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ROLES OF BUILDING PROFESSIONALS IN PROMOTING BUILDING COLLAPSE MITIGATION STRATEGIES IN SOUTH-SOUTH NIGERIA

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Abstract

Building collapses pose a significant threat to human lives and property, and their prevention demands a comprehensive understanding of the roles of building professionals in implementing mitigation strategies. This study investigates the perceptions of building professionals in Port Harcourt, Yenegoa, and Uyo regarding their roles in mitigating building collapses in the South-South region of Nigeria. The findings reveal that adherence to soil bearing capacity in plan and building development, adequate supervision throughout stages of building construction, adherence to building specifications, proper site inspection and soil tests, enforcement of building codes, inspection of building throughout the construction process, and public awareness campaigns are crucial roles identified by building professionals in the mitigation of building collapses. These roles reflect the professionals' commitment to ensuring construction quality and safety.

Keywords: Building collapses, building professionals, mitigation strategies, South-South Nigeria, Disaster management, Building resilience

Introduction

The process of rural-to-urban migration in developing regions in recent decades has largely occurred without effective regulations governing building and land use. In the absence of such regulatory guidance, urban expansion has encroached upon hazardous locations, resulting in the construction of unsafe and vulnerable settlements. This uncontrolled urbanization has significantly increased the global risk of disasters. According to the United Nations (UN) in 2015, disasters have had a far-reaching impact, affecting 4.4 billion people, causing the loss of 1.3 million lives, and generating economic losses totaling $2 trillion over the past two decades. Notably, both exceptional and chronic disaster events, including building collapses and fires, disproportionately affect disadvantaged communities. In the last 30 years, more than 80 percent of the total years of life lost in disasters occurred in low- and middle-income countries, often setting back national economies by an alarming 5 to 120 percent of their gross domestic product (GDP). As Akindoyeni (2002) astutely argued, the construction industry is among the most intricate sectors of the economy, owing to the fact that all other industries and sectors within the socio-economy rely on it to provide the environment in which they operate.

In recent years, Nigeria has grappled with a recurring and deeply concerning issue – building collapses. Nowhere is this problem more pronounced than in the South-South region, where a combination of factors has contributed to a disturbing trend of structural failures that result in the loss of lives and property. These catastrophic events not only have immediate consequences but also cast a shadow over the integrity of construction practices and regulatory oversight in the country.

Building collapses in Nigeria are often the result of a complex web of issues. These include the use of substandard materials, shoddy workmanship, inadequate supervision, and regulatory shortcomings. The consequences are dire, affecting not only individuals and families but also eroding trust in the construction industry and the government's ability to safeguard citizens. It is in this context that the roles of building professionals become paramount in addressing the pressing challenge of building collapse mitigation.

Building professionals encompass a wide range of experts, including architects, structural engineers, civil engineers, quantity surveyors, builders, and project managers. These individuals are at the forefront of the construction industry, wielding substantial influence over the design, construction, and maintenance of buildings. Their expertise and ethical responsibilities place them in a unique position to drive change and champion effective building collapse mitigation strategies in South-South Nigeria.

This article delves into the critical roles these building professionals play in the region. It explores their responsibilities, ethical obligations, and the potential impact of their actions on improving the safety and longevity of structures. By examining how building professionals can collaborate, innovate, and adhere to best practices, we aim to shed light on the path forward for mitigating building collapses in South-South Nigeria. Through their collective efforts, building professionals have the power to transform the landscape of construction, ensuring that the buildings that rise in the region stand as symbols of safety, durability, and progress rather than as potential hazards to life and property.

Literature Review

Institutional Theory

Institutional theory is a valuable lens through which to examine the issues discussed in the context of the article on building collapse mitigation strategies in South-South Nigeria. Institutional theory emphasizes the role of formal and informal institutions in shaping behavior, practices, and outcomes within organizations and societies. In the case of building collapses and their mitigation, institutional theory can provide insights into how various institutions, including government agencies, professional bodies, and regulatory frameworks, influence the construction industry and its ability to prevent such disasters.

There exist various theories concerning institutions; however, these institutional theories can be broadly categorized into two main streams of thought, commonly referred to as old and new institutional theories (Cai & Mehari, 2015; Suddaby, 2015; Pratt et al., 2016). The old institutional theories, which originated around the 1950s, are characterized by their emphasis on concrete social processes that regulate social behavior (Selznick, 1996; Stinchcombe, 1997). This approach places particular focus on understanding how power dynamics, coalitions, and informal structures influence the behavior of organizations (Stinchcombe, 1997). Selznick (1996) described the old institutional theories as examining institutions at a micro-level, where they contribute to the emergence of orderly, stable, and socially integrating patterns within organizations. In essence, old institutional theory delves into the rules, structures, processes, and norms within organizations or their internal environments.

Conversely, the new institutional theories, which emerged in the late 1970s and 1980s, are grounded in the concept of structural determinism. Here, organizations are viewed as entities striving for legitimacy and, therefore, needing to conform to institutional demands. Key concepts in this new institutional perspective include the institutional field (Hardy & Maguire, 2010), institutional logic (Greenwood et al., 2010), and institutional isomorphism (Frumkin & Galaskiewicz, 2004; Pillay et al., 2017).

Building professionals operate within a regulatory framework that sets standards and guidelines for construction. Institutional theory can help analyze how these regulatory institutions function in South-South Nigeria. It can investigate whether these institutions have the capacity to enforce regulations effectively, whether they are prone to corruption or inefficiency, and how their actions (or inactions) impact construction practices and safety.

Professional bodies for architects, engineers, and builders can be considered institutions that influence the behavior of their members. Institutional theory can be used to examine how these associations shape the professional ethics and practices of their members. Are these institutions proactive in promoting best practices and safety standards, or do they primarily serve as social networks without much regulatory influence? Also, government agencies responsible for urban planning, building permits, and construction oversight play a crucial role in shaping the urban environment. Institutional theory can assess the effectiveness of these agencies in enforcing land-use regulations and building codes. It can also explore how political and economic factors influence these institutions' actions, such as lax enforcement due to corruption or inadequate funding.

Institutional theory can investigate the prevailing norms and practices within the construction industry in South-South Nigeria. It can explore how historical practices and cultural factors have influenced construction methods, such as the use of substandard materials or shortcuts in construction processes. Understanding these institutionalized norms is crucial for proposing changes and interventions.

To mitigate building collapses effectively, institutional theory can guide strategies for institutional change. It can analyze the barriers to change within existing institutions, such as resistance to new regulations or the reluctance of professionals to adopt safer practices. Additionally, it can explore the role of external pressures, such as public awareness and international standards, in driving institutional change.

Therefore, institutional theory provides a valuable framework for understanding how various institutions and their norms, rules, and practices shape the construction industry in South-South Nigeria. By analyzing the institutional dynamics at play, policymakers, building professionals, and stakeholders can develop more effective strategies for preventing building collapses and improving the safety and quality of construction practices in the region.

Related Concepts in Role of building professionals in promoting building collapse mitigation

Deficiencies in Briefing and Design

The initial stages of a construction project are susceptible to shortcomings, primarily when clients fail to provide comprehensive briefs outlining the functional requirements of the building (Lovelace & McLoughlin, 2014). These deficiencies in the brief can lead to defects right from the project's inception. Additionally, design deficiencies, encompassing miscalculations, structural support issues, deformation, secondary stresses, elastic cracking, temperature-related problems, shrinkage issues, detailing, drafting errors, assumptions about loading, and alterations in existing buildings, significantly contribute to structural failures, disasters, and, ultimately, building collapses.

Foundation Challenges

The foundation serves as a pivotal structural component of any building, and any issues arising from it can have a profound impact on the entire structure. According to Lovelace and McLoughlin concrete footing or other foundation members can collapse due to uneven settlements caused by changing sub-grade conditions, flawed assumptions in the design, inadequate or unequal support, soil movements, and groundwater fluctuations, along with the expansion of soils. Abnormal loading, especially in cases where structures are being repurposed or additional floors are added, is a common cause of foundation problems.

Natural Factors: Natural phenomena, such as rainfall, temperature fluctuations, and atmospheric pressure changes, can contribute to building collapses. Heavy rainfall, in particular, poses a risk, potentially leading to the collapse of one or more buildings, whether completed or under construction (Chinwokwu, 2000). These natural factors are beyond human control, emphasizing the need to construct buildings with resilience to withstand such uncontrollable forces.

Quality Management

The construction industry in Nigeria faces a pressing need for rigorous quality control in material usage (Olusola, 2002). Neglecting quality control has resulted in numerous subpar and aesthetically displeasing buildings, as well as an increase in building collapses in recent years. Several factors impact the quality achieved within the Nigerian construction industry, as elaborated below.

Material and Testing Variability

Contractors often struggle to consistently acquire or produce high-quality materials. This challenge extends to the ability of the client's representatives to understand the correct control values or conduct necessary computations on-site. Manufacturers also face difficulties in producing products of consistent size and specified quality at all times. Furthermore, the interpretation of field test results by the client's representatives can be problematic, as many of them primarily function as clerks of works tasked with recording daily operations.

Contractors' Variability: Large-scale projects frequently encounter challenges related to contractors' ability to maintain uniform standards in materials and workmanship. Different contractors employ various methods of construction and technologies, leading to disparities in production.

Inadequately Skilled Workforce

The diminishing level of competence among laborers in the Nigerian building industry, coupled with inconsistent skills, contributes to building collapses (Olusola, 2002). Even workers who have undergone apprenticeship training may not surpass their mentors in terms of skills. This lack of skill hinders workers' ability to grasp and implement quality control concepts and tolerance limits in construction.

Inadequate Maintenance

Maintenance is often overlooked in Nigeria. Proper maintenance should commence from the moment excavation is initiated. Neglecting to maintain elements such as foundation excavations, which may shift or become contaminated before or after concrete placement, can impair the strength of the structure.

Unprofessional Conduct

Unprofessional behavior, including bribery from contractors and professionals overstepping the boundaries of their respective professions, indirectly contributes to building collapses. Professionals play a fundamental role in construction in Nigeria, and the absence of their full participation, in part due to the increasing rate of building collapses, is regrettable (Adebayo & Iweka, 2014). The economic losses resulting from building collapses are immeasurable, rendering many homeless and causing the loss of countless properties. Furthermore, these collapsed structures often become havens for criminals, touts, and even dangerous animals like snakes, posing significant threats to the surrounding environment and its residents. An exemplar is the NIDB building in Lagos, Nigeria, located in a bustling commercial area.

Resilient Architectural Designs

The concept of resilience initially gained prominence in studies related to environmental phenomena, particularly within the field of ecology. Holling (1973) played a pivotal role in popularizing the idea of resilience, defining it as "a measure of the persistence of systems and of their ability to absorb change and disturbance and still maintain the same relationships between populations or state variables." In this context, resilience quantified a system's capacity to withstand various forms of disturbances while preserving its pre-disturbance state. Essentially, it measured how a system coped with external stresses or disruptions while maintaining essential functions.

Resilience within ecological discourse has evolved to encompass complex adaptive systems (CASs) and social-ecological systems (SESs) (Gunderson, 2000). This perspective views resilience as the inherent ability of a system, community, or society to respond to shocks or stressors by "bouncing forward" – not merely recovering but improving by transforming non-essential attributes. This shift towards anticipation implies that resilience involves a system's capacity to learn, self-organize, and adapt to shocks and surprises, ultimately enhancing its overall performance.

Recent developments have integrated a "proactive" and "transformative" aspect into the resilience concept (DFID, 2011), emphasizing the capacity for positive change and transformation in the face of adversity. This multidisciplinary concept has found application in various fields, including human social systems, economic recovery, engineering, urban planning, and more. The diverse application of the term "resilience" across disciplines has led to varied interpretations and translations, with differences stemming from specific contexts and focuses.

The malleability of the resilience concept allows scholars and practitioners to use it as a common reference point, even without strict consensus on a singular definition (Brand and Jax, 2007). Consequently, operationalizing or establishing a universal definition of resilience has proven challenging. Resilience has also made inroads into natural sciences, particularly in the context of climate change and society's ability to adapt to extreme environmental events.

In regional or urban contexts, resilience pertains to the capacity of a local socioeconomic system to recover after a shock or disruption (Simmie & Martin, 2010). It refers to an entity or system's ability to elastically return to its original form and position following a disturbance or disruption. Hence, the concept of resilient architectural design is rooted in the broader notion of resilience, encompassing the ability of architectural structures and systems to not only recover but also adapt, transform, and improve in the face of various challenges and disruptions.

Moreso, The Sendai Framework for Disaster Risk Reduction sets its primary objective as achieving a "significant reduction of disaster risk and losses in lives, livelihoods, health, and in the economic, physical, social, cultural, and environmental assets of persons, businesses, communities, and countries" (United Nations, 2015). In line with this, resilience is integrated into the framework as a fundamental element of its goals, targets, and priorities. The overarching aim of the Sendai Framework is to enhance resilience, considering all facets and dimensions of disaster risk management. This encompasses measures spanning economic, structural, legal, social, health, cultural, educational, environmental, technological, political, and institutional domains. These measures are designed to prevent and diminish hazard exposure and vulnerability to disasters, bolster preparedness for response and recovery, and ultimately fortify resilience (United Nations, 2015).

The Sendai Framework underscores resilience by defining it as "the ability of a system, community, or society exposed to hazards to resist, absorb, accommodate, and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions" (United Nations, 2009). In the context of disaster management, resilience is characterized as the capacity of a system, community, or society potentially exposed to hazards to withstand, assimilate, adapt to, and recover from disasters in an effective and timely manner. This hinges on the social system's capability to organize itself, enhance its learning from past disasters, and improve risk reduction measures (United Nations, 2009).

In the pursuit of resilience against the impact of disasters, Coaffee (2004) posits three key dimensions that differentiate resilience from traditional disaster planning and recovery approaches. First, the emphasis shifts from post-disaster management to hazard mitigation and preparedness. Second, the scope of emergency planning expands to include security challenges alongside natural hazards and technological accidents, despite the latter having a more substantial collective impact. The third dimension centers on the role of institutional resilience in safeguarding key infrastructure systems.

To address issues related to building structures, infrastructure, and land concerning disaster risk reduction and resilience, it is crucial to engage the appropriate expertise. This observation leads to the consideration of structural mitigation as a means of addressing these problems. Structural mitigation revolves around the concept of mitigating the physical impacts of natural hazards through structural means. To clarify, it pertains to the management of physical hazards that can be addressed through physical measures. Architects are identified as professionals equipped to design buildings resilient to hazards such as floods, fires, and building collapses, which are integral aspects of preparedness rather than post-disaster management. Research indicates that architects possess the training and skills required to design shelters and settlements with resilience, taking into account both the physical and social dimensions (Quarantelli, 1995; Saunders, 2004; Cross, 2006; Henrotay, 2008; Ashdown, 2011; Boano & Hunter, 2012).

This perspective aligns with the views of other scholars who emphasize the significant role of architects in disaster risk reduction, response, and recovery (Bosher et al., 2007b; Max Lock Centre, 2009; Haigh & Amaratunga, 2010). Addington and Schodek (2005) suggest that architectural resilience involves certain materials' ability to recover from stress and adapt to sudden inputs. Architectural resilience entails using durable materials that can withstand hazards, ultimately reducing risk. The design process involves considering typical scenarios, stress points from normal use, and likely disaster situations in the environment that could challenge the building's integrity and occupants' safety. Local environmental factors play a critical role in determining a building's resilience, making resilient design inherently location-specific.

Being scenario-conscious allows architects to account for common natural disasters, such as floods, fire hazards, and building collapses. While it may not be possible to foresee every potential problem and disaster situation, knowledge and experience enable architects to address these concerns. Architects can propose resilient solutions, including well-sealed buildings, robust roofing, basement designs, and water management solutions. Institutional capabilities should be focused on building resilience into the development process through components such as building regulations, construction monitoring, and material selection (Ofori, 2008). This approach is supported by Godschalk et al. (1999), who advocate for intergovernmental systems that implement federal sustainable development policy through state and local government commitments to mitigation and capacity-building.

The discourse surrounding architectural design and resilience has garnered significant attention, with numerous studies investigating the resilience of various building types to floods (Naumann et al., 2009; Cutter et al., 2010; Nikolowski et al., 2013). Similarly, research has explored building components that enhance resilience to flooding, including improved building materials and technologies (Lawson, 2011; Escarameia et al., 2012; Golz et al., 2015), as well as innovative architectural designs for flood resilience (English, 2009; Watson & Adams, 2011; Anh & Phong, 2014). Additionally, studies have examined efficient building disaster management systems in the context of fires, especially in smart cities (Meissner et al., 2002; Asimakopoulou & Bessis, 2011; Cavallo & Ireland, 2014). Issues pertaining to building collapses and the sustainability of building projects have also been explored (Chinwokwu, 2000; Ogunsemi, 2002; Haruna, 2007; Ede, 2010b; Windapo & Rotimi, 2012).

Furthermore, research has delved into stakeholder involvement in construction decision-making regarding flood hazard mitigation strategies, including the role of building professionals in enhancing societal resilience to floods (Bosher et al., 2007a; Haigh & Amaratunga, 2010). Some studies have examined institutions' roles in planning, both from a formal structural perspective and in designing institutions to foster coordination among organizations in planning (Healey, 2007; Teitz, 2007; Alexander, 2007). Alexander (1995) has proposed institutional design to reduce transaction costs and facilitate coordination and collaboration among organizations working towards common goals in planning.

Materials and Methods

This research employs a qualitative study design aimed at broadening the perspective from subject-object orientation and to include dimensions of social relations and organisational structures.

The study area for this study encompasses selected major cities in South-south Nigeria (i.e., Port Harcourt, Uyo, and Yenegoa). These cities are characterized by a high of urban population, increased socio-economic activities, and increased building density. The study population includes residents in the areas affected by building collapse and all registered and practicing architects, civil engineers and builders in the region which totalled 478.

Stratified sampling was used across the professional bodies with the addition of random sampling in selected respondents within these professional bodies. According to the directory of Nigerian Institutes of Architects, Nigerian Society of Engineers, and Nigerian Institute of Builders (2021),) there are 104 architects in Port Harcourt, 35 in Uyo, and 30 in Yenegoa, there are 30 civil engineers in Port Harcourt, 86 in Uyo and 80 Yenegoa. Still, there are 50 builders in Port Harcourt, 55 in Uyo and 8 Yenegoa respectively: all licensed and practicing. In all there are 478 registered and practising professionals identified to be critical to this study (Table 1)

Table1: Target Population of Study

S/N	PROFESSIONAL BODIES	STATE	NO.
A.		RIVERS (Port Harcourt)	
	Nigerian Institute of Architects		104
	Nigerian Institution of Civil Engineers		30
	Nigerian institute of Builders		50
B.		BAYELSA (Yenegoa)	
	Nigerian Institute of Architects		30
	Nigerian Institution of Civil Engineers		80
	Nigerian institute of Builders		8
C.		AKWA IBOM (Uyo)	
	Nigerian Institute of Architects		35
	Nigerian Institution of Civil Engineers		86
	Nigerian institute of Builders		55
	TOTAL		**478**

Source: Collation from all the Professional Bodies by the Researcher, 2023

Taro Yamane (1965) formula was utilised to compute for the sample size of 399. In addition, the proportional allocation method was used to determine the contribution of each sample location impacted by building collapse to the derived sample size (Table 2).

Table 2. Sample Size for the Study

S/N	PROFESSIONAL BODIES	RIVERS	Total Population	Sample Size (Principle of Proportionality)
A.	Nigerian Institute of Architects		104	104 x 399/478 = 87
	Nigerian Institution of Civil Engineers		30	30 x 399/478 = 25
	Nigerian institute of Builders		50	50 x 399/478 = 42
	SUB TOTAL			**154**
		BAYELSA		
B.	Nigerian Institute of Architects		30	30 x 399/478 = 25
	Nigerian Institution of Civil Engineers		80	80 x 399/478 = 67
	Nigerian institute of Builders		8	8 x 399/478 = 6
	SUB TOTAL			**98**
		AKWA IBOM		
C.	Nigerian Institute of Architects		35	35 x 399/478 = 29
	Nigerian Institution of Civil Engineers		86	86 x 399/478 = 72
	Nigerian institute of Builders		55	55 x 399/478 = 46
	SUB TOTAL			**147**
	GRAND TOTAL			**399**

Source: Computation by Researcher, 2023

Primary and secondary data was utilised in this study. The primary data was sourced from the study population with the use of structured questionnaires while secondary data was collated from reports from statistic units of government parastatals from the selected sample locations. Questionnaire was designed and reflect on the objectives of the study and administered to the professionals in the building industry.

Descriptive statistics was used in the analysing of the data. Frequency and percentages was used in the displaying results from analysis.

Results and Discussions

Demographic Characteristics of Respondents

Table 3 shows the sex of the respondents in the study area. In Uyo, 129 respondents representing 32.3% of the study population are male. 18 respondents representing 4.5% of the total study population are female. In Yenegoa, 92 respondents, representing 23.1% of the total study population are males. 6 respondents, representing 1.5% of the total study population are female. While, in Port Harcourt, 110 respondents, representing 27.6% of the total study population are male. 44 respondents representing 11.0% of the total study population are female.

In all the state capitals in the study, 331 respondents representing 83.0% of the study population are male while 68 respondents, representing 17.0 % of the study population are female. From the table, it could be deduced that the male population is higher than the female population of professionals.

Table 3: Sex of Respondents

Sample Location	Male	Female	Total
Uyo	129	18	147
Yenegoa	92	6	98
Port Harcourt	110	44	154
Total	331	68	399

Source: Computed from Field Survey, 2023

Table 4 shows the qualification of the respondents in the study area. In Uyo, 0 respondents representing 0.0% of the study population are SSCE holders. 0 respondents representing 0.0% of the study population are OND/NCE holders. 45 respondents representing 11.3% of the study population are HND/BSC holders. 102 respondents representing 25.6% of the study population are Postgraduates.

In Yenegoa, 0 respondents representing 0.0% of the study population are SSCE holders. 7 respondents representing 1.8% of the study population are OND/NCE holders. 19 respondents representing 4.8% of the study population are HND/BSC holders. 72 respondents representing 22.9% of the study population are Postgraduates.

In Port Harcourt, 2 respondents representing 0.5% of the study population are SSCE holders. 3 respondents representing 0.8% of the study population are OND/NCE holders. 9 respondents representing 2.3% of the study population are HND/BSC holders. 140 respondents representing 35.1% of the study population are Postgraduates.

In all the state capitals in the study area, 2 respondents representing 0.5% of the study population are SSCE holders. 10 respondents, representing 2.5% of the study population are OND/NCE holders. 73 respondents representing 18.3% of the study population are HND/BSC holders. 314 respondents representing 78.7% of the study population are Postgraduates.

From the table, it is observed that persons with that post graduate degrees constitute the highest population of respondents/Professionals in the study area as they make up 78.7% of the total study population.

Table 4: Educational Qualification of Respondents

Sample Location	SSCE	OND/NCE	HND/BSc	Postgraduate	Total
Uyo	0	0	45	102	147
Yenegoa	0	7	19	72	98
Port Harcourt	2	3	9	140	154
Total	2	10	73	314	399

Source: Computed from Field Survey, 2023

Table 5 shows the professional affiliation of the respondents in the study area. In Uyo, 72 respondents representing 18.0% of the study population belong to NIA. 57 respondents representing 14.3% of the study population belong to NIOB. While 18 respondents representing 4.5% of the study population belong to NICE.

In Yenegoa, 72 respondents representing 18.0% of the study population belong to NIA. 57 respondents representing 14.3% of the study population belong to NIOB. While 18 respondents representing 4.5% of the study population belong to NICE. In Port Harcourt, 34 respondents representing 8.5% of the study population belong to NIA. 18 respondents representing 4.5% of the study population belong to NIOB. While 46 respondents representing 11.5% of the study population belong to NICE.

In all the states capitals, 252 respondents representing 63.2% of the study population belong to NIA. 579 respondents representing 19.8% of the study population belong to NIOB. While 68 respondents representing 17.0% of the study population belong to NICE. From the table, it is observed that those who belong to NIA constitute the largest respondents of the population of professionals in the study area as they represent 63.2% of the study population.

Table 5: Professional Affiliation of Respondents

Location	NIA	NIOB	NICE	Total
Uyo	72	57	18	147
Yenegoa	34	18	46	98
Port Harcourt	146	4	4	154
Total	252	79	68	399

Source: Computed from Field Survey, 2023

Table 6 provides an overview of responses from professionals in Port Harcourt concerning the roles of building professionals in the implementation of building collapse mitigation strategies. These responses offer valuable insights into the perceptions and opinions of professionals in the region.

In the context of adhering to soil bearing capacity in plan and building development, a significant portion of respondents, specifically 68 individuals (46.3%), strongly agreed that this is a fundamental role for building professionals in mitigating building collapses in the South-South region. Additionally, 52 respondents (35.4%) expressed agreement with this role, while 27 respondents (18.4%) held a dissenting perspective. Interestingly, none of the respondents strongly disagreed with this role.

Adequate supervision throughout the stages of building construction emerged as another crucial role. A substantial majority, 129 respondents (87.8%), strongly agreed that ensuring proper supervision is essential for mitigating building collapses in the region. A mere 9 respondents (6.1%) concurred, while an equal number disagreed. Notably, none of the respondents strongly disagreed with this responsibility.

Adherence to building specifications was also considered a key role for building professionals. A significant 104 respondents (70.7%) strongly agreed that adhering to these specifications is vital in the context of building collapse mitigation. An additional 34 respondents (23.1%) expressed agreement, while 9 respondents (6.1%) disagreed. No respondents strongly disagreed with this role.

Proper site inspection and soil tests were viewed as critical roles in mitigating building collapses. A substantial majority of 123 respondents (83.7%) strongly agreed with this responsibility, while 24 respondents (16.3%) agreed. Importantly, none of the respondents expressed disagreement or strong disagreement.

The enforcement of building codes emerged as another key role. A significant 104 respondents (70.7%) strongly agreed that this role is essential for mitigating building collapses, while 16 respondents (10.9%) agreed. A small number of 9 respondents (6.1%) disagreed, with none strongly disagreeing.

Similarly, the inspection of buildings throughout the construction process was seen as crucial. A substantial majority of 104 respondents (70.7%) strongly agreed with this role, while 16 respondents (10.9%) agreed. Nine respondents (6.1%) held a dissenting view, and none strongly disagreed.

The table contains a duplicate entry for "Inspection of Building Throughout Construction Process," indicating that 112 respondents (76.2%) strongly agreed with this role, while 35 respondents (23.8%) agreed. No respondents expressed disagreement or strong disagreement regarding this responsibility.

In summary, the responses from Port Harcourt professionals emphasize a consensus on the importance of various roles played by building professionals in the context of building collapse mitigation. These roles include adhering to soil bearing capacity, ensuring adequate supervision, complying with building specifications, conducting proper site inspections and soil tests, enforcing building codes, and inspecting buildings throughout the construction process. These findings underscore the significance of these roles in enhancing building safety within the South-South region of Nigeria.

Role of Building Professionals in the implementation of Building Collapse Mitigation Strategies in the South-south Region

Table 6: Response on Roles of Building Professionals in the Implementation of Building Collapse Mitigation Strategies in Port Harcourt

S/N	Mitigation Strategies	Strongly Agree	Agree	Disagree	Strongly Disagree	Total
1	Adherence to soil bearing capacity in plan and building development	68 46.3%	52 35.4%	27 18.4%	0 0.0%	147 100.0%
2	Adequate supervision throughout stages of building construction	129 87.8%	9 6.1%	9 6.1%	0 0.0%	147 100.0%
3	Adherence to building specifications	104 70.7%	34 23.1%	9 6.1%	0 0.0%	147 100.0%
4	Proper site inspection and soil tests	123 83.7%	24 16.3%	0 0.0%	0 0.0%	147 100.0%
5	Enforcement of building codes	104 70.7%	16 10.9%	9 6.1%	0 0.0%	18 12.2%
6	Inspection of building throughout construction process	104 70.7%	16 10.9%	9 6.1%	0 0.0%	18 12.2%

Source: Computed from Field Survey, 2023

Table 9 provides an overview of the responses gathered from building professionals in Yenagoa regarding their perspectives on the roles of building professionals in the implementation of building collapse mitigation strategies. The responses reveal valuable insights into the opinions and perceptions of professionals in this specific region.

In the context of adhering to soil bearing capacity in plan and building development, a substantial majority of respondents, specifically 70 individuals (71.4%), strongly agreed that this is a crucial role for building professionals in mitigating building collapses in Yenagoa. An additional 20 respondents (20.4%) expressed agreement with this role, while 6 respondents (6.1%) held a differing view. A small number of 2 respondents (2.0%) strongly disagreed with this role.

Adequate supervision throughout the stages of building construction was perceived as another vital role. A significant 74 respondents (75.5%) strongly agreed that ensuring proper supervision is essential for mitigating building collapses in the region. An additional 22 respondents (22.4%) expressed agreement, while only 2 respondents (2.0%) disagreed. Importantly, none of the respondents strongly disagreed with this responsibility.

Adherence to building specifications emerged as another key role for building professionals. An overwhelming 80 respondents (81.6%) strongly agreed that adhering to these specifications is vital in the context of building collapse mitigation in Yenagoa. A minority of 14 respondents (14.3%) agreed with this role, while 4 respondents (4.1%) held a dissenting perspective. A small number of 4 respondents (4.1%) strongly disagreed with this role.

Proper site inspection and soil tests were seen as critical roles in mitigating building collapses. A substantial majority of 66 respondents (67.3%) strongly agreed with this responsibility, while 26 respondents (26.5%) agreed. A few respondents, 4 individuals (4.1%), expressed disagreement, and 2 respondents (2.0%) strongly disagreed with this role.

The enforcement of building codes was also deemed important. Approximately 44 respondents (44.9%) strongly agreed that this role is crucial for mitigating building collapses, and an equal number of 44 respondents (44.9%) agreed. A small minority of 4 respondents (4.1%) disagreed, and 6 respondents (6.1%) strongly disagreed with this perspective.

Similarly, the inspection of buildings throughout the construction process was considered significant. Approximately 44 respondents (44.9%) strongly agreed with this role, and an equal number of 44 respondents (44.9%) agreed. A small minority of 4 respondents (4.1%) disagreed, and 6 respondents (6.1%) strongly disagreed with this responsibility.

In summary, the responses from Yenagoa professionals highlight a consensus on the importance of various roles played by building professionals in building collapse mitigation. These roles encompass adhering to soil bearing capacity, ensuring adequate supervision, complying with building specifications, conducting proper site inspections and soil tests, enforcing building codes, and inspecting buildings throughout the construction process. These findings underscore the significance of these roles in enhancing building safety within the region.

Table 9: Response on the Roles of Building Professionals in the Implementation of Building Collapse Mitigation Strategies in Yenegoa

S/N	Mitigation Strategies	Strongly Agree	Agree	Disagree	Strongly Disagree	Total
1	Adherence to soil bearing capacity in plan and building development	70 71.4%	20 20.4%	6 6.1%	2 2.0%	98 100.0%
2	Adequate supervision throughout stages of building construction	74 75.5%	22 22.4%	2 2.0%	0 0.0%	98 100.0%
3	Adherence to building specifications	80 81.6%	14 14.3%	0 0.0%	4 4.1%	98 100.0%
4	Proper site inspection and soil tests	66 67.3%	26 26.5%	4 4.1%	2 2.0%	98 100.0%
5	Enforcement of building codes	44 44.9%	44 44.9%	4 4.1%	6 6.1%	0 0.0%
6	Inspection of building throughout construction process	44 44.9%	44 44.9%	4 4.1%	6 6.1%	0 0.0%

Source: Computed from Field Survey, 2023

Table 10 provides a comprehensive overview of the responses collected from building professionals in Uyo regarding their perspectives on the roles of building professionals in implementing building collapse mitigation strategies. The responses offer valuable insights into the opinions and perceptions of professionals in this specific region.

Starting with the role of adhering to soil bearing capacity in plan and building development, a substantial majority of 95 respondents (61.7%) strongly agreed that this is a critical role for building professionals in mitigating building collapses in Uyo. Additionally, 51 respondents (33.1%) expressed agreement with this role, while 8 respondents (5.2%) held a differing view. Notably, none of the respondents strongly disagreed with this role.

Adequate supervision throughout the stages of building construction emerged as another pivotal role. A significant 110 respondents (71.4%) strongly agreed that ensuring proper supervision is essential for mitigating building collapses in the region. An additional 32 respondents (20.8%) expressed agreement, while 4 respondents (2.6%) disagreed. A small number of 8 respondents (5.2%) strongly disagreed with this responsibility.

Adherence to building specifications was seen as another crucial role for building professionals. An overwhelming 113 respondents (73.4%) strongly agreed that adhering to these specifications is vital in the context of building collapse mitigation in Uyo. A minority of 37 respondents (24.0%) agreed with this role, while 4 respondents (2.6%) held a dissenting perspective. Importantly, none of the respondents strongly disagreed with this role.

Proper site inspection and soil tests were also considered essential roles in mitigating building collapses. A substantial majority of 95 respondents (61.7%) strongly agreed with this responsibility, while 47 respondents (30.5%) agreed. A few respondents, 8 individuals (5.2%), expressed disagreement, and 4 respondents (2.6%) strongly disagreed with this role.

The enforcement of building codes was deemed important by the respondents. Approximately 83 respondents (53.9%) strongly agreed that this role is crucial for mitigating building collapses, and an equal number of 59 respondents (38.3%) agreed. A small minority of 8 respondents (5.2%) disagreed, and 4 respondents (2.6%) strongly disagreed with this perspective.

Similarly, the inspection of buildings throughout the construction process was considered significant. Approximately 83 respondents (53.9%) strongly agreed with this role, and an equal number of 59 respondents (38.3%) agreed. A small minority of 8 respondents (5.2%) disagreed, and 4 respondents (2.6%) strongly disagreed with this responsibility.

In summary, the responses from Uyo professionals underscore the consensus on the importance of various roles played by building professionals in building collapse mitigation. These roles encompass adhering to soil bearing capacity, ensuring adequate supervision, complying with building specifications, conducting proper site inspections and soil tests, enforcing building codes, and inspecting buildings throughout the construction process. These findings emphasize the significance of these roles in enhancing building safety within the region.

Table 10: Response on the Roles of Building Professionals in Implementation of Building Collapse Mitigation Strategies in Uyo

S/N	MITIGATION STRATEGIES	STRONGLY AGREE	AGREE	DISAGREE	STRONGLY DISAGREE	TOTAL
1	Adherence to soil bearing capacity in plan and building development	95 61.7%	51 33.1%	8 5.2%	0 0.0%	154 100.0%
2	Adequate supervision throughout stages of building construction	110 71.4%	32 20.8%	4 2.6%	8 5.2%	154 100.0%
3	Adherence to building specifications	113 73.4%	37 24.0%	4 2.6%	0 0.0%	154 100.0%
4	Proper site inspection and soil tests	95 61.7%	47 30.5%	8 5.2%	4 2.6%	154 100.0%
5	Enforcement of building codes	83 53.9%	59 38.3%	8 5.2%	4 2.6%	0 0.0%
6	Inspection of building throughout construction process	83 53.9%	59 38.3%	8 5.2%	4 2.6%	0 0.0%

Source: Computed from Field Survey, 2023

Discussion of Results

Findings reveal that in all three regions, professionals recognize the critical role of adhering to soil bearing capacity in the planning and development of buildings. This role is essential to ensure that structures are built on a solid foundation, mitigating the risk of structural failures due to inadequate soil conditions. Moreso, adequate supervision throughout the stages of building construction is universally acknowledged as a crucial responsibility among building professionals. This role involves monitoring and oversight to identify and address construction issues promptly, contributing significantly to building safety.

Building professionals across regions concur on the importance of adhering to building specifications. This role involves ensuring that buildings are constructed in compliance with established standards and codes, emphasizing the commitment to maintaining construction quality and safety. The significance of proper site inspections and soil tests is recognized consistently. These roles involve assessing building sites and soil conditions thoroughly to prevent potential foundation failures, indicating a shared commitment to comprehensive assessments.

The enforcement of building codes is widely acknowledged as an essential responsibility in all regions. This role involves ensuring that construction projects comply with regulatory standards, emphasizing the importance of regulatory oversight and adherence to established codes. Consistently, building professionals agree on the importance of inspecting buildings throughout the construction process. This proactive role involves ongoing assessments to identify and rectify construction deficiencies promptly, contributing to quality control and safety.

These findings resonate with the work of Ede (2010), who examined the trend and casualties of building collapses in Nigeria between 2000 and 2010. Ede's analysis of historical data on building collapses in Nigeria underscored the significance of addressing the identified roles of building professionals to mitigate the risks associated with building collapses. The alignment between the study's findings and Ede's work highlights the ongoing relevance of these roles in preventing building collapses in Nigeria and underscores the need for continued vigilance and adherence to best practices in the construction industry.

Conclusion

In conclusion, this study has delved into a critical aspect of building safety by examining the roles of building professionals in the implementation of building collapse mitigation strategies. The research collected responses from professionals in various regions, including Port Harcourt, Yenegoa, and Uyo, and identified key responsibilities that consistently emerged across these areas.

The findings of this study highlight the shared understanding among building professionals of the vital roles they play in ensuring building safety and mitigating the risk of collapses. These roles include adherence to soil bearing capacity in construction planning, adequate supervision throughout building construction stages, adherence to building specifications, proper site inspections and soil tests, enforcement of building codes, and ongoing inspection throughout the construction process. The consistency of these roles across regions underscores their universal importance in safeguarding lives and property.

Furthermore, the alignment between the study's findings and prior research, such as the work of Ede (2010), underscores the enduring significance of these roles in the context of Nigeria's construction industry. It emphasizes the need for continued attention to these responsibilities to address the challenges posed by building collapses effectively.

Recommendations

Based on the findings of this study regarding the roles of building professionals in the implementation of building collapse mitigation strategies, several recommendations can be made to enhance building safety and reduce the risk of collapses in Nigeria:

1. Building professionals, including architects, engineers, and surveyors, should undergo comprehensive training that emphasizes their roles in building safety. Certification bodies and professional associations should ensure that practitioners meet high standards of competence and ethics. Continuing education and professional development programs should also be encouraged to keep practitioners updated on the latest industry standards and best practices.
2. Government authorities and regulatory bodies should strengthen and enforce building codes, standards, and regulations. They should also consider revising and updating these codes to reflect current construction technologies and best practices. The non-penalizing of offenders and inadequate supervision should be addressed through stricter enforcement measures and accountability mechanisms.
3. Building professionals should collaborate effectively across disciplines. Architects, engineers, and other stakeholders should work together to ensure that construction projects adhere to the highest standards of safety. Proper site inspection and soil tests should involve close collaboration between engineers and geotechnical experts to assess soil stability accurately.

4. Educational institutions offering building-related programs should review their curricula to ensure that they adequately cover building safety, collapse mitigation, and disaster risk reduction. Mitigation studies should be integrated into the building curriculum to equip future professionals with the necessary knowledge and skills.
5. Building professionals, local authorities, and regulatory bodies should conduct regular inspections of construction sites throughout the building process. This includes inspections of soil conditions, adherence to building specifications, and compliance with building codes. Inspection findings should be used to make informed decisions regarding project approvals and safety compliance.
6. Building professionals should be actively involved in disaster preparedness and response efforts. They should collaborate with emergency management agencies to develop strategies for responding to building collapses and other disasters promptly.
7. Building professionals and regulatory bodies should establish mechanisms for continuous monitoring and evaluation of construction projects. This can help identify and rectify safety issues before they escalate.

By implementing these recommendations, Nigeria can make significant strides in reducing the incidence of building collapses and enhancing the safety and resilience of its built environment. Building safety should be a collective effort involving professionals, government authorities, educational institutions, and the public, with a shared commitment to safeguarding lives and property.

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