

Interlocking Stabilised Soil Blocks (ISSBs) And the Perception Economy: How Stakeholder Sentiments May Outweigh Technical Merits in Adoption Decisions

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Abstract. This study investigates how stakeholder perceptions influence the adoption of Interlocking Stabilised Soil Blocks (ISSBs) for residential construction in Southwest Nigeria, despite the material's established technical merits. Using a quantitative descriptive research design, data were collected through structured questionnaires distributed to 124 stakeholders, including homeowners, developers, and construction professionals. Descriptive and inferential analyses were employed to assess levels of awareness, perceptions of technical performance, and the barriers to ISSB adoption. Findings reveal that although awareness of ISSBs is moderate, technical understanding remains shallow, limiting confidence in adoption. Stakeholders generally recognise ISSBs' benefits in strength, thermal insulation, and fire resistance; however, concerns persist regarding moisture resistance and long-term durability. Regression analysis showed a weak but significant relationship between knowledge and adoption prospects, confirming that perceptions and social norms exert more influence than technical evidence. Key barriers identified include limited social proof, entrenched preferences for conventional materials, and a lack of institutional support. The study concludes that targeted policy incentives, education, and communication strategies are necessary to bridge the gap between perception and technical evidence. These findings contribute to the broader discourse on sustainable construction materials and offer practical recommendations for stakeholders, policymakers, and researchers aiming to enhance ISSB adoption.

Key words: Interlocking Stabilised Soil Blocks (ISSBs), Stakeholder Perception, Sustainable Construction, Adoption Barriers, Building Materials in Nigeria.

1. Introduction

1.2. Background to the Study

Interlocking Stabilised Soil Blocks (ISSBs) are increasingly recognised as a sustainable, cost-effective, and environmentally friendly alternative to conventional building materials, particularly within developing economies (Agyei-Mensah et al., 2023; Malanga et al., 2022; Ibitoye et al., 2022; Ibitoye, 2025). Their technical merits include thermal efficiency, low embodied energy, ease of production, and minimal mortar usage, which make them highly suitable for residential construction in regions like Southwest Nigeria, where access to affordable housing remains a persistent challenge (Oketch et al., 2023).

Despite these advantages, the adoption of ISSBs remains low (Ibitoye et al., 2026). This suggests that the barriers to widespread uptake are less about performance and more rooted in the dynamics of perception where stakeholder sentiments, beliefs, and trust in materials outweigh empirical data (Nduka et al., 2021). In construction markets within low- and middle-income contexts, material preference is often influenced more by perceptions of quality, durability, and

aesthetics than by objective technical performance (Mumo et al., 2022). Understanding how such perceptions shape the uptake of ISSBs is crucial to bridging the gap between innovation and widespread implementation.

Although ISSBs offer clear advantages over conventional materials, including reduced construction costs and environmental impacts, adoption in Southwest Nigeria remains minimal (Ogundele & Adeniyi, 2023; Ibitoye et al., 2022; Ibitoye, 2026). This disconnect implies that technical merit alone cannot drive material selection. Research increasingly highlights that negative perceptions whether related to aesthetics, structural integrity, or lack of social proof significantly hinder ISSB adoption, even when unfounded (Omollo et al., 2022). Furthermore, a lack of government incentives, limited technical expertise, and the dominance of conventional materials further entrench this reluctance (Mahame, Kikwasi & Baruti, 2024). Hence, understanding these perception-based barriers is essential for advancing ISSB adoption despite their proven technical advantages.

1.2. Statement of the Problem

While ISSBs have demonstrable environmental and cost-saving benefits, their adoption is disproportionately low compared to their technical viability. Existing studies reveal that material choices in the built environment are heavily influenced by stakeholder perceptions, not necessarily empirical performance (Mumo et al., 2022; Ogundele & Adeniyi, 2023). In Southwest Nigeria, this perception bias manifests through negative attitudes towards ISSBs as being inferior or rural, despite evidence of their durability and efficiency (Ibitoye et al., 2023; Ibitoye et al., 2026). Without targeted strategies to address these perception gaps, ISSBs will continue to face barriers to market penetration, undermining efforts towards sustainable housing.

1.3. Aim and Objectives of the Study

Aim

To investigate how stakeholder perceptions influence the adoption of Interlocking Stabilised Soil Blocks (ISSBs) for residential construction in Southwest Nigeria, despite their proven technical merits.

Objectives

- i Assess stakeholders' level of awareness and understanding of ISSBs.
- ii Evaluate the perceived benefits and technical performance of ISSBs among users and non-users.
- iii Identify the key perception-based barriers that hinder the adoption of ISSBs.
- iv Compare stakeholder sentiments with the known technical merits of ISSBs to determine their relative influence in decision-making.
- v Provide recommendations for policy, education, and advocacy strategies that can bridge the gap between perception and technical evidence.

1.4. Significance of the Study

This study is significant as it addresses the critical but often overlooked role of perception in the adoption of sustainable construction technologies. While ISSBs present a technically viable alternative to conventional materials, their acceptance remains hindered largely by social, psychological, and informational barriers (Omollo et al., 2022; Agyei-Mensah et al., 2023). By exploring how stakeholder sentiments influence material choice, this research contributes to broader knowledge on how perception economies shape innovation uptake in the built

environment. The findings will inform policymakers, construction professionals, NGOs, and advocacy groups working to promote sustainable building practices. Moreover, the study will offer actionable insights for developing awareness campaigns, public education strategies, and policy frameworks aimed at aligning public perception with scientific and technical realities.

1.5. Scope of the Study

This study focuses specifically on stakeholder perceptions regarding the use of ISSBs for residential buildings within Southwest Nigeria. It targets a diverse range of respondents, including homeowners, builders, developers, and community members with varying levels of experience or awareness of ISSBs. The research does not include physical testing of ISSBs or laboratory comparisons of material performance but relies solely on stakeholder feedback and sentiment analysis derived from questionnaire responses. While insightful, the findings are limited in their generalisability beyond the geographical and residential scope of Southwest Nigeria due to regional variations in building practices and policy environments.

2. Literature review

2.1. Overview of ISSBs (*Interlocking Stabilised Soil Blocks*)

Interlocking Stabilised Soil Blocks (ISSBs) are environmentally friendly construction materials produced by compacting a mixture of soil, water, and a stabilising agent typically cement into interlocking modules (Ibitoye et al., 2022; Ibitoye, 2025). Unlike traditional fired bricks or concrete blocks, ISSBs do not require kilns, thereby reducing energy consumption and emissions (Malanga et al., 2022). Their interlocking nature reduces the use of mortar, expedites construction, and limits material wastage, making them especially attractive in cost-sensitive, labour-constrained environments (Agyei-Mensah et al., 2023).

ISSBs have gained traction across East Africa, Southeast Asia, and parts of Latin America due to their local adaptability and eco-friendliness (Mumo et al., 2022). In Kenya and Uganda, widespread deployment has been supported by NGOs and low-cost housing initiatives. However, in Nigeria particularly the Southwest their uptake remains limited. Scholars attribute this to weak exposure, entrenched misperceptions, and inadequate technical support (Ogundele & Adeniyi, 2023; Ibitoye et al., 2023; Ibitoye et al., 2026). As the demand for affordable, climate-resilient housing grows, ISSBs offer a scalable solution deserving of renewed attention and investment (Oketch et al., 2023).

2.2. Technical Merits of ISSBs

ISSBs offer notable advantages that compare favourably to conventional masonry in strength, insulation, and durability provided they are properly stabilised and cured (Omollo et al., 2022). The interlocking geometry allows for rapid assembly, minimising mortar use and labour costs, while enabling vertical and horizontal alignment precision (Mumo et al., 2022). Additionally, their load-bearing capacity and weather resistance have been proven adequate for single- and double-storey housing under appropriate structural designs (Ibitoye, 2025).

Their thermal comfort benefits are also critical in tropical contexts (Rahman, Haw & Fazlizan, 2021; Ibitoye, 2025; Iwayemi, 2024). The soil matrix in ISSBs offers lower thermal conductivity than cement blocks, leading to cooler indoor temperatures and reduced energy demand for mechanical ventilation (Agyei-Mensah et al., 2023). Since raw materials are typically locally sourced, production and transport energy costs are reduced. Consequently, ISSBs are well-suited for affordable housing in Nigeria, where climatic adaptability and cost-efficiency are critical (Oketch et al., 2023).

2.3. Stakeholder Theory and Perception Economy

Stakeholder theory posits that decision-making in construction is shaped by a network of actors homeowners, builders, architects, financiers, and policymakers whose perceptions, interests, and biases must be understood to enable change (Ogundele & Adeniyi, 2023). These stakeholders' experiences and worldviews influence which materials are adopted and which are rejected, often irrespective of scientific or engineering merit.

The "perception economy" builds upon this by emphasising that trust, reputation, and visual appeal hold significant intangible value (Jimenez, Pansera & Abdelnour, 2025). Imposing innovation: How 'innovation speak' maintains postcolonial exclusion in Peru. *World Development*, 189, 106914. In many Nigerian communities, materials like concrete blocks are seen as modern and prestigious, while ISSBs are stigmatised as "rural" or "experimental," despite evidence to the contrary (Nduka et al., 2021; Omollo et al., 2022; Ibitoye et al., 2026). Overcoming this perception gap requires more than technical demonstrations it demands strategic storytelling, social proof, and sustained advocacy.

2.4. Adoption Theory in Sustainable Construction

Adoption theory, particularly Rogers' Diffusion of Innovations, outlines how technologies gain traction through stages involving awareness, interest, trial, and eventual use. In construction, the adoption process is often influenced by perceived relative advantage, compatibility with local practices, simplicity, observability, and trialability (Malanga et al., 2022).

For ISSBs, these factors interact with cultural norms, risk aversion, and institutional inertia. In Nigeria, limited advocacy, scarcity of early adopters, and lack of policy enforcement discourage experimentation with alternatives (Agyei-Mensah et al., 2023). Even when ISSBs are demonstrably effective, they may fail to diffuse if they do not align with users' economic realities and aesthetic preferences. Adoption theory thus provides a useful lens to interrogate why technically meritorious innovations like ISSBs remain marginal (Afolabi, 2025).

2.5. Previous Studies on Perceptions and Adoption of Alternative Building Materials

Recent studies from across sub-Saharan Africa reveal a consistent gap between technical performance and social acceptability of sustainable materials. In Kenya and Uganda, for instance, despite ISSBs outperforming concrete blocks in cost and thermal performance, adoption remains hindered by fears over strength and social status (Omollo et al., 2022; Ibitoye et al., 2026).

In Nigeria, compressed earth blocks and similar materials have long been associated with poverty or rural backwardness, limiting their appeal in urban or upwardly mobile settings (Ogundele & Adeniyi, 2023). Global literature corroborates that psychological and social barrier often outweigh technical limitations in slowing innovation uptake (Nduka et al., 2021). Successful case studies highlight the need for visual demonstration projects, user testimonials, and inclusive policy incentives to shift public attitudes and build trust.

2.6. Conceptual Framework

This study integrates stakeholder theory and adoption theory under the umbrella of the perception economy. It conceptualises the adoption of ISSBs as a function of both **technical merit** (e.g., durability, thermal comfort, cost-effectiveness) and **perceived value** (e.g., status, trust, aesthetics). These variables are shaped by internal factors such as users' knowledge, education, and past experience and external influences like policy environment, availability, and social norms (Mumo et al., 2022).

The framework enables a dual analysis: identifying where technical capacity is strong but adoption is weak, and diagnosing whether perception or policy can unlock wider uptake. This

approach supports the development of actionable interventions that go beyond technical recommendations, providing a nuanced roadmap for scaling up ISSBs through perception-sensitive strategies.

3. Methodology

3.1. Research Design

This study adopts a quantitative descriptive survey research design to explore how stakeholder perceptions influence the adoption of Interlocking Stabilised Soil Blocks (ISSBs) in Southwest Nigeria. The survey method was selected for its suitability in gathering large-scale data from diverse respondent groups within a defined geographical area, allowing for both descriptive and inferential analysis (Agyei-Mensah et al., 2023). This design is appropriate for studies examining attitudes, awareness, and perceptions within construction and sustainability contexts (Mumo et al., 2022; Ibitoye et al., 2026;).

3.2. Study Area and Population

The research was conducted in Southwest Nigeria, a region comprising states where urbanisation pressures and housing deficits create opportunities for alternative building technologies. Despite ISSBs' potential, their adoption remains low in this area, making it ideal for a perception-based study (Ogundele & Adeniyi, 2023). The population for this study includes stakeholders within the built environment: homeowners, developers, construction professionals, and policymakers, who are directly or indirectly involved in decisions about residential building materials (Omollo et al., 2022).

3.3. Sampling Technique and Sample Size

A purposive sampling technique was employed to ensure that participants possess relevant experience or knowledge of residential construction, building materials, or ISSBs. This non-probability method is appropriate when the goal is to gather insights from those best positioned to provide informed perspectives (Malanga et al., 2022). A total of 124 respondents were sampled, aligning with previous studies on stakeholder perceptions of sustainable building materials (Agyei-Mensah et al., 2023; Oketch et al., 2023).

3.4. Data Collection Instruments

Data were collected using a structured questionnaire comprising both closed-ended and Likert-scale items. The questionnaire was designed to capture demographic data, levels of awareness, perceptions of ISSB attributes, barriers to adoption, and stakeholders' openness to future use. This aligns with established approaches in similar studies on construction innovation adoption (Nduka et al., 2021; Mumo et al., 2022). The instrument was reviewed by field experts to ensure content validity and relevance to the study objectives.

3.5. Data Analysis Methods

Data were analysed using descriptive statistics (frequencies, means, standard deviations) and inferential methods including correlation and regression analyses to examine relationships between knowledge of ISSBs, perception of benefits, and likelihood of adoption. These methods align with previous ISSB-related studies which sought to establish links between perception variables and adoption behaviours (Omollo et al., 2022; Agyei-Mensah et al., 2023). SPSS software was employed for statistical computations.

3.6. Validity and Reliability

Validity was ensured through expert review of the research instrument, alignment with research objectives, and reference to validated measures from prior studies (Malanga et al., 2022). Reliability was assessed through a pilot test with a small subset of respondents, achieving an acceptable Cronbach's alpha value (>0.7) for internal consistency. This approach is consistent with recent studies focusing on stakeholder perceptions in construction research (Nduka et al., 2021; Ogundele & Adeniyi, 2023).

3.7. Ethical Considerations

The study adhered to established ethical guidelines for social science research. Informed consent was obtained from all participants, who were assured of confidentiality and the voluntary nature of participation. Data were anonymised, stored securely, and used solely for academic purposes. These practices align with ethical standards outlined in recent literature on construction research involving human participants (Agyei-Mensah et al., 2023; Omollo et al., 2022).

4. Results and discussion

4.1. Presentation of Findings

This section presents the findings derived from the analysis of the data collected, structured to reflect the study's objectives. It includes the demographic characteristics of respondents, their awareness and perceptions of ISSBs, as well as the identified barriers influencing adoption decisions.

4.1.1. Demographic Characteristics of Respondents

Discussion of Demographic Findings

The data in Table 1 indicate that male respondents make up 58.8%, reflecting broader trends in Nigeria where men are typically more involved in construction-related decisions (Ogundele & Adeniyi, 2023). The majority of respondents (69%) fall within the 29–50 age range, aligning with findings by Mumo et al. (2022) that individuals within this demographic are most active in housing procurement and material decisions.

Table 1. Demographic Characteristics of Respondents

Variable	Categories	Frequency	Percentage (%)
Gender	Male	60	58.8
	Female	42	41.2
Age Group	18–28	15	14.6
	29–39	35	34.0
	40–50	36	35.0
	51–61	13	12.6
	62 and above	4	3.9
Education Level	Secondary	17	13.8
	OND/NCE	22	17.9
	HND	26	21.1
	B.Sc./B.Tech	41	33.3
	M.Sc./M.Tech & above	17	13.8
Income Level (₦)	<50,000	12	9.7
	50,000–99,999	30	24.2
	100,000–149,999	40	32.3
	150,000–199,999	25	20.2
	200,000 and above	17	13.7

Source: Field Survey (2025)

In terms of education, a large portion of respondents held tertiary qualifications, with 33.3% having a bachelor's degree and 13.8% possessing a master's or higher. This suggests that respondents are reasonably informed and capable of understanding technical information about construction materials (Agyei-Mensah et al., 2023; Ibitoye et al., 2023).

Income distribution shows a concentration around ₦50,000–₦149,999, a typical earning range for middle-income earners in Southwest Nigeria. This demographic typically drives decisions on affordable housing materials, including ISSBs, but is also susceptible to perception biases regarding material prestige (Nduka et al., 2021).

These demographic insights are crucial for understanding subsequent findings on awareness, perception, and adoption attitudes, as they align with the profiles identified in previous studies (Omollo et al., 2022; Oketch et al., 2023).

4.1.2 Awareness and knowledge of ISSBs

Moderate awareness dominates, with 48% moderately familiar with ISSBs. These findings reflect the awareness challenges identified in Agyei-Mensah et al. (2023) regarding sustainable materials in developing economies.

Table 2. Awareness and Knowledge of ISSBs among Respondents

Awareness Level	Frequency	Percentage (%)
Nothing at all	3	2.4
A little	33	26.8
Moderately	59	48.0
Very much	24	19.5
Extremely	4	3.3
Total	123	100

Source: Field Survey (2025)

4.2 Analysis of Stakeholder Perceptions

Stakeholders rated strength, fire resistance, and thermal insulation highly (all $M > 3.7$), affirming findings by Oketch et al. (2023) and Omollo et al. (2022). Lower scores on dirt and moisture resistance mirror concerns raised in Malanga et al. (2022) about ISSBs' perceived durability in tropical climates.

Table 3. Perceptions of ISSBs' Physical and Technical Attributes (Mean Scores)

ISSB Attribute	Mean Score (5-Point Scale)
Aesthetic appearance	3.65
Uniform physical appearance	3.55
Smooth surface	3.35
Brownish colour	3.77
Resistance to dirt	3.29
Strength	3.88
Thermal insulation	3.73
Fire resistance	3.88
Availability in local markets	3.50
Moisture resistance	3.47
Indoor air quality	3.79
Sound insulation	3.65
Wind resistance	3.63

Source: Field Survey (2025)

4.3. Comparing Technical Merits vs. Perception-Based Adoption

Regression analysis in Table 4 confirms a weak but significant relationship ($R^2 = .064$), aligning with Omollo et al. (2022), who concluded that awareness alone does not guarantee adoption. Perceptions often outweigh empirical knowledge.

Table 4. Regression Model Linking Knowledge and Adoption Prospects

Model Variables	R	R Square	Sig. (p)
Knowledge of ISSB Physical Characteristics	.253	.064	.005
Source: Field Survey (2025)			

Table 5 shows the high frequency of moderate barrier scores (45–60) indicates prevalent concerns about social perception and policy support, echoing Ogundele and Adeniyi (2023) and Mumo et al. (2022).

Table 5. Factors Affecting Widespread Adoption of ISSBs

Barrier Score	Frequency	Cumulative %
12 - 44	45	36.3
45 - 60	52	78.2
61+	27	100.0
Source: Field Survey (2025)		

4.4. Discussion in Relation to Literature

Demographic findings align with existing research: males and middle-aged respondents dominate construction decisions (Ogundele & Adeniyi, 2023), and middle-income earners are particularly cautious about building materials (Nduka et al., 2021).

Awareness findings mirror Agyei-Mensah et al. (2023) and Mumo et al. (2022), who highlighted knowledge gaps as major barriers to alternative material adoption. Positive ratings for strength and insulation support Oketch et al. (2023) and Omollo et al. (2022), yet concerns over moisture resistance reflect Malanga et al. (2022).

Regression outcomes align with Omollo et al. (2022): technical knowledge alone is insufficient; perception shapes decisions more heavily. Perceived barriers reinforce the “perception economy” challenge identified by Nduka et al. (2021).

4.5. Implications for Practice and Policy

- i The results suggest multi-level strategies to enhance ISSB adoption:
- ii Targeted Education: Address misconceptions through stakeholder workshops (Agyei-Mensah et al., 2023).
- iii Pilot Projects: Demonstrate performance via government-supported projects (Malanga et al., 2022).
- iv Policy Incentives: Subsidies and regulatory mandates to promote ISSBs (Mumo et al., 2022).
- v Advocacy and Testimonials: Use respected figures to reshape narratives (Ogundele & Adeniyi, 2023).
- vi These strategies address perception-driven barriers and align with adoption theory (Nduka et al., 2021).

5. Conclusion and recommendation

5.1 Summary of Key Findings

This study examined how stakeholder perceptions influence the adoption of Interlocking Stabilised Soil Blocks (ISSBs) for residential construction in Southwest Nigeria. The findings revealed that awareness of ISSBs among stakeholders is generally moderate, with a limited number having an in-depth understanding of the material's technical attributes. This restricted knowledge base has been identified as a factor limiting confidence and uptake, a situation also noted by Agyei-Mensah et al. (2023) and Mumo et al. (2022).

The study further established that stakeholders generally perceive ISSBs positively regarding their strength, fire resistance, and thermal insulation performance. However, concerns persist about the blocks' moisture resistance and maintenance, reflecting similar findings by Malanga et al. (2022). Despite technical merits, adoption decisions remain heavily influenced by social perceptions and the lack of visible, large-scale success stories findings aligned with Ogundele and Adeniyi (2023) and Omollo et al. (2022).

Regression analysis confirmed that stakeholder perceptions outweigh technical evidence in influencing adoption decisions. These results reinforce existing literature, such as Omollo et al. (2022) and Nduka et al. (2021), which shows that the perception economy remains a critical barrier to sustainable material adoption.

The findings highlight the necessity of targeted education, communication, and policy strategies if ISSBs are to achieve wider acceptance and use in Nigeria's housing sector.

5.2. Recommendations for Stakeholders

To address the identified barriers and promote ISSB adoption, the following recommendations are proposed:

- i. Construction professionals (architects, builders, developers) should actively promote ISSBs through demonstration projects and inclusion in proposals to clients.
- ii. Homeowners and end-users should be encouraged to engage with educational initiatives, including workshops and site visits, to observe the practical benefits of ISSBs.
- iii. Educational institutions should integrate ISSBs into the curriculum of architecture, engineering, and construction programmes, while researchers should expand post-occupancy evaluations to provide robust performance data.
- iv. Government bodies and policymakers should consider incorporating ISSBs into building codes and offering incentives such as tax rebates or subsidies for ISSB-based construction.
- v. Public awareness campaigns should leverage mass media and testimonials from trusted industry professionals to reshape public attitudes towards ISSBs.

5.3. Policy and Communication Strategies

Given the dominance of perception over technical merit, policy frameworks should create enabling environments that incentivise ISSB adoption. These might include incorporating ISSBs into national housing schemes, offering financial incentives, and mandating their use in specific project categories to create market visibility and acceptance.

Communication strategies should focus on targeted campaigns that highlight successful ISSB projects, address common misconceptions, and elevate the visibility of ISSBs within mainstream construction conversations. Media outreach, endorsements from respected professionals, and

transparent performance data can all help to dismantle perception-based barriers and encourage adoption.

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