

Primary Causes of Building Collapse in Nigerian Construction Industry. A Systematic Analysis

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<https://doi.org/10.56201/ijemt.vol.12.no9.2026.pg203.234>

Abstract

This review synthesises research on primary causes of building collapse in Nigeria, including structural failures like foundation issues, material quality, and design flaws; economic influences such as cost-cutting measures and corruption; the role of regulatory standards and enforcement like building codes and inspection processes; and the impact of education and training of construction professionals on construction practices to address persistent safety challenges undermining sustainable development. The review aimed to evaluate structural failure factors, benchmark economic influences, assess regulatory compliance effectiveness, analyse professional education impacts, and compare regional variations across major Nigerian cities. A systematic analysis of multidisciplinary studies from 2012 to 2024, encompassing qualitative, quantitative, and geotechnical methodologies focused on urban centres such as Lagos, Abuja, Enugu, and Port Harcourt, was conducted. Findings indicate that substandard materials, foundation inadequacies, and design flaws, compounded by inadequate supervision, are primary structural causes; economic pressures including cost-cutting and corruption critically undermine construction quality and regulatory enforcement; weak building code enforcement and inspection processes prevail despite high awareness; and deficiencies in professional education and training limit adherence to quality and safety standards. Regional disparities reveal context-specific challenges requiring tailored interventions. These interconnected factors form a complex causality network influencing building collapse. The synthesis underscores the need for integrated policy reforms, enhanced regulatory capacity, and strengthened professional training to improve construction safety and quality in Nigeria.

Keywords: Structural failures, Building collapse, Construction industry, Nigeria, Regulatory compliance

1.0 Introduction

The investigation of the underlying causes of building collapse in Nigeria has become an important area of research, largely because of the substantial loss of human lives, property, and economic resources associated with such incidents (Awoyera et al., 2021; Ayedun et al., 2014). Over the past several decades, the Nigerian construction industry has experienced an increasing occurrence of building failures. Lagos State, in particular, recorded more than 100 cases of

building collapse between 2012 and 2024, resulting in hundreds of fatalities (Akuboh & Aimola, 2024; Hamma-adama & Kouider, 2017). The persistence of this trend reflects underlying challenges in construction practices, regulatory enforcement, and the competence of key stakeholders, which have become increasingly significant in the context of rapid urbanisation and growing infrastructural demands (Olubi & Adewolu, 2018; Aduloju, 2024). The consequences of building collapse extend beyond immediate deaths and injuries, as such incidents also have broader social and economic implications that can undermine sustainable development and diminish investor confidence in the construction sector (Olubi & Adewolu, 2018; Oloyede et al., 2024). Therefore, a comprehensive understanding of the various factors responsible for building collapse is necessary to strengthen construction safety practices and support effective policy development (Awoyera et al., 2021; Yakubu et al., 2022).

Building collapse in Nigeria is commonly associated with structural deficiencies, including foundation defects, inadequate material quality, and design shortcomings. These technical problems are often compounded by economic and institutional factors such as cost reduction practices and corruption (Awoyera et al., 2021; Nneka & Ejiofor, 2024). Despite the considerable body of research on the subject, an important knowledge gap remains concerning the combined influence of these factors, particularly in relation to regulatory requirements and the professional education and competence of construction practitioners (Adenuga et al., 2022; Yakubu & Agapiou, 2016; Afolayan et al., 2014). While some researchers have primarily attributed building failures to technical shortcomings and the use of substandard construction materials (Opawole et al., 2022; Adewole et al., 2018), other studies have drawn attention to governance deficiencies and weak enforcement of building regulations (Yakubu & Agapiou, 2016; Yakubu et al., 2022). Differences in scholarly perspectives are also evident regarding the contribution of stakeholder competence and professional ethics, particularly in determining the relative influence of professional negligence and systemic corruption on building failures (Adenuga, 2012; Oloyede et al., 2024). The limited integration of these technical, economic, regulatory, and professional dimensions has constrained the development of comprehensive approaches to preventing building collapse, thereby allowing recurring failures to persist and continuing to pose significant risks to public safety (Okagbue et al., 2018).

Conceptually, building collapse involves the failure of structural integrity due to deficiencies in design, materials, and construction processes, influenced by regulatory compliance and stakeholder expertise (Hamma-adama et al., 2020) (Imafidon & Ogbu, 2020). Structural failures often stem from foundation inadequacies and poor-quality control, while economic and regulatory factors mediate the extent of these technical issues (Nneka & Ejiofor, 2024) (Yakubu & Agapiou, 2016). The education and training of construction professionals underpin the effective application of standards and ethical practices, linking human capital development to construction quality (Afolayan et al., 2014) (Adenuga, 2012). This framework guides the systematic review to explore the interplay of these dimensions in the Nigerian context.

The objective of this systematically review is at examining critically the primary causes of building collapse in Nigeria, focusing on structural failures, economic influences, regulatory enforcement, and professional education. By synthesising diverse empirical findings, the review aims to fill existing knowledge gaps and provide a holistic understanding that informs policy and practice. This contribution is valuable for stakeholders seeking to enhance construction safety and sustainability in Nigeria and comparable developing contexts (Ebekozen et al., 2023) (Nwosu & Zima, 2024).

This review thorough analysed scholarly articles, government reports, and empirical investigations, applying thematic and causal analysis to identify key factors and their interrelations. Inclusion criteria prioritise recent and regionally relevant research, while findings are organised to reflect the structural, economic, regulatory, and educational

dimensions of building collapses. The subsequent sections detail the descriptive summaries, critical analyses, and synthesised insights derived from the literature.

2.0 Review Purpose and Scope

2.1 Study Purpose

The objective of this study is to examine the existing research on "primary causes of building collapse in Nigeria, including structural failures like foundation issues, material quality, and design flaws; economic influences such as cost-cutting measures and corruption; the role of regulatory standards and enforcement like building codes and inspection processes; and the impact of education and training of construction professionals on construction practices" in order to synthesise comprehensive insights into the multifaceted factors contributing to building failures. This review is important, as building collapse remains a critical challenge in Nigeria, resulting in significant loss of lives, economic setbacks, and undermining sustainable development. By systematically analysing the interplay of technical, economic, regulatory, and educational dimensions, the review aims to identify gaps in current knowledge, inform policy and practice improvements, and guide future research directions to enhance construction safety and quality in Nigeria.

2.2 Study Objectives:

- To appraise the current state of research on structural failures including foundation issues, material quality, and design flaws in Nigerian buildings.
- Benchmarking of economic influences such as cost-cutting measures and corruption affecting construction quality and safety.
- Identification and synthesis of regulatory standards, enforcement mechanisms, and their effectiveness in mitigating building collapse.
- To analyse the impact of education and training of construction professionals on adherence to quality and safety practices.
- To compare regional variations in causes and mitigation strategies of building collapse across major Nigerian cities.

3.0 Selection Criteria for Scholarly Literatures:

3.1 Query Transformation:

Exploring the research question *"primary causes of building collapse in Nigeria, including structural failures like foundation issues, material quality, and design flaws, economic influences such as cost-cutting measures and corruption, the role of regulatory standards and enforcement like building codes and inspection processes, and the impact of education and training of construction professionals on construction practices."* This was expanded it into multiple, more specific search statements. By systematically expanding a broad research question into several targeted queries, to ensure that the literature search is both comprehensive, each query returns a set of papers tightly aligned with a particular facet of the topic in question. Below were the transformed queries formed from the original query:

- Primary causes of building collapse in Nigeria, including structural failures like foundation issues, material quality, and design flaws, economic influences such as cost-cutting measures and corruption, the role of regulatory standards and enforcement like building codes and inspection processes, and the impact of education and training of construction professionals on construction practices.
- What are the regulatory enforcement gaps, material quality issues, and educational/training

deficiencies contributing to building collapses in Nigeria, and how can BIM-enabled design, construction, and inspection practices mitigate these risks across Lagos, Abuja, and Port Harcourt?

- Nigeria building collapse risk factors: regulatory framework gaps, enforcement effectiveness, and harmonized building codes; impact of design defects, foundation and material quality; economic drivers like cost-cutting and corruption; role of professional education, training, and BIM-enabled inspection practices to improve construction quality across major cities (Lagos, Abuja, Port Harcourt)

3.2 Method Use in Screening Papers:

The method involves running each of the transformed queries with the applied Inclusion & Exclusion Criteria to retrieve a focused set of candidate papers for subsequent expanding database of over 270 million research papers. during this process 50 papers were found.

3.2.1 Additional relevant articles identified through citation chaining

Backward Citation Chaining (BCC): Each core paper was systematically examined by reviewing its reference list to identify earlier studies and foundational research on which the work was based. This process helped ensure that relevant preceding studies and important foundational contributions were not overlooked. Forward Citation Chaining: In a similar manner, subsequent studies that cited each of the core papers were identified and reviewed to determine how later research had developed, extended, or built upon the findings of the earlier studies. This approach facilitated the identification of emerging debates, replication studies, and recent methodological developments within the field. Overall, 83 additional papers were identified through the citation-chaining process.

3.2.2 Semantic ordering / Merit sorting:

The assembled pool consisted of 133 candidate papers, comprising 50 papers identified through the search queries and 83 papers obtained through citation chaining. These papers were subsequently assessed and ranked according to their relevance to the research topic, allowing the most pertinent studies to be prioritised for inclusion in the final papers table. The assessment indicated that 131 papers were relevant to the research query, of which 50 papers were classified as highly relevant.

4.0 Results and Discursions

4.1 Studies Descriptive Summary

This portion synthesizes the academic discourse surrounding the primary causes of building collapse in Nigeria, including structural failures like foundation issues, material quality, and design flaws, economic influences such as cost-cutting measures and corruption, the role of regulatory standards and enforcement like building codes and inspection processes, and the impact of education and training of construction professionals on construction practices. The reviewed studies encompass a broad range of methodologies including qualitative case studies, quantitative surveys, geotechnical investigations, and systematic reviews, with a strong geographic focus on major Nigerian cities such as Lagos, Abuja, Enugu, and Port Harcourt. This comparative analysis is relevant to the research questions as it synthesizes multifaceted factors influencing building collapse (Table 1), highlighting technical, economic, regulatory, and educational dimensions, and regional variations, thereby informing policy and practice improvements.

Table 1: Multifaceted factors influencing building collapse in Nigeria

Study	Structural Failure Analysis	Economic Influence Assessment	Regulatory Compliance Evaluation	Professional Education Impact	Regional Variation Comparison
Ebekozien et al., 2023	Developer greed, design flaws, inadequate emergency response	Developer greed linked to systemic failures	Weak government agency capacity, poor enforcement	Limited impact discussed	Focus on Lagos urban context
Powell, 2023	Traditional QC practices dominate, poor material quality control	Cost constraints affect QC adoption	Low compliance despite awareness of standards	QC managers improve quality control	Lagos-specific quality control issues
Adenuga et al., 2022	Design integration failures, poor supervision, material storage issues	Not explicitly quantified	Lack of proper supervision and inspection	Professional roles critical in supervision	Lagos-focused stakeholder perceptions
Awoyera et al., 2021	Use of substandard materials, design faults, non-professional involvement	Corruption pervasive in construction industry	Non-adherence to codes and standards	Professional incompetence noted	National overview with emphasis on urban areas
Anosike, 2021	All stakeholders implicated in collapse causes	Cost-cutting and greed noted	Need for strict adherence to statutory roles	Professional adherence critical	Case study in Owerri, Imo State
Hamma-adama et al., 2020	Structural failure, differential settlement key causes	Economic factors indirectly linked	Regulatory gaps noted	Professional capacity important	National systemic approach

Olubi & Adewolu, 2018	Structural defects, poor design, substandard materials	Greed and client impatience economic drivers	Poor supervision and monitoring	Education impact implied	National focus with sustainable development lens
Ejiofor, 2018	Use of unapproved materials, defective design, quack engagement	Corruption and cost-cutting significant	Regulatory review lacking	Professional training gaps	Multi-city survey (Enugu, Lagos, Abuja)
Journal & Okoye, 2015	Low awareness and use of management documents	Corruption and negligence hinder document use	Non-enforcement of building codes	Not emphasized	Anambra State focus
Ayedun et al., 2014	Substandard materials, poor workmanship, structural defects	Cost-cutting and non-compliance noted	Inadequate supervision and inspection	Education recommended	Lagos State case study
Afolayan et al., 2014	Professional incompetence, negligence in design and construction	Profit motive linked to substandard structures	Weak enforcement of standards	Curriculum and training deficiencies highlighted	National educational perspective
Adesanya and Olanrewaju, 2014	Non-enforcement of codes, substandard materials, poor workmanship	Economic constraints affect quality	Building code enforcement weak	Training impact implied	Lagos State focus
Adenuga, 2012	Quacks and inexperienced contractors cause failures	Economic motivations implicit	Poor management and leadership	Professional ethics enforcement needed	Lagos State professional focus
Onwuka et al., 2025	Substandard materials, ineffective supervision,	Corruption and greed noted	Non-adherence to codes prevalent	Maintenance culture lacking	South Eastern Nigeria focus

	bad workmanship				
Akuboh & Aimola, 2024	Structural failure, illegal conversions, under-reinforcement	Cost-cutting and regulatory violations	Enforcement challenges noted	Professional roles implied	Lagos-specific data 2012-2024
Nwosu & Zima, 2024	Weak foundations, poor quality control, inexperienced personnel	Cost-cutting and management failures	Site investigation absence critical	Training and experience gaps	Abuja and Lagos urban centres
Akomolafe Maryam Abidemi, 2022	Inadequate supervision, material shortages, cash flow problems	Economic factors like inflation impact failures	Regulatory enforcement weak	Technical skill deficits noted	Osun State urban cities
Nneka & Ejiofor, 2024	Poor construction practices, substandard materials	Cost-cutting directly linked to failures	Quality control challenges	QC training recommended	Case study on cost-cutting effects
Adeosun et al., 2020	Unqualified personnel, substandard materials major causes	Economic constraints implicit	Compliance evaluation recommended	Contractor evaluation suggested	Osogbo, Osun State
Opawole et al., 2022	Non-compliance of concreting materials to standards	Procurement and capacity issues affect quality	Enforcement and standards observance low	Training and ethical standards needed	Lagos State focus
Obiora et al., 2022	Poor foundation, substandard materials, inadequate reinforcement	Economic factors not primary focus	Supervision deficiencies noted	Professional qualifications emphasized	Anambra State case study

Okah, 2022	Foundation and structural failures prevalent	Economic impacts significant	Enforcement of codes recommended	Professional supervision critical	Rivers State focus
Abija, 2023	Geotechnical uncertainties affect foundation reliability	Economic factors not primary focus	Need for geotechnical consultancy	Professional involvement essential	National geotechnical perspective
Uchenna et al., 2023	Poor soil suitability for foundations	Economic factors not emphasized	Regulatory gaps in site investigation	Professional geotechnical input needed	Enugu Metropolis
Eze et al., 2023	High clay content soils cause settlement	Economic factors not primary focus	Poor foundation materials identified	Technical skills critical	South East Nigeria
Afolabi et al., 2024	Competent subsurface materials; human factors blamed	Economic factors not discussed	Enforcement of site investigations weak	Professional oversight needed	Ile-Ife, Southwestern Nigeria
Hammadama & Kouider, 2017	Substandard reinforcement and materials main causes	Economic factors linked to supervision lapses	Construction supervision critical	Professional roles emphasized	National professional survey
Adewole et al., 2018	Use of inappropriate cement grades causes failures	Economic constraints affect material choice	Standards awareness needed	Training on material standards important	National focus
Adewale et al., 2018	Poor specification leads to collapse	Economic factors implicit in poor specs	Specification adherence weak	Professional specification training needed	National perspective
Imafidon & Ogbu, 2020	Design, policy, and quality-related causes identified	Economic factors linked to policy and quality	Policy enforcement weak	Professional compliance critical	Lagos State clustering study

Oyediran et al., 2015	Geotechnical causes significant in Lagos failures	Economic factors not primary focus	Regulatory oversight on geotechnical issues needed	Professional geotechnical expertise required	Lagos State geotechnical study
Eze et al., 2024	Estate Surveyors' role in prevention highlighted	Economic factors not primary focus	Regulatory challenges faced by estate surveyors	Professional roles expanded	Lagos Island areas
Una et al., 2015	Soil properties linked to building cracks and failures	Economic factors not emphasized	Regulatory gaps in geotechnical monitoring	Professional geotechnical involvement needed	Enugu State
Alaneme et al., 2021	Under-reinforcement, low concrete strength cause failure	Economic factors not primary focus	Supervision and quality control weak	Professional supervision critical	Case study of partial collapse
Qurix & Doshu, 2020	Change of use, poor supervision, substandard materials	Economic factors like client impatience noted	Monitoring and standards enforcement weak	Professional certification emphasized	National urban focus
Nwosu & Zima, n.d.	Weak foundations, poor quality control, inexperienced personnel	Economic factors linked to management failures	Site investigation and enforcement lacking	Professional training gaps	Abuja and Lagos
Okagbue et al., 2018	Poor materials, structural defects, corruption major causes	Economic factors like corruption quantified	Legal compliance weak	Professional capacity building needed	National systematic review
Yakubu & Agapiou, 2016	Legislation, leadership, and corruption	Economic factors like poverty and	Building code development and	Professional involvement lacking	Lokoja Municipality

	hinder code implementation	fees impact enforcement	enforcement weak		
Siddiq & Xianyi, 2022	Structural failures linked to poor management and BIM adoption	Economic factors implicit in poor management	Regulatory challenges addressed via BIM	Education and training improvements recommended	National focus
Faremi et al., 2020	Corruption, quacks, greed influence substandard material use	Economic drivers significant	Regulatory non-compliance widespread	Professional awareness and training needed	Lagos metropolis
"Building Disaster and Failures in Nigeria...", 2022	Inadequate supervision, material shortages, cash flow problems	Economic factors like inflation impact failures	Regulatory enforcement weak	Technical skill deficits noted	Osun State urban cities
Yakubu et al., 2022	Structural failures linked to poor regulatory enforcement	Economic factors like poverty affect compliance	Enforcement and compliance very low	Training capacity building critical	National housing sector

4.1.1 Structural Failure Analysis: Forty-five studies identified foundation issues, substandard materials, design flaws, and poor workmanship as primary structural failure causes, with geotechnical factors also significant in several regional studies (Obiora et al., 2022) (Uchenna et al., 2023) (Oyediran et al., 2015). Several studies emphasized inadequate supervision and inspection as critical contributors to structural failures (Adenuga et al., 2022) (Ayedun et al., 2014) (Alaneme et al., 2021). While some studies highlighted specific technical issues such as inappropriate cement grades and under-reinforcement as direct causes of collapse (Adewole et al., 2018) (Alaneme et al., 2021).

4.1.2 Economic Influence Assessment: Thirty studies explicitly linked economic factors such as cost-cutting, corruption, greed, and client impatience to building collapse causes (Ebekozen et al., 2023) (Awoyera et al., 2021) (Nneka & Ejiofor, 2024) (Faremi et al., 2020). Cost-cutting was frequently associated with the use of substandard materials and poor-quality control practices (Nneka & Ejiofor, 2024) (Faremi et al., 2020). Also, corruption was identified as a pervasive factor undermining regulatory enforcement and quality standards (Awoyera et al., 2021) (Faremi et al., 2020) (Okagbue et al., 2018).

4.1.3 Regulatory Compliance Evaluation: Over forty studies reported weak enforcement of building codes, poor adherence to standards, and ineffective inspection processes as major issues (Ebekozen et al., 2023) (Journal & Okoye, 2015) (Adesanya & Olanrewaju, 2014) (Yakubu & Agapiou, 2016). While several studies noted that awareness of building codes and standards is often high, but compliance remains low due to systemic challenges (Powell, 2023) (Opawole et al., 2022) (Imafidon & Ogbu, 2020). Furthermore, regulatory challenges were linked to political will, leadership deficits, and corruption (Yakubu & Agapiou, 2016) (Oloyede et al., 2024).

4.1.4 Professional Education Impact: More than thirty studies underscored the role of professional training, competence, and ethical conduct in preventing building collapse (Afolayan et al., 2014) (Adenuga, 2012) (Fawale et al., 2023). While deficiencies in curriculum, practical exposure, and multidisciplinary integration were highlighted as educational gaps (Afolayan et al., 2014). Similarly, professional supervision and certification were recommended as critical to improving construction quality (Adenuga, 2012) (Eze et al., 2024).

4.1.5 Regional Variation Comparison: Studies revealed regional differences in collapse causes and mitigation effectiveness, with Lagos, Abuja, Enugu, and South Eastern Nigeria frequently studied (Ebekozen et al., 2023) (Onwuka et al., 2025) (Akuboh & Aimola, 2024) (Uchenna et al., 2023). Lagos studies often emphasized regulatory enforcement and economic factors, while South Eastern studies highlighted geotechnical and maintenance issues (Onwuka et al., 2025) (Uchenna et al., 2023). Some regional studies called for localized strategies tailored to specific urban challenges (Akomolafe Maryam Abidemi (2022) ("Building Disaster and Failures in Nigeria.", 2022).

4.2 Studies Evaluative Integration

The reviewed literature on the primary causes of building collapse in Nigeria reveals a multifaceted and complex interplay of structural, economic, regulatory, and educational factors. While many studies provide valuable empirical data and stakeholder perspectives, there is a notable variation in methodological rigor and scope, which affects the generalizability of findings. The research collectively underscores the critical role of substandard materials, poor supervision, and regulatory lapses, yet often lacks comprehensive integration of these dimensions into cohesive frameworks. Furthermore, the influence of education and training on construction quality is acknowledged but insufficiently explored in depth (Table 2). Regional disparities and the effectiveness of enforcement mechanisms also emerge as significant but under-investigated themes, highlighting gaps for future research and policy intervention (Table 7).

Table 2: Strength and weaknesses of factors influencing building collapse in Nigeria

Aspect	Strengths	Weaknesses
Structural Failures (Foundation, Material Quality, Design Flaws)	Numerous studies employ both qualitative and quantitative methods to identify key structural causes such as foundation inadequacies, use of substandard	Despite detailed case studies, many investigations focus on isolated incidents or specific regions, limiting broader applicability (Afolabi et al., 2024). Some studies

Aspect	Strengths	Weaknesses
	materials, and design defects, supported by physical testing and expert surveys (Obiora et al., 2022) (Hamma-adama & Kouider, 2017) (Alaneme et al., 2021). Geotechnical investigations provide robust empirical evidence on soil and foundation issues contributing to collapse (Uchenna et al., 2023) (Eze et al., 2023) (Oyediran et al., 2015). The integration of laboratory analyses with field data strengthens the validity of conclusions on material and foundation failures (Obiora et al., 2022) (Alaneme et al., 2021).	rely heavily on self-reported data from professionals, which may introduce bias or underreport systemic issues (Adenuga et al., 2022) (Adenuga, 2012). There is often insufficient longitudinal data to assess the evolution of structural failures over time or the impact of remedial measures (Hamma-adama et al., 2020). The complexity of interactions between design flaws and material quality is not always fully addressed.
Economic Influences (Cost-Cutting, Corruption)	Research highlights the pervasive impact of economic pressures such as cost-cutting and corruption on construction quality, linking these factors to the use of inferior materials and compromised workmanship (Ebekozi et al., 2023) (Nneka & Ejiofor, 2024) (Faremi et al., 2020). Empirical surveys capture stakeholder perceptions on how financial constraints and greed undermine safety standards (Anosike, 2021) (Oloyede et al., 2024). The identification of economic drivers provides a critical lens for understanding root causes beyond technical failures (Nneka & Ejiofor, 2024).	Economic factors are often discussed in broad terms without rigorous quantification or causal modelling (Oloyede et al., 2024) (Faremi et al., 2020). There is limited exploration of how economic incentives interact with regulatory enforcement or professional ethics. Some studies note variance in stakeholder opinions, reflecting challenges in isolating economic causes from other factors (Nwosu & Zima, 2024) (Nwosu & Zima, 2024). The role of informal practices and systemic corruption is acknowledged but not deeply analysed in relation to policy effectiveness.
Regulatory Standards and Enforcement	Several studies critically assess the inadequacy of building codes, weak enforcement, and regulatory failures as central to building collapse prevention (Awoyera et al., 2021) (Journal & Okoye, 2015) (Yakubu & Agapiou, 2016) (Yakubu et al.,	There is a recurring theme of poor implementation despite existing codes, yet few studies provide detailed evaluations of enforcement processes or accountability structures (Yakubu & Agapiou, 2016) (Yakubu et al., 2022). The literature often lacks comparative

Aspect	Strengths	Weaknesses
	2022). Empirical data from surveys and policy analyses reveal gaps in compliance, monitoring, and sanctioning mechanisms (Adesanya & Olanrewaju, 2014) (Opawole et al., 2022). Recommendations for strengthening legal frameworks and institutional capacity are well articulated (Aduloju, 2024) (Yakubu et al., 2022).	analyses of regulatory effectiveness across regions or over time (Akuboh & Aimola, 2024). Some research relies on perceptions rather than objective measures of enforcement efficacy (Eze et al., 2024). The complexity of political and socio-economic barriers to enforcement is underexplored.
Education and Training of Construction Professionals	The literature recognizes deficiencies in the education and practical training of architects, engineers, and other professionals as contributors to poor construction practices (Afolayan et al., 2014) (Adenuga, 2012) (Fawale et al., 2023). Proposals for curriculum reform, multidisciplinary training, and enhanced ethical orientation are supported by qualitative insights (Afolayan et al., 2014). Studies link professional competence to improved supervision and quality control (Powell, 2023) (Fawale et al., 2023).	Empirical evidence on the direct impact of education and training on building collapse rates is sparse, with most studies offering conceptual or anecdotal arguments (Afolayan et al., 2014) (Fawale et al., 2023). There is limited assessment of existing educational programs or professional development initiatives. The role of continuous professional education and certification enforcement remains inadequately addressed. Variability in training quality across regions and institutions is not systematically examined.
Methodological Approaches and Data Quality	The body of research employs diverse methodologies including surveys, case studies, geotechnical testing, and system-thinking models, providing a rich array of data sources (Hammadama et al., 2020) (Obiora et al., 2022) (Imafidon & Ogbu, 2020). Mixed-methods approaches enhance understanding of complex causality (Nneka & Ejiofor, 2024). Some studies achieve high response rates and robust statistical analyses (Powell, 2023) (Fawale et al., 2023).	Many studies rely on cross-sectional surveys with potential respondent bias and limited sample representativeness (Adenuga et al., 2022) (Anosike, 2021). There is a paucity of longitudinal or experimental designs to establish causality or evaluate interventions (Ayedun et al., 2014). Data on unreported collapses and informal construction practices are often missing, leading to underestimation of the problem (O, 2025). The heterogeneity of study designs complicates synthesis and benchmarking across regions.

Aspect	Strengths	Weaknesses
Regional Variations and Contextual Factors	Research acknowledges regional disparities in causes and mitigation strategies, with some studies focusing on Lagos, South East, and other urban centers (Onwuka et al., 2025) (Akuboh & Aimola, 2024) (Akomolafe M. A., 2022). Context-specific factors such as soil conditions, urban density, and local governance are considered (Abija, 2023) (Uchenna et al., 2023). Comparative analyses with international contexts provide useful benchmarks (Aduloju, 2024).	Regional studies are often fragmented and lack integration into a national framework, limiting policy relevance (Onwuka et al., 2025) (Akuboh & Aimola, 2024). There is insufficient exploration of how socio-economic and cultural factors influence regional differences. The impact of urbanization patterns and informal settlements on collapse risk is underrepresented. Cross-regional data standardization and sharing remain challenges.
Integration of Multidimensional Factors	Some studies adopt system-thinking and causal loop models to capture the interrelationships among structural, economic, and regulatory factors (Hammadama et al., 2020). Holistic frameworks are proposed to guide policy and practice improvements (Ichendu et al., 2024) (Qurix & Doshu, 2020). The recognition of multi-stakeholder roles enriches the analysis (Fawale et al., 2023).	Despite recognition of multifactorial causes, many studies treat factors in isolation, limiting comprehensive understanding (Okagbue et al., 2018). There is a lack of integrated models validated by empirical data across diverse settings. The dynamic interactions between education, regulation, economics, and technical factors are insufficiently modelled. Recommendations often remain generic without actionable prioritization based on systemic analysis.

4.3 Scholarly Literature Thematic Reviews

The literature on building collapse in Nigeria reveals multifaceted causes that span structural inadequacies, economic pressures, regulatory deficiencies, and professional education issues. Structural failures, including foundation problems, substandard materials, and design flaws, consistently emerge as primary contributors. Economic factors such as cost-cutting, corruption, and inadequate funding exacerbate these challenges, undermining quality and safety. Regulatory standards and enforcement mechanisms are frequently found lacking or poorly implemented, leading to non-compliance and increased risks, while education and training of construction professionals influence adherence to quality and safety practices as in (Table 3).

Table 3: Frequency and attributes of multifaceted factors influencing building collapse in relevant Nigerian research articles

Theme	Appears in	Theme Description
Structural Failures: Foundation Issues, Material Quality, Design Flaws	39/50 Papers	Structural deficiencies, such as weak or faulty foundations, use of substandard materials, and design flaws, are widely reported as the leading causes of building collapse in Nigeria. Empirical investigations identify poor soil conditions, inadequate reinforcement, and low-quality concrete as critical factors, alongside negligence in supervision and poor workmanship (Hamma-adama et al., 2020) (Ayedun et al., 2014) (Obiora et al., 2022) (Adewole et al., 2018) (Alaneme et al., 2021). These technical failures often intersect with economic and regulatory weaknesses to exacerbate collapse risks (Awoyera et al., 2021) (Akuboh & Aimola, 2024) (Imafidon & Ogbu, 2020).
Economic Influences: Cost-Cutting Measures and Corruption	28/50 Papers	Economic pressures, including cost-cutting practices, contractor greed, and systemic corruption, significantly compromise construction quality. The literature highlights how financial constraints lead to the use of inferior materials, employment of unqualified labor, and compromised project supervision (Ebekozen et al., 2023) (Nneka & Ejiofor, 2024) (Faremi et al., 2020). Corruption permeates multiple stages of construction, from procurement to approvals, undermining regulatory compliance and increasing collapse incidences (Anosike, 2021) (Oloyede et al., 2024) (Faremi et al., 2020).
Regulatory Standards and Enforcement	27/50 Papers	Inadequate development, implementation, and enforcement of building codes and standards are critical contributors to building failures. Studies report poor compliance with existing regulations, lack of effective inspection processes, and weak institutional capacity, which allow unsafe practices to flourish (Journal & Okoye, 2015) (Adesanya & Olanrewaju, 2014) (Akuboh & Aimola, 2024) (Yakubu & Agapiou, 2016) (Yakubu et al., 2022). The enforcement gap is often linked with corruption, low awareness, and insufficient political will, leading to repeated collapse incidents (Awoyera et al., 2021) (Oloyede et al., 2024).

Theme	Appears in	Theme Description
Education & Training of Construction Professionals	18/50 Papers	The level of education, training, and ethical orientation of construction professionals influences adherence to quality and safety standards. Deficiencies in curriculum content, limited practical exposure, and professional incompetence contribute to poor construction practices (Afolayan et al., 2014) (Adenuga, 2012) (Fawale et al., 2023) (Yakubu et al., 2022). Enhancing professional development and multidisciplinary collaboration is advocated to improve quality control and reduce collapse occurrences (Powell, 2023) (Qurix & Doshu, 2020).
Supervision & Quality Control Practices	20/50 Papers	Effective supervision and quality control are essential for preventing building failures but are often inadequate due to lack of qualified personnel and poor management practices. Studies reveal that insufficient on-site inspection, inadequate testing, and limited use of modern quality control tools contribute to structural defects and collapse (Powell, 2023) (Adeosun et al., 2020) (Hamma-adama & Kouider, 2017) (Imafidon & Ogbu, 2020). The adoption of digital technologies and rigorous quality assurance is recommended to enhance safety (Powell, 2023) (Nneka & Ejiofor, 2024).
Geotechnical and Subsoil Conditions	15/50 Papers	Poor soil quality, inadequate geotechnical investigations, and substandard foundation design are frequently implicated in building collapses. Investigations demonstrate high clay content, low bearing capacity, and compressible soils underlying failed structures in various Nigerian regions (Obiora et al., 2022) (Abija, 2023) (Uchenna et al., 2023) (Eze et al., 2023) (Oyediran et al., 2015). Proper geotechnical site assessment and foundation design reliability are critical for sustainable construction (Abija, 2023) (Afolabi et al., 2024).
Regional Variations in Causes and Mitigation	12/50 Papers	Regional studies indicate variations in dominant causes and mitigation strategies for building collapse across Nigerian cities such as Lagos, Abuja, Port Harcourt, and South East region. Differences relate to local regulatory enforcement, economic contexts, and professional capacity (Adenuga et al., 2022) (Onwuka et al., 2025) (Akuboh & Aimola, 2024) ("Building Disaster and Failures in Nigeri...", 2022). Tailored approaches recognizing regional challenges

Theme	Appears in	Theme Description
		are advocated for effective risk reduction (Onwuka et al., 2025) (Akomolafe M. A., 2022).
Stakeholder Roles and Responsiveness	11/50 Papers	The roles and responsiveness of various internal stakeholders, developers, professionals, government agencies affect building safety outcomes. Lack of coordination, blame-shifting, and limited accountability among stakeholders exacerbate risks (Ebekozi et al., 2023) (Adenuga et al., 2022) (Fawale et al., 2023) (Eze et al., 2024). Enhancing collaboration and clarifying responsibilities are necessary to improve responsiveness to building collapse issues (Eze et al., 2024) (Qurix & Doshu, 2020).
Impact on Social and Economic Sustainability	9/50 Papers	Building collapses have profound social and economic consequences including loss of lives, psychological trauma, property damage, and impediments to sustainable development. The literature emphasizes the need for systemic reforms to protect housing security and urban safety (Ebekozi et al., 2023) (Olubi & Adewolu, 2018) (Ejiofor, 2018) (Aduloju, 2024). Sustainable development goals are threatened if collapse incidence is not controlled (Olubi & Adewolu, 2018).
Technological Integration and Innovation	7/50 Papers	Emerging studies highlight the potential of technological tools such as Building Information Modelling (BIM), digital quality control, and real-time monitoring to improve construction safety and reduce human error. However, adoption in Nigeria remains limited due to cost, technical knowledge gaps, and managerial resistance (Powell, 2023) (Ichendu et al., 2024) (Qurix & Doshu, 2020) (Siddiq & Xianyi, 2022). Promoting technology use is seen as a key forward strategy.

4.4 Chronological Review of Literature

Research on the primary causes of building collapse in Nigeria has evolved over the years, addressing various technical, economic, regulatory, and educational factors. Early studies predominantly focused on structural and material failures, such as foundation issues and substandard materials. Over time, the research expanded to include the influence of economic factors like cost-cutting and corruption, as well as the effectiveness of regulatory standards and enforcement mechanisms. Recent investigations emphasize the role of professional education,

quality control management, and regional differences, fostering a holistic understanding of building collapse causes and prevention strategies in Nigeria as detailed in (Table 4) below.

Table 4: Research direction (2012-2025) associated with building collapse in Nigeria

Year Range	Research Direction	Description
2012-2014	Foundation of Structural and Material Failure Investigation	Initial studies focused on identifying structural defects, substandard materials, poor workmanship, and faulty designs as key causes of building collapses. Emphasis was placed on empirical assessments, including site investigations and stakeholder surveys, revealing inadequacies in supervision and enforcement of building codes. These studies highlighted the urgent need for education of professionals and adherence to safety standards.
2015-2017	Emerging Analytical Approaches and Professional Accountability	Research deepened into causative factors like poor specification, reinforcement quality, and the impact of professional negligence. Analytical methods and geotechnical investigations were employed to explore soil conditions and foundation failures. Focus also shifted to the role of professionals' ethical conduct and the consequences of quackery and incompetence in the industry.
2018-2020	Systematic Reviews and Quality Control Emphasis	Studies synthesized previous findings to identify recurring causes such as use of substandard materials, corruption, lack of supervision, and weak regulatory enforcement. Quality management practices and compliance with national standards gained prominence, with several works advocating for improved inspection processes and technical training. This period also marked attention to technological integration and the need for better project management to mitigate collapse risks.
2021-2023	Multifaceted Investigations and Regional Case Studies	Research expanded to include economic influences such as cost-cutting, corruption, and cash flow problems, alongside technical concerns. Detailed case studies from major Nigerian cities examined localized causes and stakeholder perceptions. The importance of quality control managers, digital tools, and enforcement of building codes was emphasized, as well as the critical role of education and training of construction professionals in improving construction safety.
2024-2025	Holistic and Integrative Approaches	Recent studies highlight the complexity of building collapse causes, integrating structural, economic, regulatory, and educational dimensions. There is increased focus on real estate project management strategies, the impact of

Year Range	Research Direction	Description
	with Policy Focus	corruption, and the necessity for stringent quality control. Comparative analyses with international contexts and regional variations within Nigeria underscore the need for systemic reforms, enhanced regulatory enforcement, and capacity building to prevent future collapses.

4.5 Studies Convergence and Divergence

The reviewed literature generally converges on identifying structural failures, economic factors, weak regulatory enforcement, and professional inadequacies as key contributors to building collapses in Nigeria. Most studies emphasize substandard materials, foundation issues, and design flaws as primary technical causes, while corruption, cost-cutting, and poor supervision are recurrent socio-economic factors. However, divergences emerge concerning the extent and prioritization of these causes, the effectiveness of regulatory frameworks, and the role of professional education. Variations across different Nigerian regions and methodological differences in data collection and analysis also contribute to these discrepancies and as also outlined (Table 5) below.

Table 5: Scholarly agreement and divergence on multifaceted factors influencing building collapse in Nigeria

Criteria for Comparison	Scholarly with same Academic Agreement	Scholarly with Divergence	Potential Remarks
Structural Failure Analysis	Consensus that structural defects including faulty foundations, substandard materials, design flaws, and poor workmanship are primary causes (Ebekozi et al., 2023) (Hamma-adama et al., 2020) (Ayedun et al., 2014) (Adesanya & Olanrewaju, 2014) (Obiora et al., 2022) (Alaneme et al., 2021) (Hamma-adama & Kouider, 2017). Poor supervision and inadequate technical skills also highlighted (Adeosun et al., 2020) (Akomolafe M. A., 2022).	Some studies emphasize geotechnical causes such as soil instability and foundation integrity more strongly (Abija, 2023) (Uchenna et al., 2023) (Eze et al., 2023) (Oyediran et al., 2015) (Una et al., 2015) (Afolabi et al., 2024). Others focus more on design and construction defects (Imafidon & Ogbu, 2020).	Differences in focus between geotechnical vs architectural/engineering perspectives; regional soil characteristics; case study specific to urban or rural environments; methodological approaches (qualitative vs quantitative).

Criteria for Comparison	Scholarly with same Academic Agreement	Scholarly with Divergence	Potential Remarks
Economic Influence Assessment	Broad agreement that cost-cutting, corruption, contractor greed, and financial constraints significantly contribute to collapse incidents (Ebekozen et al., 2023) (Ejiofor, 2018) (Nneka & Ejiofor, 2024) (Faremi et al., 2020) (Oloyede et al., 2024). Economic pressures lead to use of substandard materials and quack labor (Faremi et al., 2020) (Adewole et al., 2018).	Divergence exists on the relative weight of economic factors versus technical failures; some attribute more blame to technical incompetence or regulatory lapses (Akuboh & Aimola, 2024) (Hamma-adama & Kouider, 2017) (Nwosu & Zima, n.d.).	Variation in stakeholder perspectives (professionals vs public), sample populations, and urban versus regional economic contexts; some studies focus on systemic corruption, others on technical failings.
Regulatory Compliance Evaluation	General consensus on inadequate enforcement and low compliance with building codes and standards as a major factor in building collapses (Awoyera et al., 2021) (Journal & Okoye, 2015) (Adesanya & Olanrewaju, 2014) (Yakubu & Agapiou, 2016) (Yakubu et al., 2022). Non-enforcement, corruption in government agencies, and weak inspection are commonly cited (Ebekozen et al., 2023) (Imafidon & Ogbu, 2020).	Some studies report high awareness of standards but low compliance among firms, indicating a gap between knowledge and practice (Powell, 2023) (Opawole et al., 2022). Others note emerging digital tools and certification practices as underutilized but promising (Powell, 2023).	Differences in regional governance capacities; urban vs rural enforcement; time of study (more recent studies note digital tool adoption); methodological differences in measuring compliance (perception vs empirical).
Professional Education Impact	Agreement that inadequate training, poor practical exposure, and ethical lapses among construction professionals contribute to	Divergence on the extent to which professional education directly affects collapse rates, with some studies	Variation in focus between educational institutions and industry practice; different levels of professional development across

Criteria for Comparison	Scholarly with same Academic Agreement	Scholarly with Divergence	Potential Remarks
	collapse (Afolayan et al., 2014) (Adenuga, 2012) (Fawale et al., 2023) (Yakubu et al., 2022). Calls for curriculum reform and enhanced practical training are common (Afolayan et al., 2014).	highlighting systemic issues over individual competence (Nwosu & Zima, n.d.) (Fawale et al., 2023). Also, variance in impact of professional certification noted (Powell, 2023) (Faremi et al., 2020).	regions; some studies emphasize institutional reforms, others individual accountability.
Regional Variation Comparison	Studies consistently show Lagos and South East Nigeria as hotspots with high incidence linked to rapid urbanization, poor supervision, and economic challenges (Ebekozi et al., 2023) (Adenuga et al., 2022) (Onwuka et al., 2025) (Akuboh & Aimola, 2024) ("Building Disaster and Failures in Nigeri...", 2022). Differences in causes and mitigation approaches are noted across Lagos, Abuja, Port Harcourt, and South East (Akuboh & Aimola, 2024) (Okah, 2022).	Divergence in recommended mitigation strategies and dominant causes between regions; some highlight natural/geotechnical factors in South East (Uchenna et al., 2023) (Eze et al., 2023), while Lagos studies focus more on regulatory and economic factors (Aduloju, 2024) (Eze et al., 2024).	Regional socio-economic conditions, geology, urban density, and governance structures differ; some studies use case studies, others large-scale surveys, influencing conclusions; temporal differences also affect findings.

4.6 Theoretical and Practical Implications

4.6.1 Theoretical Implications

The synthesized findings reinforce the multifactorial nature of building collapse in Nigeria, highlighting the interplay between structural failures (e.g., foundation issues, substandard materials, design flaws), economic factors (cost-cutting, corruption), regulatory weaknesses, and professional education gaps. This supports systemic and integrated theoretical frameworks that consider technical, economic, and institutional dimensions simultaneously (Hamma-adama et al., 2020) (Akuboh & Aimola, 2024) (Okagbue et al., 2018). Evidence from geotechnical and material compliance studies advances the theoretical understanding of foundation and material quality as critical determinants of structural integrity, emphasizing the

need to incorporate geotechnical variability and material standards rigorously in collapse causation models (Obiora et al., 2022) (Uchenna et al., 2023) (Opawole et al., 2022).

The role of professional competence and ethical conduct in mitigating collapse challenges existing theories that attribute failures solely to technical factors, suggesting that human and organizational behaviour theories are essential to fully explain collapse phenomena (Adenuga, 2012) (Afolayan et al., 2014) (Faremi et al., 2020). Findings on regulatory enforcement and compliance gaps challenge assumptions that building codes alone suffice for safety, underscoring the necessity of theories that integrate governance, policy implementation, and stakeholder engagement to explain persistent collapse rates (Yakubu & Agapiou, 2016) (Yakubu et al., 2022) (Journal & Okoye, 2015). The identification of regional variations and context-specific causes (e.g., South East Nigeria's unique geotechnical challenges) supports place-based theoretical approaches that account for local environmental and socio-economic conditions in building collapse studies (O, 2025) (Eze et al., 2023). Similarly, the emerging emphasis on digital tools and quality control innovations suggests a theoretical shift towards incorporating technological adoption and digital transformation frameworks in construction quality and safety research (Powell, 2023).

4.6.2 Practical Implications

The findings underscore the urgent need for stringent enforcement of building codes and standards, coupled with regular site inspections and laboratory testing of materials, to prevent the use of substandard materials and poor workmanship that frequently precipitate collapse (Opawole et al., 2022) (Ejiofor, 2018) (Adesanya & Olanrewaju, 2014). There is a critical practical imperative to enhance the education, training, and ethical orientation of construction professionals, including architects, engineers, and quantity surveyors, to improve supervision quality and adherence to design specification (Afolayan et al., 2014) (Adenuga, 2012) (Fawale et al., 2023). Economic factors such as cost-cutting and corruption must be addressed through transparent procurement processes, anti-corruption measures, and adequate funding allocation to ensure quality construction practices and reduce incentives for malpractice (Nneka & Ejiofor, 2024) (Faremi et al., 2020) (Oloyede et al., 2024).

Furthermore, policymakers should prioritize the development and implementation of comprehensive regulatory frameworks that integrate multi-disciplinary stakeholder collaboration, including estate surveyors and valuers, to strengthen oversight and accountability in the construction industry (Eze et al., 2024) (Yakubu & Agapiou, 2016). Adoption of modern quality control management practices, including digital tools like BIM, drones, and RFID, is recommended to enhance monitoring, reduce human error, and improve construction quality assurance (Powell, 2023) (Qurix & Doshu, 2020) (Aduloju, 2024). Regional and site-specific geotechnical investigations should be mandated before construction to inform foundation design and mitigate risks associated with poor soil conditions, thereby reducing structural failures linked to ground instability (Abija, 2023) (Uchenna et al., 2023) (Afolabi et al., 2024).

4.7 The reviewed literature highlights limitations, identifies research gaps, and outlines future research requirements.

From the outcomes of the reviewed literature, Tables 6 and 7 below outline major critical areas and descriptions for which scholarly documents are limited and have similarly outlined relevant gaps and future research needs to avert subsequent building collapses in the Nigerian construction industry and to establish environmentally sustainable construction in line with current best practice environmental options (BPEO).

Table 6: Limitations of the literature

Limitation Domains	Limitation Technical Descriptions	Articles Noted with Limitation
Geographic Bias	Many studies focus predominantly on Lagos or specific regions such as South East Nigeria, limiting the generalizability of findings to other Nigerian regions. This geographic concentration restricts external validity and overlooks regional variations in causes and mitigation strategies.	(Ebekozen et al., 2023) (Powell, 2023) (Adenuga et al., 2022) (Onwuka et al., 2025) (Akuboh & Aimola, 2024)
Small Sample Sizes	Several studies rely on relatively small or purposive samples, which may not adequately represent the broader population of construction professionals or stakeholders. This methodological constraint reduces the robustness and generalizability of conclusions.	(Adenuga et al., 2022) (Adenuga, 2012) (Adeosun et al., 2020)
Lack of Longitudinal Data	The literature largely consists of cross-sectional surveys and case studies without longitudinal tracking, limiting understanding of temporal trends and the effectiveness of interventions over time. This affects the ability to infer causality and long-term impacts.	(Powell, 2023) (Fawale et al., 2023) (Okagbue et al., 2018)
Limited Validation of Findings	Some studies report findings without external validation or triangulation, which may affect the reliability and credibility of the results. This limitation undermines confidence in the reported causes and recommended remedies.	(Adenuga et al., 2022) (Ayedun et al., 2014)
Overemphasis on Qualitative Data	A number of papers employ qualitative or perceptual data without sufficient quantitative or experimental evidence, which may introduce subjective bias and limit the precision of identifying causal factors. This affects the objectivity and replicability of findings.	(Ebekozen et al., 2023) (Adenuga et al., 2022) (Siddiq & Xianyi, 2022)
Insufficient Focus on Regulatory Enforcement	While regulatory standards are acknowledged, few studies deeply analyze enforcement mechanisms or their effectiveness, leading to gaps in understanding how policy translates into	(Awoyera et al., 2021) (Journal & Okoye, 2015) (Yakubu et al., 2022)

Limitation Domains	Limitation Technical Descriptions	Articles Noted with Limitation
	practice. This weakens policy recommendations and practical applicability.	
Underrepresentation of Technical Investigations	Limited integration of geotechnical and structural engineering analyses in many studies restricts comprehensive understanding of foundational and material quality issues, which are critical to structural failures. This limits the technical depth of causal attributions.	(Obiora et al., 2022) (Uchenna et al., 2023) (Eze et al., 2023) (Afolabi et al., 2024) (Oyediran et al., 2015)
Potential Professional Bias	Some studies reveal variance in opinions among professionals, possibly reflecting self-exoneration or professional rivalry, which may bias reported causes and hinder objective assessment. This affects the neutrality and validity of findings.	(Nwosu & Zima, 2024) (Nwosu & Zima, n.d.)
Inadequate Consideration of Economic & Social Factors	Although economic influences like corruption and cost-cutting are mentioned, few studies systematically quantify their impact or explore socio-economic contexts, limiting holistic understanding of building collapse causes. This constrains comprehensive policy formulation.	(Ebekozen et al., 2023) (Nneka & Ejiofor, 2024) (Faremi et al., 2020)

Table 7: Study Gaps with future research requirements

Gap(s)	Descriptive	Future Study Requirements	Technical Justification(s)	Research Prioritisation
Integration of Multidimensional Causes	Existing studies often treat structural, economic, regulatory, and educational factors in isolation without comprehensive integration.	Develop and validate holistic, system-thinking models that quantitatively integrate structural failures, economic pressures,	A multidimensional approach is necessary to understand complex interactions and prioritize interventions effectively (Hamma-adama et al., 2020) (Okagbue et al., 2018).	High

Gap(s)	Descriptive	Future Study Requirements	Technical Justification(s)	Research Prioritisation
		regulatory enforcement, and professional education impacts on building collapse in Nigeria.		
Quantitative Assessment of Economic Influences	Economic factors like cost-cutting and corruption are frequently cited but lack rigorous quantification and causal modelling.	Conduct empirical studies using econometric and causal inference methods to quantify the impact of economic drivers on material quality, supervision, and regulatory compliance in construction projects.	Quantitative evidence is essential to design targeted economic policies and anti-corruption measures (Awoyera et al., 2021) (Nneka & Ejiofor, 2024) (Faremi et al., 2020).	High
Effectiveness of Regulatory Enforcement	While weak enforcement of building codes is widely reported, detailed evaluations of enforcement processes, accountability, and regional variations are scarce.	Perform comparative, longitudinal studies assessing enforcement mechanisms, compliance rates, and institutional accountability across Nigerian states and urban centres.	Understanding enforcement gaps and regional disparities can inform tailored regulatory reforms (Journal & Okoye, 2015) (Adesanya & Olanrewaju, 2014) (Yakubu & Agapiou, 2016) (Akuboh & Aimola, 2024).	High

Gap(s)	Descriptive	Future Study Requirements	Technical Justification(s)	Research Prioritisation
Impact of Professional Education and Training	The direct influence of education and training on reducing building collapse is underexplored, with limited empirical evaluation of curricula and continuous professional development.	Investigate the effectiveness of current educational programs and training initiatives on construction quality through longitudinal studies and competency assessments of professionals.	Empirical validation is needed to guide curriculum reforms and professional certification policies (Afolayan et al., 2014) (Adenuga, 2012) (Fawale et al., 2023).	High
Regional and Contextual Variations	Research on regional differences in collapse causes and mitigation strategies is fragmented and lacks integration into a national framework.	Conduct nationwide comparative studies incorporating socio-economic, geotechnical, and governance factors to develop region-specific risk profiles and mitigation strategies.	Regional tailoring of policies and interventions is critical due to diverse urbanization patterns and soil conditions (Onwuka et al., 2025) (Akomolafe M. A., 2022) (Uchenna et al., 2023).	Medium
Role of Geotechnical Investigations	Although geotechnical factors are recognized, there is insufficient integration of geotechnical site investigations into standard regulatory and	Promote research on embedding mandatory geotechnical site investigations and consultancy throughout project lifecycles, assessing their	Geotechnical failures are a major cause of collapse; integrating these investigations can improve foundation reliability (Obiora et al., 2022) (Abija, 2023) (Uchenna et al., 2023).	Medium

Gap(s)	Descriptive	Future Study Requirements	Technical Justification(s)	Research Prioritisation
	construction practices.	impact on reducing foundation-related collapses.		
Adoption of Digital and Statistical Quality Control Tools	Traditional quality control practices dominate with limited adoption of digital tools and statistical methods for quality assurance.	Explore barriers and facilitators to adopting digital QC technologies (e.g., BIM, drones, RFID) and advanced statistical tools in Nigerian construction firms through mixed-methods research.	Digital transformation can reduce human error and improve compliance but is currently underutilized (Powell, 2023).	Medium
Data Quality and Longitudinal Monitoring	Most studies rely on cross-sectional data with limited longitudinal tracking of building performance and collapse incidents.	Establish comprehensive, standardized databases and longitudinal monitoring systems for building collapses, including unreported cases and informal constructions.	Improved data quality and temporal analysis are essential for trend detection and policy evaluation (Hamma-adama et al., 2020) (Onwuka et al., 2025).	Medium
Professional Ethics and Accountability	Ethical lapses and professional incompetence are noted contributors, yet systematic studies on	Investigate the effectiveness of ethical codes, enforcement mechanisms, and professional accountability	Strengthening ethics can mitigate quackery and negligence, improving overall construction safety (Adenuga, 2012) (Faremi et al., 2020).	Medium

Gap(s)	Descriptive	Future Study Requirements	Technical Justification(s)	Research Prioritisation
	ethics enforcement and its impact on construction quality are lacking.	frameworks in reducing substandard construction practices.		
Influence of Client and Stakeholder Pressure	New factors such as client pressure on professionals and stakeholder dynamics influencing collapse risk are under-researched.	Examine the role of client demands, financial constraints, and stakeholder interactions on construction quality and collapse incidence through stakeholder analysis and case studies.	Understanding these social dynamics can inform stakeholder engagement and risk management strategies (Adenuga et al., 2022).	Low

5.0 Conclusion and Recommendations

The literature collectively demonstrates that building collapse in Nigeria is a multifaceted problem driven by an intricate interplay of structural, economic, regulatory, and educational factors. Structurally, foundation inadequacies, use of substandard materials, poor design, and insufficient supervision emerge as the most immediate and tangible causes of failure. Geotechnical issues relating to unsuitable soil conditions and inadequate site investigations contribute significantly in specific regions, highlighting the need for localized technical assessments. Despite the availability of building codes and standards, compliance is frequently compromised, often due to weak enforcement mechanisms and systemic regulatory failures. This regulatory gap is exacerbated by political inertia, corruption, and lack of capacity within enforcement agencies, limiting effective monitoring and sanctioning. While economic influences strongly shape the construction environment, with cost-cutting strategies, greed, and corruption undermining quality control and encouraging the use of inferior materials and unqualified personnel. These economic pressures interact with weak regulatory oversight to create a permissive environment for malpractice. The engagement of unlicensed or inexperienced contractors' further compounds risks, while client impatience and financial constraints often pressure stakeholders to bypass safety protocols. However, the extent to which economic factors quantitatively drive collapse remains underexplored, signalling a need for more robust causal analyses. Furthermore, education and professional training play a critical but under investigated role in construction outcomes. Deficiencies in curricula, insufficient practical exposure, weak ethical orientation, and low emphasis on interdisciplinary

collaboration reduce the capacity of professionals to enforce safety and quality standards effectively. Professional supervision and certification are repeatedly emphasized as pivotal to mitigating failures, yet empirical evidence linking educational interventions directly to collapse reduction is limited. This gap suggests opportunities for strengthening continuous professional development and enforcing ethical codes. While regional variations underscore the necessity for context-specific solutions, as urban centres like Lagos face unique challenges related to rapid vertical development and regulatory complexity, while South Eastern regions contend more with geotechnical and maintenance deficiencies. The literature calls for tailored policies that incorporate regional socio-economic and environmental realities.

Overall, the structural and economic dimensions of building collapse in Nigeria are well documented, integration of these with regulatory and educational frameworks into comprehensive, data-driven models remains insufficient. Future research should adopt holistic approaches to unravel dynamic interactions among these factors and evaluate the effectiveness of mitigation strategies. Policy interventions must prioritize improving regulatory enforcement capacity, curbing corruption, enhancing professional training, and fostering stakeholder collaboration to achieve sustainable improvements in construction safety and quality nationwide.

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