ANALYSIS OF THE IMPACT OF BUILDING COLLAPSE RISKS IN THE NIGERIAN ECONOMY

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ABSTRACT
The study examines the impact of building collapse risks in the Nigerian economy. Survey research design was adopted in carrying out the research and five cities in Nigeria were chosen (Abuja, Ibadan, Port Harcourt, Owerri and Lagos). The choice of those cities was based on frequency of building collapse, population pressure and concentration of building activities. The target population for the study is made up of the key professionals in the Nigerian construction industry, stakeholders, clients and developers. A sample size of 1999 was chosen using Taro Yamane method. Data generated from 1860 respondents representing 93 % of the distributed questionnaires were presented using frequency tables, pie –charts and bar charts, while analysis was done using percentages and weighted mean. The findings of the study show that building collapse risks have multifarious factors which were categorized as Economic/Financial risks, Socio-political risks, Human related risks, Physical risks, Environmental risks and Law/legal risks. The negative effects of these risks are: Loss of lives, loss of property, professionals marketability to foreign firms has been devalued, environmental damage and structural damage. It was also discovered that human related risks have predominant effect in the Nigerian economy, while law/legal risks have the least effect. The study recommends that there should be adequate funding and monitoring of the activities of all emergency services such as National Emergency Management Agency (NEMA), State Emergency Management Agency (SEMA), Local Emergency Management Agency (LEMA), Red Cross Society, Fire Services, and NGOs among others.

KEYWORDS: Building Collapse, Building Collapse Risks, Nigerian Economy, Socio-Economic Development, Millennium Development Goals (MDGs).

INTRODUCTION

The place and priority of buildings to man's existence and survival as he lives and carries out his activities within them is unquantifiable and very important. Buildings are also major contributors to every nation's sustainable development. The construction sector of any nation is important for its socio-economic development and plays a crucial role in the quality of life of its citizens. However, the contribution of buildings to Nigeria's development and socio-economic development of its citizens has not yielded the desired results due to building failures, abandonment, building collapse and the associated risks that have been frequently witnessed in different parts of the country. In the past 30 years, there have been multiple incidences which have resulted in avoidable loss of lives, destruction of property and other valuable resources.

Building collapse is a phenomenon characterized by the compromise in the structural integrity of a building's component elements, resulting in its eventual failure. Structural failure refers to the loss of load carrying capacity of a structural component or structure itself that is failure of the structural component to perform as designed (Bala, 2017). This failure in many cases renders the building unsafe for habitation or continuation of construction activities and could eventually lead to collapse, damage to property and loss of lives

Building collapse risk can be described as an event or action that could cause negative impacts or consequences on the building users, investors, stakeholders and the general public, and hence affect the project objectives. From this perspective, building collapse risks can be observed as "threats to success". In the pre-colonial period, building construction was carried out by our fore fathers with local building materials and the type of buildings prevalent within the period are mud houses, with thatched roofs. Within this period, there were no sophisticated and complex buildings like block of flats, maisonettes, high-rise buildings etc. What was obtainable are bungalows hence, there were no recorded cases of building collapse.

In the post-colonial period especially within the period of oil boom (1970s), the building construction industry witnessed a boom and many building construction projects were carried out. During this period also, improvements in the technological know-how, economic development and industrialization led to the improvement in the building construction processes and procedure. The sophisticated nature and complexity in modern building designs introduced various lines of risks in building development process instead of eliminating or removing them. These new designs and technology associated with different types of risks could lead to building failures, abandonment and collapse. Hence, from the period of oil boom to the present day, Nigeria has witnessed many cases of building collapse in different parts of the country. The frequency of building collapse in Nigeria in recent past has become a major issue and concern in her economic ratings. The spate and frequency of occurrence has become major source of concern not only to the government but to all well-meaning Nigerians and stakeholders in the building industry.

Previous researches show that there were spikes in the reported cases of building collapse in Nigeria in the years 1985, 1995, 1999, and 2005, and also suggests an upward trend in the number of cases of building collapse in the year 2010 (Windapo and Rotimi, 2012). The Council of Registered Builders of Nigeria (CORBON, 2016) identified 104 incidences of building collapse based on available records in Nigeria spanning from 1974 – 2016. These observations are astonishing and most worrying.

In order to tackle the cases of building collapse and the associated risks, the Nigerian government at different periods made Laws to guide the building development to curb the menace and risks associated with building collapse. In 1992, the government enacted the Nigerian Urban and Regional Planning Act No. 88 of 1992 to facilitate the preparation and implementation of development plans and planning scheme with a view of establishing a better environment for living, working and recreation. Apart from the above general aim, the Act was also meant to give more seriousness to development control among other specific objectives. Also in 2018, the Federal Republic of Nigeria announced a new National Building Code that will regulate construction with the aim of improving on measures to safeguard lives and property in the country. This has not yielded the desired result as most states in the country have not passed the Urban and Regional Planning Law to make the new National Building Code operational in their respective states. Building code is a set of legal requirements of which the purpose is to promote good practice in design, construction and maintenance of buildings in the interest of the health, safety and welfare of people using the buildings. The code sets out the basic requirements for the design and construction of building which represents a code of good building practice.

In spite of 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, the catastrophic 2014 Synagogue Guest House, Jos School Building (2014), 3- Storey building in Maryland Enugu (2015), 5-Storey Lekki Building under construction (2016), Reigners Bible Church in Uyo (December, 2016) and the recent collapse of 4-Storey Building at No.3 Massey Street, lagos Island (July, 2017), a storey building in Apo Mechanic Village Abuja (July, 2017), 3-

Storey building in Umuguma, Owerri (July, 2017), One storey building at Olomore area of Abeokuta (July,2017), 3-Storey building in Richard Abimbola Street, Ilasa lagos (May, 2017), 4 – storey building at Owelle Aja Layout, Obosi (July 17, 2018) and 4 – storey building at Jabi, Abuja (August 16, 2018) point to evidence.

The above scenario mars the ability of the building industry to perform its role as one of the major contributors of the nation's Gross Domestic Product (GDP). The building collapses which frequently occur in the building industry usually put fears on would be investors thereby deterring and affecting their investment morale. According to Nwachukwu (2016), building construction projects must be made to succeed because its execution often involve substantial funds, loss through failure or collapse has crippling effect on the capabilities of the investors, the financiers and for the fact that scarce resources are tied down for a long time as opportunity cost for its alternative uses. He went further to state that the project may also be the only future hope of the client; therefore he expects nothing but success. . This situation calls for further research on the issue of risks associated with building collapse, and what could be done to forestall the present situation.

LITERATURE REVIEW

In recent times, building collapse in Nigeria has been a source of concern to so many people particularly those associated with the construction industry. This is so because there are so many cases of building collapse all over the world and particularly in Nigeria. Most of these cases had resulted into colossal economic losses in terms of lives and property. The cases of building collapse are some of the cardinal issues, which have created serious concern to all the professionals in the building industry such as the Architects, Engineers, Builders, Quantity Surveyors, Estate Surveyors and Valuers, Town Planners and Land Surveyors. The government is also worried about the frequency of collapse of buildings in Nigeria. However, Aderibigbe (2001) in his study admitted that the reoccurring event of building 9collapse has forced some state governments to enforce and enact some laws recommending forfeiture of such buildings and prosecution of their owners. Below is Table 1 showing some reported cases of building collapse in Nigeria from 2009 till date.

Table 1: Some reported cases of Building collapse in Nigeria from 2009 – 2018.

S/No	Location	Building Type	Date	Cause of collapse	Casualties
1	Ogbomoso Oyo State	6-Storey LAUTECH Teaching Hospital Complex	February, 2009	Use of substandard materials Poor workmanship/ Supervision	5 died
2	Aghaji Crescent, GRA Enugu	A fence wall	August, 2009	No proper drainage	1 died
3	Oke Padre St Ita Morin, Abeokuta	Uncompleted Building	October, 2009	Substandard materials, Hasty construction	3 died, 11 injured
4	Isopakodowo St., Cairo Oshodi, Lagos	Building under construction	April, 2010	Use of substandard materials	4 died, 12 injured
5	Adenike St., Off New market, Oniru Estate, Lagos	Uncompleted storey building	June, 2010	Substandard materials, Non-compliance with approved building plans and weak structure	1 died, 2 injured
6	Ikole St. Area 11, Abuja	Uncompleted 3-Storey Building	August, 2010	Undisclosed	5 died, 40 trapped

7	24 Alli Street V.I. Lagos	4-Storey Building	September, 2010	Structural defects/overloading	3 died
8	Maraba, Abuja	2-Storey Zenith Bank Building	2011	N/A	N/A
9	Pape, Abuja	4-Storey Hospital Building	2011	N/A	N/A
10	11 Aderibigbe St, Maryland Lagos	5-Storey Office Complex with a Pent house	2011	Structural failure, Gross serviceability limit violation	Nil
11	Adenubi Close, Ikeja Lagos	5-Storey Hotel Building	2011	N/A	N/A
12	16 Nnobi Str. Uwani Enugu	3-Storey Block of Flats	2012	Structural defects	N/A
13	Awka, Anambra State	One storey residential building	2012	Defective materials	N/A
14	Owerri, Imo State	3-Storey Block of Flats in a water logged area of Owerri	2012	Flooding	N/A
15	Agbama Estate, Umuahia, Abia State	Four storey Block of Flats at Agbama Estate, Umuahia	2012	Non-adherence to building Regulation that permits only 2 floors in the area	Undisclosed number of squatters Perished
16	Abanye Street Onitsha, Anambra State	4-Storey commercial building collapsed during a downpour.	2013	Heavy Rainfall/flooding	N/A
17	Bukuru, Jos South LGA	2-Storey School Building	September, 2013	Structural failure, Violation of Original approved plan	10 died
18	Oloto Street, Ebute Meta Lagos	3-Storey building	July, 2013	Dilapidated structure	7 died
19	House No.12 Hadeja Road Kaduna	Old 3-Storey Building	July, 2013	Old and dilapidated	3 died
20	Ikotun Egbe, Lagos	6-Storey Synagogue Guest House Building	September 2014	Structural failure	116 died 100 injured
21	Maryland, Enugu	3-Storey Building Under construction	April, 2015	Unknown	Nil
22	Dolphin Estate, Ikoyi Lagos	Residential building of Senior Politician	July, 2015	Gas Explosion	3 injured
23	Ebute Meta Lagos	3-Storey Building	July, 2015	Weak Structure	Nil
24	Oduma, Aninri LGA, Enugu State	St Anthony Catholic Church, Oduma	2015	Unknown	5 died
25	Lekki Gardens	5-Storey building	March, 2016	Violation of approved	34 died

	Lekki Phase 1, Lagos State	Under construction		number of floors	
26	Itoku Market, Abeokuta, Ogun State	4-Storey Shopping Plaza	May, 2016	Under investigation	1 died
27	444 Crescent, Citec Villas, Gwarimpa, Abuja	Six Storey Hotel Building	August 26, 2016	Poor quality materials	Five trapped
28	Uyo, Akwa Ibom State	Reigners Bible Church, Uyo	December, 2016	Poor materials	60 died, Many injure
29	Nkpokiti Estate, Enugu	2-Storey building	March 24, 2017	Not disclosed	2 site workers injured
30	Richard Abimbola St. Ilasa, Lagos	3-Storey Building	May 29, 2017	Unknown	N/A
31	3 Massey St. Lagos Island	4-Storey Building	July 25, 2017	Not disclosed	6 died
32	Apo Mechanic Village Abuja	A storey building	July, 2017	Not Known	4 trapped
33	Hospital Junction, Umuguma, Owerri	3-Storey building Hotel Extension	July 7, 2017	Unknown	Unknown
34	Ulakwo Junction, Owerri North LGA, Imo State	Four & three Storey buildings under construction	July, 2017	Not ascertained	Unknown
35	Oforola, Owerri West LGA, Imo State	A storey building	July 8, 2017	Unknown	3 died
36	Fire Service/ Mbaise Road, Owerri	2- Storey Building	August 13, 2017	Unknown	4 died
37	9 Egbu Road, Owerri	3-Storey building	August 13, 2017	Unknown	3 died. 6 injured
38	31 Ilufe Street Ojo Alaba, Lagos	A residential building	August 28, 2017	Unknown	Nil
39	Owelle Aja Layout, Obosi, Anambra State	4-Storey building	July 17, 2018	Substandard Materials, Under the rain and sun for many years, originally had foundation for two floors and later two extra floors added.	Nil
40	Jabi, FCT, Abuja	4- Storey building	August 16, 2018	Substandard materials	2 died and many trapped in the rubbles
41	Ifite Awka, Anambra State	3 - Storey Building	October 2018	Substandard material	Nil

42	Okpuno, Otolo in Nnewi, Anambra State	3 – Storey Building	October 18, 2018	Substandard materials	Nil
43	Woji Road, GRA Phase 2, Port Harcourt, Rivers State	7 – Storey Building	November 23, 2018		5 died and more still trapped inside

Source: (Ayedun et al 2012, Windapo and Rotimi 2012, Oloke et al 2017 & News 2018

The negative impact of building collapse risks on the socio-economic development of our economy is obvious. Ede (2010) observed that many precious lives are lost and the nation looses the contributions that could have come from these victims towards the socio-economic growth of the nation. In addition, this increasing rate of death from building collapse in Nigeria runs against the United Nation Millenium Development Goals (MDGs) programs aimed at reducing the mortality rate and improving safety and life expectancy of the world population.

Akande, Debo-Saiye, Alao and Akinrogunde (2016) in their study identified the following as the effects of building collapse: Abrupt loss of lives and properties, Waste of properties, Discouragement of property development and Scarcity of property. Windapo and Rotimi (2012) in their study on contemporary issues in building collapse and its implications for sustainable development opined that due to rate of building collapse in Nigeria, current construction practices are unsustainable and not in alignment with ideal sustainability principle.

Several researchers agreed that building collapse cause a lot of havoc in the built environment. Hence, the need to find a solution to mitigate this ugly incident calls for serious attention. The need for a functional Building Code that enforced against all odds has always been canvassed for at the end of every occurrence. After a short while, the clamour dies down until another collapse occurs. Then the canvassers will return to the drawing board.

The consequences of building collapse are enormous and these had been identified by several researchers such as Ede (2013), Oke (2011), Nwafor (2015), Chendo and Obi (2015), Olumide (2012), Dimuna (2010), Janssens, Dermot and Marios (2010), etc. Janssens et al (2010) in their study on building failure consequences classified the consequences resulting from a building failure into three groups: Economic, Human and Environmental consequences. For the purpose of this study building collapse risks could be classified into six groups: Economic/Financial risks, Socio-Political risks, Human related risks, Environmental risks, Physical risks and Law/Legal risks.

Economic/Financial Risks: Economic/Financial risks can be described as building collapse risks associated with money. These risks include: Loss of property, Loss of annual income/capital investment, Loss of materials, Bankruptcy of the investor/developer, Decrease in the contributions of real estate sector to the nation's GDP, Loss of investment, Increase in the cost of maintenance, Shortage in the supply of real estate facilities, Clean up costs, Rescue costs, Cost of investigation/compensation, Treatment of injured people, Cost of rebuilding/repair, Cost of loss of functionality, Cost of replacement/repair of its contents, Cost of temporary relocation, Regional economic effects, Waste of resources, time and labour, Cost of legal dispute, etc.

Socio-Political Risks: The sub-risks under this category include: Loss of reputation and integrity of the contractors, Psychological trauma and shocks, Loss of new commission and contracts, Withdrawal of practicing licenses, Loss of trust, Discourages investment in property development, Loss of jobs, Scarcity of property, Loss of prestige of the owner, Shortage of manpower, De-marketing the values of industry professionals, Portrays Nigeria building industry as being corrupt, Professionals marketability to foreign firms/clients has been devalued, etc.

Human Related Risks: These are building collapse risks that directly affect human beings/human lives. They include: Loss of lives, Injuries, Disruption of educational activities, Loss of contributions from the victims towards the socio-economic growth of the nation, Increase in death rate against the United Nations Millennium Development Goals (MDGs), Leads the victims to permanent disability, Psychological damage (fear, helplessness, distress, depression and suicides), Disruption of economic activities, etc.

Environmental Risks: The Environmental risks in building collapse consist of: Provides hideout for robbers and hoodlums, Place of abode for dangerous animals like snakes, Environmental damage, Loss of functionality in the neighbourhoods, CO_2 Emission/Pollution, Reduction in the energy use, Increase in toxic emission, Environmental studies/repair, Loss of building aesthetic values, Degrading of the environment, etc.

Physical Risks: These are building collapse risks that are often associated with the physical nature of the building that collapsed. They include: Structural damage, Damage to contents, Loss of functionality, Replacement/repair of structure, Replacement/repair of contents, Temporary relocation, Loss of strength of the building, Shortage of manpower, Increment of sick citizens, Street blockage, Evacuation difficulty, Travel distance increment, Damage of materials beyond re-use, Loss of fauna and flora, etc.

Law/Legal Risks: Legal risks associated with building collapse include: Exasperation of crises among stakeholders, Legal tussle among stakeholders, Arbitration/Mediation to resolve crises arising from building collapse, Conflicts resolution, Apportioning blames and arbitrary words of mouth among the stakeholders, etc.

RESEARCH METHODOLOGY

Survey research design was adopted for the study. The study was carried out in five selected cities in Nigeria and they are Abuja, Ibadan, Lagos, Owerri and Port Harcourt. The study focused on the key professionals in the Nigerian construction industry and the stakeholders in the built environment. A sample size of 1999 was determined using Taro Yamane formular. The data for research were collected through questionnaires and personal observations, and analyzed using Statistical Package for Social Science (SPSS), version 23.

DATA ANALYSIS AND RESULTS

SOCIO-ECONOMIC CHARACTERISTICS OF THE RESPONDENTS

Table 2: Distribution and Return of Questionnaires

Response Option	Number Distributed	Number Collected	Unreturned
Professionals	1231	1146(57%)	85(4%)
Clients	384	360(18%)	24(1%)
Users	384	354(18%)	30(2%)
Total	1999	1860(93%)	139(7%)

Source: Field Survey, 2018

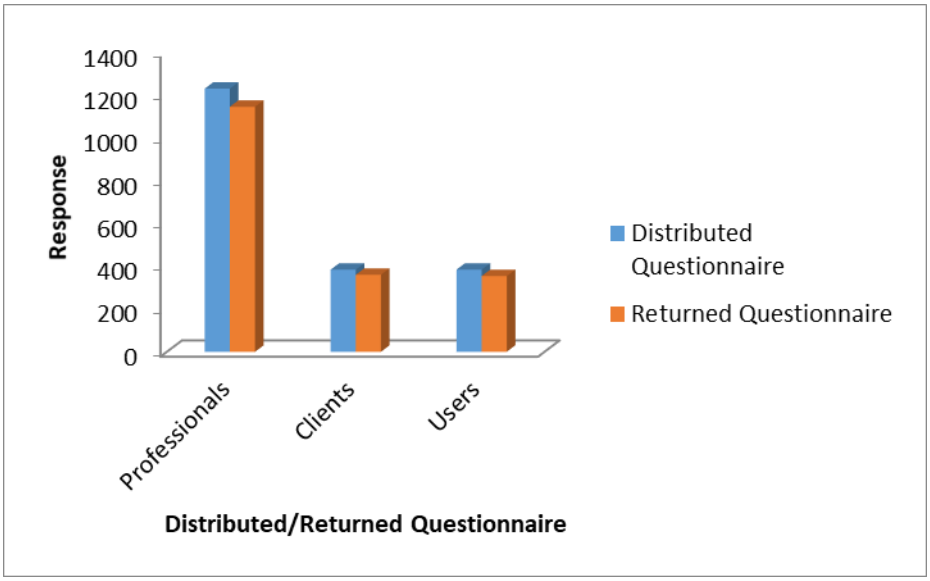


Fig 1: Response on Distributed/Returned Questionnaire

From the analysis in Table 2 above, it shows that 93 percent of the distributed questionnaires were returned while 7 percent of the distributed questionnaires were unreturned. This shows that high percentage of the distributed questionnaire was returned. The above response rate is adjudged high enough to be used and relied upon for data analysis.

Table 3: Age of Respondents

Age (years)	Number of Response
Less than 30	42 (2%)
31 – 40	192(10%)
41 – 50	410(22%)
51 – 60	821(44%)
61 and above	395(21%)
Total	1860(100%)

Source: Field Survey, 2018

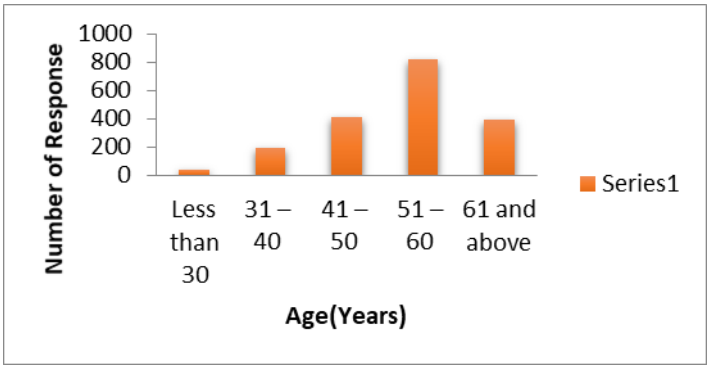


Fig 2: Response on Age

Table 3 shows that 2 percent of the respondents are less than 30 years of age, 10 percent are between the age ranges of 31-40 years, 22 percent are 41-50 years, 44 percent are within 51-60 years while 21 percent are 61 years and above. The above analysis shows that the majority of the respondents are between the ages of 31 and above. This shows that the majority of the respondents is enough to understand the problem of the study and therefore experienced to give adequate answers to the questions.

Table 4: Educational Qualification of Respondents

Response Option	Number of Response
First School Leaving Certificate	Nil
SSCE/GCE	28(1%)
ND/NCE	197(11%)
B.Sc/HND	1219(66%)
M.Sc	361(19%)
PhD	55(3%)
Total	1860(100%)

Source: Field Survey, 2018

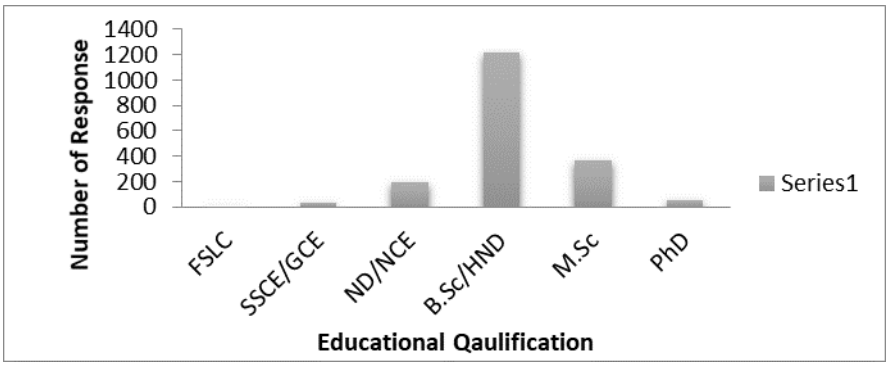


Fig 3: Response on Educational Qualifications

From the analysis in Table 4 above, it shows that 1 percent of the respondents are SSCE/WAEC holders, 11 percent are ND/NCE holders, 66 percent are B.Sc/HND holder, 19 percent are M.Sc holders while 3 percent of the respondents are PhD holder. The analysis shows that most of the respondents are B.Sc/HND holders. Therefore, it could be deduced from the data analysis that the majority (66%) of the total respondents have educational status of B.Sc/HND and were literate enough to understand and express ideas on the Impact of building collapse risks in the Nigerian economy other related issues in the study area.

Table 5: Status of Respondents

Response Option	Number of Response
Professional	1146(62%)
Client	360(19%)
User	354(19%)
Total	1860(100%)

Source: Field Survey, 2018

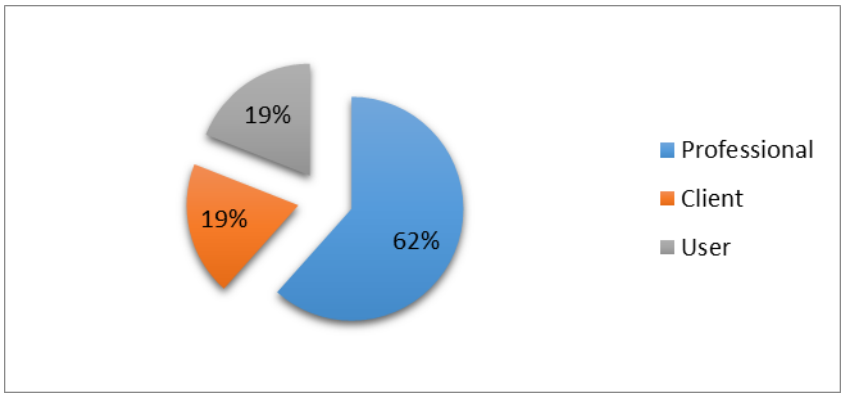


Figure 4: Response on status of respondents

The analysis in Table 5 above shows that 62 percent of the respondents are professionals, 19 percent clients while 19 percent are users. This shows that majority of the respondents are professionals. Therefore, it could be deduced from the data analysis that the information given by such professionals that form the majority in respondents status could be relied upon for data analysis while that of clients and users will compliment. **Table 6: Profession of Respondents (Professionals only)**

Response Option	Number of Response
Architects	275(24%)
Builders	197(17%)
Engineers	328(29%)
Quantity Surveyors	161(14%)
Town Planners	185(16%)
Total	1146(100%)

Source: Field Survey, 2018

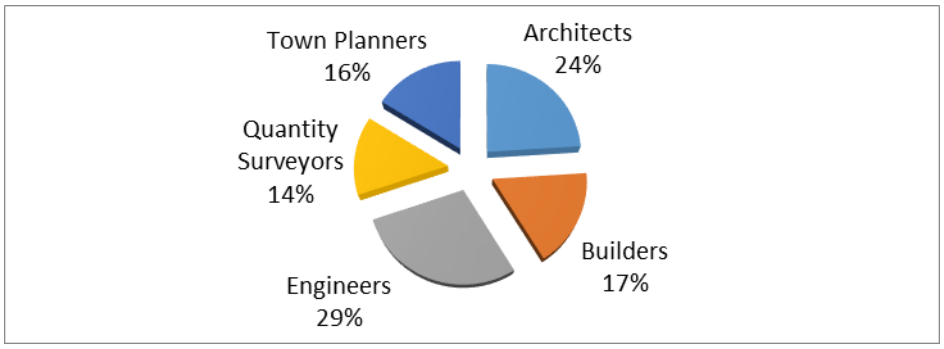


Figure 5: Response on Profession of Respondents

Table 6 shows that 24 percent of the respondents are Architects, 17 percent are Builders, 29 percent of the respondents are Engineers, 14 percent are Quantity Surveyors while 16 percent of the respondents are Town Planners. This shows that majority of the respondents are Engineers, followed by Architects, Builders, Town Planners and Quantity Surveyors which form the key players in the Built Environment.

Table 7: Working Experience of Respondents (Professionals only)

Response Option	Number of Response
Less than 5 years	15(1%)
6 – 10 years	198(17%)

11 – 15 years	405(35%)
16 – 20 years	381(33%)
21 years and above	147(13%)
Total	1146(100%)

Source: Field Survey, 2018

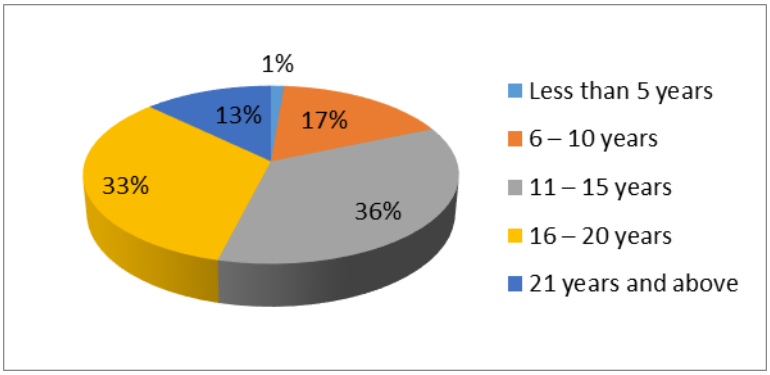


Figure 6: Response on Working Experience

The analysis in Table 7 shows that 1 percent of the respondents have work for less than 5 years, 17 percent of the respondents have working experience of 6-10 years, 36 percent have work for 11-15 years, 33 percent have working experience of 16-20 years while 13 percent of the respondents have working experience of 21 years and above. This shows that majority of the respondents have reasonable working experience in construction industry to understand the problem of the study and other related issues. Therefore, the information given could be used and relied upon for data analysis.

Effects of Building Collapse Risks in the Nigerian Economy

1. In your own opinion, state the extent of severity of the following identified Economic/Financial risks in the Nigerian Economy.

Table 8: Effects of Economic/Financial risks in the Nigerian economy

S/No	Economic/Financial Risks	Very Severe(5)	Severe (4)	Moderate (3)	Minor (2)	No injury (1)	Mean	Rank
1	Loss of property	1178(63%)	589(32%)	62(3%)	31(2%)	0	6.80	1st
2	Loss of annual income/capital investment	713(38%)	899(48%)	186(10%)	62(3%)	0	5.66	7th
3	Loss of materials	868(47%)	744(40%)	155(8%)	62(3%)	31(2%)	5.78	4th
4	Decrease in the contributions of real estate sector to the nation's GDP	620(33%)	899(48%)	217(312)	124(12%)	0	5.38	11th
5	Bankruptcy of investor or developer	496(27%)	806(43%)	434(23%)	124(6%)	0	5.05	15th
6	Loss of life investment	558(30%)	868(47%)	279(15%)	124(6%)	31	5.14	13th
7	Increase in the cost of maintenance	527(32%)	744(40%)	341(18%)	248(13%)	0	5.10	14th
8	Shortage in the supply of real estate facilities	589(32%)	713(38%)	341(18%)	186(10%)	31	5.23	12th

9	Clean up costs	713(38%)	713(38%)	279(15%)	155(8%)	0	5.63	8th
10	Rescue costs	744(40%)	496(27%)	465(25%)	155(8%)	0	5.79	6th
11	Cost of investigation/ Compensation	651(35%)	589(32%)	434(23%)	186(10%)	0	5.60	9th
12	Treatment of injured people	930(50%)	713(38%)	124(6%)	93(5%)	0	5.83	3rd
13	Cost of rebuilding/repair	992(53%)	744(40%)	93(5%)	31(2%)	0	5.97	2nd
14	Cost of loss of functionality	403(22%)	837(45%)	496(27%)	124(6%)	0	4.73	17th
15	Cost of replacement/ Repair of its contents	620(33%)	1085(58%)	155(8%)	0	0	5.55	10th
16	Cost of temporary relocation	403(22%)	899(48%)	465(25%)	93(5%)	0	4.92	16th
17	Regional economic effects	279(15%)	837(45%)	496(27%)	217(312%)	31	4.55	18th
18	Waste of resources, time and labour	868(47%)	713(38%)	155(8%)	93(5%)	31(2%)	5.75	5th

From the analysis in Table 8 above, it shows that Economic/Financial risks severely affect the Nigerian economy. The degree of the severity is shown by their mean values: loss of property- 6.80, followed by Cost of rebuilding/repair -5.97, treatment of injured people – 5.83, loss of materials -5.78, and Waste of resources, time and labour – 5.75, among others. The analysis concludes that in Economic/Financial risks, loss of property has the greatest effect in the Nigerian economy followed by, Cost of rebuilding/repair, Treatment of injured people, Loss of materials, Waste of resources, time and labour

2. How severe are the following Socio-Political Risks in the Nigerian Economy

Table 9: Effects of Socio-Political Risks in the Nigerian Economy

S/No	Socio-Political Risks	Very Severe(5)	Severe (4)	Moderate (3)	Minor (2)	No injury (1)	Mean	Rank
1	Loss of reputations and integrity of the contractors	1023(55%)	651(35%)	155(8%)	31(2%)	0	6.69	2nd
2	Psychological trauma and shocks	682(37%)	899(48%)	248(13%)	31(2%)	0	5.81	6th
3	Loss of new commission and contracts	589(32%)	961(52%)	186(10%)	62(3%)	62(3%)	5.48	8th
4	Withdrawal of practicing licenses	620(33%)	558(32%)	372(20%)	248(13%)	62(3%)	5.61	7th
5	Loss of trust	775(42%)	837(45%)	248(13%)	0	0	6.25	3rd
6	Discourages investment in property development	713(38%)	589(32%)	310(17%)	155(8%)	9362(5%)	5.97	5th
7	Loss of jobs	558(30%)	930(50%)	186(10%)	155(8%)	31(2%)	5.39	9th
8	Scarcity of property	434(23%)	775(42%)	279(15%)	310(17)	62(3%)	4.99	11th
9	Loss of	310(17%)	868(47%)	372(20%)	155(8%)	155(8%)	4.60	12th

	prestige of the owner							
10	Shortage of manpower	279(15%)	496(26%)	589(32%)	465(25%)	31(2%)	4.34	13th
11	De-marketing the values of industry professionals	434(23%)	837(45%)	279(15%)	217(12%)	93(5%)	5.30	10th
12	Portrays the Nigerian building industry as being corrupt	775(42%)	589(32%)	341(18%)	93(5%)	31(5%)	6.16	4th
13	Professionals' marketability to foreign firms/clients has been devalued	1116(60%)	465(25%)	186(10%)	93(5%)	0	6.81	1st

From the analysis above in Table 9, it shows that socio-political risks severely affect the Nigerian economy. The extent of the effect of socio-political risks in the Nigerian economy is shown by their mean values: Professionals' marketability to foreign firms/clients has been devalued – 6.81, followed by loss of reputations and integrity of the contractors – 6.69, loss of trust – 6.25, Portrays the Nigerian building industry as being corrupt – 6.16, Discourages investment in the property development -5.97, among others. It could be deduced from the analysis that Professionals' marketability to foreign firms/ clients has bee devalued tops the list of the socio-political risks that affect the Nigerian economy, closely followed byLOss of reputation and integrity of the contractors, Loss of trust, Portrays the Nigerian building industry as being corrupt, Discourages investment in the property development, among others.

4. **How severe are the following identified Human related risks in the Nigerian Economy**

Table 10: Effects of Human related risks in the Nigerian Economy

	Human Related Risks	Very Severe(5)	Severe (4)	Moderate (3)	Minor (2)	No injury (1)	Mean	Rank
1	Loss of lives	1240(66%)	403(21%)	62(2%)	155(8%)	0	7.10	1st
2	Injuries	1116(60%)	496(27%)	62(2%)	186(10%)	0	6.91	2nd
3	Disruption of educational activities	217(12%)	310(17%)	837(45%)	372(20%)	124(6%)		8th
4	Loss of the contribution from the victims towards the socio-economic growth of the nation	372(20%)	682(37%)	620(33%)	124(6%)	62(2%)	4.51	6th
5	Increase in	310(17%)	744(40%)	496(27%)	279(15%)	31(2%)	4.44	7th

	death rates against the United Nations Millennium Development Goals (MDGs)							
6	Leads the victims to permanent disability	589(32%)	806(43%)	372(20%)	93(5%)	0	5.31	3rd
7	Psychological damage (fear, helplessness, distress, depression and suicides)	558(30%)	806(43%)	434(23%)	62(2%)	0	5.09	4th
8	Disruption of economic activities	496(27%)	837(45%)	37262(20%)	15562(8%)	0	4.99	5th

From the analysis in Table 10 above, it shows the degree of the effect of human related risks in the Nigerian economy. The human related risks affect the Nigerian economy is mostly as indicated by the following mean values: loss of lives – 7.10, followed by injuries – 6.91, Leads victims to permanent disability – 5.31, psychological damage (fear, helplessness, distress, depression and suicides) – 5.09, Disruption of economic activities – 4.99, etc. The analysis shows that in human related risks, loss of lives has the greatest effect in the Nigerian economy. Others are injuries, leads victims to permanent disability, psychological damage (fear, helplessness, distress, depression and suicides), Disruption of economic activities, etc.

5. **How severe are the following identified Environmental Risks in the Nigerian Economy**

Table 11: Effects of Environmental Risks in the Nigerian Economy

	Environmental Risks	Very Severe(5)	Severe (4)	Moderate (3)	Minor (2)	No injury (1)	Mean	Rank
1	Provides hideouts for robbers and hoodlums	527 (28%)	806(43%)	279 (15%)	248 (13%)	0 (0%)	5.46	4th
2	Place of abode for dangerous animals like snakes	620 (33%)	775(42%)	248 (13%)	217 (12%)	0 (0%)	5.50	3rd
3	Environmental damage	744 (40%)	589(32%)	465 (25%)	62 (3%)	0 (0%)	5.83	1st
4	Loss of functionality in the neighborhoods	372 (20%)	868(47%)	341 (18%)	279 (15%)	0 (0%)	4.70	5th
5	CO_2 Emissions/Pollution	248 (13%)	713(38%)	496(27)	434(23%)	31 (2%)	4.42	8th
6	Reduction in the energy use	217 (12%)	465(25%)	744 (40%)	372 (20%)	62 (3%)	4.21	10th

7	Increase in toxic emission	248 (13%)	620(33%)	434 (23%)	496 (27%)	62 (3%)	4.38	9th
8	Environmental studies/repair	279 (15%)	403(22%)	651 (35%)	434 (23%)	93 (5%)	4.48	7th
9	Loss of building aesthetic values	341(18%)	930(50%)	372(20%)	124(7%)	93 (5%)	4.67	6th
10	Degrading of the environment	651	620	496	62	31 (3%)	5.75	2nd

The analysis in Table 11 above shows the effects of Environmental risks in the Nigerian economy. The degree of the effects of Environmental risks in the Nigerian economy is indicated by their mean values: environmental damage – Environmental damage – 5.83, followed by degrading of the environment – 5.75, place of abode for dangerous animals like snakes – 5.50, provides hideouts for robbers and hoodlums – 5.46, and Loss of functionality in the neighbourhoods – 4.70. From the analysis, it could be observed that Environmental risks affect the Nigerian economy moderately and least affected by reduction in the energy use.

How severe are the following identified Physical Risks in the Nigerian Economy

Table 12: Effects of Physical Risks in the Nigerian Economy

	Physical Risks	Very Severe(5)	Severe (4)	Moderate (3)	Minor (2)	No injury (1)	Mean	Rank
1	Structural damage	1209(65%)	496(27%)	124 (7%)	31 (2%)	0 (0%)	6.90	1st
2	Damage to contents	744(40%)	868(47%)	186(10%)	62 (3%)	0	5.98	4th
3	Loss of functionality	589(32%)	930(50%)	248(13%)	93 (5%)	0	5.73	6th
4	Replacement/repair of structure	744(40%)	899(48%)	155(8%)	31(2%)	31(2%)	6.09	3rd
5	Replacement/repair of contents	527(28%)	775(42%)	372(20%)	186(10%)	0	5.68	8th
6	Temporary relocation	465(25%)	868(47%)	434(23%)	93(5%)	0	5.60	9th
7	Loss of strength of the building	899(48%)	620(33%)	248(13%)	93(5%)	0	6.21	2nd
8	Shortage of manpower	341(18%)	434(23%)	558(30%)	434(23%)	93(5%)	5.36	11th
9	Increment of sick citizens	372(20%)	589(32%)	558(30%)	341(18%)	0	5.44	10th
10	Street blockage	279(15%)	806(43%)	496(27%)	248(13%)	31(2%)	4.78	12th
11	Evacuation difficulty	558(30%)	806(43%)	341(18%)	124(7%)	31(2%)	5.80	7th
12	Travel distance increment	186(10%)	558(30%)	651(35%)	434(23%)	31(2%)	4.34	13th
13	Damage of materials beyond re-use	620(33%)	713(38%)	310(17%)	124(7%)	93(5%)	5.81	5th
14	Loss of fauna and flora	124(7%)	651(35%)	558(30%)	465(25%)	62(3%)	4.01	14th

From the analysis in Table 12 above, it shows the degree of the effects of Physical risks in the Nigerian economy. This is shown by their mean values: structural damage – 6.90, followed by loss of strength of the building – 6.21, replacement/repair of structure – 6.09,

Damage to contents – 5.98, Damage of materials beyond re-use, among others. The analysis shows that physical risks severely affect the Nigerian economy with structural damage topping the list and Loss of fauna and flora having least effect.

How severe are the following identified Law/Legal risks in the Nigerian Economy

Table 13: Effects of Law/Legal risks in the Nigerian Economy

	Law/Legal Risks	Very Severe(5)	Severe (4)	Moderate (3)	Minor (2)	No injury (1)	Mean	Rank
1	Exasperation of crises among stakeholders	403(22%)	868(47%)	496(27%)	93(5%)	0	4.70	4th
2	Legal tussle among stakeholders	527(28%)	868(47%)	403(22%)	62(3%)	0	5.20	2nd
3	Arbitration/Mediation to resolve crises arising from building collapse	434(23%)	868(47%)	372(20%)	186(10%)	0	4.92	3rd
4	Conflicts resolution	372(20%)	961(52%)	372(20%)	124(7%)	31(2%)	4.31	5th
5	Apportioning blames and arbitrary words of mouth among the stakeholders	589(32%)	868(47%)	248(13%)	124(7%)	31(2%)	5.31	1st

The analysis in Table 13 above shows the extent Law/Legal risks affect the Nigerian economy. This shown as indicated by their mean values: Apportioning blames and arbitrary words of mouth among the stakeholders – 5.31, followed by legal tussle among stakeholders – 5.20, Arbitration/Mediation to resolve crises arising from building collapse – 4.92, Exasperation of crises among the stakeholders – 4.70 and Conflicts resolution – 4.31. The above analysis indicates that Law/Legal moderately affect the Nigerian economy. From the overall analysis above, the building collapse risks that mostly affect the Nigerian Economy are Human related risks (7.10), followed by Physical Risks (6.90), Socio-Political Risks (6.81), Economic/Financial Risks (6.80), Environmental Risks (5.83) and lastly Law/Legal Risks (5.31).

CONCLUSION AND RECOMMENDATIONS

Analysis of the impact of building collapse risks in the Nigerian economy was studied and the specific objectives attained. The aim and objectives of the study were achieved through the analysis of the views of the key professionals in the built environment, clients/developers and users of the finished product. From the study carried out, it is evident that building collapse risks exist in the Nigerian environment. These building collapse risks have multifarious factors which were categorized as Economic/Financials risk factors, Socio-Political risk factors, Human related risk factors, Physical risk factors, Environmental risk

factors and Law/legal risk factors. The negative effects of these risks are: loss of lives, loss of property, and professionals marketability to foreign firms has been devalued, structural damage, environmental damage, etc. It was also discovered that human related risks have predominant effect in the Nigerian economy while law/legal risk factors have the least effect. The National Assembly should be prevailed upon to pass the National Building Code into law as its provisions are comprehensive enough to address the problems of the construction industry. The risks associated with building collapse and the impact in the Nigerian economy and the stakeholders in the built environment calls for urgent attention to reduce or if possible eliminate the ugly incident. All hands should be on deck to curb the havoc caused by the building collapse as the effect is usually felt by all and sundry. There should be adequate funding and monitoring of the activities of all emergency services such as National Emergency Management Agency (NEMA), State Emergency Management Agency (SEMA), Local Emergency Management Agency (LEMA), Red Cross Society, Fire Services, and NGOs among others.

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