International Journal of Social Science and Economic Research

ISSN: 2455-8834

Volume:10, Issue:12 "December 2025"

Industry Perspectives on Sustainable Material Adoption within the Indian Construction Industry: A Qualitative Exploration

Aaliyah Bajaj

Pathways School, Gurugram, India

DOI: 10.46609/IJSSER.2025.v10i12.005 URL: https://doi.org/10.46609/IJSSER.2025.v10i12.005

Received: 22 November 2025 / Accepted: 8 December 2025 / Published: 15 December 2025

ABSTRACT

This study explores the perspectives of construction professionals on the adoption of sustainable materials in India. Semi-structured interviews were conducted with seven architects, civil engineers, project managers, and designers to understand how material choices have evolved and what factors influence sustainability in practice. The findings reveal that sustainability is widely acknowledged but adoption remains uneven across projects. Professionals reported gradual shifts towards materials such as AAC blocks, recycled steel, bamboo, lime plaster, and precast elements, mainly in high-end or boutique projects, while mainstream construction continues to prioritize cost, speed, and aesthetics. Key barriers identified include high upfront costs, limited availability, low client awareness, lack of skilled labor, regional climate constraints, and conflicting design preferences. Drivers for adoption include environmental responsibility, long-term durability, regulatory compliance, and market positioning. Regional variations, project scale, and client expectations were found to strongly shape material selection. The study highlights the gap between sustainability policies and on-the-ground practice, emphasizing the need for targeted interventions such as training programs, improved supply chains, and awareness campaigns. By capturing the lived experiences of industry practitioners, this research provides actionable insights to promote broader adoption of sustainable construction practices in India.

Keywords: Construction professionals, India, material adoption, Qualitative study, Sustainable construction.

1. Introduction

The construction industry is one of the largest contributors to the total global carbon emissions , energy consumption, and waste generation. As stated by the United Nations Environment Programme, this sector alone accounts for nearly 37 percent of the global CO_2 emissions . Due to

ISSN: 2455-8834

Volume:10, Issue:12 "December 2025"

the disastrous consequences of the growing carbon footprint , humans are intensifying their efforts to combat climate change ; thus, the importance of sustainability within construction has grown significantly. International government frameworks such as BREEAM , GRIHA, and LEED are actively trying to drive a shift towards responsible construction practices. Moreover , initiatives like the United Nations Sustainable Development Goals—specifically SDG 11 (sustainable cities and communities) and SDG 13 (climate action)—further elaborate on the importance of the transformation of how buildings are designed and constructed.

In India the construction sector is going through a slow but steady evolution towards sustainability—not just because of ethical reasons but also because it acts as a competitive benefit for the product. While green buildings and sustainable technologies are beginning to gain recognition , their adoption remains limited to selected firms and luxury projects. Some of the key challenges slow down the widespread adoption of sustainable materials; nonetheless , growing client interest , environmental awareness, and new government policies are gradually directing the industry towards more sustainable outcomes. Material selection is one of the most integral elements of a building claiming to be sustainable. The impact made by construction materials on the environment spans their entire life cycle—from extraction and manufacturing to use , maintenance, and eventual disposal. Therefore, picking materials with higher recyclability and durability and lower embodied energy can substantially minimize a building's carbon footprint.

Materials such as low-carbon concrete , cross-laminated timber (CLT), recycled steel, and bamboo have been emphasized in recent studies [1]. Such materials do not only reduce environmental harm but also contribute to an improvement in building performance and occupant health. Another study observed that there are many obstacles in the way of the transition to environmentally friendly practices, such as high costs , limited supply and a lack of technical knowledge [2]. The shift is not just technical but also represents a cultural and behavioral change within the construction industry. Professions are learning to balance sustainability with cost , aesthetics , performance, and client expectations. Over the past 10 years the global construction industry has seen notable development in terms of sustainable material research , technological tools that support green construction and energy efficient design. While its adoption remains uneven amongst firms and regions, with hesitations due to market and cost pressures, some architects and builders are mindfully incorporating sustainability into designs.

Trends in India suggest an increasing awareness amongst architects and developers, particularly in high-need residential and boutique projects . This shows how sustainability is looked at as a luxury rather than a practical solution to the ongoing environmental issues. It's unfortunate that the market still prioritizes cost savings and speed over sustainability, especially amongst mass housing and mid- or low-income consumers. Several barriers continue to constrict the usage of

ISSN: 2455-8834

Volume:10, Issue:12 "December 2025"

such green materials. These include lack of policy incentives , insufficient technical training and under-skilled labor, high initial costs , lack of supply, specialized handling or additional time requirements, and consumer skepticism about long-term performance.

Furthermore , the perception gap exists in clients expressing environmental concerns but being unwilling to bear the added costs. As many professionals pointed out , sustainability is often treated as a marketing gimmick rather than a practically integrated design philosophy. Thus, having an understanding of these ground-level challenges is essential for creating and editing effective policies, educational programs, and incentive mechanisms.

While previous research has primarily concentrated on policy frameworks , environmental assessments, and certification systems , relatively fewer studies have captured the industrial perspectives—particularly within the Indian context. To bridge the existent gap , this study focuses on the exploration of perceptions and experiences of developers, architects, civil engineers, and project managers. Through structured interviews , the research aims to uncover how such stakeholders interpret , evaluate, and put these sustainable materials into practice. Through the analysis of their life experiences , the study seeks to identify other drivers , barriers, and opportunities influencing the adoption of sustainable construction materials in India. Ultimately the findings aim to help us to create a better understanding of how sustainability can shift from policy to discourse to daily construction—balancing the well-being of the environment with economic growth. The next section elaborates on the existing studies in this field of research.

2. Literature Review

An extensive review of literature has been conducted to understand the existing field of research in terms of sustainable materials, material efficiency, and consumer adoption patterns within the construction and urban development sectors. The key studies that contribute to the understanding of sustainability practices have been discussed in this section.

Anttonen et al. [3] examined the demand for eco-efficient services in Finland across major waste-generating sectors such as manufacturing, wholesale and retail trade, logistics, and construction. The study used a mixed-method approach where the authors combined semi-structured interviews with 30 practitioners, a survey of 224 potential customer companies, and two focus groups conducted in 2009. The data was analyzed using cross-tabulations with chi-square tests to understand the variations by sector and respondent roles. The results of the study depict that the slow penetration of eco-efficient services is largely attributed to a mismatch between customer needs and service providers' offerings. The study further found insufficient awareness of material-efficiency practices, underdeveloped turnkey service solutions, and

ISSN: 2455-8834

Volume:10, Issue:12 "December 2025"

significant sector-specific information gaps, particularly in the construction sector, despite the availability of sustainable service options. Pricing expectations and anticipated cost savings also influenced customer willingness to adopt such services. These findings suggest the need for improved communication, innovation in service design, and better alignment between customer requirements and provider capabilities.

Building on the assessment of service-level efficiency, Yahia et al. [4] conducted a systematic review of sustainable material selection in building design and construction. Following PRISMA guidelines, the authors screened peer-reviewed studies published between 2010 and 2023, ultimately selecting 50 relevant papers. Secondary data were extracted using a predefined template, and quality was assessed through the Cochrane risk-of-bias tool. The study synthesizes evidence on environmental, social, and economic aspects of sustainable materials, including bamboo, recycled steel, and low-carbon concrete. The study suggests that such materials reduce greenhouse gas emissions by 30–50%, decrease waste generation, and lower long-term operating costs despite higher initial investments. Social benefits include improved indoor air quality and enhanced occupant comfort. The authors conclude that while sustainable materials exhibit strong environmental and economic potential, barriers persist due to limited availability, cost constraints, and slow industry-wide adoption.

Ruuska and Häkkinen [5] analyzed material efficiency in the construction of residential buildings using two reference types: a modern VAP-system house and a traditional reinforced masonry structure. The study employed a simplified Life Cycle Assessment (LCA) framework evaluating global warming potential, embodied energy, cumulative energy demand, and construction-phase impacts. Additional metrics—such as on-site waste generation, labor productivity, project duration, and percentage of material circularity—were incorporated to provide a comprehensive comparison. Data were derived from on-site audits, off-site manufacturing records, and documented productivity figures. The analysis reveals that modern methods of construction significantly reduce environmental impacts, with approximately 50% lower cumulative energy demand and greenhouse gas emissions, 68% less onsite waste, and substantially faster construction timelines. The study also highlights the influence of transportation distance on sustainability performance and identifies structural components such as foundations and walls as major contributors to environmental impacts.

Weniger et al. [6] examined sustainability-related purchasing behavior among private individuals in the German construction industry. Through a quantitative online survey of 306 participants aged 18 and above, the authors assessed respondents' understanding of sustainability and the extent to which sustainability criteria influence building product choices. Demographic data, self-assessed sustainability knowledge, and evaluations of sustainability-related criteria formed part of the questionnaire. Statistical analysis of the responses indicates that most participants

ISSN: 2455-8834

Volume:10, Issue:12 "December 2025"

associate sustainability predominantly with environmental factors, suggesting limited understanding of broader sustainability dimensions. The study further finds that individuals with higher sustainability knowledge place greater importance on recycled content, energy efficiency, and locally sourced materials. Knowledge positively influences the likelihood of selecting sustainable construction products.

Expanding the review scope to urban development, Singh et al. [7] proposed a sustainable urbanization model for Indian cities, using New Delhi as a case study. The authors utilized a qualitative methodology combining case-study analysis, review of institutional reports, comparative assessment of urban trends, and policy evaluation. Their findings highlight issues of unplanned urban sprawl, severe housing shortages, declining green cover, inadequate transportation systems, waste management failures, and widespread environmental degradation. The study proposes solutions aligned with Green Urbanism principles, such as zero-emission frameworks, integrated planning approaches, expansion of sustainable transportation systems, environmental restoration, and inclusive housing policies. The recommendations provide direction for adopting sustainable urban structures in rapidly growing metropolitan regions.

Based on the review of literature, it is seen that there is very little research on how construction professionals like architects, designers, and engineers actually face choices and make decisions in the market. This study aims to understand how decisions are made in real-life projects and what helps or stops professionals from using sustainable materials by conducting interviews with people working in the construction industry.

3. Methodology

3.1 Objectives of the study

1. To explore how construction professionals perceive and make decisions regarding sustainable materials in India.

2. To identify the key challenges, drivers, and factors shaping the adoption and future of sustainable construction.

3.2 Research design

This research follows a qualitative design, which helped in capturing the perceptions, experiences, and barriers faced by professionals in the construction industry while adopting sustainable materials. A semi-structured interview approach was followed to ensure structure and flexibility, which allowed participants to express their personal perspectives freely while maintaining consistency across responses at the same time. The rationale behind this were Semi-

ISSN: 2455-8834

Volume:10, Issue:12 "December 2025"

structured interviews are specifically suitable for this research, as they allow us to obtain detailed, experience-based insights that quantitative surveys may overlook.

3.3 Study population

The target group included construction experts such as architects, civil engineers, project managers, and real estate developers. These professionals were selected because they are directly involved in material selection, project management, and sustainability-related decision-making. Each of these participants has had a minimum of 3-4 years of experience in the construction field, which ensures informed and practical perspectives.

3.4 Sampling method

A purposive sampling (non-random/judgmental sampling) was adopted, which would help select individuals who could provide the most relevant insights into sustainable construction practices.

The sample size included a total of 7 professionals who were interviewed for this study. This number allowed for a diverse range of viewpoints while keeping the data manageable for detailed qualitative analysis.

3.5 Data collection

Data was collected through semi-structured interviews, each lasting between 10 and 15 minutes. The interviews were conducted either in person or online depending on participant availability throughout the months of July-October 2025. All of the participants were informed of the research purpose. The interview questions covered topics such as evolving trends in material choices , adoption and performance of such sustainable materials , client demand and awareness amongst consumers , economic and regulatory influences , barriers to wider adoption and , how to overcome these factors which demotivate consumers from adopting sustainable construction materials ; exploring individual opinions on the role of government support , consumer attitude , and potential changes required to encourage usage of sustainable practices in construction

3.6 Analytical Framework

The data has been analyzed using thematic analysis to identify recurring ideas and relationships amongst responses. First it began with reading and familiarizing with all interview transcripts and generating initial codes based on related patterns in responses. Secondly, the grouping of the codes into broader themes such as “cost barriers” and “client awareness.” After which took place the reviewing and refining of themes for clarity and consistency. Later interpreting and analyzing findings in relation to the research objectives and comparing them with insights from the

ISSN: 2455-8834

Volume:10, Issue:12 "December 2025"

literature review. Lastly, concluding while considering all the different perspectives offered by experts and forming observations

3.7 Ethical considerations

Ethical guidelines were followed throughout the research process. Informed consent was obtained from all participants prior to the interview . Participation was voluntary, and individuals were free to withdraw at any point . The collected data was stored securely and used strictly for academic purposes.

4. Results and Findings

The interviews revealed diverse yet converging perspectives on the evolving role of sustainability in the Indian construction industry. Thematic analysis of the five interviews identified five dominant themes: (1) Evolution of Material Choices, (2) Client Awareness and Demand, (3) Drivers of Sustainable Adoption, (4) Barriers to Implementation, and (5) Performance and Future Outlook.

The theme-based analysis of the seven interviews highlights many recurring patterns across professionals involved in the field of construction . While each interviewee approached sustainability from a unique role, be it architecture , civil engineering, or project management , there was a clear convergence on specific issues. These interviews revealed the five central themes:

4.1 Evolution of material choices

Spanning the different interviews , most of the participants observed a certain level of change in construction material over the period of a decade while contexts varied. An Architect described by stating, *"There's been a strong move toward low-carbon materials, recycled content, and locally sourced products."* Which notes the rising interest in lime plaster , bamboo, and reclaimed wood. In contrast , another architect explained how *"the material choices have shifted from the use of natural materials to cost-friendlier materials,"* including adhesives and low-grade tiles.

From a developer's or a project manager's perspective, one of the most evident changes has taken place in the interior finishes, which is due to the increased imports and market availability. *"For stuff like floorings, panellings, and, you know, façade equipment and façade materials, there is a whole lot of variety in the market, which wasn't available earlier."* The project manager also added another dimension by *explaining that in Goa , material choices are strongly shaped by climate conditions. He stated that "whatever works in Delhi or Mumbai will not work*

ISSN: 2455-8834

Volume:10, Issue:12 "December 2025"

in Goa" and choosing unsuitable material can lead to speak or leakage due to the local region's humidity and rainfall . He also noted that there is an increasing adoption of recycled steel bars in residential projects .

Meanwhile , a civil engineer elaborated on the transition from traditional laterite stone to AAC blocks while emphasizing their light weight , practicality, and sustainability for steel structures . However, the site contractor felt that the materials *" In terms of the basic construction, I think it has been the same,"* while he did acknowledge usage of lightweight stone or blocks and precast elements for faster completion.

Taken together , the theme suggests the fact that there is a gradual but scattered material evolution , specifically faster in interiors and region-specific contexts and slower in structural elements.

4.2 Client awareness and Demand

Demand for sustainable materials seems to be unevenly distributed across market segments. An architect had reported that 60-70 percent of his clients , primarily the high-end and boutique project clients , have expressed an inclination towards sustainable materials, though *"the depth of understanding varies."* Conversely , the other architect estimated that only 1 in 10 clients *"have actively asked for such environment-friendly materials."*

Both real estate developers and civil engineers commonly analyzed the low awareness amongst mid-income buyers. One of them explained with clarity how *"the middle-class customer is more worried about the price rather than these factors of sustainability. okay..and only the rich really care for all this,"* and one of the experts agreed that clients *"do not really ask for it"* mostly because of limited awareness. The project manager strongly supported this observation, stating how most clients *"don't pay attention to whether materials are eco-friendly or not."*

Moreover , a professional added that clients heavily focused on speed of project delivery and convenience more than the environmental concerns surrounding it , stating that "what the client wants is easy and fast construction."

Overall, this theme portrays that while niche segments might show interest , most of the mainstream consumer demand for sustainable materials remains low due to limited awareness , sensitivity to cost, and aesthetic trends.

4.3 Drivers behind sustainable adoption

The interviews have revealed many motivations for adopting sustainable materials, while they vary by professional role. The architects mentioned environmental responsibility , long-term

ISSN: 2455-8834

Volume:10, Issue:12 "December 2025"

durability, and aesthetic values as mainstream drivers . One of the architects emphasized that natural materials *"age beautifully"* and also come with lower maintenance, while the other pointed out how sustainability encourages material reuse and reduction of waste. Adding to this, the project manager explained that luxury expectations shape the material choices since clients want *"high-grade, high-quality"* finishes, and it is quite difficult to source materials that are both premium-looking and eco-friendly.

Developers, however, associate adoption of sustainability with mostly market positioning , noting how sustainability is often used as a *"selling point"* even if clients don't explicitly demand it.

The study also came across some technical drivers, such as AAC blocks, which are preferred for their lower heat transfer and lightweight nature. Additionally, lime plaster is also gaining popularity because it is breathable and easily reusable. Several participants also stated that rainwater harvesting and water recycling remain popular because they strengthen project value or are sometimes legally required.

Together these respondents are trying to display that sustainability is adopted when it aligns with performance benefits , regulatory requirements, brand positioning, or aesthetics.

4.4 Barriers to implementation

All of the interviewees had successfully identified barriers that restricted the wider adoption of sustainable materials . The most consistently mentioned obstacle was the high upfront cost. An architect had compared it to *" EV vs petrol cars"* showing how sustainability required a premium investment . The real estate developer echoed with this statement, stating how cost and economic viability are the major barriers for an average consumer.

Another significant barrier highlighted was the limited awareness especially amongst the middle income clients who prioritised affordability. The civil engineer added that availability and skilled labour are some of the challenged *" Sometimes the material is not available … and local workers may not have experience working with them."* The project manager reinforced this barrier by saying how materials including cross-laminated timber, are not available in the local region, making them extremely expensive since they must be imported. This creates a regional supply restriction which limits the usage of effective sustainable materials.

Another professional also pressed on the point that clients prefer faster methods, while sustainable materials and techniques may take up longer time . To add on , he also talked about the market preferences like the trend of large glass facades—which often work against sustainable design: "It *looks modern, but it's not sustainable."*

ISSN: 2455-8834

Volume:10, Issue:12 "December 2025"

Across interviews , the conclusion was reached that barriers fall broadly within eight categories : cost , convenience , supply limitations , low awareness , climatic conditions , labor skills , geographic locations, and conflicting aesthetic preferences.

4.5 Performance and future outlook

All the professionals had mixed views about the performance of sustainable materials.

The project manager added a climate-based performance perspective by elaborating on how solars panels are used widely, but they are *"not very efficient in Goa"* due to weather conditions and therefore sometimes perform worse than traditional electricity sources. An architect believed that such materials *"can meet or exceed traditional performance"* if used in the correct way. The architect agreed to that point but also added that some materials, such as mud walls, *"require more thickness"* to match with traditional standards. An engineer on the other side expressed his concerns: *"You can't have the same quality of work with two different materials,"* though he acknowledged the fact that they can still be good alternatives in many cases.

Sustainable methods appeared to be more commonly used in interiors , water systems , landscaping and finishing works rather than core architectural elements. When asked about the future adoption several professionals thought change will require strong government involvement. The real estate developer also state that government intervention like subsidies and incentives are essential for growth : *" that is the only way adoption will increase faster."*

One of the experts pointed out that many sustainable systems are implemented due to regulation (e.g., STPSs) rather than voluntary demand. Conclusively , the respondents felt that the future of sustainable construction in India depends on policy support , wider awareness , cost reductions, and the slow expansion of proven high-performance materials.

5. Discussion

The interviews consistently indicate that sustainability within the Indian construction industry is acknowledged in principle by professionals, but significant barriers remain in practicing it. Across all roles—architects, developers, engineers, contractors, or project managers—experts have shown a limited and edscattered adoption of sustainable materials. Architects have recently observed selective shifts towards materials like recycled wood, bamboo, and lime plaster, but engineers and contractors have seen incremental changes featuring an increase in the use of AAC blocks and precast elements. Client demand generally remains low for sustainable materials and is primarily occurring in luxurious residential projects, while the majority of clients choose to prioritize elements like cost, aesthetics, and speed over environmental concerns. This could be

ISSN: 2455-8834

Volume:10, Issue:12 "December 2025"

due to the fact that sustainability is to this date viewed as an added feature rather than a core requirement in mainstream construction, resulting in uneven adoption across segments.

These practioning insights are supported by the empirical research in the Indian context. These pan-India surveys [8] found that lack of skilled human resources, reluctant clients, and limited awareness of sustainable practices are some of the major barriers hindering the implementation of construction practices, alongside skills shortages. This directly aligns with the interview data collected in this study, where participants have repeatedly highlighted availability, labor skill gaps, and cost as key constraints. This alignment could suggest that the issues raised by the practitioners are not isolated cases but reflect the challenges in the construction industry as a whole.

Another study on sustainable construction focusing on smaller Indian cities such as Gwalior has found that cost perception, material availability, and education or training have had an impactful influence on adoption rates [9]. The interviews conducted in our study have reflected similar patterns, as they pointed out that the availability of such materials often depends on the local region (e.g., CLT in Goa), which leads to increasing costs, further limiting the use of sustainable materials to only projects with higher budgets. This may be due to the fragmentation in supply chains where sustainable materials are not yet produced or distributed to an extent that reduces cost and improves access across varying regions.

A central theme in the data was seen as the limited influence of client awareness. Many experts note that most clients do not actively request sustainable materials and instead focus on factors like cost and project speed, which hinders wider uptake. This had been reflected in broader market trends reported in industry analyses. These analyses [10] emphasize a lack of stakeholder understanding and awareness about the benefits of sustainable construction, which slows progress in India and contributes to a continued dependence on traditional materials. This could be due to the perception that sustainability causes entan increment in complexity or cost, making clients a little less willing to manage with unfamiliar alternatives. The interviews have also revealed that economic considerations have outweighed the environmental objectives in material decision-making. One developer explained that clients are seemingly “more worried about the price rather than sustainability,” to which other experts added how such materials often carry a premium cost. This echoes broader research identifying higher upfront costs as a considerable barrier to adopting such green building materials, despite their potential long-term savings [11].

Regional context has also emerged as an important determinant of material choice. The project manager in Goa noted that climate conditions can also influence suitability—for instance, some materials perform poorly in high humidity—which goes hand in hand with the critical observations from regional case studies, which argue that material sustainability and climate

ISSN: 2455-8834

Volume:10, Issue:12 "December 2025"

sensitivity must guide sustainable construction decisions in India. [12] This suggests that sustainable construction cannot follow a uniform model across the country of India, and material decisions should be adapted to climatic and environmental realities.

However, there are some points of particular divergence between the findings of this study and some other recent studies. For example, these interviews discussed the limited market demand, while research in larger Indian cities has documented a growing number of IGBC-rated green buildings specifically in states like Rajasthan, which suggests that sustainability has been gaining traction in commercial sectors but unevenly [13]. This divergence could have been due to differences between metropolitan-level investments and other large city markets where commercial markets may differ.

Another contrast lies in the perceived impact of regulation and certification. In the interviews taken, regulatory influence was stated majorly in the context of compliance features like sewage treatment plants but not as a proactive driver of material choices. Some industry reviews suggest contradictory statements portraying that regulatory support and incentives can be meaningful in boosting sustainable adoption when aligned carefully with policy frameworks and market mechanisms. This difference may arise due to many compliance requirements focusing on systems (e.g., STPs) rather than material selection, which leads these practitioners to perceive regulations as procedural rather than transformative.

Overall the interviews paint a picture of a sector that is aware of sustainability in technical terms, but the practice is constrained by structural, economic, and perceptual barriers. The comparison with recent Indian research shows that the findings from this are consistent with broader patterns—lack of awareness, cost pressures, supply shortage, and training gaps—which are repeatedly identified as obstacles to sustainable material adoption. Together, these insights suggest that meaningful progress will require community efforts across policy, education, market, and supply chains to support adoption of sustainable construction beyond niche segments.

6. Conclusion

This study examined the perceptions and experiences of six professionals across the construction industry in India to understand how sustainable materials are being adopted within the industry. By conducting semistructured interviews, the research explored the evolution of material selection, the role of clients, the drivers and barriers of adoption, regulations, and market forces. The findings showed how sustainability is widely acknowledged as a concept, but its practical implementation remained limited in most construction segments. The interviews revealed that material transitions were occurring but really unevenly. Architects observed selective shifts

ISSN: 2455-8834

Volume:10, Issue:12 "December 2025"

towards materials like bamboo, lime sterplaster, and recycled wood, whereas engineers and contractors had identified changes such as incremental usage of AAC blocks and precast systems; however, client demand for environmentally friendly material remains limited, particularly outside the luxury segment in a market dominated by decision-making. Cost, restricted availability, labor skill gaps, regional climatic constraints, and perceptions were repeatedly seen as the key obstacles. These insights aligned with several Indian studies indicating that rather than attitudinal resistance alone, systematic structural challenges shape sustainability practice in the sector.

The findings had suggested important implications for policy and industry. Improving training for labor and contractors , incentivizing low-carbon materials, enhancing regional supply, and strengthening awareness campaigns might encourage broader adoption. Moreover, aligning these regulatory frameworks along with material-level sustainability rather than only system-level compliance could support a meaningful change.

This study has certain limitations, including its small sample size and its focus on qualitative perspectives, which may not represent the entire industry. Future research could expand and include quantitative surveys, with comparisons across metropolitan and nonmetropolitan regions and a deeper analysis of life cycle costing to comprehend the long-term benefits of sustainable materials in the Indian subcontinent. Overall this study has contributed to a growing understanding of the practicalities influencing sustainable construction and has highlighted the need for coordinated efforts across policy, industry, and consumers to support wider adoption.

References

[1] Radhika V. and J.M. Chandra Kishen, "A comparative study of crack growth mechanisms in concrete through acoustic emission analysis: Monotonic versus fatigue loading," *Construction and Building Materials*, vol. 432, Jun. 2024, [Online]. Available: https://www.sciencedirect.com/science/article/abs/pii/S0950061824017094

[2] K. Aaltonen and J. Kujala, "A project lifecycle perspective on stakeholder influence strategies in global projects," *Scandinavian Journal of Management*, vol. 26, no. 4, pp. 381–397, Oct. 2010, doi: 10.1016/j.scaman.2010.09.001.

[3] M. Anttonen, M. Halme, E. Houtbeckers, and J. Nurkka, "The other side of sustainable innovation: is there a demand for innovative services?," *Journal of Cleaner Production*, vol. 45, pp. 89–103, Dec. 2011, doi: 10.1016/j.jclepro.2011.12.019.

ISSN: 2455-8834

Volume:10, Issue:12 "December 2025"

[4] A. K. M. Yahia and M. Shahjalal, "Sustainable materials selection in building design and construction," *International Journal of Science and Engineering*, vol. 1, no. 4, 2024. [Online]. Available: https://ssrn.com/abstract=5049566. doi: 10.62304/ijse.v1i04.198.

[5] A. Ruuska and T. Häkkinen, "Material efficiency of building construction," *Buildings*, vol. 4, no. 3, pp. 266–294, Jul. 2014, doi: 10.3390/buildings4030266.

[6] A. Weniger, P. Del Rosario, J. G. Backes, and M. Traverso, "Consumer Behavior and Sustainability in the Construction Industry—Relevance of Sustainability-Related Criteria in Purchasing decision," *Buildings*, vol. 13, no. 3, p. 638, Feb. 2023, doi: 10.3390/buildings13030638.

[7] M. Agarwal, "A Sustainable model of urbanization for Indian cities, A case study of New Delhi," *IJERT*, Mar. 2021, doi: 10.17577/IJERTV10IS030022.

[8] M. Gehlot and S. Shrivastava, "Sustainable construction Practices: A perspective view of Indian construction industry professionals," *Materials Today Proceedings*, vol. 61, pp. 315–319, Oct. 2021, doi: 10.1016/j.matpr.2021.09.493.

[9] Ijraset, "Barriers to sustainable construction in Tier-2 Indian cities: A case study of Gwalior," *IJRASET*.https://www.ijraset.com/research-paper/barriers-to-sustainable-construction-in-tier-2-indian-cities?

[10] Wresearch, *India Sustainable Construction Market Top 5 Importing Countries and Market Competition (HHI) analysis*. [Online]. Available: https://www.6wresearch.com/industry-report/india-sustainable-construction-market?

[11] Konstructify, "Sustainable Construction: The future of building in India," *Konstructify*, Jul. 05, 2024. https://www.konstructify.com/sustainable-construction-the-future-of-building-in-india?

[12] P. V. Raj, P. S. Teja, K. S. Siddhartha, and J. S. K. Rama, "Housing with low-cost materials and techniques for a sustainable construction in India-A review," *Materials Today Proceedings*, vol. 43, pp. 1850–1855, Dec. 2020, doi: 10.1016/j.matpr.2020.10.816.

[13[Tnn, "More than 600 IGBC-rated green buildings in Raj now," *The Times of India*, Jun. 04, 2025.[Online].Available: https://timesofindia.indiatimes.com/city/jaipur/more-than-600-igbc-rated-green-buildings-in-raj-now/articleshow/121631266.cms?

