# ASSESSMENT OF THE IMPACT OF BUILDING COLLAPSE RISKS ON BUILDING DEVELOPMENT IN NIGERIA

**Obodoh D. A[1]; Ubani, E. C[2] and Obodoh, C. M[3]**
[1] *Department of Building, Nnamdi Azikiwe University Awka, Nigeria*
[2] *Department of Project Management Technology,*
*Federal University of Technology Owerri, Nigeria*
[3] *Department of Estate Management, Enugu State University of Science and Technology Enugu, Nigeria*
da.obodoh@unizik.edu.ng

**Abstract**
*Building collapse risks have been judged to have negative impacts on the stakeholders in the built environment and as well "threats to success". The study examines the impact of building collapse risks on the building development in Nigeria. Survey research design was adopted in carrying out the research and five cities in Nigeria were selected (Abuja, Ibadan, Port Harcourt, Owerri and Lagos). The target population for the study is the key professionals in the Nigerian Construction Industry (Architects, Builders, Engineers, Quantity Surveyors and Town Planners), Neighborhood Inhabitants and Staff of Emergency Management Agencies). A total sample size of 1999 was determined using Taro Yamane formula for determining sample size for finite population and Cochran's formula for calculating sample size when population is infinite. Questionnaire was used for data collection and data collected were presented in tables. The data were analyzed using percentages and weighted mean. The results of the study show that the identified building collapse risks have significant impacts on the building development in Nigeria. The results of the mean and ranking show that the key building collapse risks that impact on the building development in Nigeria include: loss of property (6.80), loss of lives (7.10), Structural damage (6.90), discourages investment in property development (6.81), among others. The study recommends among other things, the need to develop a framework for effective management of building collapse risks in Nigeria with a view to reducing or eliminating the impact on building development in Nigeria.*
**Keywords:** Building collapse risks, disaster management, emergency management agencies, building development, built environment, stakeholders

## INTRODUCTION

Building collapse is usually associated with some risks, known as "building collapse risks", which cause negative impacts on the stakeholders in the built environment.
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 ((Akande, Debo-Saiye, Akinyobi, Alao & Akinrogunde 2016).

The building collapse risks include: loss of lives, loss of physical properties and destruction of movable properties. Beyond this, building collapse always has far reaching economic, financial, psychological and sociological implications (Oloke, Oni, Ogunde, Opeyemi & Babalola, 2017). Investment ideas are frustrated and those who have a stake in it become temporarily or permanently destabilized or frustrated. From this perspective, building collapse risks can be observed as "threats to success".

In the past 30 years, there have been multiple incidences of building collapse 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 building component, resulting in its eventual failure (Bala, 2017). This phenomenon has multiplying alarming effects on the Nigerian populace especially in building development. The current

situation has given rise to supply – demand dichotomy in the Nigerian property market where demand outweighs supply thereby retarding economic growth and development of the nation.

**Literature Review**

The collapse of a building has tremendous effects that cannot be easily forgotten by any of its victims. The consequences are usually in the form of economic and social implications, and they include loss of human lives, injuries, economic waste in terms of loss of properties, investments, jobs, incomes, loss of trust, dignity and exasperation of crises among the stakeholders and environmental disaster (Ede 2010).

The complete quantification of the effects of any collapse is extremely difficult, as there are so many factors involved which include emotional and subjective factors. Apart from the number of deaths that can often be truly identified, the rest of the effects are surrounded by so many uncertainties which make analysis only approximate. Putting aside the quantifiable economic sums, the stress, trauma and shocks may have far-reaching effects upon the building owner and /or employees, occupants and others involved in one way or the other with the structure (Ede, 2010).

More so, various site of building collapse scattered across the length and breadth of Nigeria is making the environment unhealthy as such collapsed buildings has become hideout for hoodlums, touts etc. Dangerous animals like snakes have also made such buildings their place of abode, which is a danger.

Oke (2011) carried out a research on the Causes and Effects of building collapse in Nigeria and identified the following as the consequences of building collapse. Apart from loss of lives (mostly innocent citizens), many other people have been rendered permanently disabled in one form or the other as a result of increasing rate of building collapse. Other consequences include: economic losses, loss of countless properties, creates unhealthy environment, hideout for hoodlums and places of abode for dangerous animals like snake.

Nwafor (2015) in his study identified the reputational effects building collapse on Nigerian building industry to include: de-market of the values and integrity of on building professionals, portray Nigerian building industry as being corrupt and professionals' marketability to foreign firms/clients has been devalued. The researcher agrees with Nwafor (2015) on the reputational effect of building collapse on Nigerian construction industry considering the spate of building collapse in Nigeria and the attendant losses.

Dimuna (2010) stated in his study, that the incidences of building collapse witnessed in the country in the recent years has resulted in the loss of many lives and destruction of properties worth several millions of naira. Many families have been traumatized and many developers have lost their life investments.

According to Olumide (2012), the consequences of building collapse can be summarized as:loss of lives, loss of money invested, material wastage, loss of prestige of the owner, loss of reputation of the contractor, leads to shortage of manpower and great loss to the economy.

Adebowale et al (2016) in their study identified that the effects of building collapse are usually in the form of economic and social implications which include: loss of human life, loss of materials, loss of capital investments and physical damage and psychological trauma.

Chendo and Obi (2015) identified the following as the consequences of building collapse in Nigeria and they include: loss of life property and huge sum of capital, loss of reputation and integrity leading to psychological trauma, loss of new commissions and contracts, withdrawal of practicing licenses and loss of materials and capital investments.

Janssens, Dermot and Marios (2010) in their study on building failure consequences classified the consequences resulting from a building failure into three groups: economic, human and environmental consequences.

They stated that difficulties may arise when trying to compare different types of consequences. For example, in order to compute an overall 'failure cost', one may wish to assign monetary values to the different consequences (fatalities, injuries, $CO_2$ emissions etc), which could then be used as part of a cost benefit analysis. But, this may not always be the most suitable approach especially if the environmental or human consequences are significant.

This study went further beyond Janssen's et al (2010) to identify and classified building collapse risks into six groups: Economic/Financial risks, Socio-Political risks, Human related risks, Environmental risks, Physical risks and Law/Legal 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.

**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, heighbourhood inhabitants of collapsed buildings and staff of Emergency Management Agencies . A total sample size of 1999 was determined using Taro Yamane formular for determining sample size for finite population (professionals) and Cochran's formula for calculating sample size when population is infinite

(staff of Emergency Management Agencies and Neighbourhood inhabitants). The data for the research were collected through questionnaires and personal observations, and analyzed using percentages and weighted mean**.**

## Results and Discussion

**Table 1: Impact of Economic/Financial risks on building development in Nigeria.**

| 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 1, it shows that economic/financial risks severely impact negatively on the building development in Nigeria. 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 impact on the building development in Nigeria followed by, cost of rebuilding/repair, treatment of injured people, loss of materials, waste of resources, time and labour.

**Table 2: Impact of Socio-Political Risks on the building development in Nigeria**

| 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 | 1116(60%) | 465(25%) | 186(10%) | 93(5%) | 0 | 6.81 | 1st |
| 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 prestige of the owner | 310(17%) | 868(47%) | 372(20%) | 155(8%) | 155(8%) | 4.60 | 12th |
| 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 | 715(38%) | 589(32%) | 310(17%) | 155(8%) | 93(5%) | 5.97 | 5th |

From the analysis above in Table 2, it shows that socio-political risks severely impact on the building development in Nigeria. The extent of the negative impact of socio-political risks on the building development in Nigeria is shown by their mean values: professionals' marketability to foreign firms/clients has been devalued – 5.97, 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 -6.81, among others. It could be deduced from the analysis that professionals' marketability to foreign firms/ clients has be devalued tops the list of the socio-political risks that impact negatively on the building development in Nigeria, closely followed by loss 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.

**Table 3: Impact of Human related risks on building development in Nigeria**

| | **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 death rates against the United Nations Millennium Development Goals (MDGs) | 310(17%) | 744(40%) | 496(27%) | 279(15%) | 31(2%) | 4.44 | 7th |
| 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 3, it shows the degree of the negative impact of human related risks on the building development in Nigeria. The human related risks that impact negatively on the building development in Nigeria 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 impact on the building development in Nigeria. Others are injuries, leads victims to permanent disability, psychological damage (fear, helplessness, distress, depression and suicides), disruption of economic activities, etc.

**Table 4: Impact of Environmental Risks on building development in Nigeria**

| | **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 |

| | **Environmental Risks** | **Very Severe(5)** | **Severe (4)** | **Moderate (3)** | **Minor (2)** | **No injury (1)** | **Mean** | **Rank** |
|---|---|---|---|---|---|---|---|---|
| *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 4 shows the impact of environmental risks on the building development in Nigeria. The degree of the impact of environmental risks on the building development in Nigeria is indicated by their mean values: 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 impact on the building development in Nigeria moderately and least impacted by reduction in the energy use.

**Table 5: Impact of Physical Risks on the building development in Nigeria**

| | **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 |

| | **Physical Risks** | **Very Severe(5)** | **Severe (4)** | **Moderate (3)** | **Minor (2)** | **No injury (1)** | **Mean** | **Rank** |
|---|---|---|---|---|---|---|---|---|
| *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 5, it shows the degree of the impact of Physical risks on the building development in Nigeria. 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 impact on the building development in Nigeria, with structural damage topping the list and loss of fauna and flora having least effect.

**Table 6: Impact of Law/Legal risks on building development in Nigeria**

| | **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 6 shows the extent law/legal risks impact on the building development in Nigeria. This is 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 impact on the building development in Nigeria.

From the overall analysis above, the building collapse risks that mostly impact on the building development 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**

Building collapse risks have significant impact on building development in Nigeria, It was also discovered that the building collapse risk factors that impact majorly on building development in Nigeria are economic/financial, socio-political and human related risks. The study identified numerous building collapse risk factors that undermine building development in Nigeria and affect the supply of real properties and the socio-economic development of the nation. The study recommends the need to develop a framework for effective management of building collapse risks in Nigeria with a view to reducing or eliminating the impact on building development in Nigeria.

**References**

Akande, B.F, Debo-Saiye, B., Alao, T.O & Akinrogunde, O.O (2016). Cause, Effects and Remedies to Incessant Building Collapse in Lagos State. *International Journal of Basic and Applied Sciences. 16(4*)

Bala, K. (2017), Building Collapse in Nigeria: Challenges and Remediation. 11th Annual Lecture/Conference. Faculty of Environmental Sciences, Nnamdi Azikiwe University, Awka, Nigeria.

Chendo, I.G and Obi, N.I. (2015). Building collapse in Nigeria: The causes, effects, consequences and remedies, *International Journal of Civil Engineering Construction and Estate Management. 3(4).*

CORBON **(**2016) Submissions of Council of Registered Builders of Nigeria on the Building Collapse in Nigeria to the Senate Committee on Housing,

Dimuna, K. O (2010). Incessant Incidents of Building Collapse in Nigeria: A Challenge to Stakeholders. *Global Journal of Research in Engineering.*

Ede, A. N. (2013) Building Collapse in Nigeria: The trend of casualties in the last decade (2000 – 2010). *International Journal of Civil & Environmental Engineering, 10.*

Janssens, V., Dermot, W.O & Marios (2010). Building Failure Consequences. Robustness of Structures. *Proceedings of the final conference of COST Action TU0601*.

Nkpa, N (1997*). Educational Research - For Modern Scholars.* Enugu; Fourth Dimension Publishers.

Nwafor, A.U. (2015). Building Failures/ Collapses and their Reputational Effect on Building Industry in Nigeria. *International Journal of Science and Research (IJSR*). 4(6)

Oke, A. (2011). An Examination of the Causes and Effects of Building Collapse in Nigeria. *Journal of Design and Built Environment. 9/2*

Olumide, A.A. (2012). Professionals in the Built Environment and Incidences of Building Collapse in Nigeria. *Organisation, Technology and Management in Construction _ An International Journal 4(2).*