.91
	Total	110	100.00

Level of knowledge of CE principles among Nigerian construction professionals

Table 2 presents the mean scores (MS) and standard deviations (SD) for the respondents' self-assessed knowledge of CE principles. The findings reveal varying levels of familiarity and competence across different CE-related activities. On the average, the Nigerian construction professionals demonstrated moderate knowledge levels, with a few areas of relative strength. The highest-rated competence was the ability to plan construction activities to minimise waste (MS = 3.86, SD = 1.10), indicating that waste minimisation is a more familiar CE concept among professionals.

Similarly, the ability to recommend material reuse and recycling strategies (MS = 3.62, SD = 1.22) and select sustainable materials (MS = 3.34, SD = 1.05) ranked relatively high. However, more profound, systems-based CE knowledge, such as conducting life cycle assessments (MS = 2.43, SD = 1.18),

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integrating CE principles into procurement documents (MS = 2.46, SD = 1.35), or advising clients on sustainable procurement (MS = 2.11, SD = 1.30), showed notably lower scores. This suggests that while basic CE awareness exists, advanced competencies necessary for comprehensive CE integration are underdeveloped. Particularly concerning were competencies like supervising projects with CE-focused practices (MS = 1.89, SD = 1.15), promoting the adoption of CE technologies such as Building Information Modelling (BIM) (MS = 1.62, SD = 1.45), and monitoring the effectiveness of CE initiatives during execution (MS = 1.36, SD = 1.52), which were the lowest-rated items. These results imply a significant gap in digital adoption and performance evaluation when applying CE principles. Furthermore, the relatively high standard deviations across many items suggest variability in knowledge levels among the respondents, which differences could be an influence of the professional exposure, organisational culture, or access to formal CE training.

These findings answer Research Question 1 by indicating that while there is moderate familiarity with basic CE principles, Nigerian construction professionals generally lack the advanced competencies necessary for holistic CE application.

Table 2: Level of knowledge of CE principles

Code	Item Statement	MS	SD	R	Action Required
B3	I can plan construction activities to minimise waste	3.86	1.10	1	Focus on waste management techniques and strategies
B7	I can recommend material reuse and recycling strategies to project teams	3.62	1.22	2	Focus on training for material reuse and recycling strategies
B2	I can select sustainable building materials based on CE principles	3.34	1.05	3	Increase awareness and knowledge of sustainable materials
B5	I can prepare construction waste management plans	3.19	1.12	4	Develop comprehensive waste management training programs
B8	I can develop designs that promote easy deconstruction and reuse	3.16	1.25	5	Encourage learning about design for deconstruction
B10	I can integrate CE principles into construction contracts and procurement documents	2.46	1.35	6	Train professionals to incorporate CE into procurement contracts
B6	I can conduct lifecycle assessments (LCA) for construction materials	2.43	1.18	7	Provide in-depth training on lifecycle assessments
B12	I evaluate construction processes for potential CE improvements	2.28	1.42	8	Emphasise process evaluation techniques for CE
B9	I use CE principles to advise clients on sustainable procurement	2.11	1.30	9	Provide tools and resources for advising clients on sustainable procurement
B1	I can integrate CE principles in project design	2.10	1.02	10	Provide more training on CE integration in design
B11	I encourage subcontractors to apply CE practices	2.05	1.40	11	Improve subcontractor engagement through training or workshops
B4	I have supervised projects with CE-focused practices	1.89	1.15	12	Introduce more hands-on CE practices during supervision
B14	I can successfully implement CE strategies even under budget constraints	1.89	1.50	13	Focus on training for implementing CE within budget limits
B13	I promote the adoption of CE technologies (e.g., BIM for material tracking)	1.62	1.45	14	Foster adoption of digital technologies (e.g., BIM) for CE applications
B15	I monitor the effectiveness of CE initiatives during project execution	1.36	1.52	15	Develop systems for monitoring and evaluating CE practices

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Barriers affecting competence development for CE among Nigerian construction professionals

Table 3 revealed that several critical factors significantly constrain the development and application of CE competencies among construction professionals in Nigeria. The MS for all identified barriers were notably high, ranging between 3.90 and 4.30 on a 5-point Likert scale, indicating strong agreement among respondents about the prevalence and severity of these challenges. The most critical barriers identified were the lack of awareness about CE principles (D1; MS = 4.30, SD = 0.74) and the lack of technical expertise in CE concepts (D8; MS = 4.30, SD = 0.73). These findings highlight a significant knowledge and skills gap within the professional community, which fundamentally limits the integration of CE practices in the Nigerian construction industry.

Further, insufficient educational coverage of CE principles (D2; MS = 4.25, SD = 0.76) and poor government policies supporting CE (D6; MS = 4.25, SD = 0.77) point to systemic gaps within the formal education system and policy environment. The result suggests that the growth of CE competence among construction professionals will remain stunted without structured curricular reforms and stronger regulatory support. Additionally, barriers such as the high cost of sustainable materials (D4; MS = 4.20, SD = 0.79) and the absence of professional standards for CE (D12; MS = 4.20, SD = 0.80) were perceived as serious obstacles. These challenges reflect practical and operational difficulties discouraging professionals from investing time and resources into developing CE competencies.

Table 3: Barriers affecting competence development for CE

Code	Barrier Description	MS	SD	R
D1	Lack of awareness about CE limits its acquisition and application in the Nigerian construction industry	4.30	0.74	1
D8	Lack of technical expertise in CE concepts among professionals limits the successful application of CE practices	4.30	0.73	2
D2	Insufficient educational coverage of CE principles in training programs hinders the development of necessary competencies	4.25	0.76	3
D6	Poor government policies supporting CE practices affect professional adoption and hinder competency development	4.25	0.77	4
D4	High cost of sustainable materials hinders the application of CE practices, despite competency development	4.20	0.79	5
D12	Absence of professional standards and guidelines for CE discourages the acquisition of competencies and application	4.20	0.80	6
D5	Limited access to CE training programs affects the acquisition of competencies among construction professionals	4.15	0.82	7
D10	Limited knowledge-sharing among professionals restricts the growth of CE competencies in the industry	4.15	0.78	8
D3	Lack of incentives for sustainable practices discourages the acquisition and application of CE competencies	4.10	0.80	9
D9	Inadequate funding for innovation in CE technologies hinders the development of required competencies	4.10	0.81	10
D19	Traditional construction practices dominate over CE-friendly innovations, hindering the acquisition and application of CE competencies	4.10	0.79	11
D20	Lack of collaboration among stakeholders restricts effective knowledge exchange and competency development in CE practices	4.10	0.80	12
D7	Absence of client demand for sustainable practices reduces motivation to acquire and apply CE competencies	4.05	0.83	13
D11	Resistance to change among construction professionals hinders the acquisition and application of CE practices	4.05	0.85	14

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D18	Fragmentation of the construction industry affects integrated CE application and restricts competency acquisition	4.05	0.81	15
D13	Lack of leadership commitment to CE adoption within organisations reduces investment in competency development	4.00	0.85	16
D17	Corruption in construction procurement reduces focus on sustainable practices and limits the application of CE competencies	4.00	0.88	17
D22	Inconsistent government enforcement of environmental regulations affects CE uptake and limits competency application	4.00	0.86	18
D24	Lack of case studies/success stories reduces confidence in the acquisition and practical application of CE competencies	4.00	0.79	19
D14	Short-term project focus discourages investment in CE strategies, affecting competency development	3.95	0.84	20
D16	Poor monitoring and evaluation frameworks for CE initiatives hinder the application of competencies	3.95	0.82	21
D21	Limited use of digital technologies (e.g., BIM) hampers the development and application of CE strategies and competencies	3.95	0.84	22
D15	Risk aversion limits experimentation with CE approaches, hindering the development of relevant competencies	3.90	0.87	23
D23	Socio-cultural factors influence resistance to CE practices in construction, affecting the acquisition of related competencies	3.90	0.85	24

Limited access to training programs (D5; MS = 4.15, SD = 0.82) and restricted knowledge-sharing among professionals (D10; MS = 4.15, SD = 0.78) compound the problem by reducing opportunities for skill acquisition and professional learning.
The findings also showed that institutional and cultural factors such as lack of incentives for sustainable practices (D3; MS = 4.10) and traditional dominance of linear construction methods (D19; MS = 4.10) are significant deterrents. Moreover, fragmentation of the construction industry (D18; MS = 4.05, SD = 0.81) and resistance to change among professionals (D11; MS = 4.05, SD = 0.85) emerged as prominent socio-technical challenges. Lower-ranked barriers such as risk aversion (D15; MS = 3.90, SD = 0.87) and socio-cultural factors (D23; MS = 3.90, SD = 0.85) underscore important behavioural and contextual hurdles. Although they ranked relatively lower, their mean scores still indicate notable agreement among respondents, suggesting they cannot be overlooked when designing interventions.

Discussion of Results

The findings of this study offer important insights into the current state of CE knowledge and barriers in the Nigerian construction industry, with clear alignments and divergences from existing literature.

The moderate level of basic CE knowledge among Nigerian construction professionals, particularly regarding waste minimisation and material reuse, reflects global trends in emerging economies. Studies such as Akinade *et al*. (2017) and Adams *et al*. (2017) have similarly highlighted that waste management strategies are often the most familiar entry points for CE integration in the construction industry of developing countries. This may be attributed to the relatively tangible and immediate benefits of waste minimisation, such as cost savings and regulatory compliance, which makes it a pragmatic focus for practitioners. However, the lower competence levels in advanced CE practices — including life cycle assessment (LCA), sustainable procurement advising, and digital technology adoption (e.g., BIM for material tracking) — are consistent with findings by Bello *et al.* (2024), which observed that the conceptual complexity and higher initial costs of implementing advanced CE frameworks act as significant deterrents in low- and middle-income contexts.

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The low knowledge scores in systems-based CE applications further highlight a gap in systemic thinking skills among professionals, supporting previous observations by Kirchherr *et al.* (2018) that CE adoption often struggles beyond basic recycling in developing economies due to insufficient capacity building and limited exposure to holistic sustainability frameworks. The observed variability in knowledge levels, as reflected in the high standard deviations, aligns with Rafiq *et al*. (2024), who argued that disparities in organisational support, access to training, and project exposure significantly shape professionals' sustainability competencies.

The barriers identified in this study, particularly the lack of awareness and technical expertise, mirror challenges documented in the literature. For instance, Agyekum and Amudjie (2024) found that limited CE literacy in the Ghanaian construction industry severely curtailed adoption efforts, reinforcing the importance of education and awareness campaigns. Furthermore, the impact of insufficient educational coverage of CE principles confirms the assertion by Pomponi and Moncaster (2017) that curricula economy in construction-related disciplines often lag emerging sustainability paradigms, thereby perpetuating skills gaps. The strong agreement regarding poor government policies and the absence of professional standards as key barriers aligns with the broader institutional voids identified by Omopariola *et al*. (2024) in Nigerian sustainable construction discourse. These findings suggest that beyond individual competence, systemic policy and regulatory frameworks critically shape CE uptake. As discussed by Geng *et al*. (2016), inadequate public sector leadership and inconsistent enforcement mechanisms may create a weak enabling environment, deterring professional investment in CE competencies. Similarly, the limited access to CE-specific training programs and knowledge-sharing platforms supports the calls by Chileshe and Rameezdeen (2024) for establishing targeted professional development initiatives and collaborative industry networks.
The socio-technical challenges such as the dominance of traditional construction practices, fragmentation of the industry, and resistance to change — resonate with findings from Charef *et al*. (2021), who noted that ingrained construction practices and conservative mindsets often resist innovation unless strongly incentivised. The low prioritisation of digital technologies, such as BIM, further underlines the technological lag and supports Eze *et al*. (2024) assertion that digital transformation is a crucial but underdeveloped component of CE implementation in the Global South.

Limitations and Future Studies

Despite its contributions, this study has some limitations. First, the sample was geographically restricted to a single region in Nigeria, which may limit the generalisability of the findings to other regions. Second, the use of a purely quantitative design constrained the exploration of deeper qualitative dimensions of CE adoption. Third, the cross-sectional design captures perceptions at only one point in time and does not reflect temporal changes. Future research should broaden geographical coverage, adopt mixed-methods designs to integrate qualitative insights, and employ longitudinal approaches to capture evolving industry dynamics. Further examination of organisational and institutional factors influencing CE implementation is also recommended.

Conclusion

This study critically examined the competence of construction professionals in applying CE principles within the Nigerian construction industry. The findings reveal significant gaps in knowledge, skills, and practical experience related to CE practices. While a general awareness of CE concepts exists among

professionals, applying these principles remains largely theoretical. A lack of formal training and limited exposure to CE-oriented project management techniques impedes professionals from fully implementing CE in construction projects. This is further compounded by the absence of robust regulatory frameworks and organisational incentives to promote circular economy practices. Furthermore, the study identifies several barriers to acquiring and applying CE competencies, including inadequate professional development programs, a lack of industry-specific CE guidelines, and weak enforcement of sustainable construction standards. These barriers not only hinder individual competence but also limit the collective capacity of the Nigerian construction sector to transition towards a more sustainable CE. From a broader perspective, this study highlights the critical role of human capital in driving the successful integration of CE principles in construction practices. It challenges the prevailing view that technological and material advancements alone can lead to sustainable construction. Instead, it underscores the importance of equipping professionals with the necessary knowledge, technical expertise, and training to translate circularity into practice. This calls for a paradigm shift in education and training, focusing on equipping practitioners with the competencies required to navigate the complexities of sustainable construction. The findings also have significant implications for policy and practice. For CE to be successfully implemented in Nigeria's construction sector, targeted interventions at the institutional level are required. Policy reforms should focus on integrating CE principles into formal education, professional certifications, and industry standards. Additionally, organisations and regulatory bodies must prioritise developing and enforcing CE frameworks that provide clear guidance for professionals and incentivise sustainable practices.

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