Examining the Role of Regulatory Policy and Professional Practice in Selecting Sustainable Building Materials in Kaduna State, Nigeria

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Abstract
Despite global shifts toward sustainable building materials (SBMs), integration within Nigeria's construction industry remains inconsistent and poorly understood. This study examines how regulatory policy and professional practice influence SBM selection in Kaduna State, Nigeria. Adopting a pragmatist philosophy, the research employed an explanatory sequential mixed-methods design. Phase 1 involved a systematic document analysis of the National Building Code (NBC) 2019 and the Kaduna State Urban and Regional Planning Law (KURPL) 2018. Phase 2 utilized semi-structured interviews with 20 built environment professionals to explore how these regulatory realities shape decision-making. Findings reveal a significant "implementation gap"; while the NBC contains sustainability language, it lacks the legal force and enforcement mechanisms to alter professional behaviour. Consequently, material selection is driven by upfront costs, client preference, and local availability rather than environmental impact. The study concludes that the current regulatory framework is not fit for purpose. Recommendations include enacting the NBC as primary legislation, introducing financial incentives such as tax credits, and implementing mandatory professional development on sustainable practices to bridge the gap between policy and the construction site.

Keywords: *Sustainable building materials, Regulatory policy, Professional practice, Kaduna State, Nigeria.*

Introduction

Over the past few years, the global building construction industry has forged ahead in sustainable transformation through its various construction activities and practices (Ghaffar et al., 2022; Rivero-Camacho et al., 2023). Chief of these practices is the use of sustainable building materials (SBMs). Internationally, the paradigm is shifting towards materials that are not only structurally sound and cost-effective but also environmentally responsible across their entire life cycle, that is from their sourcing and production even to their eventual disposal (Ding, 2014; Vierra, 2023). In Nigeria this transformation presents a profound challenge in how to build the cities of the future without perpetuating the unsustainable legacies of the past (Eze, Ugulu, et al., 2021). The choices made at the drawing board and on construction sites today, particularly regarding the complex process of material selection, will

indelibly shape the nation's ecological footprint, resource security, and societal well-being for generations to come. Despite the growing global consensus on the importance of sustainable building materials (SBMs), their integration into conventional construction practice within Nigeria remains in its infancy, inconsistent, and poorly understood. A discernible gap exists between the theoretical potential of SBMs and their practical, widespread application (Akinshipe et al., 2019; Opoko, 2006; Oyewobi & Jimoh, 2022; Toriola-Coker et al., 2021). This gap suggests that the transition to sustainable construction is hampered by complex, interwoven barriers that extend beyond mere technical availability. While the problem is often acknowledged subjectively, there is a pressing need for structured empirical inquiry to dissect its root causes. This study proceeds from the premise that the selection of materials is not made in a vacuum but is profoundly influenced by two overarching forces, the directive of regulatory policies and the realities of professional practice. The relationship between these forces forms the critical unknown that this research seeks to investigate.

To systematically address this problem, the study is guided by the following research objectives,

1. To analyse the existing framework of regulatory policies (national and local) governing building material selection in Nigeria.
2. To investigate the factors within professional practice that determines material selection amongst key built environment professionals.

The study is significant for policymakers and regulatory bodies because it will provide an evidence-based audit of the current policy landscape, highlighting strengths, gaps, and opportunities for more effective formulation and enforcement. For professionals in the building construction industry, it will foster a dialogue on best practices and collective action. For the academic community, it will contribute to the body of knowledge on sustainable construction and offer an integrated analytical framework that provides a holistic understanding. In the long run, this study aims to contribute to the broader goal of fostering a more sustainable, resilient, and equitable built environment in Nigeria.

The study focuses specifically on the selection processes for sustainable building materials within the Nigerian construction industry. Geographically, the investigation will concentrate on Kaduna urban centre where regulatory activity and professional practice are most concentrated in the state. The research will delimit its analysis to policies directly pertinent to building construction and material specification, such as the National Building Code, National Climate Change Policy, and Kaduna State Urban and Regional Planning Law 2018. The professional perspective will be garnered from a purposive sample of key decision-makers, including architects, civil engineers, and project managers with significant experience in material specification. While acknowledging their importance, this study will not deeply explore the roles of manufacturers or end-users, nor will it conduct a life-cycle assessment of specific materials, thereby setting clear boundaries for a focused inquiry.

Literature Review

Conceptual Framework

Sustainability in construction balances environmental responsibility, occupant health, and long-term economic value, moving beyond short-term measures of speed and cost. Sustainable building materials (SBMs) are the tools for achieving this. They are defined by low embodied energy, recycled content, local availability, non-toxicity, and durability. In Nigeria, examples include recycled plastic bricks, bamboo composites, and compressed earth blocks (Berge, 2009; Eze et al., 2023; Umar et al., 2021). Selection of these materials is mostly shaped by regulatory policy such as government rules, codes, and incentives that guide industry behaviour (Eze, et al., 2021; Ogunkah & Yang, 2012). However, policy only

becomes reality through professional practice which is the daily decisions, habits, and constraints of architects, engineers, and contractors. Their choices are negotiated between technical requirements, client budgets, and their own knowledge and training (Figueiredo et al., 2021; Garba et al., 2016; Oyewobi & Jimoh, 2022). In essence, professional practice is where policy meets the ground.

Global Perspectives

International rating systems have accelerated sustainable material adoption by creating clear, measurable benchmarks. LEED (USA) and BREEAM (UK) reward recycled content, local sourcing, and low emission products, using market prestige to drive demand (Ismaeel, 2023). EDGE (IFC) offers a streamlined alternative for emerging economies, focusing on cost-effective embodied energy reduction through locally available materials like fly-ash concrete (EDGE, 2025). These systems demonstrate that sustainable material selection is increasingly standard practice globally, driven not only by regulation but by operational savings and corporate reputation (Windapo & Ogunsanmi, 2014). They provide instructive models for nations like Nigeria.

The Nigerian Context

Nigeria's construction industry is expanding rapidly but remains anchored to conventional methods that prioritise speed and upfront cost over long-term performance (Adeleke & Ogunsemi, 2020; Chukwu et al., 2026). Three persistent challenges dominate the literature, poor waste management that forecloses recycling opportunities, highly energy-inefficient building stock, and heavy reliance on imported materials, which strains foreign exchange and stifles local manufacturing (Ogundeji, 2024; Adeyemi et al., 2022). These are not isolated operational failures. They signal deeper dysfunction within the regulatory framework and professional norms that govern material selection.

Policy and Regulatory Environment: Nigeria possesses formal regulatory instruments, including the National Building Code, yet a profound implementation gap renders them largely ineffective. Policies exist on paper but are rarely enforced on site. The core problem is enforcement failure. Regulatory bodies lack capacity and mandate, while political will to ensure compliance is absent (Babalola & Harinarain, 2021). Non-compliance is consequently widespread and risk-free. Economic barriers compound this; sustainable technologies carry high upfront costs, yet no financial incentives exist to offset them (Lembi et al., 2021; Okoye et al., 2022). Socio-cultural resistance, preference for familiar methods and low public awareness, further suppresses demand for compliance. The policy environment is thus ill-equipped to drive sustainable material selection without fundamental reform.

Professional Practice and Decision-Making: The decision to specify sustainable materials is made within professional practice, yet this space is constrained at multiple levels. Organisationally, firms exhibit passive cultures and weak top-management commitment. Sustainability is rarely prioritised, and resources for training are withheld. Perceived higher initial costs override life-cycle considerations, and technical knowledge of novel materials is scarce (Abisuga & Oyekanmi, 2014; Tunji-Olayeni et al., 2020). Institutionally, professionals receive minimal support. Research and development is inadequate, local performance data is unavailable, and government guidance is absent. The burden of innovation falls on individuals, whose capacity varies widely (Toriola-Coker et al., 2021; Unegbu et al., 2025).
Individually, awareness is uneven. Clients and academics demonstrate highest receptivity; contractors, facing direct budget pressure, lag behind. Critical barriers include insufficient

expertise, time constraints, staff shortages, and exclusion of end-users from specification decisions (Eze et al., 2023; Tunji-Olayeni et al., 2020). The result is a self-reinforcing cycle. Weak institutions enable unambitious firms, which fail to develop capable individuals.

Research Gap

Existing research has thoroughly catalogued barriers to sustainable material adoption in Nigeria. Policy weaknesses are well documented and professional constraints are extensively mapped. However, these domains have been treated as separate entities. What is missing is an integrated analysis that traces how regulatory failures directly shape professional decision-making. We do not know how practitioners in Kaduna state perceive, interpret, and respond to the policy environment when selecting materials. The connective tissue between policy and practice remains unexplored.

This study addresses that gap. By linking policy analysis directly with professional perspectives, it asks not only what the barriers are, but how they interact. This approach is essential for developing interventions that are both policy-sound and ground-true.

Research Methodology

Research Philosophy and Design

This study is grounded in the philosophical tradition of pragmatism (Creswell & Creswell, 2018). Given that this study seeks both to objectively quantify the regulatory landscape (Objective 1) and to subjectively interpret how professionals navigate that landscape in practice (Objective 2), pragmatism provides the most coherent philosophical justification for employing mixed methods.

An explanatory sequential mixed-methods design is adopted as the most appropriate framework for this study. This design is characterised by a two-phase process in which an initial quantitative phase is followed by a qualitative phase specifically designed to build upon and explain the quantitative findings (Creswell & Creswell, 2018).

Phase 1 Quantitative: Systematic Document Analysis (Objective 1): Phase 1 addresses Objective 1 by undertaking a systematic documentary analysis of the two principal regulatory instruments governing building material selection in Kaduna State;

1. The National Building Code 2019 (NBC)
2. The Kaduna State Urban and Regional Planning Law 2018 (KURPL)

A content analysis coding framework is applied to each document to objectively identify, categorise, and quantify clauses and provisions according to their relevance to sustainable building material (SBM) selection. Each qualifying provision is coded against four dimensions:

(i) Policy theme;
(ii) Regulatory instrument type (mandatory, discretionary, or incentive-based);
(iii) Specificity (whether the provision names, defines, or merely refers to sustainable materials); and
(iv) Enforcement mechanism (whether a compliance body, inspection protocol, or sanction is specified). The resulting coded dataset is then subjected to thematic analysis to identify overarching policy themes, regulatory mandates, incentive structures, and governance gaps. The outputs of this phase constitute the primary analytical framework that informs the construction of Phase 2 instruments.

Phase 2 Qualitative: Semi-Structured Interviews and Survey (Objective 2): Phase 2 addresses Objective 2 by collecting empirical data on how built environment professionals perceive,

navigate, and are constrained by the specific regulatory realities identified in Phase 1. The instrument employed in this phase is a semi-structured interview guide for in-depth qualitative elaboration. Critically, the instrument is constructed directly from the Phase 1 findings. The specific policy provisions, regulatory gaps, enforcement deficits, and thematic absences identified through document analysis are embedded into interview prompts, ensuring that participants respond to documented regulatory realities rather than abstract hypothetical scenarios. Purposive and snowball sampling will be used to identify experienced, relevant construction professionals such as registered architects, civil and structural engineers, and quantity surveyors practising in Kaduna urban centre with a minimum of ten years of post-qualification experience. A target of 15–20 interview participants is proposed, consistent with mixed-methods adequacy norms (Creswell & Creswell, 2018).

Phase 1: Systematic Document Analysis of the Regulatory Framework

The National Building Code 2019 Document Analysis

Table 1 presents the frequency and instrument type of provisions identified within the NBC 2019 that are relevant to sustainable building material selection.

Thematic Analysis and Critical Findings

The coding results reveal a regulatory instrument whose coverage of sustainable building materials is structurally uneven. Of the ten policy themes interrogated, three are completely absent from the NBC 2019 these are life-cycle and embodied carbon considerations, green building certification provisions, and financial incentives for sustainable material use. These are precisely the mechanisms that international evidence identifies as most effective in driving sustainable material adoption (Windapo & Ogunsanmi, 2014). A further three themes are present (local material sourcing, energy performance, and recycled content) but they classified as discretionary, with no mandatory obligations, measurable targets, or enforcement provisions attached. Only structural standards, fire resistance, and hazardous material prohibitions carry mandatory force, and even this lacks a designated national compliance body or sanction regime. The defining characteristic of the NBC 2019 with respect to sustainability is therefore the prevalent use of motivational, non-binding language. Terms such as “encourages,” “recommends,” and “where practicable” persist throughout sustainability-adjacent provisions, transforming what could be regulatory obligations into voluntary best-practice suggestions. Compounding this is the Code’s foundational legal flaw, it is transmitted as a ministerial directive rather than an Act of the National Assembly, the NBC is inadequate in the constitutional force to compel state domestication, professional compliance, or judicial enforcement. As a result, it is a technically comprehensive document whose sustainability ambitions are systematically undermined by the absence of binding obligations, institutional enforcement structure, and financial incentive mechanisms.

Table 1: NBC 2019 Coded Provisions Relevant to Sustainable Building Material Selection

Policy Theme	Key Provision(s)	Instrument Type	Specificity Level	Enforcement Mechanism
Structural material standards	Part B: materials must conform to NIS, BS, or ASTM equivalents	Mandatory	High — named standards cited	None specified; referral to state authorities
Local material sourcing	Sec. 3.2: encourages use of locally sourced materials where practicable	Discretionary	Low — aspirational language	None
Energy performance / thermal efficiency	Sec. 5.4: recommends thermally efficient materials to reduce mechanical cooling	Discretionary	Medium — performance outcome stated	None
Recycled & reclaimed materials	Sec. 3.2: references desirability of recycled/reclaimed content	Discretionary	Low — no thresholds defined	None
Hazardous material prohibition	Explicit prohibition of asbestos; restriction of high-VOC products	Mandatory	High — specific substances named	None specified
Fire resistance	Part C: fire rating requirements for structural and finish materials	Mandatory	High — performance ratings specified	None specified
Climate-responsive design	General reference to climatic zones; no material-specific mandates	Discretionary	Low — no material specifications	None
Life-cycle / embodied carbon	Not addressed	Absent	None	N/A
Green building certification	Not addressed	Absent	None	N/A

Policy Theme	Key Provision(s)	Instrument Type	Specificity Level	Enforcement Mechanism
Financial incentives for SBMs	Not addressed	Absent	None	N/A

Source: Author's systematic document analysis, 2026

Kaduna State Urban and Regional Planning Law 2018 Document Analysis

Table 2 presents the coded analysis of the KURPL 2018 against the same thematic framework applied to the NBC.

Thematic Analysis and Critical Findings

The KURPL 2018 analysis reveals a planning statute, whose regulatory function that directs the process of development approval, as primarily procedural rather than substantive in relation to building material selection. Of the ten sustainability-related policy themes examined, seven are entirely absent. The Law contains no provisions referencing sustainable materials, energy-efficient specifications, recycled content, life-cycle considerations, climate-responsive construction, or financial incentives for green building practice. Its engagement with material sustainability is entirely indirect, limited to requiring that submitted building plans conform to "applicable building standards", which is a cross-reference to the NBC. However, this provides little practical power considering the NBC's own aspirational framing of its sustainability provisions. The KURPL 2018's principal regulatory strength is its legal character as primary legislation enacted by the Kaduna State House of Assembly, which confers binding force and positions KADGIS as a legitimate enforcement authority. However, this institutional capacity is directed almost entirely at spatial and structural compliance, not environmental performance. The KADGIS permit review process does not apply sustainability criteria, and the EIA requirement under Part VII, while potentially relevant to material selection, provides no explicit criteria linking environmental impact findings to material specification decisions. In practice, the EIA and permit processes operate as parallel, non-integrated instruments.

Comparative Gap Analysis

Table 3 provides a consolidated comparative gap analysis of both instruments, identifying the key regulatory gaps that will form the basis of the Phase 2 data collection instruments.

Summary of Phase 1 Findings and Transition to Phase 2

The systematic document analysis yields four principal findings that will anchor the Phase 2 instruments.

1. Sustainability provisions in both instruments are largely absent or aspirational, with no binding mandates specifically requiring the selection of sustainable building materials.
2. There is a complete absence of financial incentives, tax relief, or procurement preferences linked to sustainable materials in either instrument.
3. Enforcement mechanisms are weak or absent: the NBC has no statutory enforcement architecture at the national level, and the KURPL 2018's KADGIS-led permit process does not systematically evaluate material sustainability.
4. Critical sustainability concepts (including life-cycle assessment, embodied carbon, and green building certification) are entirely unaddressed by either instrument.

Table 2: KURPL 2018 Coded Provisions Relevant to Sustainable Building Material Selection

Policy Theme	Key Provision(s)	Instrument Type	Specificity Level	Enforcement Mechanism
Building permit & plan approval	Part IV: all development requires permit; plans must reference applicable building standards	Mandatory	Medium — defers to NBC and relevant codes	KADGIS empowered to refuse/revoke permits
Environmental Impact Assessment	Part VII: EIAs required for large-scale development; must assess environmental consequences of construction	Mandatory	Low — no material-specific criteria in EIA scope	KADGIS/State Environmental Agency oversight
Structural / safety standards	Permit conditions implicitly incorporate NBC structural requirements	Mandatory (by reference)	Medium — through NBC cross-reference	KADGIS permit process; site inspections
Local material sourcing	Not addressed	Absent	None	N/A
Sustainable/green building materials	Not addressed	Absent	None	N/A
Energy performance of materials	Not addressed	Absent	None	N/A
Life-cycle / embodied carbon	Not addressed	Absent	None	N/A
Recycled / reclaimed materials	Not addressed	Absent	None	N/A

Policy Theme	Key Provision(s)	Instrument Type	Specificity Level	Enforcement Mechanism
Financial incentives for SBMs	Not addressed	Absent	None	N/A
Climate-responsive construction	Not addressed	Absent	None	N/A

Source: Author's systematic document analysis, 2026

Table 3: Comparative Regulatory Gap Analysis NBC 2019 and KURPL 2018

Regulatory Dimension	NBC 2019	KURPL 2018	Implication for Phase 2
Legal enforceability of sustainability provisions	Weak — ministerial directive; no Act	Strong — primary legislation	Ask professionals: does the NBC's non-statutory status affect compliance behaviour?
Mandatory SBM requirements	Absent — all sustainability provisions discretionary	Absent	Ask: in the absence of mandates, what drives or suppresses SBM use?
Financial incentives/disincentives for SBMs	Absent	Absent	Ask: would financial incentives change specification decisions? What incentives are perceived as most effective?
Enforcement of material specifications on site	No mechanism specified	Limited to permit stage; no systematic site inspection	Ask: how does enforcement failure shape procurement behaviour post-permit?
Definition of 'sustainable building material'	Not defined with regulatory precision	Not defined	Ask: how do professionals define SBMs in the absence of regulatory definition?
Life-cycle/embodied carbon provisions	Completely absent	Completely absent	Ask: are life-cycle considerations factored into practice? Why/why not?
Integration with national climate policy	Limited — no formal linkage to NCCP or NDC	Absent	Ask: are professionals aware of/influenced by climate commitments?
Green building certification pathway	No national certification framework referenced	Not referenced	Ask: is the absence of a certification system perceived as a barrier?

Source: Author's systematic document analysis, 2026

These four findings constitute the core of the 'policy reality' that Phase 2 asks professionals to respond to.

Phase 2 Data Collection Instruments
Semi-Structured Interview Guide
The interview questions were designed to elicit in-depth elaboration on the Phase 1 regulatory findings. Each question is grounded in a specific Phase 1 gap or finding, which is noted in italics as an analytical anchor for the interviewer. The duration of the interview was approximately 45–60 minutes. Consent and audio recording were required.
The following interview guide is structured under five substantive sections.

Section A: Demographic and Professional Profile: The participants were registered architects, civil/structural engineers, and quantity surveyors with ≥10 years of post-qualification experience in Kaduna urban centre as shown in Table 4.

Section B: Awareness and Understanding of Sustainable Building Materials
Phase 1 anchor: NBC 2019 and KURPL 2018 contain no operational definition of 'sustainable building material.'
IB1. In your day-to-day practice, how do you determine whether a building material qualifies as 'sustainable'? Given that neither the NBC nor the KURPL defines this term, what criteria or reference points do you rely on?
IB2. How would you describe the general level of awareness of sustainable building? materials among construction professionals and clients in Kaduna? What do you see as the primary knowledge gaps, and where do you think responsibility for closing those gaps lies?

Findings
Most participants had a working sense of what sustainable materials are but relied on their own experience rather than any regulatory definition. Ten of the fifteen interviewed said they look mainly at local availability and durability when deciding if a material is "sustainable enough." Only three had ever referred to international frameworks like LEED or EDGE. Client awareness was described as very low across the board. P01 (Architect, 12 yrs) said: "I know what sustainable materials are in theory, but honestly there is no official guide telling me what qualifies. I go by what I have seen work." P06 (Architect, 20 yrs) was blunter: "My clients do not ask for sustainability. They ask for cheap and fast. Until clients demand it, it will not happen." Twelve of the fifteen interviewed also pointed to poor educational input as a major knowledge gap, this is consistent with concerns in the literature about sustainability not being adequately embedded in Nigerian professional education (Amuda-Yusuf et al., 2020).

Table 4: Profile of Interview Participants

ID	Profession	Experience	Sector
P01	Architect	12 yrs	Private – Commercial
P02	Civil Engineer	10 yrs	Public / Government
P03	Quantity Surveyor	15 yrs	Mixed
P04	Architect	11 yrs	Private – Residential
P05	Structural Engineer	11 yrs	Private – Commercial

ID	Profession	Experience	Sector
P06	Architect	20 yrs	Mixed
P07	Quantity Surveyor	10 yrs	Private – Residential
P08	Civil Engineer	10 yrs	Public / Government
P09	Architect	14 yrs	Private – Commercial
P10	Quantity Surveyor	10 yrs	Mixed
P11	Structural Engineer	18 yrs	Public / Government
P12	Architect	12 yrs	Private – Residential
P13	Civil Engineer	13 yrs	Mixed
P14	Quantity Surveyor	18 yrs	Private – Commercial
P15	Structural Engineer	16 yrs	Public / Government
P16	Architect	17 yrs	Mixed
P17	Quantity Surveyor	15 yrs	Public / Government
P18	Structural Engineer	17 yrs	Mixed
P19	Civil Engineer	11 yrs	Mixed
P20	Architect	14 yrs	Public / Government

Source: Field data, 2026

Section C: The Influence of Regulatory Policy on Practice

Phase 1 anchor: Sustainability provisions in the NBC are discretionary and aspirational; NBC lacks statutory force; KADGIS permit review does not apply sustainability criteria.

IC1. Phase 1 analysis found that the NBC 2019's provisions on sustainable materials, such as encouraging locally sourced or recycled materials, use non-binding language and carry no enforcement mechanism. In your experience, does this reflect the reality of how the NBC is applied on projects in Kaduna? How does the Code's lack of statutory backing affect how you and your colleagues treat its recommendations?

IC2. With respect to the KADGIS permit process, how closely are material specifications actually, examined during plan approval in your experience? Can you describe a specific instance where the regulatory process either supported or failed to support a sustainable material choice?

IC3. Phase 1 identified a complete absence of financial incentives for sustainable material use in either the NBC or the KURPL. How significant a barrier is this in your practice, and what form of incentive, if it were available, would most change your specification behaviour?

Findings

This section produced the study's bluntest findings. Participants rated regulatory influence very low, responses were almost uniformly critical of both the NBC and the KADGIS permit process. P11 (Structural Engineer, 18 yrs) said: "The NBC is a nice document but it has no teeth. Nobody gets punished for ignoring it. We all know that." On the permit process, P02 (Civil Engineer, 10yrs) explained: "KADGIS looks at whether your drawings are complete

and your setbacks are correct. Nobody is checking what brand of block you used or where it came from." P13 (Civil Engineer, 13 yrs) added: "Once the permit is approved, inspectors rarely show up. A lot of what actually gets built on site is different from what was submitted." More evidently, no one could identify or recall a regulation that specifically requires the use of a sustainable material.

Section D: Factors within Professional Practice that Determine Material Selection

Phase 1 anchor: In the absence of mandatory SBM provisions, material selection is governed by non-regulatory factors. Life-cycle/embodied carbon considerations are entirely absent from both instruments.

ID1. When regulatory requirements provide little or no direction on material sustainability, what factors most powerfully determine what materials you specify? Can you walk me through a recent project as an example?

ID2. Phase 1 found that neither the NBC nor the KURPL contains any provision on life-cycle assessment or embodied carbon. Do these concepts feature in your practice at all? If not, what would need to change, at the regulatory, organisational, or educational level, for them to become routine considerations?

ID3. How do you navigate the tension between client budget pressure and the specification? of sustainable materials? Can you describe a situation where this tension arose and how it was resolved?

Findings

Here, the findings show that when regulation is weak, other forces take over hence cost emerged as the dominant driver, followed by client pressure and supply chain limitations. P03 (Quantity Surveyor, 15 yrs) put it simply: "Cost is king. If a sustainable option costs more upfront, the client says no, and that is the end of the matter." On the supply side, P09 (Architect, 14 yrs) noted: "I know compressed earth blocks work. I have seen them used. But if you try finding a consistent supplier in Kaduna for a mid-size project, it is a real challenge." In addition, the response from about 18 respondents show that life-cycle thinking and embodied carbon are virtually absent from daily practice. P05 (Structural Engineer, 11 yrs) confirmed: "Life-cycle cost is something I learned about in school but never practiced. P03 (Quantity Surveyor, 15 yrs) says: I have never done that calculation on an actual project here."

Section E: Professional Body, Continuing Development, and Institutional Support

Phase 1 anchor: Neither the NBC nor the KURPL creates linkage between professional registration obligations and sustainable practice.

IE1. To what extent does your professional body actively promote sustainable material selection as part of its regulatory or CPD function in Kaduna? Do you believe professional registration should carry explicit obligations regarding environmental practice, and if so, what form should those obligations take?

Findings

Professional bodies fared poorly. P15 (Structural Engineer, 16 yrs) said: "I am an NSE member. The last time sustainability came up strongly in a meeting was maybe three years ago, and it was briefly. There is no real programme for it." Yet despite the poor support, majority showed strong support for making CPD on sustainability mandatory, suggesting that professionals recognise the gap even if institutions are not filling it.

Section F: Recommendations for Policy and Practice Reform

Phase 1 anchor: Both instruments lack financial incentives, a national SBM catalogue, and a green building certification pathway.

IF1. Based on the regulatory gaps identified in this study, specifically the absence of mandatory SBM requirements, financial incentives, and a national green building framework, what one or two reforms to the regulatory environment would you prioritise, and why?

IF2. Looking forward five to ten years, do you see the conditions in Kaduna's construction industry changing in a way that would make sustainable material selection more routine? What would need to happen for that change to occur?

Findings

Surprisingly, Section F had the most positive response. P07 (Quantity Surveyor, 10 yrs) said: "If specifying sustainable materials saved the client money on the permit or gave them a tax break, I could sell that idea easily. Right now, it costs more and nobody benefits officially." P04 (Architect,11 yrs) added: "A simple list - these are the materials that count as sustainable in Nigeria, and these are the ones approved for use in North-West climate, simple! It would change everything. We are guessing right now."

Discussion

The combined findings show a consistent picture that Nigeria's regulatory framework for sustainable building materials exists in name but not in practice. The NBC 2019 contains some language pointing toward sustainability, but that language is soft, unenforceable, and largely unknown to practitioners on the ground. The KURPL 2018 barely mentions materials at all. When regulation is this weak, the market defaults to its most powerful signal which is cost. The result is a construction industry in Kaduna where the choice of building materials is driven almost entirely by upfront price, client preference, and what happens to be available locally, with sustainability rarely entering the conversation.

What makes this situation particularly hard to break is that it is self-reinforcing. Weak regulation gives professionals no obligation to use sustainable materials. No obligation means no demand. No demand means suppliers do not develop the supply chain. Scarce supply makes sustainable materials more expensive and harder to find. High cost and low availability give clients more reason to reject them, which gives professionals less incentive to specify them, and so the cycle continues. In relation to the literature**,** these findings are broadly consistent with the existing literature, but they also add important local detail. For instance, the study agrees with Amuda-Yusuf et al., 2020 assertion that sustainability is not being adequately embedded in Nigerian professional education (Section B). The study goes further to identify this as a Knowledge gap showing that education specifically fails at equipping students to evaluate material sustainability. Unegbu et al. (2025) and Abisuga & Okuntade, 2020 both document an enforcement gap in Nigeria's building regulatory system, and this study confirms that gap acutely in Kaduna. The consistently low scores on regulatory influence (Section C) go further than most previous studies in quantifying just how little the existing framework is felt in daily practice. The dominance of cost as a barrier (Section D) aligns with Windapo (2013), who identify high upfront cost as the primary obstacle to sustainable material adoption across sub-Saharan Africa. However, this study adds an important distinction, the literature tends to treat cost as a market problem, whereas professionals here point to it as a regulatory problem. It is precisely because there are no incentives, that is, no tax relief, no reduced permit fees, no green procurement targets e.t.c. that cost functions as an absolute barrier rather than one factor among several.

The near-zero engagement with life-cycle cost and embodied carbon (Section D) aligns with

Akinshipe et al. (2019) and Mogaji et al. (2024), who found that sustainability thinking in Nigerian construction remains shallow and largely theoretical. However, the present study traces this more specifically to the regulatory framework, when neither the NBC nor the KURPL requires or even references these concepts, professionals have neither the mandate nor the reference point to apply them. This is in stark contrast with international contexts where LEED, BREEAM, or mandatory carbon reporting obligations push life-cycle thinking into routine practice (Doan et al., 2017).

The finding on professional bodies (Section E) adds to what Amuda-Yusuf et al. (2020) describe as the "institutional vacuum" surrounding sustainable construction in Nigeria. The high support for mandatory CPD (Section E) suggests professionals are not resistant to change, they simply lack the institutional structure to enable it.

Implications

The most urgent policy need is to give the NBC legal force. A voluntary code consulted by a few and ignored by most cannot drive industry-wide change. If the NBC is enacted as an Act of the National Assembly with clear penalties for non-compliance, the entire compliance landscape shifts. Alongside this, both the NBC and the KURPL need explicit, mandatory provisions on sustainable materials, not "encouragements" but requirements, with thresholds that can be verified. The introduction of financial incentives, that is reduced permit fees, tax credits, or preferential access to government contracts for sustainable projects, would be the single most impactful lever available to policymakers, given the cost sensitivity revealed across this data. Finally, the KADGIS permit process needs a sustainability component. Submitted material schedules should be checked against a national list of approved sustainable materials, not just for structural compliance.

Firms need internal sustainability policies. Only 2 of 20 participants reported that their organisation had any formal process for evaluating material sustainability. Even simple internal checklists or a designated sustainability lead within a practice would create the organisational conditions for more consistent SBM specification. At the individual level, professionals expressed strong appetite for CPD, and professional bodies should treat this as a mandate. Sustainability should be embedded not just in occasional seminars but in core CPD requirements for annual registration renewal. On the client side, professionals repeatedly identified client demand, or the lack of it, as a powerful gatekeeper. This suggests that awareness campaigns targeting building owners and developers, not just practitioners, are needed to shift market expectations.

Conclusion and Recommendations

Summary of the Study

This study set out to understand how regulatory policy and professional practice together shape the selection of sustainable building materials in Kaduna State, Nigeria. Using an explanatory sequential mixed-methods design, Phase 1 carried out a systematic document analysis of the National Building Code 2019 and the Kaduna State Urban and Regional Planning Law 2018. Phase 2 collected interview data from 20 built environment professionals in Kaduna. The two phases were formally connected: Phase 1 findings were embedded directly into the Phase 2 instruments, so that professionals responded to documented policy realities rather than general questions.

Conclusion

The central finding of this study is that the regulatory framework governing sustainable building material selection in Nigeria is not yet fit for purpose. Both the NBC and the

KURPL lack the legal force, specific mandates, enforcement mechanisms, and financial incentives needed to change professional behaviour. In this vacuum, decisions are governed by cost, client pressure, and supply chain availability, and none of which currently favour sustainable materials. Professionals are not hostile to sustainability; many are aware of it and willing to engage with it. But awareness alone does not produce change when the system (regulatory, institutional, and market) provides no support, no obligation, and no reward for sustainable choices. The gap between what policy documents say and what happens on building sites in Kaduna is wide, and it will not close without deliberate, coordinated action from government, professional bodies, and the industry.

Nevertheless, this study has a limitation of the geographic scope which is limited to Kaduna urban centre, so the findings may not fully represent conditions in other Nigerian states with different regulatory histories or market conditions. Therefore, future research could explore a larger-scale national survey across multiple states, this would test whether the findings here are specific to Kaduna or reflect a wider pattern. Also, a comparative study between states that have domesticated the NBC and those that have not could reveal what difference formal state adoption makes in practice. Research into the perspectives of building materials manufacturers and suppliers, whose role in the supply chain was outside the scope of this study, would add an important dimension. Finally, a longitudinal study tracking how professional practice evolves if the NBC is eventually enacted as law would provide valuable evidence on the effect of regulatory change on material selection behaviour.

Recommendations

Based on the findings, the following specific actions are recommended:

1. The Federal Government of Nigeria needs to enact the NBC as primary legislation with mandatory SBM clauses and penalties. This is of high priority and they should in addition create a national pre-approved sustainable materials catalogue for Nigerian climate zones. Tax incentives or reduced permit fees for certified sustainable projects should also be Introduce.
2. Kaduna State Government should consider amending the KURPL 2018 or enact a dedicated state green building policy with explicit SBM requirements. Also, KADGIS needs to add a sustainability checklist to the building permit review process and strengthen post-permit site inspection, specifically for material compliance.
3. Mandatory CPD on sustainable construction as a condition of annual registration renewal should be introduced by the relevant professional bodies (NIA / NSE / NIOB / NIQS). They should endeavour to develop clear practice guidelines defining sustainable materials in the Nigerian context.
4. Adopting internal sustainability policies and simple checklists for material specification should be a part of Construction Firms. They should also consider investing in client education to shift demand toward sustainable alternatives.

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