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STRATEGIES FOR MINIMIZING BUILDING COLLAPSE IN EBONYI STATE

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Abstract: *The study was designed to find out the strategies for minimizing building collapse in Ebonyi State. Two research questions and two hypotheses were formulated to guide the study. The study adopted a survey research design. The population of the study comprised of 160 government agencies and building professionals in Ebonyi State and was subjected to purposive sampling in which 90 respondents were drawn. A 31-item structured questionnaire was used as the instrument for data collection. The instrument was subjected to face validation by three experts. Cronbach Alpha was used to establish the internal consistency of the instrument which yielded a reliability value of 0.71. Data collected were analysed using mean and standard deviation for the research questions at acceptance value of 2.50 while t-test was used for the hypotheses at 0.05 level of significance. The result of the data analysis revealed that 31 strategies could minimize building collapse. There was no statically significant difference in the mean responses of the respondents in any sections on how to minimize building collapse in Ebonyi State. It was recommended that government agencies and professional organizations should champion the awareness campaign, especially among the private clients through different public programs as this would increase the knowledge level of the clients and desirability to demand sustainable building construction projects.*
Keywords*: Building Collapse, Minimizing, Strategies, Building professionals and Government*

Introduction

The process of producing new buildings is a complex activity reflecting the skills, perceptions, and expectations of many professionals who must endeavor to respond to the technical and philosophical challenges associated with teamwork. Understanding the building process in terms of what should be done and who should do it minimizes the negative constraints on the quality of buildings delivered to the client. In Nigeria, the unpleasant incidences of building collapse and the poor reputation of the building sector in the construction industry calls for understanding the building process.

A building must provide such functions as stability, durability, resistance to weather and fire, security, safety to lives and property as well as comfort to users (Olise, 2011). When a building fails to provide these functions, it has failed in terms of performance. Simply put, if a building or its component fails to perform the function for which it is designed or intended, that building has failed. This implies that failure can occur in any component of a building and therefore differs from collapse. While failure is the inability of a constructed facility or its components to perform as intended in the design, building collapse occurs when the entire or a substantial part of the building structure completely comes down thereby losing the ability to perform its functions.

This again shows that building collapse may be total or partial depending on the extent to which the structural members or components have fallen (Nnadi, 2018). Although building collapse is a global phenomenon, the rate of occurrence in Nigeria has gone beyond acceptable limits. According to Taiwo and Afolami (2011), the frequency of building collapse in Nigeria has become so disturbing that one wonders if it is a deliberate design to reduce the population of the country.

A literature scan on the collapse of buildings in Nigeria shows that the phenomenon has taken a demeaning and embarrassing shape despite ostensible efforts to contain it. Each building collapse carries with it tremendous effects that cannot be easily forgotten by any of its survivors (Ede, 2010). The economic, health, and social consequences in the form of loss of precious human lives, increases in the number of widows and

fatherless, injuries, and loss of incomes and properties have amplified the crises of confidence, trust, and dignity among professionals and stakeholders in the construction industry.

Despite the above efforts to forestall the cases of building collapse by the Federal government and professionals in the building industry, not enough appears to be done, as this phenomenon appears to be on the rise (Bala, 2017). In recent years, Ebonyi State recorded building collapses on a two-story building at Aguogboriga, Ebonyi State (7th February 2011), a three-story building at Afikpo, Ebonyi State (June 2012), a three-story building at Amasiri, Ebonyi State (September 2013). The two-story building at Abakaliki, Ebonyi State (July 2019), a three-story building in Abakaliki, Ebonyi State, (July 2020), a two-story building at Uburu, Ebonyi State (June 2021), five-story building at Ngbabor, off Presco campus, Ebonyi State (8th June 2022), a three-storey residential building located at Ogboloko Street, off Nnodo Street in Abakaliki (27th September 2023), a three-storey building adjacent to the Alex Ekwueme Federal University Teaching Hospital Abakaliki (AE-FUTHA 1), (18th June 2024), a three-storey student accommodation building known as Pentagon Lodge, situated directly in front of the main gate of the Alex Ekwueme Federal University, Ndufu-Alike, Ikwo (AE-FUNAI), (25th July 2025).

The above scenario calls for proactive action by all stakeholders to forestall negative practices in the industry. According to Ede (2010), it is worthy to note that if there is any area Nigeria has failed since her Independence, it is in the area of regulation and control of the building construction practices. Anecdotal evidence shows that in Nigeria, people see the building and construction business as a quick and easy way to make money. For instance, you see a Lawyer, a Microbiologist, a Political Scientist, or even a Trader venturing into the Building and Engineering professions undisturbed. These professions are purely technical knowledge areas that a layman not trained in them would not understand. As such, it is not about knowing how to read a mere Architectural drawing or having money to go into real estate and property development that makes one a builder or an engineer. It is all about having the required skill and academic discipline to practice the profession.

Statement of the Problem

There can be little doubt that over the last two decades the design, construction of new buildings, and the incidence of frequent building collapse in Nigeria had become so controversial. The government and construction professionals/stakeholders (Designers, Builders, and Clients) now seek ways of wriggling out of the negative cycle of unsustainable practices in which the industry is trapped. The prevailing scenario in most cases is for each profession to justify its sincerity of purpose by laying blame at the doorstep of another profession based on incompetence, greed, corruption, inadequate supervision, and ignorant society (Oloyede, Omoogun, and Akinjare, 2010). This unsustainable construction atmosphere and lack of cooperation among construction professionals has been described as wasteful and therefore contributes to a diminution of quality in both design and construction (Okunola, 2021). Therefore, these facts had resulted to the need to identify the strategies for minimizing building collapse in Ebonyi State.

Purpose of the Study

The major purpose of this study is to determine the strategies for minimizing building collapse in Ebonyi State. Specifically, the study seemed to:

1. Determine government strategies to minimize building collapse in Ebonyi State.
2. Find out actions from building professionals for minimizing building collapse in Ebonyi State.

Research Questions

The following research questions guided the study.

1. What are the government strategies for minimizing building collapse in Ebonyi State?
2. What are the actions of building professionals for minimizing building collapse in Ebonyi State?

Hypotheses

The study was guided by the following hypotheses which was tested at a 0.05 level of significance.

H0₁ There is no significant difference in the mean responses of the respondents on how the government could minimize building collapse in Ebonyi State.

H0₂ There is no significant difference in the mean responses of the respondents on how building professionals could minimize building collapse in Ebonyi State.

Methodology

This study was a descriptive survey design. Check and Schutt (2012) described survey research as the collection of information from a sample of individuals through their responses to questions. Survey design is suitable for this study because it helped the researcher to collects a detailed description of existing phenomena with the intent of using the data to justify current conditions and practices. The study was carried out in Ebonyi State. The study covered 13 Local Government Areas in Ebonyi State, which is divided into three educational zone namely, Abakaliki, Onueke, and Afikpo. The population of this study consisted of Government Officials from Ebonyi State Capital Territory = 18 and Ebonyi State Town Planning and Development Authority = 12 and Building Professionals (members of Nigerian Institute of Architects (NIA), Ebonyi State Chapter = 42, members of Nigerian society of Engineers (NSE), Ebonyi State Chapter, Civil Engineers = 46 and members of Nigerian Institute of Building, (NIOB), Ebonyi State Chapter = 42), totaling 160. This study employed purposive sampling in which 18 government officials from Ebonyi State Capital Territory, 12 government officials from Ebonyi State Town Planning and Development Authority, 20 Architects, 20 Civil Engineers, and 20 Builders all in Ebonyi State were sampled, making it a total of 90 respondents. The instrument for data collection was a structured survey questionnaire. The instrument was developed by the researcher after a review of available literature on strategies for minimizing building collapse in Ebonyi State and was structured in line with the research questions. The instrument is based on a four-point Likert scale of Strongly Agree, Agree, Disagree, Strongly Disagree, with nominal values of 4, 3, 2, and 1. The scale range, SA = 4.00 - 3.00, A = 2.99 - 2.00, D = 1.99 - 1.00, SD = 1.00 - 0.99. The instrument was subjected to face validation by two experts from the Department of Technology and Vocational Education, and one expert from the Science Education Department all in Ebonyi State University, Abakaliki. To establish the reliability of the instrument, 30 items of the questionnaire was administered to 30 respondents. In an effort to ensure that the respondents used in the reliability were not from the study area, the reliability test was conducted in Enugu State. The returned copies of the questionnaire were analyzed to compute for the reliability co-efficient. Cronbach alpha Co-efficient 'r' was used to estimate the reliability coefficient and the reliability value of 0.71 was obtained. 90 copies of the questionnaire were administered to the respondents by the researcher and with the aid of two research assistants. The completed questionnaires were collected after two weeks. The data collected for the study were analyzed using mean, standard deviation, and t-test. The mean and standard deviation were used to answer the three research questions. Any item with a mean value of 2.50 and above was considered as Agree, while any item with a mean value that is less than 2.50 was considered as Disagree. The three null hypotheses were tested using t-test at a 0.05 level of significance. (The computation was done with the SPSS package). For any item where the calculated significance value is greater than 0.05, the hypotheses of no significant difference was up-held at 0.05 level of significance, but where the calculated significance value is less or equal to 0.05, the hypotheses of no significant difference was not up-held at 0.05 level of significance.

Results and Analysis

Table 1: Government Agencies Strategies for Minimizing Building Collapse in Ebonyi State

Descriptive Statistics **N = 90**

S/N	Item Statements	Mean	Std. D	Remarks
1	Assess the building plan before approvals	3.92	0.28	Agreed
2	Ensure compliance to approved building drawings on site	3.62	0.49	Agreed
3	Provide sufficient inspectors	3.75	0.43	Agreed
4	Provide an efficient tracking system for monitoring	3.57	0.50	Agreed
5	Ensure the engagement of only competent building contractors	3.78	0.42	Agreed

6	Make public the approved building list	3.68	0.47	Agreed
7	Ensure that no building commences without approvals	3.66	0.48	Agreed
8	Stop buildings conversion without necessary approvals	3.66	0.48	Agreed
9	Ensure that quality building materials are used	3.60	0.49	Agreed
10	Shun corrupt practices and granting of illegal approvals	3.57	0.50	Agreed
11	Ensure that approvals are in line with building codes, regulations, and local laws	3.63	0.48	Agreed
12	Adopt regular state-wide campaigns on safety	3.44	0.50	Agreed
13	Remove every political interference in the approval procedure	3.74	0.44	Agreed
14	Enforce punishment for disobedience	3.62	0.49	Agreed
15	Employ technology for tracking the approval process	3.66	0.48	Agreed
16	Increase the efficiency of granting statutory approvals	3.56	0.50	Agreed
17	Ensure the conduct of soil test on the proposed site	3.67	0.47	Agreed

Table 1 shows that the mean responses of the respondents on how government agencies could minimize building collapse ranged between 3.44 and 3.92. This indicates that all the 17 items in the instruments as the approaches of government agencies before, during, and after any building construction were accepted as effective ways toward minimizing or total eradication of building collapse incidents in Ebonyi State.

Table 2: Building Professionals Actions for Minimizing Building Collapse in Ebonyi State
Descriptive Statistics **N = 90**

S/N	Item Statements	Mean	Std. D	Remarks
1	Ensure adequate competent personnel on site	3.84	0.37	Agreed
2	Ensure regular inspection of the construction processes	3.73	0.45	Agreed
3	Examine the work at sub-contractor and suppliers' levels	3.65	0.48	Agreed
4	Check work progress regularly	3.48	0.50	Agreed
5	Monitor the application techniques and materials	3.54	0.50	Agreed
6	Insist that concrete gains the required strength before loading	3.47	0.50	Agreed
7	Work with other building professionals	3.57	0.50	Agreed
8	Ensure that everyone on the site adopts the plan	3.71	0.46	Agreed
9	Specify quality materials from the beginning	3.65	0.48	Agreed
10	Anchorage bond should conform to standards and codes	3.51	0.50	Agreed
11	Ensure that materials conform to standard quantity and quantity	3.56	0.50	Agreed
12	Water used for building should be of the right PH value	3.75	0.44	Agreed
13	Ensure the use of the right techniques and process of construction	3.47	0.50	Agreed
14	Adopt the right foundation for every building situation	3.57	0.50	Agreed

Table 2 gave an idea that the mean responses of the respondents on how building professionals could minimize building collapse ranged between 3.47 and 3.84. This indicates that all the 14 items in the instruments as the approaches of building professionals before, during, and after any building construction were accepted as effective ways toward minimizing or total eradication of building collapse incidents in Ebonyi State.

Hypothesis Testing

Data collected for government agencies, and building professionals of the structured questionnaire were subjected to t-test of difference between means of independent samples.

Table 3: t-test Analysis of the Mean Responses of Government Agencies and Building Professionals on how Government Agencies Could Minimize Building Collapse in Ebonyi State

Groups	N	Mean	SD	t-value	df	P-value	Decision
Government Agencies	30	3.64	0.47				
Building Professionals	60	3.65	0.46	0.12	2	0.43	NS

Table 3 displayed the independent samples t-test result of how government agencies could minimize building collapse in Ebonyi State. The result shows that the p-value is 0.43, which is greater than 0.05, indicating that there was no significant difference in the responses of government agencies, and building professionals on how government agencies could minimize building collapse in Ebonyi State.

Data collected for government agencies, and building professionals of the structured questionnaire were subjected to t-test of difference between means of independent samples.

Table 4: t-test Analysis of the Mean Responses of Government Agencies and Building Professionals on how Building Professionals Could Minimize Building Collapse in Ebonyi State

Groups	N	Mean	SD	t-value	df	P-value	Decision
Government Agencies	30	3.10	0.48				
Building Professionals	60	3.61	0.47	0.36	88	0.68	NS

Table 4 displayed the independent samples t-test result of how building professionals could minimize building collapse in Ebonyi State. The result shows that the p-value is 0.68, which is greater than 0.05, indicating that there was no significant difference in the responses of government agencies, and building professionals on how building professionals could minimize building collapse in Ebonyi State.

Findings of the Study

Based on the result analysis, the following findings were revealed:

1. All the questionnaire items used to find out how to minimize building collapse in Ebonyi State were accepted.
2. All the items recorded a high number of mean values, indicating high acceptance.
3. There was mostly no statically significant difference in the mean responses of the respondents in any sections on how to minimize building collapse in Ebonyi State.

Discussion of findings

In research question one, Table 1 displayed that the mean responses of government agencies, and building professionals to how government agencies could minimize building collapse. This indicated that all the items proposed as the approach of government agencies before, during, and after any building construction were accepted as effective ways toward minimizing or total eradication of building collapse incidents in Ebonyi State. The hypotheses result presented that the p-value of the item, each of these were greater than the p-value of 0.05. It, therefore, means that there was no significant difference in the mean responses of government agencies, and building professionals on each of the items meant to find how government agencies could minimize building collapse in Ebonyi State. The findings of the study were also in agreement with the submission of Ayeni and Adedeji (2015), they stated that various government agencies have also contributed to the huge losses experienced in the building industry through building collapse. The inability of the Local Planning Authority to ensure that the design conforms to design principles before approval has not helped matters in Nigeria. Ayeni, and Adedeji (2015), further stated that there are cases, where the Planning Authority in a particular Local Government lacks expertise personnel (architects, engineers, and planners) to ensure the right decisions are taken before approval and during the execution of buildings. This must be corrected.

According to the researcher, if building collapse would be curbed in Nigeria, the Planning Authority must wake up to their role of ensuring designs conform to building regulations before they are approved for execution. In research question two, Table 2 displayed that the mean responses of government agencies and building professionals to how building professionals could minimize building collapse. This indicated that all the items proposed as the approach of building professionals before, during, and after any building construction were accepted as effective ways toward minimizing or total eradication of building collapse incidents in Ebonyi state. The hypotheses result presented that the p-value of individual items. Each of these was greater than the significant value of 0.05. It, therefore, means that there was no significant difference in the mean responses of government agencies, and building professionals on each of the items meant to find how building professionals could minimize building collapse in Ebonyi State. The findings of the study were also in agreement with the submission of (Nnadi E. 2018)). which stated that construction is teamwork. It is acknowledged worldwide that process of building an edifice is the collaborative responsibility of various professionals. All over the world, the trend is that specialization. This is because better performance, high productivity, and cost-effectiveness can best be achieved through specialization. All facets of the economy have benefited from specialization and the building construction industry should not be an exception. According to the researcher, the complexity of design, modern construction materials/ components, construction methodology, awareness on the part of clients, etc. has called for specialization which is required to respond positively to the needs and aspirations of today's clients. As a result of this, the need for experts in the production management of building projects cannot be over-emphasized.

Conclusion

From the findings of the study, it was discovered that all the strategies presented could minimize building collapse in Ebonyi State. Government assessing the building plan before approvals, ensuring total compliance to approved building drawings on-site, ensuring that approvals are in line with building codes, regulations, and local laws, removing every political interference on approval procedure, and enforcing punishment on disobedience minimizes building collapse. Building professionals ensure adequate competent personnel on site, ensure regular inspection of the construction processes, monitor the application techniques and materials, ensure that materials conform to standard quantity and quantity, and adopt the right foundation for every building situation to minimize building collapse.

Recommendations

Based on the findings of the study, the following recommendations were made:

1. Government agencies and professional organizations should champion the awareness campaign, especially among the private clients through different public programs as this would increase the knowledge level of the clients and desirability to demand sustainable building construction projects.
2. Stiffer penalties (such as jail or death sentence) should be placed on owners of collapsed buildings and the project handlers in the country, especially where the loss of lives is involved.

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