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Building Collapse in Nigeria: Causes, Effects and Remedies

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ABSTRACT

Building collapses are frequent occurrences in Nigeria and often result in devastating consequences. Recent incidents, such as building collapses in Port Harcourt, Lagos, and Abuja, highlight the urgency of addressing this menace. Hence, this study explored the factors contributing to building collapses in Nigeria. Major factors identified were poor construction practices, use of substandard materials and use of unqualified professional craftsmen, corruption, inadequate regulatory enforcement, neglect of soil text reports and load-bearing capacity, overloading, faulty foundations, inadequate supervision, lack of maintenance, poor drainage systems, seismic activities, and unauthorized design alterations. Through case studies, the study provided real-world examples of how these factors lead to structural failures. It assessed the short-term and long-term effects on individuals, communities, and the environment which include loss of lives, financial losses, displacement of affected residents, decline in public trust, social conflicts, psychological trauma, and hindered economic growth. The study concluded by recommending stricter adherence to building codes, enhanced quality control measures, and construction by properly trained professionals to address these challenges. Strengthening regulatory policies and fostering integrity within the construction sector were also emphasized as essential steps toward improving safety standards. By raising awareness of these issues, this research hopes to prevent future structural failures and building collapses across the nation and ensure safer environments for all.

Keywords: Building collapse, structural failure, building design, construction, supervision

INTRODUCTION

Buildings are one of the important necessities of man after food and the need to ensure that it is both safe and functional cannot be overestimated. (Ndububa, 2021)

They are designed to last for several decades or centuries. This is considered a building's life span, which (Omopariola & Olufemi, 2015) said ranges from 100 to 150 years, during which it is considered safe, functional, and efficient with standard maintenance.

When a building does not meet its designed lifespan, such a building is termed to have failed and building failure causes building collapse (Okagbue et al., 2018)

Buildings are made of components and elements, like columns, beams, and load-bearing walls that carry the load of the superstructure safely to the foundation and the earth. When these elements fail, the structure inevitably collapses.

Building collapses remain a significant issue in Nigeria, with well over a dozen incidents in 2024 alone. The Council for the Regulation of Engineering in Nigeria (COREN), the organization responsible for overseeing engineering practices, reported that 22 building collapses occurred in Nigeria between January and July 2024. Major hotspots for these incidents include Lagos, Abuja, and parts of Southern Nigeria. In Lagos State alone, over 91 collapses have been recorded since 2012, causing more than 354 fatalities.

On October 31, 2024, a devastating incident occurred in Ibadan, the capital of Oyo State, resulting in 10 fatalities and injuries to seven others. Just a few days later, on November 5, 2024, another collapse happened in the Egbelu Mgbaraja community within the Ogbogoro area of Obio/Akpor Local Government in Rivers State, where a two-storey structure still under construction gave way and claimed one life.

These alarming figures underscore the seriousness of the issue, even after countless investigations.

Statement of the Problem

In Nigeria, structural failure and building collapse have become a frequent and extremely alarming problem, bringing the nation's construction sector and regulatory environment into sharp focus and scrutiny. This has been on the increase over the last few decades, which has led to significant economic losses and loss of lives and properties. These incidents have drawn attention to obvious issues in the construction industry that have affected the quality and safety of building construction processes negatively.

The figure below presents data on building collapses recorded by the Building Collapse Prevention Guild (BCPG) from 1974 to 2024, revealing an average of a dozen incidents yearly.

State	**Incidents**	**State**	**Incidents**	**State**	**Incidents**	**State**	**Incidents**
Lagos	348	Plateau	9	Cross-River	5	Taraba	1
Anambra	26	Imo	9	Jigawa	5	Yobe	1
Abuja	25	Kwara	8	Benue	4	Bauchi	1
Oyo	21	Edo	7	Adamawa	3	Bayelsa	1
Kano	19	Osun	7	Niger	4	Sokoto	1
Delta	14	Kaduna	6	Kogi	2	Gombe	1
Ogun	16	Ekiti	6	Bornu	2	Katsina	1
Ondo	13	Ebonyi	6	Nassarawa	2	Zamfara	1
Rivers	13			Akwa-Ibom	2	Kebbi	1
Abia	12						
Enugu	11					**Total**	**614**

Table 1: Recorded building collapse incidents in Nigeria from October 1974 to 7th July 2024

Source: Building Collapse Prevention Guild (BCPG), 2024

These occurrences have far-reaching consequences that extend beyond the immediate damage caused by structural failure. They harm local economies, disrupt communities, and undermine public confidence in the construction industry. Apart from the immediate loss of lives and displacement of residents, they also resulted in financial setbacks, reduced public trust in the construction industry, and hindered economic growth. These issues highlight the urgent need to understand the root causes and implement effective solutions to prevent future occurrences. Due to the widespread impact of this issue, effective solutions are urgently needed. This study examines the key causes of building collapse in Nigeria, and the effects on the immediate and broader environment, and proposes practical solutions to the existing challenge. It seeks to establish a basis for safer and more resilient construction practices across Nigeria by exploring various preventive and corrective measures. Without actionable measures to address these challenges, building collapses will continue to pose a threat to safety and development in Nigeria.

Aim and Objectives of the Study

This study aims to explore the factors contributing to building collapses in Nigeria, assess their impact on individuals and the environment, and propose practical solutions to address these issues. The specific objectives are to:

1. Identify and analyze the primary causes of building collapse in Nigeria, including poor construction practices, substandard materials, corruption, and inadequate regulatory enforcement.
2. Investigate the short-term and long-term effects of building collapse on individuals, affected areas, and the community at large.
3. Evaluate some case studies of significant building collapses in Nigeria.
4. Propose feasible methods and sustainable solutions to lower the incidence of building collapse in Nigeria.
5. Strengthen the role of regulatory bodies and government policies in preventing building collapses and ensuring development control.

LITERATURE REVIEW

(Alabi et al., 2023), said buildings are fundamental to life, offering shelter for people to live in and spaces for various social, economic, educational, religious, and recreational activities. This implies that the collapse of a life essential is nothing short of a disaster, whether natural or human-inflicted

Building collapses are widespread phenomena that have become familiar with Nigeria, over the last few decades (Alade Olanipekun et al., 2024).

(Oke, 2011) highlighted the fact that the building industry is the most intricate of all sectors in the economy, with its complexity stemming from the fact that every other industry and sector of the socio-economy relies on it to provide the environment in which they function

According to (Okonkwo & Umo, 2020), the first documented case of a multi-story building under construction collapsed due to excessive load occurred in Mokola, Ibadan, in 1974, resulting in the deaths of 27 people. This is approximately five decades ago and one would think that by now, such occurences

would be a thing of the past. However, the rate of building collapse per decade since then has been on the steady rise. This has led to a concurrent rise in the loss of lives.

The figure below highlights several reported cases of building collapses in Nigeria during the first decade and a half of this century.

S/N	Building Location	Date	Suspected Causes	Casualties
1	Mushin, Lagos	2000	Faulty Construction	Nil
2	Oke-Bola, Ado-Ekiti	2000	Poor quality control, rainstorm	Nil
3	Ogbagi Street, Ikare	2001	Fire disaster	Nil
4	Odolokoyi, Akure	2001	Foundation problem	Nil
5	Odoso compound, Ikare	2002	Fire disaster	Nil
6	Ojuelegba, Akure	2003	Poor workmanship & under reinforcement	Nil
7	Stadium Road, Akure	2003	No structural members	Nil
8	Onyearugbulem market, Akure	2003	Poor workmanship & under reinforcement of cantilevered end	Nil
9	Ebute Meta	2003	Structural defect	8 injured
10	Elias Street, Lagos	2004	Rainstorm	8 died
11	Iponri	2005	Inappropriate Foundation	Nil
12	OkeSuna, Lagos	2005	Structural degeneration	1
13	Broad Street, Lagos	2006	Rainstorm	Not disclosed
14	Ebute Meta	2006	Structural defect	37
15	Oworonsoki	2006	Faulty Construction	1
16	Abuja	2008	Faulty Construction	3 died, 10 injured
17	Apongbon	2008	Structural defect	3 injured
18	Ikeja	2008	Faulty Construction	Several injured
19	Alade Street, Lagos	2008	Structural defect	3 died, 5 injured
20	Ojerinde Street, Idiaraba	2009	Excessive Loading, Faulty Construction	9 died, 3 missing, 21 injured
21	Ajegunle, Apapa Lagos	2009	Structural degeneration	Not disclosed
22	Abuja	2010	Faulty Construction	Not disclosed
23	Garki, Abuja	2010	Overloading	23 died, 10 injured

24	Kano	2011	Rainstorm	6 died
25	Abuja	2011	Overloading	100 died
26	Abuja	2012	Unsupervised demolition	2 died
27	Kaduna	2011	Demolition-gone wrong	5 died
28	Ebute Meta	2013	Structural defect	7 died
29	Abia	2013	Structural defect	7 died
30	Kaduna	2013	Structural degeneration	14 died
31	Jos	2013	Change in dead load	30 died
32	Lagos	2014	Structural defect	116 died
33	Lagos	2016	Change in dead load	34 died

Table 2: Some Reported Cases of Collapsed Buildings in Nigeria from 2000–2016

Source: (Alalade et al., 2018)

Building collapse can be attributed to various factors. One primary reason is human error, which includes issues like defective designs, poor construction practices, the use of inferior materials, carelessness, oversights, lack of knowledge, unqualified professionals, corruption, and deliberate acts of sabotage. Another contributing factor is natural events, such as floods, earthquakes, and strong winds.

(Okonkwo & Umo, 2020) also mentioned three types of building collapse and explained that while buildings may collapse from top to bottom all of a sudden, buildings may also collapse partially in one segment or another. Another type of collapse expatiated in was progressive collapse where the structure gives signs of impending failure such as cracks and deflections.

The figure below further shows that using substandard materials causes one in four cases of building collapse and that in approximately one in five cases, no cause of the collapse is usually deduced.

S/NO	**Cause**	**Frequency**	**Percentage (%)**
1	Excessive loading	3	1.39
2	Structural failure	58	26.85
3	Substandard materials	23	10.65
4	Faulty design	12	5.56
5	Inappropriate foundation	13	6.02
6	Carelessness	3	1.39
7	Heavy rain	10	4.63
8	Poor workmanship	13	6.02
9	Approval violation	7	3.24
10	Use of quacks	17	7.87
11	Geotechnical violation	2	0.93
12	Design violation	8	3.7
13	Regulations violation	4	1.85
14	Lack of maintenance	1	0.46

15	No reported cause	42	19.44
	Total	**216**	**100**

Table 3: Frequency distribution for causes of building collapse

Source: (Chinecherem Aluma et al., 2023)

(Philips Adebowale & Ibrahim Dabara, 2019) also observed that failure occurs when there is an unacceptable gap between the anticipated and actual performance and that collapse refers to a total failure, where the structure has entirely failed, with most components having collapsed, disintegrated, or buckled.

(Okagbue et al., 2018) further explained that failure refers to any issue, such as a defect, imperfection, weakness, deficiency, error, or malfunction, within the components or elements that form a building structure.

The figure below presents several documented instances of building collapses, categorizing them by building type, number of floors, geographic location, and the number of casualties.

Building Type	**Frequency**	**Percentage (%)**
Residential Use	25	39.7
Business/Professional Use (Hotels, Office)	9	14.3
Educational Use	9	14.3
Assembly Use (Churches, Mosques, etc.)	8	12.7
Institutional Use (Hospital)	5	8.0
Mercantile (Shopping Complex)	4	6.3
Mixed Use and Occupancy	3	4.7
Number of Floors	**Frequency**	**Percentage (%)**
One Floor	1	1.6
Two Floors	17	27.1
Three Floors	16	25.4
Four Floors	16	25.4
Five Floors	4	6.3
Six Floors and Above	9	14.2
Geographical Location	**Frequency**	**Percentage (%)**
Lagos	47	51.6
South West Nigeria	17	18.7
Abuja	8	8.8

South Nigeria	6	6.6
South Eastern Nigeria	5	5.5
North Western Nigeria	4	4.4
North Central Nigeria	4	4.4
North Eastern Nigeria	Nil	0.0
Number of Lives Lost	**Frequency**	**Percentage (%)**
None	11	20.3
From 1–5	24	44.4
From 6–10	9	16.7
From 11–20	5	9.3
21 and above	5	9.3

Table 4: Reported cases of building collapse (1974–2010) according to type, number of floors, geographical location and casualties

Source: (Windapo & Rotimi, 2012)

The figure below also highlights the trend of building collapse from 1974 to 2021 in Southern Nigeria with a steady rise noted from the mid-2010s to the early 2020s.

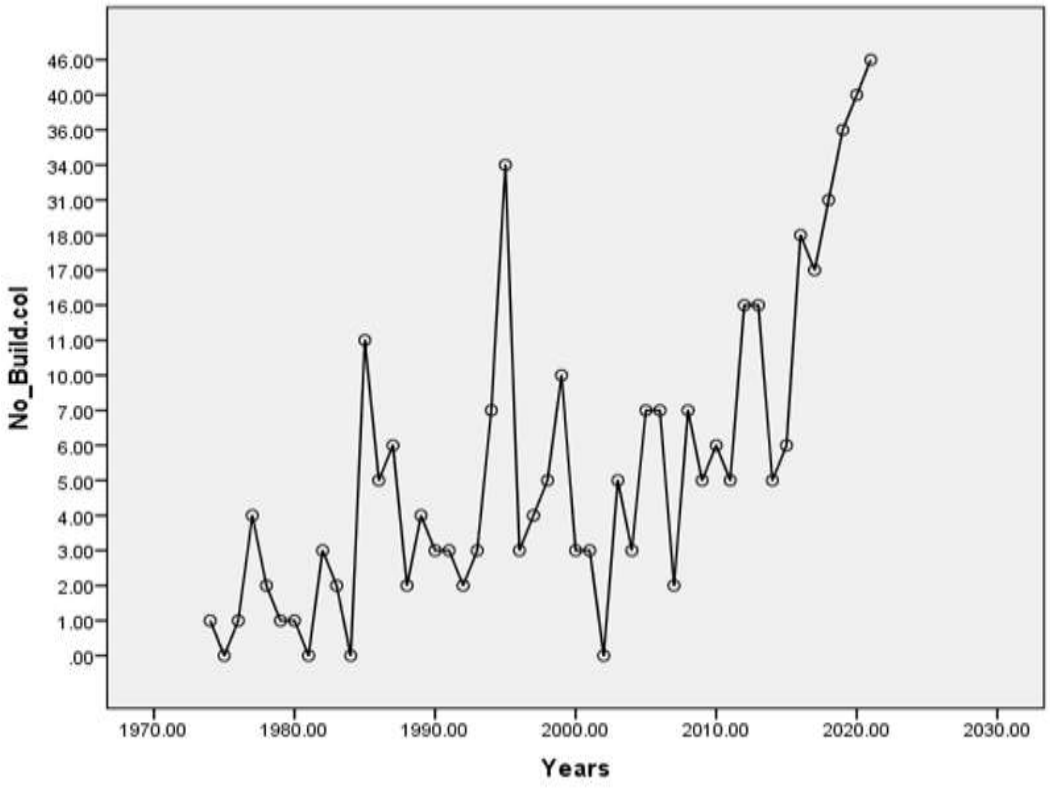

Figure 1: The Trend of Building Collapse from 1974 to 2021

Source: (Weli & Umeuduji, 2023)

According to (Weli & Umeuduji, 2023), the failure of a building's components which ultimately leads to collapse, often renders a building useless as it becomes unable to perform its primary goal of providing safe shelter. It was also noted that building collapses have become a distinct problem in the southern region of Nigeria. Concerns were raised about whether the buildings that have failed in the past were even granted the appropriate permits by the relevant authorities.

Lagos State has the highest casualties in terms of death and displacement as a result of building collapse (Ndububa, 2021)

(Nwosu & Zima, 2021) deduced that project management entails using expertise, skills, resources, and methods to manage project tasks to meet or exceed stakeholder expectations. Therefore, if a project fails to complete its life span, such as in the case of a collapse, it does not meet the needs of clients or stakeholders and is a failed project. Therefore, effective project management determines whether a project succeeds or fails.

All sorts of buildings ranging from old buildings, new buildings, completed buildings, uncompleted buildings, and residential and commercial buildings are all at risk of building collapse (Ajayi, 2022)

According to (Obodoh, 2019), the negative impacts of building collapses include loss of life, property damage, reduced marketability of professionals to international firms, structural damage, and environmental harm.

RESEARCH METHODOLOGY

This study reviewed academic journals, government reports, and documented case studies to analyze the causes and impacts of building collapses in Nigeria. Key factors contributing to structural failures were identified, including the use of substandard materials, non-compliance with building regulations, and inadequate oversight. Quantitative data from records on building approvals, construction practices, and failure rates were examined alongside economic metrics such as financial losses and human casualties resulting from collapses.

FINDINGS OF THE STUDY

Causes of Building Collapse

There are various causes of building collapses in Nigeria.

1. Use of Substandard Materials: Many buildings in Nigeria fail due to low-quality materials that cannot withstand the stresses of daily use or environmental conditions. For example, weak cement mixes, poorly manufactured steel reinforcements, and low-grade blocks are commonly used to reduce costs. Such materials often do not meet safety standards, leading to structural weaknesses and eventual collapse.
2. Non-Adherence to Building Codes: Construction projects in Nigeria frequently disregard building regulations and standards set by authorities. Developers sometimes skip obtaining necessary approvals or choose shortcuts that violate safety codes to save time or costs. For instance, designs may fail to include adequate load-bearing components or proper reinforcement, increasing vulnerability which results in structural failure, and ultimately collapse.
3. Engagement of Unqualified Professionals: The engagement of individuals without adequate training or professional licenses is a major issue. Instead of qualified architects, engineers, or builders, some projects rely on unskilled laborers or quacks to design and construct buildings. This often results in poor-quality work, faulty design, and eventual failure.
4. Design Modifications After Approval: Structural alterations made after initial approval by regulatory authorities introduce unforeseen stresses. This is done by both clients and contractors. For example, adding extra floors to a building without reevaluating the load-bearing capacity of the foundation and structural framework leads to imbalances that can trigger collapse. Removal of load-bearing elements such as columns and beams indiscriminately, is another prime example of this.
5. Overloading: Buildings are designed to carry a specific load based on intended use and these buildings must be designed to successfully transfer the building's load from the superstructure to the substructure and eventually to the soil below to achieve structural stability. When this capacity is exceeded, the structure becomes overstressed. Overloading can lead to cracks, sagging beams, buckling columns, and eventual collapse.
6. Foundation and Soil Issues: A strong foundation is critical to structural stability. However, poor soil testing or none at all and poorly designed foundations frequently occur in Nigeria. In areas with unstable soils or high-water tables, buildings may experience settlement or shifting. For example, constructing on flood-prone land without proper measures increases the risk of collapse and for many collapsed buildings in Nigeria, this is often the case.
7. Corruption in the Construction Sector: Corruption is a pervasive issue, where regulatory agencies fail to enforce standards due to bribery. Substandard materials may pass inspection, and projects can proceed without adequate oversight, creating hazardous structures with structural failure inevitable.

8. Poor Workmanship: Construction workers who lack proper training or supervision often make errors during construction. For instance, inadequate mixing of concrete, poor alignment of structural elements, or improper reinforcement placement are common faults that compromise the stability of buildings. Poor workmanship can even undermine the capacity of a discrete and well-qualified architect or structural engineer overseeing construction on a site.
9. Inadequate Supervision: Many construction projects in Nigeria suffer from a lack of competent oversight. Contractors may neglect to monitor construction quality or inspect work regularly, allowing small errors to compound into major structural deficiencies over time. Even proper workmanship can become a disaster because of inadequate supervision.
10. Aging Infrastructure and Lack of Maintenance: Buildings require regular maintenance to remain safe over their lifespan. In Nigeria, many structures are neglected after completion, with minimal repair of cracks, leaks, or deteriorating components. This often leads to wear and tear, gradually weakening the load-bearing elements and eventually leading to structural failure. Aging buildings, particularly those over several decades old, are more likely to collapse if maintenance is ignored.
11. Natural Factors: Environmental factors, such as heavy rainfall, flooding, erosion, and windstorms, exacerbate structural weaknesses in buildings. For instance, persistent flooding can weaken foundations and cause settlement, while strong winds may dislodge poorly secured roofs. Poor construction methods may be gotten away with but when that is coupled with natural factors that are out of man's control, the structural faults become more glaring, and structural failure/collapse becomes inevitable.
12. Economic Pressures: Budget constraints often lead developers to cut corners on materials, labor, and design. Cost-cutting measures may include hiring unqualified personnel or opting for cheaper, unsafe alternatives, increasing the risk of failure. For example, weak cement mixes, poorly manufactured steel reinforcements, and low-grade blocks are commonly used to reduce costs. (Prof et al., 2015) correctly stated that a bag of cement equals 45 blocks of 225mm thickness. However, to cut down on costs, over 50 blocks are got from a bag of cement at the expense of the quality and strength of the block.
13. Improper Drainage Systems: Poor or non-existent drainage systems around buildings can lead to waterlogging, soil erosion, and foundation weakening. This is particularly problematic during Nigeria's rainy season when excessive water undermines structural stability, especially in areas with poorly designed foundations.
14. Rapid Urbanization: The fast pace of urbanization in Nigeria often because of the increasing population has led to a surge in construction activities, often without adequate planning or regulatory oversight. This is also caused by displaced residents of already collapsed buildings immigrating into and emigrating out of already densely populated areas in search of new residences. This places pressure on builders and developers to cut corners, resulting in poor-quality constructions.
15. Seismic Activities: (Tsalha et al., 2015) stated that between 1933 and 2011, minor seismic events were recorded in Nigeria, and although Nigeria is not in a high-seismic zone compared to parts of America and Asia, this should be factored in when designing and constructing in possible seismic zones. Hence, structures that are poorly designed to withstand even low-level seismic forces may collapse during such events.
16. Inadequate Risk Assessment: During construction, potential risks, such as proximity to high-vibration zones near factories where the usage of heavy artillery is a norm are often overlooked. These risks can contribute to gradual structural deterioration or sudden collapse.

Case Study of a Few Collapsed Buildings

Saint Academy School Collapse, Plateau State (2024)

Details: A two-storey school building in Busa Buji gave way shortly after students arrived.

Casualties: 22 students lost their lives, and 134 others sustained injuries.

Causes: Structural deficiencies, possibly aggravated by poor upkeep or the use of inferior construction materials.

Sabon-Lugbe Building Collapse, Abuja (2024)

Details: A partially demolished structure in an Abuja suburb collapsed, likely due to further weakening caused by scavengers removing essential structural elements.

Casualties: 7 deaths and 5 people rescued.

Causes: Structural integrity compromised by unauthorized activities.

Kubwa Building Collapse, Abuja (2024)

Details: A three-storey building under construction in Kubwa crumbled, resulting in multiple casualties and injuries.

Casualties: 4 individuals were rescued.

Causes: Investigations pointed to the use of poor-quality materials and insufficient supervision during construction.

Synagogue Church of All Nations (SCOAN) Building Collapse (2014)

Details: A six-storey guesthouse of the Synagogue Church of All Nations (SCOAN) collapsed.

Casualties: 116 people were killed.

Causes: The collapse was attributed to structural failure and the use of substandard materials.

Effects of Building Collapse

1. Loss of Lives: This is unarguably the most felt effect of building collapse in Nigeria. Building collapses often result in fatalities, with many victims being caught unaware inside the structures. This is particularly catastrophic in densely populated areas, where residential and commercial buildings house many people. For example, the Synagogue Church of All Nations (SCOAN) building collapse in 2014 led to the loss of over 100 lives, drawing global attention to the problem (Michael Bolaji, 2016). Beyond the immediate tragedy, such events devastate families, leaving dependents without caregivers or breadwinners, perpetuating cycles of poverty.
2. Financial Losses: Financial implications are widespread and affect multiple stakeholders. Property owners face significant expenses to rebuild collapsed structures, often without the aid of insurance. In addition, developers incur legal and financial liabilities, while governments lose potential tax revenues. Businesses operating in the collapsed buildings may experience long-term disruption, leading to job losses and reduced economic activity. For instance, in the 2021 Ikoyi building collapse, estimated financial losses exceeded billions of naira, further straining the local economy.
3. Displacement of Residents: Residents affected by collapsed buildings are often forced to seek temporary housing, which may not be readily available. This leads to overcrowding in shelters or reliance on relatives and friends, causing stress and discomfort. Displacement can last for months or years, disrupting lives, education, and employment. In extreme cases, entire communities may relocate, resulting in social fragmentation.
4. Decline in Public Trust: Frequent collapses undermine confidence in the construction industry and government oversight. People may avoid investing in real estate or engaging construction companies, fearing substandard work. This lack of trust slows economic development and infrastructure projects, as potential investors become skeptical due to the frequency of building collapse in the country. The fading trust in the building industry in turn leads to decreased property valuation.
5. Legal and Social Conflicts: Building collapses often lead to prolonged legal disputes involving contractors, developers, and government bodies. Social conflicts also arise when affected families demand compensation, sometimes leading to protests or violence. These disputes further polarize communities and erode faith in the already questionable legal system in Nigeria.
6. Psychological Impact: Survivors and witnesses of building collapses often suffer long-term psychological trauma. Conditions such as anxiety, depression, and PTSD are common, particularly among those who lost loved ones or sustained severe injuries. This further affects the already fragile mental health of most Nigerians living in poverty and depression.
7. Hindered Economic Growth: The widespread impact of building collapses contributes to economic stagnation in affected regions. Resources allocated for rescue and rebuilding divert funds from other developmental projects. Collapses can tarnish a country's reputation, discouraging foreign investment and partnerships in infrastructure development.

RECOMMENDATIONS

To address the persistent issue of building collapse in Nigeria and foster a safer construction industry, the following recommendations are proposed;

1. The government should enforce strict adherence to national building codes during the planning, design, and construction phases. Regulatory agencies must conduct regular site inspections to verify compliance with approved designs and building standards, imposing penalties on individuals and organizations that violate these regulations.
2. Testing and certification of construction materials should be made mandatory, with laboratories established across the country to verify material standards and construction sites should have qualified quality control officers to oversee the implementation of these standards. Additionally, subsidies should be provided for certified building materials to discourage substandard alternatives.
3. Professional development through continuous training programs should be organized to update architects, engineers, and construction workers on best practices. Furthermore, only licensed and certified professionals should be permitted to handle building design and construction projects. Public awareness campaigns should educate individuals on the risks of engaging unqualified builders.
4. Channels should be created for whistleblowers to report unsafe building practices and specialized disaster response units should also be trained to handle emergencies effectively, with clear protocols established for post-collapse management, including rescue operations, victim support, and rebuilding efforts.

5. Independent oversight bodies should be established to monitor construction projects and reduce the influence of corruption. Collaboration between regulatory agencies, professional bodies, and academic institutions should be encouraged to promote best practices as partnerships between academia and the construction industry can help translate research findings into practical solutions.

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