Examining Causes and Solutions for Building Collapse in Nigeria: A Review

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Abstract- ***Building collapse remains a significant concern in Nigeria, posing severe risks to lives and property. This study aims to explore the factors contributing to building collapse and to identify effective architectural safety measures. A narrative review research method was employed to synthesise findings from 61 published journal articles from 2010 to 2023. The review highlights critical issues such as substandard materials, poor construction practices, inadequate supervision, regulatory lapses, and environmental factors. Additionally, the study underscores the pivotal role of architects in mitigating these challenges through implementing rigorous safety protocols, adhering to building codes, and adopting innovative construction technologies. The findings emphasise the necessity for enhanced regulatory frameworks and continuous professional development for architects to ensure the structural integrity of buildings. The study concludes with recommendations for policy reforms and the integration of advanced safety measures in architectural practices to prevent future occurrences of building collapse.***

Indexed Terms- ***Building collapse, architectural safety, construction practices, regulatory frameworks, structural integrity, innovative technologies***

I. INTRODUCTION

Building collapses in Nigeria have escalated into a critical issue over the past decade, leading to substantial loss of life, injuries, and economic setbacks. Rapid urbanisation, insufficient regulatory oversight, and the use of substandard materials in construction have only worsened this problem. The frequent reports of structural failures underscore the pressing need for immediate and comprehensive safety measures and strict adherence to building standards.

This study explores the causes of building collapses in Nigeria and identifies architectural safety measures to mitigate these risks. A narrative review of 61 published journal articles from 2010 to 2023 synthesises existing knowledge to provide a holistic understanding of the issue. This approach identifies patterns and commonalities in the literature, offering insights into strategies for preventing future building collapses.

The study is confined to published journal articles, ensuring the data analysed is from peer-reviewed sources and thus maintaining academic rigour. This focus, however, excludes grey literature, reports, and unpublished studies that might offer additional perspectives. Despite these limitations, the selected articles provide a robust foundation for analysis.

The narrative review approach is suitable for synthesising findings from diverse studies integrating qualitative and quantitative data to understand the factors contributing to building collapses. This method's flexibility is essential for addressing multifaceted issues like building safety.

Rapid urbanisation in Nigeria has increased the demand for housing and infrastructure, often outpacing the regulatory capacity of government agencies. This surge in construction activities has led to numerous building collapses, usually attributed to

substandard materials, poor craftsmanship, and inadequate supervision. For instance, Egwunatum et al. (2022) and Okunola (2022) found that substandard materials were a major factor in many building collapses, highlighting the need for stricter quality control measures in procurement.

Inadequate regulatory oversight is another critical issue contributing to building collapses. Regulatory bodies are often understaffed and lack the resources to enforce compliance with building codes and standards. According to Windapo and Rotimi (2012), enforcement of building regulations in Nigeria is hampered by corruption, bureaucratic inefficiencies, and a lack of political will, allowing widespread violations of safety standards.

Environmental factors also significantly impact building stability. Nigeria's diverse climate, from humid tropical regions to arid northern areas, poses various construction challenges. Soil erosion, flooding, and high winds can undermine building stability if not properly accounted for during design and construction. Research by Lacasse et al. (2020) highlights the impact of environmental conditions on building strength, calling for more resilient construction practices.

The role of architects in ensuring building safety is crucial. Architects are responsible for designing and supervising construction projects, and adherence to safety protocols and building codes is essential for preventing structural failures (Samsudin et al., 2021). However, the effectiveness of architects is often compromised by external pressures, such as cost-cutting measures imposed by clients and contractors (Angral, 2019).

This study underscores the importance of enhancing regulatory frameworks and professional practices to prevent building collapses in Nigeria. Addressing the root causes identified in the literature, such as substandard materials, poor construction practices, and inadequate supervision, can develop more effective safety measures. The findings provide a foundation for policymakers, industry stakeholders, and practitioners to implement strategies ensuring the structural integrity and safety of buildings in Nigeria.

II. METHODOLOGY

- Research Design and Data Sources

A narrative review was chosen for its flexibility in synthesising diverse findings, providing a holistic understanding of the factors contributing to building collapses. The review focused on peer-reviewed journal articles published between 2010 and 2023, sourced from Google Scholar, JSTOR, ScienceDirect, and the Directory of Open Access Journals (DOAJ).

- Inclusion and Exclusion Criteria

Inclusion Criteria:

- Published between 2010 and 2023.
- Peer-reviewed journal articles.
- Focus on building collapses in Nigeria or other developed countries.
- Examination of causes, impacts, and prevention of building collapses.
- Data on regulatory frameworks, construction practices, and architectural safety measures.

Exclusion Criteria:

- Published before 2010.
- Non-peer-reviewed sources.
- Studies not directly related to building collapses or focused on regions outside Nigeria.

- Data Collection and Analysis

A systematic search using keywords like "building collapse," "Nigeria," "construction practices," "architectural safety," "regulatory frameworks," "substandard materials," and "environmental factors" was conducted. Boolean operators refined the search. Titles and abstracts were screened for relevance, and selected articles underwent full-text review. Data on causes, regulatory issues, construction practices, and safety measures were thematically organised.

- Quality Assessment and Ethical Considerations

The quality of the selected studies was assessed using the Critical Appraisal Skills Programme (CASP) checklist, ensuring reliability and validity by evaluating methodological rigour, clarity, and relevance. Ethical considerations focused on accurately representing and acknowledging original

authors' work, maintaining proper citations, and adhering to academic integrity guidelines.

- Limitations

This review is limited to published journal articles, potentially excluding relevant grey literature and unpublished studies. Additionally, the findings depend on the quality and scope of the included studies. Despite these limitations, the review provides a robust foundation for understanding the factors contributing to building collapses in Nigeria and identifying effective safety measures.

III. ANALYSIS OF FACTORS CONTRIBUTING TO BUILDING COLLAPSE IN NIGERIA

- Frequency and Severity of Building Collapses

Building collapse incidents in Nigeria are extensively documented, highlighting their frequency and severity. Oloyede et al. (2010) reported over 100 collapses between 1974 and 2006, resulting in significant loss of life and property. The trend has continued, with Oloyede et al. (2010), Obodoh et al. (2019) and Ohenhen & Shirzaei (2022) noting ongoing building failures. These collapses are often due to human errors, regulatory failures, and environmental factors. Abdelwahed (2019) suggests that despite increased awareness, implementing preventive measures remains inadequate.

This trend highlights systemic issues within the Nigerian construction industry and regulatory framework. Despite historical data and awareness, recurring collapses indicate a need for more effective safety measures and regulatory oversight. Akinyemi et al. (2016), Awoyera et al. (2020), and Ebekozien et al. (2023) emphasise significant economic losses and undermine public trust in construction practices and regulatory bodies. These failures often displace communities, causing long-term psychological and financial hardship for victims.

- Use of Substandard Materials

Substandard materials are a primary cause of building collapse in Nigeria. Inadequate quality control during procurement allows the widespread use of inferior materials. Danbaba et al. (2020) and Ede et al. (2021) found substandard cement, steel reinforcements, and other materials prevalent in many collapsed buildings, leading to structural weaknesses and collapse. Faremi et al. (2020) corroborate this finding.

The prevalence of substandard materials is linked to corrupt practices and weak regulatory enforcement. Suppliers and contractors cut costs by sourcing cheaper, low-quality materials, compromising safety. Akinyemi et al. (2016) and Osuizugbo (2019) note that weak regulation allows the continued use of substandard materials. This issue calls for an overhaul of procurement processes and stricter penalties for non-compliance to improve material quality.

- Poor Construction Practices

Poor construction practices significantly contribute to building collapses. Many projects in Nigeria lack supervision, leading to deviations from approved plans. This is compounded by the employment of unskilled labour, who lack the necessary training (Ojo et al., 2021). Windapo and Rotimi (2012) highlight poor artistry as a critical factor in many collapses, as substandard methods compromise structural integrity. Toriola-Coker et al. (2021) explain that workers' lack of professional development exacerbates this problem.

Additionally, unskilled labourers often do not follow correct procedures, leading to structural weaknesses (Hussain et al., 2020). Inadequate supervision from project managers and engineers further aggravates this issue. Windapo and Rotimi (2012) emphasise that improving construction practices requires better training and stricter oversight.

- Inadequate Regulatory Oversight

Inadequate supervision by authorities is a major factor in a building collapse. Regulatory bodies like the Standards Organization of Nigeria (SON) and the Nigerian Building and Road Research Institute (NBRRI) are tasked with ensuring compliance with building codes but often lack resources to enforce regulations (Osuizugbo, 2019; Opara et al., 2012). Corruption and bureaucratic inefficiencies allow for widespread safety violations (Oyewole et al., 2011; Olatunji et al., 2019; Emma-Ochu et al., 2021). This

creates a regulatory environment that fails to safeguard buildings' structural integrity. Amoah & Steyn (2023) and Imoni et al. (2023) highlight that bribery within regulatory bodies undermines enforcement efforts.

Inadequate regulatory oversight extends beyond structural failures to long-term trust issues in the construction sector. Regulatory lapses create a cycle of non-compliance, where builders cut corners without fear of repercussions (Zailani et al., 2022). Effective regulation requires robust laws, political will, and institutional capacity to enforce them (Oyewole et al., 2011; Olatunji et al., 2019; Emma-Ochu et al., 2021).

- Environmental Factors

Environmental factors significantly impact building stability in Nigeria. The country's diverse climate presents construction challenges. Soil erosion, flooding, and high winds can undermine buildings if not properly accounted for during design and construction. Erkal et al. (2012) and Oni & Akingbohungbe (2013) highlighted the impact of soil erosion and flooding, emphasising the need for resilient construction practices. Lacasse et al. (2020) discuss the importance of climate-resilient design principles.

Addressing these challenges requires understanding local conditions and integrating resilient construction practices. Climate change complicates these issues, as changing weather patterns exacerbate vulnerabilities. Figueiredo et al. (2021) argue that sustainable building practices can mitigate environmental impacts. Ayeni & Adedeji (2015) and Laboy & Onnis-Hayden (2019) emphasise that collaboration between architects, engineers, and ecological scientists is crucial.

IV. ARCHITECTURAL SAFETY MEASURES

- Role of Architects in Ensuring Safety

Architects play a crucial role in ensuring the safety and integrity of buildings. They design structures that comply with safety standards and withstand environmental stresses. Idham (2020) emphasises that architects must incorporate adequate safety measures and use appropriate materials. Furthermore, architects oversee the construction process to ensure alignment with approved plans and specifications (Wong, 2017; Orikpete & Ewim, 2023).

Architects' involvement is vital from the initial design phase to project completion. They collaborate with engineers and builders to address structural issues and ensure high-quality materials (Windapo & Rotimi, 2012). However, external pressures, such as cost-cutting measures imposed by clients, can compromise their effectiveness. Architects also implement innovative construction technologies that enhance building safety and sustainability (Gallo et al., 2021).

To enhance their role, architects must engage in continuous professional development to stay updated with the latest safety standards and technological advancements (Ede, 2011; Kim et al., 2016). Additionally, regulatory bodies should enforce stringent licensing and certification processes to ensure that only qualified architects oversee construction projects (Osuizugbo, 2019). By adhering to these practices, architects can significantly reduce building collapses and provide safer, more resilient structures.

- Implementation of Rigorous Safety Protocols

The implementation of rigorous safety protocols during the construction phase is essential. This includes detailed supervision and inspection of construction activities to ensure compliance with the approved design and use of specified materials. According to Amadi (2012), poor supervision is one of the major factors contributing to building collapses in Nigeria. Effective supervision involves regular site visits by architects and engineers to monitor construction progress and verify that all safety measures are followed.

Safety protocols should also encompass proper documentation and adherence to construction schedules. This ensures that each construction phase is completed to the required standards before moving on to the next stage. For example, ensuring concrete is adequately cured and reinforcement bars are correctly placed and secured can prevent many structural issues. Ede (2011) notes that such detailed

attention to construction processes can significantly reduce the risk of collapse.

- Adherence to Building Codes

Adherence to building codes is fundamental to ensuring the safety of buildings. Building codes are established to provide minimum standards for construction to safeguard public health, safety, and welfare. In Nigeria, the enforcement of building codes is often lax, leading to frequent violations that compromise the structural integrity of buildings. According to Windapo and Rotimi (2012), strict enforcement of building codes is necessary to prevent substandard materials and poor construction practices.

Architects and other construction professionals must be well-versed in the relevant building codes and ensure their designs and construction practices comply with these regulations. This includes the use of appropriate materials, adherence to specified load-bearing capacities, and ensuring adequate ventilation and fire safety measures. The Nigerian Building and Road Research Institute (NBRRI) provides guidelines and standards that should be followed to enhance building safety.

- Adoption of Innovative Construction Technologies

Adopting innovative construction technologies can greatly enhance building safety and durability. Advances in building materials, such as high-performance concrete and steel, offer better strength and resilience compared to traditional materials. Ferdous et al. (2019) emphasise the importance of modern techniques like prefabrication and modular construction, which improve quality control and speed up construction times. Building Information Modeling (BIM) technologies in design and construction processes also improve safety outcomes. BIM allows architects and engineers to create detailed 3D models, identifying and addressing potential issues before construction begins. Akinyemi et al. (2016) note that BIM leads to more accurate designs, efficient resource management, and better coordination among project stakeholders. Integrating smart building technologies, such as sensors and automated systems, provides real-time monitoring of a building's structural health. These technologies detect stress or damage, enabling timely maintenance and repairs (Sivasuriyan et al., 2021). Adopting these technologies is crucial for ensuring long-term structural integrity and safety.

- Training and Capacity Building

For architects and construction professionals, continuous training and capacity building are critical for maintaining high safety standards. Professional bodies like the Nigerian Institute of Architects (NIA) provide training programs and certification courses that keep professionals updated with industry standards and practices. According to Qurix & Doshu (2020) and Mahmoud et al. (2021), regular training helps professionals understand new materials, construction methods, and safety regulations, vital for preventing building collapses. Moreover, fostering a culture of safety within the construction industry is essential.

This involves promoting awareness about the importance of safety measures and encouraging ethical practices among professionals. A strong moral foundation is necessary to combat corruption and negligence, significantly contributing to building failures (Opara et al., 2012; Mukumbwa & Muya, 2013; Bucha et al., 2020).

V. REGULATORY FRAMEWORKS

Nigeria's regulatory frameworks governing building construction are crucial for ensuring building safety and structural integrity. However, significant gaps and challenges within these frameworks contribute to frequent building collapses. Analysing the current regulatory environment, its deficiencies, and potential reforms provides insight into enhancing building safety. Various building codes and regulations, such as the National Building Code (NBC) and state-specific rules, govern Nigeria's construction industry to ensure structures meet safety and quality standards. The NBC, established in 2006, provides comprehensive guidelines for building construction, including standards for materials, design, and artistry (Amadi et al., 2012; Ayedun et al., 2012). However, inconsistent implementation and enforcement, largely due to institutional weaknesses and corruption, undermine these codes.

A primary challenge facing Nigeria's regulatory frameworks is inadequate enforcement. Regulatory bodies like the Standards Organization of Nigeria (SON) and state-building control agencies often lack resources and staff (Windapo & Rotimi, 2012), hampering their ability to conduct regular inspections and ensure compliance with building codes. According to Adegboye and Ojo (2013), many building collapses can be attributed to this regulatory gap, where substandard materials and poor construction practices go unchecked. Corruption within regulatory agencies further exacerbates the problem. Building permits are often issued without thorough inspections, facilitated by bribery, undermining the regulatory process and allowing the construction of unsafe buildings. Ojelabi et al. (2017) note that corruption in the building approval process significantly contributes to the high incidence of building collapses in Nigeria. This pervasive issue calls for stringent anti-corruption measures and greater transparency.

Another significant challenge is the fragmentation and lack of coordination among various regulatory bodies. Multiple agencies with overlapping responsibilities often result in bureaucratic delays and inefficiencies, complicating establishing a unified and effective enforcement strategy. Imoni et al. (2023) suggest better coordination and communication between agencies to streamline the regulatory process and improve oversight. Furthermore, regulatory frameworks often fail to account adequately for Nigeria's diverse environmental and climatic conditions. Echendu (2020) highlights that regulations must address specific local challenges, such as soil erosion, flooding, and high winds. The current one-size-fits-all approach fails to address these regional disparities, leading to inadequate building design and construction practices.

Addressing these challenges requires comprehensive reforms to strengthen regulatory frameworks. One key recommendation is to enhance the capacity and resources of regulatory bodies, including increasing funding, hiring more qualified personnel, and providing adequate training to ensure inspectors and enforcement officers are well-equipped (Osuizugbo, 2019). Enhanced capacity will enable more frequent and thorough inspections, improving compliance with building codes. Another critical reform is implementing stricter anti-corruption measures. This could involve using technology to automate the building permit process, reducing opportunities for corrupt practices. Additionally, establishing independent oversight bodies to monitor regulatory agencies can help ensure.

VI. CASE STUDIES

- The Synagogue Church of All Nations Collapse (2014)

On September 12, 2014, a guesthouse at the Synagogue Church of All Nations (SCOAN) in Lagos collapsed, killing 116 people, including many South Africans. Investigations revealed several critical factors: initially designed as a two-story structure, the building was extended to six stories without adequate reinforcement or consideration of the original foundation's load-bearing capacity.

Substandard materials and poor construction practices were also identified (Agwu, 2014). Umo et al. (2018) and Sulymon et al. (2019) highlighted additional issues like improper drainage, use of unqualified workers, and non-compliance with building regulations. This incident underscores the necessity of adhering to architectural designs, obtaining proper modification approvals, and ensuring rigorous supervision and quality control during construction.

- The Reigners Bible Church Collapse (2016)

On December 10, 2016, the Reigners Bible Church in Uyo, Akwa Ibom State, collapsed during a church service, killing over 200 people. Investigations pointed to inadequate reinforcement and the use of substandard materials. Umo et al. (2018) noted inadequate drainage and improper design considerations, while Onomivbori and Agbafor (2022) emphasised inadequate project supervision and the absence of qualified structural engineers.

The collapse highlights the importance of adhering to architectural plans, obtaining proper modification approvals, and rigorous supervision and quality control during construction.

- Lekki Gardens Building Collapse (2016)

On March 8, 2016, a five-story building under construction by Lekki Gardens in Lagos collapsed, killing 34 people. Investigations identified multiple factors, including substandard materials, poor construction practices, and inadequate supervision. The building's foundation was insufficient and deviated from approved plans (Windapo & Rotimi, 2012). Onwuanyi (2016) noted systemic issues like poor artistry and regulatory non-compliance.

The Lagos State Building Control Agency (LASBCA) failed to follow up on contravention notices, reflecting serious enforcement lapses. Corruption and bribery allowed inspectors to overlook violations, undermining construction integrity and safety. This incident underscores the need for transparency, accountability, and strict adherence to approved construction standards.

- The Ita Faji Building Collapse (2019)

On March 13, 2019, a three-story building housing a primary school and residential apartments collapsed in Ita Faji, Lagos Island, killing 20 people, including many children. The building, flagged for demolition several times, was structurally unsound with visible cracks and leaning walls. Investigations revealed substandard materials and poor construction techniques (Punch Newspaper, 2019).

Additionally, the lack of maintenance and enforcement of demolition orders highlighted significant regulatory lapses. The building suffered from severe foundation issues and poor quality control (Alabi, 2023; Mrabure & Awhefeada, 2020). This collapse illustrates the severe consequences of neglecting maintenance in ageing buildings and the importance of enforcing demolition orders for unsafe structures.

- Lessons Learned

These case studies reveal several common themes and lessons for enhancing building safety in Nigeria. First, using substandard materials and poor construction practices increases the risk of building collapse. Ensuring that materials meet required standards and that construction practices adhere to approved plans is critical. Second, regulatory oversight is crucial; proper inspections and enforcement could have prevented many collapses. Strengthening regulatory frameworks and ensuring agencies have the resources and authority to enforce compliance is essential. Third, addressing corruption within regulatory bodies and the construction industry is vital for upholding safety standards, achievable through transparent processes, regular audits, and stringent penalties for violations.

Fourth, proper maintenance and timely repairs are essential for the longevity and safety of buildings. Regular inspections and proactive maintenance can identify and address potential issues before they lead to structural failures. Lastly, the involvement of qualified professionals throughout the construction process is vital. Architects, engineers, and builders must have the necessary skills and knowledge to design and construct safe buildings. Continuous professional development and stringent licensing requirements can help ensure that construction professionals are competent and adhere to best practices.

VII. FINDINGS AND DISCUSSION

- Impact of Identified Factors on Building Integrity

The literature review highlights several recurring factors that significantly impact the integrity of buildings in Nigeria. These factors include substandard materials, poor construction practices, inadequate supervision, regulatory lapses, and environmental conditions.

- Substandard Materials: Substandard materials are a predominant cause of building collapse in Nigeria. Okwilagwe et al. (2021) and Egwunatum et al. (2022) found that many construction projects in Nigeria utilise materials that must meet the required standards, leading to structural weaknesses. These substandard materials are often cheaper and more readily available, making them attractive to contractors looking to cut costs. However, their use compromises the durability and safety of buildings.
- Poor Construction Practices: Inadequate training and a lack of technical expertise among construction workers contribute to

poor construction practices. Adegboye and Ojo (2013) note that many workers must be properly trained, leading to errors in mixing concrete, placing reinforcements, and other critical construction activities. These practices result in structurally unsound buildings that are prone to collapse.

- Inadequate Supervision: The lack of proper supervision during construction projects is another significant issue. Osuizugbo 2019 (2019) argues that effective supervision is crucial for ensuring construction practices adhere to approved designs and standards. However, many projects suffer from lax supervision, often due to corruption or negligence, allowing substandard practices to go unchecked.
- Regulatory Lapses: Nigeria's enforcement of building regulations needs to be improved due to corruption, bureaucratic inefficiencies, and a lack of resources. Windapo and Rotimi (2012) highlight that regulatory bodies often fail to enforce compliance with building codes, leading to widespread violations. This regulatory gap allows unsafe buildings to be constructed and occupied, increasing the risk of collapse.
- Environmental Conditions: Nigeria's diverse climate challenges building integrity. Erkal et al. (2013) discuss how soil erosion, flooding, and high winds can undermine building stability. Many construction projects must adequately account for these environmental factors, making structures resistant to local climatic conditions.

- Effectiveness of Safety Measures and Regulations

The literature review also examines the effectiveness of existing safety measures and regulations in preventing building collapses in Nigeria. While some measures have been implemented, significant gaps and challenges remain.

- Building Codes and Standards: The National Building Code (NBC) sets out the minimum standards for construction in Nigeria. However, compliance with these codes could be better. Dash & Chakraborty (2018) and Xiong et al. (2019) emphasise that strict adherence to building codes is essential for ensuring structural integrity. Strengthening the enforcement of these codes and ensuring that all construction projects comply with the standards is critical for improving building safety.
- Professional Involvement: Qualified professionals, such as architects and engineers, must be involved throughout the construction process to ensure safety. Ede (2011) and Abhishek et al. (2020) highlight the importance of professional oversight in maintaining construction quality. However, the influence of these professionals is often undermined by cost-cutting measures and external pressures from clients and contractors.
- Innovative Construction Technologies: Innovative construction technologies can enhance building safety. Advances in materials science and construction techniques, such as high-strength concrete and prefabricated components, can improve buildings' durability and resilience. Olanrewaju et al. (2020) suggest that integrating these technologies into construction practices can address some of the inherent challenges in the Nigerian construction industry.
- Regulatory Reforms: Addressing regulatory lapses requires comprehensive reforms to enhance the capacity and effectiveness of regulatory bodies. Windapo and Rotimi (2012) and Umeokafor (2020) recommend increasing these bodies' resources and authority to enforce compliance with building codes. Combating corruption and ensuring transparency in regulatory processes are also essential for improving building safety.

- Comprehensive Analysis

The findings from the literature review provide a comprehensive understanding of the factors contributing to building collapses in Nigeria and the measures needed to address these issues. The impact of substandard materials, poor construction practices, inadequate supervision, regulatory lapses, and environmental conditions on building integrity is clear. These factors are interrelated and often

compound, creating a complex challenge for ensuring building safety.

Substandard materials and poor construction practices result from economic pressures, a lack of technical expertise, and inadequate oversight. Addressing these issues requires a multifaceted approach that includes improving the quality of construction materials, enhancing construction workers' training and certification, and ensuring strict supervision throughout construction.

Regulatory lapses and corruption significantly undermine the effectiveness of building codes and standards. Strengthening regulatory frameworks, increasing the resources and authority of regulatory bodies, and implementing anti-corruption measures are essential for ensuring compliance with safety standards.

Environmental conditions pose additional challenges to building integrity, particularly in a country with diverse climatic conditions like Nigeria. Incorporating resilience to ecological factors into building designs and construction practices is crucial for enhancing the durability and safety of buildings.

The involvement of qualified professionals and the adoption of innovative construction technologies can significantly improve building safety. Ensuring that architects, engineers, and builders possess the necessary skills and knowledge to adhere to best practices and integrating advanced construction techniques into projects can address many of the current shortcomings in the Nigerian construction industry.

Overall, the literature review underscores the need for a comprehensive and coordinated approach to improving building safety in Nigeria. Addressing the identified challenges and implementing robust safety measures and regulatory reforms can reduce the incidence of building collapses and ensure safer, more resilient structures.

VIII. RECOMMENDATIONS

- Policy Recommendations

Strengthening regulatory frameworks is essential for building safety in Nigeria. Regulatory bodies must be adequately funded and staffed to enforce building codes effectively. This includes increasing the number of inspectors and providing them with the necessary tools and training. Strict anti-corruption measures, such as transparency, regular audits, and severe penalties, are crucial for restoring the integrity of regulatory frameworks.

Streamlining and digitising the building permit approval process can reduce bureaucratic delays and encourage compliance. Extending regulatory oversight to informal construction areas ensures that basic safety standards are met. Supporting low-income builders in adhering to safety standards and increasing awareness of building regulations are also necessary.

- Strategies for Enhancing Architectural Practices

Architects must be continuously involved throughout the construction process to ensure adherence to approved plans and standards. This involvement helps address potential issues before they compromise the building’s integrity.

Innovative construction technologies, such as high-strength concrete and prefabricated components, can enhance building durability and resilience. Integrating these technologies addresses challenges like material quality and skilled labour shortages in Nigeria.

Promoting sustainable architecture is vital. Sustainable design principles, including using durable materials, energy efficiency, and resilience to local environmental conditions, enhance building safety and contribute to broader environmental and economic goals.

- Role of Continuous Professional Development

Mandatory continuous professional development (CPD) for architects, engineers, and builders is essential for maintaining high standards in the industry. CPD programs, including workshops and online courses, should cover the latest safety standards, construction technologies, and best practices.

Stringent licensing and certification processes ensure that only qualified individuals undertake construction projects. These processes should include rigorous exams and regular re-certification. Professional bodies like the Nigerian Institute of Architects and the Nigerian Institute of Building can help develop and administer these programs.

Encouraging collaboration and knowledge sharing among professionals through industry conferences and online forums can also improve the quality of construction in Nigeria.

CONCLUSION

Building collapse in Nigeria stems from substandard materials, poor construction practices, inadequate supervision, regulatory lapses, and challenging environmental conditions. Addressing this problem requires policy reforms, improved professional practices, innovative construction technologies, and increased public awareness.

A review of 61 journal articles from 2010 to 2023 identified critical factors contributing to building collapse in Nigeria. Substandard materials, often used to cut costs, compromise structural integrity. Poor construction practices, resulting from insufficient training and expertise, further exacerbate the problem. Inadequate supervision allows these issues to persist, leading to structurally unsound buildings.
Regulatory lapses, characterised by corruption and inefficiencies, undermine building code enforcement, allowing widespread violations. Environmental factors, such as soil erosion, flooding, and high winds, require resilient construction practices tailored to local conditions.

The findings highlight the essential role of architects, engineers, and construction professionals in ensuring building safety. Their involvement throughout the design and construction process is vital for maintaining adherence to safety standards. However, cost and time pressures from clients and contractors often compromise their influence.

Innovative construction technologies, such as high-strength concrete and prefabricated components, can improve building durability and resilience. Integrating these technologies can address inherent challenges in the Nigerian construction industry.

Policy reforms are essential for strengthening regulatory frameworks and ensuring effective enforcement. This includes updating the National Building Code, increasing the capacity of regulatory bodies, and implementing strict anti-corruption measures. Simplifying the approval process for building permits and extending oversight to informal constructions can ensure compliance with safety standards.

Enhancing professional practices through continuous training and certification programs for architects, engineers, and builders is crucial. Establishing stringent licensing processes can ensure that only qualified professionals undertake construction projects, improving quality and safety.

Raising public awareness about building safety and the risk of substandard construction is vital. Public campaigns can inform property owners, builders, and the general public about the benefits of adhering to building codes and using high-quality materials. Engaging local communities in the construction process can foster a sense of responsibility for building safety.

In conclusion, preventing building collapses in Nigeria requires coordinated efforts from regulatory bodies, construction professionals, educational institutions, and the public. Addressing the challenges and implementing robust safety measures and reforms can significantly reduce building collapses and ensure safer structures. The comprehensive approach outlined in this study provides a roadmap for achieving this goal, emphasising collaboration, accountability, and continuous improvement in the construction industry.

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