
Social security and building collapse in Lagos state, Nigeria

Israel, Esther Ohiseghame

Centre for Foundation Education,
Bells University of Technology, Ota, Nigeria

Patricia Omega Kukoyi

Department of Building
Faculty of Environmental Sciences
University of Lagos
Nigeria

Abstract:

Urban settlements in Nigeria have witnessed many collapses of buildings. Evidence from some literature suggests that this has culminated in increased mortality in the country. Hence building collapse is a security challenge because it poses threats to the lives and property of not only individuals but also of the nation. The benefits of mitigating building collapse include, inter alia, increased human capital, adequate security of lives and property, health and safety of individuals. This study aims to identify and assess the effects of a building collapse on individuals and society. An understanding of these impediments provides an opportunity to develop strategies to eradicate this challenge. Quantitative and qualitative methods were used to address the objectives of the study. The findings revealed that stakeholders' lack of commitment, ineffective implementation of construction codes and regulations are salient factors that contribute to the challenge. In addition, the menace of building collapse resulted in security challenges, loss of lives, investments, and ill-health of individuals. This study contributes to the existing knowledge by highlighting the significant socio-economic effects of building collapse. Although the study is limited to Lagos State, the findings may be 'generalizable' to other states within Nigeria.

Keywords: Building, Collapse, Factors, Lagos, Security.

Introduction

Buildings are one of the most essential human needs because they provide shelter, a basic need that all men irrespective of region, race, or gender seek to satisfy. Apart from this, buildings provide housing for many businesses. Hence buildings are an important resource globally. As important as buildings are to man they have in recent times been a source of concern in many places due to sudden collapse and its attendant effects.¹ Douglas and Ransom assert that

¹ Douglas, James and Ransom, Bill. Understanding Building Failures: Third edition. Understanding Building Failures, 4th ed.(New York: Rutledge, 2013),12.

building defects are avoidable as they are caused by the non-application of already acquired knowledge. This is worrisome as building failure does not occur without some negative impacts. Some victims of building collapse never recover from the shock of losing all they laboured for. Apart from this, the psychological effect can be overbearing for victims who have been forcefully displaced and have to look for a new home and probably a new social network. This paper examines the contemporary issues causing building collapse and the effect of a building collapse on individuals and society.

The built environment in Nigeria has undergone rapid deterioration with incidences of building collapse. It is pertinent to note that buildings are structures that serve as shelters for man, his properties, and activities and so they must be properly planned, designed, and constructed to provide desired satisfaction to the user²; ³. The factors to be observed in building construction include durability, weather resistance, adequate stability to prevent its failure or discomfort to the users. Buildings have been important aspects of the socio-economic development of humans⁴. However, the contribution of buildings to Nigeria's development has not yielded the desired potentials because of failed construction projects and more recently inadequate functional performance. Building failure is defined as an unacceptable difference between expected and observed performance in a building component when that component can no longer be relied upon to fulfill its principal functions⁵. Tinga refers to failure as when something is in a state that some of the components can no longer perform the intended function⁶. Corroborating this view, Adesanya et al opine that building collapse could be a result of a failure of some parts of the structure, and this is not supposed to happen during the expected length of time of the building.⁷

² Taiwo, A.A. and Afolami, J.A. "A Case of a Hotel in Akure, Nigeria" *Journal of Building Appraisal* 6,no.3-4 (2011): 241-248, accessed June 10, 2020, <https://doi.org/10.1057/jba.2011.1>

³ Awoyera, P.O., Alfa, J., Odetoan A. and Akinwumi I.I. "Building Collapse in Nigeria during Recent Years – Causes, Effects and Way Forward" *IOP Conf. Series: Materials Science and Engineering*. (2020):1-9, accessed April 21, 2021, doi:10.1088/1757-899X/1036/1/012021

⁴ Windapo, A. O., and Rotimi, J. O. "Contemporary Issues in Building Collapse and Its Implications for Sustainable Development". *Buildings*, 2no.3(2012): 283-299, accessed Dec.12 2020, <https://doi.org/10.3390/buildings2030283>

⁵ Ayininuola, G. M. and Olalusi, O.O. Assessment of Building Failures in Nigeria: Lagos and Ibadan Case Study". *African Journal of Science and Technology (AJST)*, Science and Engineering Series 5, No. 1. (2004):73-

7https://www.researchgate.net/publication/237374553_Assessment_of_building_failures_in_Nigeria_Lagos_and_Ibadan_case_study/link/53ed18970cf2981ada128576/download,

⁶ Tinga T., *Principles of Loads and Failure Mechanisms: Application in Maintenance, Reliability and Design* (London :Springer, 2013), accessed: April 19, 2021, DOI: 10.1007/978-1-4471-4917-0_1t

Springer Series in Reliability Engineering,

⁷ Adesanya A.T. and Olanrewaju D.O.. "Study of Factors Responsible for Incessant Collapse of Building in Lagos state". *Journal of Emerging Trends in Economics and Management*

It is common to hear of incidents of building collapse in major Nigerian cities like Lagos, Port Harcourt, Abuja, Enugu, and Ibadan⁸; ⁹. Also, Omenihu et al's study reveal that cities such as Lagos, FCT Abuja, Rivers, and Oyo had high rates of building collapse with high casualty rates which increased progressively over the years. In addition, building collapse occurs more with private clients than with public buildings.¹⁰

The problem of building collapse is not only peculiar to Nigeria. It occurs in other parts of the world like Ghana, Kenya, Uganda, and South Asia, etc. Some earliest building collapse includes the Fidenae amphitheater in 27AD (Italia Roman Empire) that killed over 20,000 people, the Belltower of St Mary's Church collapse in Stralsund in present Germany 1382, and in 1549 was the collapse of Lincoln Cathedral in England¹¹. Laws targeted at reducing building collapse dates back to sometime between 1792-1750 BC where the legal code declared by Hamurabi, a Babylonian king authorized the killing of a builder whose building killed an occupant¹². Some scholars have also associated building collapse with developing countries and areas that are rapidly urbanizing.

Building collapse in Nigeria has increased in recent times particularly in a major city like Lagos where a considerably high number of fatal incidences of building collapse has occurred. This is an enormous challenge leaving people to ask many questions from professionals in the field of building and especially from building regulatory bodies. Building collapse has a lot of overwhelming impacts on individuals, families, and the nation at large.

Theoretical Background.

In other to understand the nature of building collapse in urban cities, this research is situated within urbanization theories. Urbanization has been

Sciences (JETEMS) 5, no.7(2014):57-61.accessed Dec.19,2019,
jetems.scholarlinkresearch.org.

⁸Ejeh, S. P. "Building Collapse Phenomenon in Nigeria: the Role of NBRRI". (paper presented at NBRRI 2011 international conference Sheraton, Abuja, May 24 - 25, 2011), accessed January 20, 2020, [https://nbrri.gov.ng/new/proceedings/Proceedings of NBRRI Stakeholders' Forum](https://nbrri.gov.ng/new/proceedings/Proceedings%20of%20NBRRI%20Stakeholders'%20Forum)

⁹ Windapo and Rotimi, Contemporary Issues in Building Collapse, 284.

¹⁰ Omenihu, F.C., Onundi L.O. and Alkali, M." An Analysis of Building Collapse in Nigeria (1971-2016): Challenges For Stakeholders". Annals of Borno 26,no.1 (2016):113-140 .

¹¹ Chendo I. G. and Obi N.I. "Building Collapse in Nigeria: the Causes, Effects, Consequences and Remedies". International Journal of Civil Engineering Construction and Estate Management 3 no.4 (2015):41-49,accessed April 4,2021 (www.eajournals.org)

___Published by European Centre for Research Training and Development UK (www.eajournals.org)

¹² Taiwo and Afolami, A Case of a Hotel, 242

explained through many theories. These theories include the self-generated /endogenous theory of urbanization, modernization theory, and dependency /world-system perspective among others. Self-generated theory explains that urbanization is a result of the movement of people from rural to urban areas. Peng, Chen, and Cheng suggest that the rural-urban shift is the foundation of urbanization and the driving force of this movement is industrialization hence people moved in search of jobs¹³. It is pertinent to note that the industrial revolution in Great Britain gave birth to the beginning of urbanization in the west. Rapid industrialization and the urbanization of Great Britain in the mid-twentieth century led to rapid industrialization and subsequent urbanization in other parts of the world ¹⁴. However modernization theory links urbanization with the advent of inventions through industrialization. It was most prevalent between the 1950s and 1970s¹⁵. According to Smith, modernization theory assumes that urbanization is a result of the introduction of new things and innovations within the society through industrialization, technological application, information penetration, and cultural diffusion¹⁶. Kasarda and Crenshaw explains that

Constrained opportunities in rural areas and the allure of modern cities lead to rural-to-urban migration. Moreover, the age-selectivity of migrants and an overall high rate of fertility swell urban areas beyond their capacities to provide infrastructure, housing, social services, and employment¹⁷.

Another theory of urbanization is dependency/world-system theory which links unequal development to capitalism. Kasarda and Crenshaw explain that this theory views capitalist structure and process as a sole source of social change in the third world and that the world system theorists think first that capitalism is a unique form of social organization and secondly, that capitalism needs a particular social structure that is characterized by unequal exchange, lopsided development, individual social inequality, core peripheral hierarchy, and dominance structure ¹⁸. Bodo links the causes of urbanization to rural to urban migration (which is as a result of economical and technological growth or advancement in the desired location); rural-urban transformation (this is when villages gradually become small towns, smaller towns become larger towns, and

¹³ Peng X, Chen X and Cheng "Urbanization and its Consequences", Demography II(2021), accessed May 2, 2021, <https://www.eolss.net/sample-chapters/C04/E6-147-18.pdf>©Encyclopedia of Life Support Systems (EOLSS)

¹⁴ Ibid.,

¹⁵ Bodo T. "Rapid Urbanisation: Theories, Causes, Consequences and Coping Strategies" Annals of Geographical Studies 2, Issue 3 (2019): 32-45.

¹⁶ Bodo, Rapid Urbanisation, 35.

¹⁷ Kasarda J.D, and Crenshaw E.M. "Third World urbanization: dimensions, theories, and determinants", Annual Review Sociology 17 (1991):467-501, accessed May 22021, www.annualreviews.org

¹⁸ Kasarda and Crenshaw, third World Urbanisation, 483

large towns become megacities due to increase in economic activities like job opportunities,) and negative policies (for instance places like Nigeria where attention is given to the capital while other places are underdeveloped and marginalized)¹⁹.

It is established in the literature of urban pathology that myriads of social problems like poor housing structure, development of slums, overpopulation, crime, pollution of water are features and products of urbanization. Boateng and Wright also noted that socio-economic and environmental and other urban-related problems are a result of the dynamic process of urbanization thus they maintain that building collapse in urban centers is a result of urban expansions and continued unsafe building practices and corruption ²⁰. They also argue that:

The more people come to the city, the more demand for buildings is amplified – for accommodation and other purposes. The pressures of demand often engender shoddy construction and building use practices. Buildings are hastily built. Existing ones are hastily converted for uses that were not built into the original design. Extra floors are added atop old buildings ²¹.

It, therefore, implies that building collapse is inevitable in urban areas where stakeholders lack the political will to enforce rules and regulations needed to have safe buildings which will not endanger the lives of people now and in the future.

Building Collapse

Building collapse occurs when there is a compromise of the structural integrity of a building which subsequently leads to the failure of the building ²². However, Obot et al opine that a building fails whenever any of its components can no longer meet its minimum requirement for which it was constructed. ²³ Leading causes of building collapse according to Omenihu et al²⁴ are structural failures,

¹⁹ Bodo, Rapid Urbanisation, 36

²⁰ Boateng F.G and Wright R “conceptual inquiry into building collapse in cities in developing countries”.(paper presented at Australasian Universities Building Education Association Conference,RACN Noosa Resort, Noosa QLD,November 6-8,2019),accessed May 2,2021, <https://www.researchgate.net/publication/338934292>

²¹ Boateng and Wright, Conceptual inquiry into Building Collapse, 14

²²Obodoh D., Amade B., Obodoh C. and Igwe C. “Assessment of the Effects Of Building Collapse Risks on the Stakeholders in the Nigerian Built Environment” Nigerian Journal of Technology (NIJOTECH) 38 no.4 (2019): 822– 831, accessed www.nijotech.com <http://dx.doi.org/10.4314/njt.v38i4.2>

²³ Obot, I.D. and Archibong, A. E. “Collapsed buildings in Nigeria”. Global Journal of Engineering Research. 15(2016): 11-15, accessed April 9,2021 <https://dx.doi.org/10.4314/gjer.v15i1.2> www.globaljournalseries.com

²⁴ Omenihu, Onundi and Alkali, An Analysis of Building, 116

substandard materials, and poor workmanship. Though building failures have been attributed to human errors ²⁵ believe that some of these errors could have been avoided hence professionals need to study the nature and effects of building failures for the following reasons: the cost of repair is high; it is also a source of distress to occupants and because it undermines the reputation of the construction industry as well as the high cost of litigation when it occurs. The incessant building collapse points to the fact that much is left to be desired than what is obtainable in the building industry and because of this ²⁶submit that more guidance is needed to avoid building failures hence they suggest a review of the syllabus of students (in the field of construction) which will enable building failure to be taught explicitly. According to Tinga building failure can be divided into physical failure and non-physical failure and thus states that:

Non-physical failures are mostly due to human errors, for example, the application of wrong types of fuel or lubricants, or due to contamination (dust, fouling). In these cases, the failure mode (i.e. functional failure) is observed, without any actual physical failure occurring. Physical failures, on the other hand, are due to a physical or chemical process or mechanism yielding degradation of the component and ultimately leading to the physical failure.²⁷

²⁸Tinga also indicates that there would be a failure when there is no balance between the loads a system is carrying and its load capacity. ²⁹ Douglas and Ransom support the view that overload can culminate into building failure. Current literature reveals that some building collapses are due to overload. One of such cases is the building collapse at 36 Massey street Lagos Island state where a three-story building was rented out to a school that occupied both the first and second floor³⁰. This overload could also be caused by owners of a building trying to add more structure to an existing one. Some buildings also are overcrowded with people and when the foundation is not strong enough it collapses. The following is the summary of categories of building failure: aesthetic failure (include when the paints are removing); Functional failure (when doors and windows are not working well, when the walls, roofs, and floors are leaking); Failure of materials (when fungi infect timber and metals get corroded); System failure of components and elements (when concretes get carbonated and this leads to cracking of concretes); Structural failure (desiccation of clay soil which allows a building to move downwards and downward movement of the building because of overload); Non-structural

²⁵ Douglas and Ransom, Building Failures, 11-12.

²⁶ Douglas and Ransom, Building Failures, 2.

²⁷ Tinga, Principles of Loads and Failure Mechanisms, 4

²⁸ Ibid., 4

²⁹ Douglas and Ransom, Building Failures, 10

³⁰ Adeniran, I "How Lagos building, housing children, collapsed" Premiumtimes, March 13, 2019, <https://www.premiumtimesng.com/news/top-news/320058-updated-how-lagos-building-housing-children-collapsed.html>

failure (when plasters are debonding and the peeling of floor coating); Reversible failure (when doors and windows absorb moisture and become difficult to open); and failure that is reversible (reaction of chemicals altering of the beam as a result of structural movement)³¹

³² identified some causes of building collapse and this includes among others; defective designs, deviating from approved building plans, improper site, and soil investigation, illicit conversion, alteration, and adding more structures to existing structures. The causes of building collapse also include weak foundations; lack of strong building materials; workers' errors; when the load is carrying is more than its capacity; when the strength is not tried and when people live in dilapidated buildings already condemned³³. Douglas and Ransom maintain that building defects are a result of external factors on most building materials. These factors according to them are weather (solar radiation, moisture, air, and its pollutants); fungi and insects; ground salt and water, and all material used in producing building material like calcium chloride in concrete.³⁴ However, the issues of building collapse during and after construction has failed to receive the attention it deserves from construction stakeholders in Nigeria³⁵. This is impertinent because of the evident consequences of building collapse on urban and socio-economic development. Several productive lives and properties have been lost in the various incidents of building collapse in Nigeria, and these losses, which would only truly be felt by future generations, have negatively impacted the socio-economic status of its citizenry. In 2017 over 54 buildings collapse ³⁶ while in an incident of collapse in 2019, 40 pupils, as well as 10 dead bodies, were pulled out of the rubbles of a building collapse at Massey street Lagos Island³⁷.

Table 1 Building Collapse in Lagos State

Year	State	No. of Building Collapse
2012	Lagos	33
2013	Lagos	17

³¹ Douglas and Ransom, Building Failures, 10

³² Chendo and Obi, Building Collapse in Nigeria, 45

³³ "Six reasons why building collapse" <https://www.bbc.com/news/world-africa-47573224>, March 14, 2019, accessed April 20, 2021.

³⁴ Douglas and Ransom, Building Failures, 2

³⁵ Windapo, A.O. "The Threat of Building Collapse on Sustainable Development in the Built Environment" (paper presented at National Conference on Sustainable Development and the Built Environment Jos, Aug. 9-12, 2006), accessed May 3, 2021, https://www.academia.edu/9289287/The_Threat_of_Building_Collapse_on_Sustainable_Development_in_the_Built_Environment_in_Nigeria

³⁶ Six reasons why building collapse" <https://www.bbc.com/news/world-africa-47573224>, March 14, 2019, accessed April 20, 2021.

³⁷ Adeniran, I "How Lagos building, housing children, collapsed" Premiumtimes, March 13, 2019, <https://www.premiumtimesng.com/news/top-news/320058-updated-how-lagos-building-housing-children-collapsed.html>

2014	Lagos	13
------	-------	----

Source: BBC News³⁸

Effects and security impacts of building collapse

Building collapse like other disasters is a threat to man's life. Building collapse is a challenge to human security as records have shown that several people die as a result of building collapse. It is rare not to have a human victim when a building collapses except no one is living or using that particular building. Building collapse includes the destruction of the environment and economic loss^{39, 40} observe that effects of building collapse are felt more by the inhabitant of a building than the owner.

Loss of lives

Adewale et al recount the collapse of a nine-story commercial building in Darka, Bangladesh stating that about 1132 people died and about 2500 persons were injured.⁴¹ Omenihu et al in their study, report that between 1971 and 2016 a total of 175 buildings had collapsed leaving about 1455 people dead in Nigeria⁴². The Nigerian Building and Road Research Institute reports that 199 people lost their lives to building collapse between 2014 and 2016 in four incidences⁴³. Also, another church building belonging to Reigners Bible church in Uyo collapsed in 2016 during a church service killing over 200 persons with some worshipers injured⁴⁴. Omenihu et al also make it clear that Lagos had the highest occurrence of building collapse of about 83 with 702 deaths⁴⁵. In 2014 a guest house belonging to the Synagogue Church of all Nations (SCOAN) collapsed injuring many people and killing about 115 people with over 50%

³⁸ Six reasons why building collapse" <https://www.bbc.com/news/world-africa-47573224>, March 14, 2019, accessed April 20, 2021.

³⁹Hingorania, R., Tanner,P., Prieto, M. and Lara C. "Consequence Classes And Associated Models for Predicting Loss of Life in Collapse Of Building Structures" Structural Safety 85 (2020) 101910. www.elsevier.com/locate/strusafe <https://doi.org/10.1016/j.strusafe.2019.101910>

⁴⁰ Taiwo and Afolami, A Case of a Hotel, 242

⁴¹ Adewale B., Alalade G.M., Akinwande A., Daramola A., Joseph A., Odili A., Odugbesan A., Ogunleye A., Adeleke J., Oyeyiola M., Famurewa O., Oladapa M., Olumuyiwa O., Eyiaro S., Oyeshomo T., Ugah U. and Eke W. "An Investigation of the Effects of Poor Specification on Building Collapse In Nigeria". Vestnik MGSU (Proceedings of the Moscow State University of Civil Engineering) 13, no 5 .116 (2018): 426-440, accessed Dec.9, 2019 DOI: 10.22227/1997-0935.2018.5.p1-p2.

⁴² Omenihu, Onundi and Alkali, An Analysis of Building,131.

⁴³ Six reasons why building collapse" <https://www.bbc.com/news/world-africa-47573224>, March 14, 2019, accessed April 20, 2021..

⁴⁴ Udoma, D. and Onuegbu, C. 2016. "Uyo Church Building Collapse: How Gov. Udom Survived , over 200 died during the service". Dec.11,2016.Accessed Jan.20, 2020 www.vanguardngr.com

⁴⁵ Omenihu, Onundi and Alkali, An Analysis of Building, 134

being South Africans ⁴⁶. This evidence shows that building collapse is a challenge to the safety of people.

Disability

Another impact of building collapse is that many people end up losing parts of their bodies. This reduces the quality of lives that victims live thereafter. Some victims end up living dependent lives. This is because the people affected may never be able to do things for themselves without being aided by someone.

Psychosocial impact

Building collapse can also lead to emotional distress. The psychological impact of losing a part of the body, losing a loved one like child, husband, wife, a breadwinner of the family, etc. in such an incident can be traumatic. Victims may find it hard to cope with the reality of living without their loved ones. A devastating effect of building collapse is its ability to forcefully displace people. Those who are affected sometimes have to be evacuated. This implies that they have to live in an environment and probably live with people they may never have met, known, or lived with all their lives. When this is the case victims will have to devise new coping mechanisms. It is also pertinent to note that some low-income earners who live in the city of Lagos may go for old dilapidated buildings because they cannot afford to pay for better accommodation in a good location. More so some survivors might even have to move to uncompleted buildings because of their inability to pay for accommodation and this further increases the vulnerability of victims. Children of survivors might make the streets their home and soon become social miscreants.

Economic Impacts

Economic impacts of building collapse include loss of personal property, goods, and lifetime investment of owners and users. Akande et al note that property destroyed as a result of synagogue building collapse were in millions⁴⁷. It is also important to note that the cost of building the structure is a loss to owners because collapse building (s) could be the only source of income for the owner. All this will in turn directly affect the household economy and this is made

⁴⁶ Mnia, E.U., Patrick, N and Unyime, I. "Incessant Collapse Of Buildings In Nigeria: The Implications for Religious/ Worship Centres" International Journal of Civil Engineering, Construction and Estate Management. 6, no. 2(2016):17-24 accessed July 7,2019.
<https://www.eajournals.org/wp-content/uploads/Incessant-Collapse-of-Buildings-in-Nigeria-The-Implications-for-Religious-Worship-Centres.pdf>
___Published by European Centre for Research Training and Development UK

⁴⁷Akande B. F., Debo-Saiye B., Akinjobi S D., Alao T. O. and Akinrogunde O. O. Causes, Effects and Remedies to the Incessant Building Collapse in Lagos State, Nigeria. International Journal of Basic & Applied Sciences IJBAS-IJENS 16, no.4 (2016)):15-30 accessed Aug,10, 2019 http://ijens.org/Vol_16_1_04/167703-1604-1818-IJBAS-IJENS.pdf

worse when victims do not have anything to fall back on. The nation's economy is also indirectly affected. Apart from this, survivors who have been made physically challenged by building collapse might lose their jobs due to disability and subsequently lose their sources of income. Relatives of survivors might also spend a lot of money in seeking legal action against owners of the building or construction engineers.

Health impact

Another source of concern is the impact of the dust raised during the collapse of mighty buildings on the respiratory health of individuals. When buildings collapse it can increase the chances of victims having a respiratory disease⁴⁸.

Research method

This study adopts both quantitative and qualitative approaches in answering the research question. This involved the use of questionnaires to collect data for the study as well as an interview guide to elicit information during the in-depth interview. The sample considered were victims, eyewitnesses of building collapse as well as professionals in building within Lagos State. Lagos State was selected for the study because of the high rate of building collapse in the state⁴⁹. The questionnaire was developed from literature and pre-tested with experienced sociology experts. This enabled the researchers to make corrections to the questionnaires before it was administered. Purposive and snowball sampling technique was used. 150 copies of the questionnaire were distributed and 150 questionnaires were used for the study. Descriptive and inferential statistical analyses were conducted. The responses from the in-depth interview were analyzed based on the objective of the research. A scale of 1 (Strongly disagree) to 5 (Strongly agree) was adopted to evaluate the factors that cause building collapse and the effects of building collapse on victims of building collapse. Mean scores were used to rank the significant reasons and effects of building collapse.

Analyses and Discussion of Findings

Table 2.

Distribution of respondents by age	Frequency	Percent
18-25	48	32
26-35	24	16

⁴⁸ Gavett S H. "Physical Characteristics and Health Effects of Aerosols from Collapsed Buildings". Journal Aerosol Medicine. Spring 19 no.1(2006):84-91, accessed Feb 11, 2021 https://cfpub.epa.gov/si/si_public_record_Report.cfm?Lab=NHEERL&dirEntryId=114665

⁴⁹ Omenihu, Onundi and Alkali, An Analysis of Building, 134

36-45	57	38
46 and above	21	14
Total	150	100

Source: Researchers' field survey

The analysis of data reveals that 32% of the respondents are between 18-25years, 16% are between 26-35years, 38% of the respondents are between the ages of 36 to 45 years and 14% were above 46 years. This implies that the respondents are mature and can respond to the questionnaire.

Table 3

Distribution of respondents by educational qualification		Frequency	Percentage
	SSCE	15	10.0
	National diploma	15	10.0
	Bachelor degree	85	56.7
	MA or M.Sc.	20	13.3
	Ph.D.	15	10.0
	Total	150	100.0

Source: Researchers' fieldwork

The results also showed that 57% of the respondents had Bachelor's degree, 13% had a Master's degree while 10% of respondents had a Ph.D. Respondents with Diploma were 10% and those with Secondary certificates were 10%.

Table 4

Distribution of respondents by gender		Frequency	Percentage
	Male	60	40
	Female	90	60
	Total	150	100

Source: Researchers' field survey

It is important to note that 60% of the respondents were females while 40% were males. This shows females were readily available to respond to the questionnaire.

Table 5: Causes of Building collapse

Causes of building collapse	Mean	Rank
Poor workmanship	5.20	1
inadequate understanding of the construction process	5.04	2
Insufficient design information	4.95	3
Inadequate construction laws and regulations	4.77	4
Corruption	4.75	5
Substandard materials	4.75	5
Late design changes	4.65	7
Lack of soil suitability test	4.57	8
Inadequate monitoring by government agencies	4.48	9
Conflicting design information	4.43	10
Poor specification of materials	4.41	11
Lack of maintenance of the building.	4.29	12
Overcrowding	4.09	13

Source: Researchers' field survey

Table 5 shows the causes of building collapse with poor workmanship ranking first while poor understanding of the construction process ranked second. Other factors ranking 3rd, 4th, 5th, and 6th are insufficient design information, inadequate construction laws and regulation, corruption, and substandard materials respectively. Poor workmanship is a result of inadequate training of construction workers. Studies such as Omenihu et al and Kukoyi et al highlight the need for the retraining of construction workers^{50,51}. This will enable construction workers to understand the construction process and to work healthily and safely⁵². Inadequate construction laws and regulations encourage clients to engage individuals that are not qualified to conduct construction activities.^{53,54} Omenihu et al and Asante and Sasu reiterate that inadequate construction laws and regulations affect construction industry performance. All factors have a mean above 5 (Five) this implies that all the factors are significant. Inadequate monitoring by government agencies, conflicting design

⁵⁰ Omenihu, Onundi and Alkali, An Analysis of Building,131.

⁵¹ Kukoyi, P.O and Smallwood, J. "A Qualitative Study of Health and Safety (H&S) Construction Practices in Lagos". Journal of Construction Business Management1, no.1, (2016) :1-7.

⁵² Mnia, E.U., Patrick, N and Unyime, I. "Incessant Collapse Of Buildings In Nigeria: The Implications for Religious/ Worship Centres" International Journal of Civil Engineering, Construction and Estate Management. 6, no. 2(2016):17-24 accessed July 7,2019. <https://www.eajournals.org/wp-content/uploads/Incessant-Collapse-of-Buildings-in-Nigeria-The-Implications-for-Religious-Worship-Centres.pdf>

___Published by European Centre for Research Training and Development UK

⁵³ Ibid., 114.

⁵⁴ Asante, L.A and Sasu A. "The Challenge of Reducing the Incidence of Building Collapse in Ghana: Analyzing the Perspectives of Building Inspectors in Kumasi", Sage open 8 no.2(2018):1-12 DOI: 10.1177/2158244018778109.

information, and poor specification of materials, and lack of maintenance of the building are important factors that can lead to building collapse ⁵⁵, ⁵⁶.

Table 6: Effects of building collapse

Effects of Building collapse	Mean	Rank
Loss of money and investment	5.04	1
Loss of lives	5.00	2
Post-traumatic stress disorder	4.74	3
Increases family dislocation	4.71	4
Impact generally on well being	4.64	5
A high cause of disability	4.63	6
Affects the economy of the nation	4.44	7
A source of insecurity for families	4.44	7
Loss of human capital	4.39	9
Leads to new social formation	4.35	10

Source: Researchers' field survey

Table 6 shows that loss of money and investment ranked first among the effects of building collapse in Lagos state. However loss of lives ranked 2nd with post-traumatic stress disorder ranking 3rd. Other effects include family dislocation which ranked 4th and the last in the rank is 'leads to new social formation' which is the 10th. Building collapse is an established source of immortality⁵⁷. All the factors have a mean that exceeds 4 which shows that all the factors in table 6 are significant.

The interview section also gave insight into the dynamics of building collapse in Lagos. A respondent when asked about the causes of building collapse in Lagos, states thus: "the problem with most buildings here is a foundation. Most buildings here lack good foundations and more so they are weak. Most times the soils are not tested before a structure is put on it" He goes on to narrate his experience; "God saved me and my family from death. The house we rented before we came to where we are now would have collapsed on us. The house was a story building, it was caving and it had cracked from up down to the foundation. If I was not proactive it would have collapsed on us. Before it collapsed we had to quickly move out" ⁵⁸.

However, another participant reiterated the causes of building collapse in Lagos Island that: "We have building collapse here on the Island because there is high demand for accommodation especially for those who work on the Island and just need a place to sleep for the week and then go home during the weekend. These people make many apartments overcrowded. More so Landlords seeing

⁵⁵ Asante and Sasu, The Challenge of Reducing the Incidence of Building Collapse in Ghana, 10

⁵⁶ Mnia, E.U., Patrick, N and Unyime, I. "Incessant Collapse Of Buildings In Nigeria, p 114.

⁵⁷ Chendo and Obi, Building Collapse in Nigeria, 47.

⁵⁸ Interview with a building Engineer, April 20, 2021.

high demand for apartments for both offices and residential purpose convert their houses to meet the need of people”⁵⁹.

Another respondent added that “most bungalows are now housed with two floors while 2-floor buildings are raised to three or four floors. Most apartments are renovated to create more apartments. Accommodation is expensive now in Lagos so Landlords make a lot of money forgetting that the building will be overwhelmed with load because that was not the original design from the foundation”⁶⁰. A participant also stated that “the economic hardship make some people go for low-cost houses that are already weak and sometimes have been marked for demolition by Government agencies”⁶¹

Corroborating this view another participant and Engineer said that: “Most houses in the Island are not strong because of the press to minimize cost by Landlords. They give the work to unqualified persons who do not have expertise in building. Sometimes the contract of the building may be given to a developer and because he wants to maximize profit and cut cost decides to use substandard materials. Where the developer is supposed to use 5bags of cement he might use 2bags or where he is supposed to use 25mm iron rod he might use 16mm. All these will affect the composition of the building and it will not be able to withstand the pressure that it will be subjected to when complete”⁶²

Still, on the cause of building collapse, a participant stated that; “bribing is too much everywhere in Nigeria. You know the soil in the Island area is sandy and the water there is salty because of this stockpiling is important and some processes that are capital intensive has to be taken at the foundation level especially but developers and owners bribe concerned building officials who are supposed to ensure quality control. Hence they bypass regulations and get a permit for what is not in place”⁶³. However, another participant stated that “Some developers do not adhere to rules and guidelines”⁶⁴ A respondent also states thus: “that the level of corruption in the country make people cut corners. Enforcing the law is hard. Another thing is that people don’t build the design that has been approved for them and when town planners go for inspection they find a way around it”⁶⁵

Apart from this, another respondent giving a historical perspective to the cause of building collapse in the Island expressed that “Lagos Island is a village caught up with modernization. Most of the buildings here on the Island are very old houses made with mud as modernization and civilization crept in with more

⁵⁹ Interview with a participant in Lagos Island, April 20, 2021.

⁶⁰ Interview with a worker in the Island, April 2021.

⁶¹ Interview with a worker on the Island, April 23, 2021

⁶² Interview with a building engineer, April 20, 2021.

⁶³ Interview with a building engineer, April 24 2021.

⁶⁴ Interview with a building engineer, April 24, 2021.

⁶⁵ Interview with a community worker, April 2021.

people coming into the Island for business purposes there was and still increasing need to also give a modern outlook to the houses. This is what brought about most of the mud houses being coated with concrete. Developers seeing the upsurge in the need for apartments for both residential and commercial purposes approached many families for them to develop their houses on a contract where the developers will use their money to restructure the houses. Some of these houses were raised to 2, 3, 4, 5 story buildings as the case may be neglecting some structural ethics because of their selfish interest. The developers will collect the rent for some years or make the house into four-story buildings leaving one apartment for the families until the developers make the agreed money on the building. Though these old houses are reinforced, they later collapse”.⁶⁶

A participant also stated that old age and conversion of buildings from residential to commercial (in areas like Oke Arin, broad street, Idumota in Lagos Island⁶⁷) are reasons for many building collapses. This is because many of the buildings carry loads beyond their capacity. A building having two three floors could have about 10 to fifteen generators owned by traders and all will be working at the same time of the day on all the floors. This weight most times were not put into consideration while building or reconstructing the houses. The weight and the vibrations of these generators will cause strain and stress for the building⁶⁸.

An eyewitness of the last building collapse that occurred at No. 7 Saidu Okeleji street off Alaro street Meiran, in Abule Egba area stated thus that “.... the place is a waterlogged area and the house has been decked for long. The house owner wanted to continue the building to the first floor, while he poured sand and other materials to continue the building the weight brought down the building killing two people.....the foundation is weak and the house had been soaked by the constant water that is like a stream beside the house. It was a devastating incident that left everyone around perplexed. It was overwhelming for even the victims’ family”⁶⁹

Another eyewitness narrated her experience of how her neighbour’s house collapsed beside her house at Moses Emmeya street at Abule Egba; “the building is an old one and had had cracks for long from the decking up to the lintel but nothing was done about it. The house is story-building and my neighbour had already told me that part of the pillar of the toilet upstairs had already fallen. Then on this particular day, no one was in the house except for a woman who sells in the shop downstairs. All that happened before the collapse was a loud noise and half of the house from up to the ground floor collapsed. No

⁶⁶ Interview with a community secretary.

⁶⁷ This places are core business areas in Lagos Island.

⁶⁸ Interview with resident in Victoria Island.

⁶⁹ Interview with a resident in Meiran. Abule Egba, Lagos.

life was lost but properties were damaged and goods belonging to the woman who sells in the shop were all destroyed”⁷⁰

On the effects of building collapse on individuals and the nation a building engineer stated that: “apart from the loss of lives, and investments, building collapse constitute a burden to the government because they have to cater for the casualties and have to move victims out of the debris. It impacts the Lagos state as a whole because the incessant collapse of a building can discourage investors. Constant building collapse can be seen as a sign of government weak laws and regulations”⁷¹. On the effect of building collapse a respondent and a resident in Abule Egba stated, “when a part of a building collapse and nothing is done to bring down the remaining part of the building then it becomes a hiding place for miscreants and hoodlums thereby making the environment unsafe”⁷². Other respondents also stated that the effect of building collapse to individuals include loss of lives, loss of skilled men, land ownership, bodily damage, and loss of financial resources while the state losses of human capital, waste of man-hours to clear the debris, and waste of man-hours in traffic where building collapse is close to a major road.

Conclusion

The purpose of this present research is to ascertain the factors responsible for the frequent building collapse experienced in Lagos Nigeria and to explore the effect of building collapse on victims and society. The study revealed that poor workmanship; inadequate understanding of the construction process, and inadequate construction laws and regulations are the foremost reasons for building collapse. This finding is in tandem with that of those who asserted that lack of adherence to building laws is a significant cause of building collapses in Africa.⁷³

The findings of the study on one hand indicate that adequate training of construction workers is vital. In addition, the government should establish policies to enhance professionalism in the construction sector hence, eradicating ‘quackery’ in the construction industry. Adequate construction laws and regulations tailored towards the construction industry will reduce the menace of building collapse in Nigeria. Corruption, use of substandard materials, and late design changes are also factors that cause building collapse. Apart from this, it was discovered from the study that adding more structures

⁷⁰ Interview with a resident in Abule Egba where a building also collapsed.

⁷¹ Interview with a building Engineer at Abule Egba April, 2020.

⁷² Interview with a resident in Abule Egba, April, 2021

⁷³ Mnia, E.U., Patrick, N and Unyime, I. “Incessant Collapse Of Buildings In Nigeria: The Implications for Religious/ Worship Centres” International Journal of Civil Engineering, Construction and Estate Management. 6, no. 2(2016):17-24 accessed July 7,2019. <https://www.eajournals.org/wp-content/uploads/Incessant-Collapse-of-Buildings-in-Nigeria-The-Implications-for-Religious-Worship-Centres.pdf>

—Published by European Centre for Research Training and Development UK

to an old weak building may lead to collapse. The study also shows that houses that have been built over a long time or are in a swampy place stand a chance of becoming weak. It is therefore imperative for monitoring agency to stop builders or owners from adding to such structures.

On the other hand, loss of money and investment is the most mentioned effect of building collapse on victims. Respondents agreed that victims lose money and investment. Lives are also lost during and after building collapse. In addition, post-traumatic stress disorder ranked third. Research from the study of Taiwo and Afolami⁷⁴ reveals that loss of money and investment and loss of lives can lead to stressful moments for victims hence stakeholders in social welfare should enlighten the public on the need to seek counsel when faced with social issues/problems. The study shows that the state also loses human capital, man-hours to evacuate people as well as clear the debris. Findings from the study also indicated that partially collapsed buildings constitute security challenge as it becomes a hideout for hoodlums and those involved with hard drugs. It is therefore important for the government to engage a monitoring team so that such buildings are pulled down. Increased family dislocation is also one of the effects of building collapse hence the need for government to make policies that will encourage adequate support systems for victims. There is a need for future research on the cost of building collapse in the state. The information presented in this study can be used to improve strategies for providing an adequate support system for building collapse victims in Nigeria.

⁷⁴ Ibid., note 40