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BUILDING COLLAPSE IN NIGERIA AND DEVELOPMENT CONTROL, THE MISSING LINK

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A chain is only as strong as its weakest link. This analogy is also applicable to the building and construction industry. In Nigeria, the collapse of buildings is no more news as this happens very often. Given the frequency and devastating consequences of building collapse nationwide, it is apt to ask, what factors contribute to the reoccurring collapse of buildings? What laws and regulations are applicable to the building industry? What measures are taken by government, builders and end users? The study examines the root cause of frequent building collapse in Nigeria using Enugu as a case study. A structured questionnaire was prepared and distributed among the three planning approval offices within Enugu metropolis and the study employed a snowball sampling technique because the target sample population are involved in some kind of network with each other. The result of the survey indicates huge lapses in implementation of building regulations and laws. It also identifies that, there is inadequate staffing of skilled man power and professionals particularly architects to assess, scrutinize, and evaluate building document and supervise construction project. Furthermore the study reveals that no culprit of building collapse have ever been prosecuted by the relevant authorities. It concludes and recommends that government should take a proactive step and engage necessary professionals in her planning approval offices and also advocate that the laws must be strictly adhered to for the implementation and administration of justice. This will be an effective deterrent towards curbing the menace.

Keywords: building collapse, building industry, Enugu metropolis, environmental laws, town planning office

INTRODUCTION

Building collapse

Every society has its own problems and Nigeria is not an exception. Given the recent sad happening of building failure and collapse it is easier to believe and understand when natural disasters occur but there are no convincing explanations

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when disasters occur as a result of man's carelessness or irresponsibility. A building, once properly designed and constructed is expected to be in use for a very long time depending on the intents of the patron or end users. The collapse of one building can take more than hundred lives, this can be related to the statement of Iyagba (2005), who said that "doctors kill in unit while builders kill in tens". The incidence of building failures and collapse is fast becoming a national tragedy as the frequencies of their occurrence and the magnitude of the losses are now very alarming. Over the last four years, Nigeria has recorded over 56 cases of building collapse (Yaqub, 2019), and more still counting. According to Oyedele, (2018) there is no state in Nigeria, out of the 36 states and the Federal Capital Territory (FCT) that building collapse has not occurred in the past ten (10) years. In some years, building collapse in Nigeria occurred in more than ten (10) places. With a cumulative number of lives lost to building collapse in Nigeria from 1971 to 2016, at 1455 deaths in 175 collapse cases, (Omenihu, etal., 2016) the incidence is surfacing as a major clog in the wheel of efforts at reducing the nation's housing deficits.

Some professional bodies have proposed death penalty for culprits of building collapse, this has not stemmed the tide of these occurrences. Simire (2008), who spoke on the "impact of standards in the construction industry" and as a remedy charged professionals to adopt standards in the sector, that it will introduce sanity in the building industry. Again, a dual remedy approach was proposed by Omenihu, etal., (2016) and it consist of the legal imperative strategy and technological enhancements perspective to minimize the ugly incidence of building collapse, yet no significant progress in the fight against building have been recorded as the trend has taken on weekly basis as of the case of Lagos State.

This study aims to uncover the root cause of building collapse and the reason behind its steady occurrences with specific objectives as follows;

- To identify who is to be blame for building collapse
- To investigate what factors contribute to the reoccurrence of the menace
- To highlight the preventive measures to be taken by government and home users against building collapse

Through survey and interviews it tries to expose how the government and its regulatory agencies have been lukewarm in the discharge of their duties because building construction is not a game of luck neither is it a trial and error activity.

LITERATURE REVIEW

Building industry

The building industry is the most complex and multifaceted of all the industries in the economy and the basis of its complexity is established on the simple fact that, all other industries and sector of the socio-economy depend heavily on it for the environment in which they function and operate. The building industry is to all practical purpose an all-comer affairs (Akindoyeni, 2002). It is an industry where all manners of foreign and local professionals, materials, labour and equipment co-habit, interact and function in order to realize quality structures and constructions of high standard.

Laws, standards and regulations governing the industry, are primarily designed to ensure safe working environment and delivery of sound structures of high integrity. Each stage of a project may require some permit or approval or certification of the preceding stage as a prerequisite to embarking on the new phase, or certain specialized skills or standard materials. This becomes a legal requirement, and prudent care and attention must be given to its satisfaction, failure of which may result in liability.

An overview of laws and regulations in the building industry

The Constitution of the Federal Republic of Nigeria CFRN 1999 classifies building/construction standards in the concurrent legislative list- meaning that the standards can be set by both Federal and State governments, but where there is a conflict the federal standard overrides the state standards.

Standard have developed over the years from customs, practices, materials and contracts to deliver structures of high integrity. Best practices in designs, materials, safety, labour, professions, monitoring and management are developed and continually modified in all aspects of building works, from planning to post completion (Onyema, 2017). The standards are called performance standards, and may be codified into laws or simply left as guidelines or enforceable clauses in a contract. Thus there are statutory regulations, which set compulsory minimum compliance standards and non-statutory guidelines, such as the national building code and ethics of the professional bodies- both complementing each other to ensure the integrity of the project, the welfare of workers and optimal health, safety and environmental practices. Federal laws applicable to the industry as elaborated by Onyema, (2017) include. Standard Organization of Nigeria Act (SON Act), the Land Use Act, Factories Act 2004, National building Code (NBC), Labour Act 2004, Industrial training Fund Act 2011 and State laws. All the laws and regulations are targeted towards human and environmental protection, yet its effects in arresting the frequency of building collapse has not been effective and at minimal given the current trend of building failure within the country.

Causes of building collapse in Nigeria

Due to the catastrophic impact and consequences of building collapse in Nigeria, several studies by researchers including Adenuga O.A (2012), Adeyemi E. O (2002), Chendo and Obi (2005) etc have identified numerous factors responsible for the incessant collapse of Buildings in Nigeria. These factors include

- Lack of soil test investigation
- bad design,
- faulty construction,
- non-adherence to approved standards,
- non-enforcement of building codes,
- use of substandard materials,
- engagement of quacks, poorly trained workers,
- unqualified builders and non-professionals,
- poor supervision,
- inadequate soil investigation,
- Lack of maintenance, greed and corruption….

Buildings fail mainly through ignorance, negligence and greed, all of which are human fault as elaborated by Bolaji 2002. Ikpo, (1998) added that the degree of building collapse can be related to the degree of deviation of the building from its "as built" state which in most cases represents the acceptable standard within the neighbourhood, locality, state or country.

According to Oyewande 1992, causes of building collapse in Nigeria are attributed as follows; 50% of the causes being owing to design faults, 40% to fault on construction site and 10% to product failure. Building collapse could be as a result of defects under any or all of the stages in design approval of drawings and the supervision / construction stages.

Building professionals view about building collapse in Nigeria

Experts in the building industry stresses that building collapses will remain a problem until those who violate building laws are prosecuted. Worried at the incessant spate of building collapse in the country, the Council for the Regulation of Engineering in Nigeria (COREN) proposed the death penalty for owners of such faulty properties. They made this recommendation in May, 2014 at a three-day public hearing organised by the House of Representatives' Ad-Hoc Committee on the "composition and pigmentation of cement." in Abuja.

The view of the Former Honorary General Secretary of, Nigerian Institute of Architects, Arc Abimbola Ajayi (Mrs), in her report on Lagos State 2013 building collapse, is not different stating that: "Although there is provision for summary trial of violators and offenders in the law, there is no record of persons prosecuted or sanctioned for incidence of building collapse by the Ministry of Justice, the Nigeria Police and other law organs because of political, cultural, administrative and other interventions." Her submission echoes loudly to the fact that the implementation of the law is very weak.

Lawyers view about building collapse in Nigeria

There is no amount of damages that can pay for lives lost in a building collapse, therefore effective prosecution of culprits will serve as a deterrent to the multiplying culprits in our society. (Jibueze 2015).

Legal practitioners in Nigeria have advised that the government should ensure that corrupt building regulation officials found to be responsible in any building collapse should be prosecuted and made to serve long detention terms to serve as deterrent to others, adding that policy should be put in place to ensure that professionals associated with collapsed building should not only have their licences withdrawn, they should be made to face the full weight of the law. They reiterated that where death occurs due to negligence of a professional advice, the body responsible for granting licence for that profession should be sued together with the negligent professional for damages and punitive compensation.

Furthermore, the parliament should step in here and enact laws that will compel owners and/or developers of the offending properties, in conjunction with the regulatory agency if found to have connived with the builders or failed in its duty, to pay adequate compensation to victims and their dependents. Victims of collapsed buildings deserve compensation.

Reasons for the continual collapse of building

Experts and professionals in the building and construction industry believes that non-implementation of existing laws by Town Planning Authorities because of the absence of political will by the different arms of government has been the major contributory factor. This is closely followed by the endemic poor work ethics and attitude among Nigerians as a consequence of the ever increasing demand for more pay in view of the consistently growing cost of living for the average citizen. Other three factors which include– falling standard of education; lack of continuing professional development, bribery and corruption are not viewed as critical as the previously mentioned

The study area

Enugu is a city in south-eastern Nigeria and the capital city of Enugu State. The city, which is dominantly populated by people of the Igbo ethnic group, is a medium-size, but rapidly growing urban centre located on latitude 6° 27′ 10″ North of the Equator and 7° 30′ 40″ East of the Greenwich Meridian. It is sited within the tropical rain forest region of Nigeria with a derived savannah. The city has witnessed immense growth in the size of built-up areas, a number of immigrants, transportation, and commercial activities since it became the capital of the Eastern Region after Nigeria's independence in 1960 and has attracted both foreign investors and private developers; a succession of territorial adjustments in 1967, 1976 and 1991 led to Enugu becoming the capital of what is now Enugu State, therefore whatever practice obtainable in Enugu state is assumed to be the standard in the south east as a whole. The city had a population of 722,664 and ranked 9th most populous state according to the 2006 Nigerian census and many are still trooping into the city. It covers a total area of 215 sq mi (556 km2) with a population Density of 3,400/sq mi (1,300/km2) and situated in the Cross River basin and the Benue trough and has the best developed coal in this area.

Enugu is characterized by administrative occupation due to the presence of colonial administrative headquarters, state government and the local government seat in the city, and this has influenced the real estate investment as the city is believed to be a greener pasture for many rural dweller seeking for a better standard of living, this has encouraged rural-urban movement in favour of the city. More so, this has also stimulated the demand for residential and commercial space leading to an outburst of mass housing construction projects embarked upon by the state government, corporate organization and private individuals. A major type of residential property springing up in Enugu is estate housing to cater for the ever increasing demand for accommodation.

RESEARCH METHODOLOGY

Methodology comprises the theoretical analysis of the body of methods and principle associated with a branch of knowledge. (Berg, Bruce L., 2009). It refers to entire process used in obtaining information and data for a successful study. This study is survey approach which involved gathering and collection of primary data. Primary sources of data was employed and it provided direct or first-hand information about the study. This quantitative research dwelled on obtaining responses from respondents with the use of questionnaires, distributed and collected by hand by the researcher. The population for this study is the 3 Local

Government Town Planning and Approval offices in Enugu urban. Snowball sampling technique was used because the target sample population are in a network of connection with each other and share the same operational methods or characteristics been that it is a government regulatory body. The instrument for data collection involved a five-item well-structured questionnaire that requires respondents to provide information as regards staffing of the approval offices, the requirement and document for building plan approval in the local government, duties and other responsibility the authority shoulders. Some data collected are from the planning office document assessment checklist. The reason for selecting this research instrument is because it allows the researcher to specify a measurement procedure in detail in order to define the quantity of a variable.

Using random sampling method a reconnaissance survey was also obtained from 30 developers in ongoing construction projects within Enugu urban, comprising of 10 sites from each local government area within the metropolis to validate the response of the planning authority through oral interview. This is because of the high level of secrecy and reluctance by contractors to give out information due to fear of the unknown. The responses collected were analyzed by means of descriptive and inferential statistics.

RESULT

Staff strength

The research conducted in Enugu metropolis which include Enugu North, Enugu East and Enugu South on 17th January, 2017 is presented below

Table 1; statistics of workers in Enugu metropolis town planning and approval offices

Staff qualification	Enugu south	Enugu east	Enugu north	Staff Total
Town planners	3	2	3	8
Administrative staff	18	39	21	78
Architects	Not applicable	Not applicable	Not applicable	0
Structural Engineers	Not applicable	Not applicable	Not applicable	0
Total	21	41	24	86

Source; researcher's field work

The statistics above reveals that in Enugu metropolis, they have 8 Town Planners who do the actual vetting and approval of drawing in the town planning and approval offices. This represents a very small percentage as compared to other administrative staff including health workers that sum up to make the highest percentage of 78 staff. The 3 Local Government Town Planning Authority visited have No Architect, No Structural Engineer, No Electrical engineer, No Mechanical engineer and No Soil Test Engineer in their workforce.

Document required for building plan approval in Enugu urban

From the survey conducted, below are the requirement for building approval in Enugu metropolis.

1. 4 set of building plan (architectural, mechanical, structural and electrical)
2. One survey plan of the site.

3. Evidence of ownership (C of O, deeds of assignment, deed of need)
4. 3 year tax clearance. (if the land is located in a government layout, you obtain clearance from zonal officer in the ministry of lands)
5. Affidavit from court on facts.

When you bring building Plan to the town planning office; they assess the plan and give you bill for fees to be paid. It include;

i. Official fees for town planning
ii. Capital territory fees
iii. Fees for site analysis report and plan (SARP)

What the town planning office vet in drawings before giving approval
After survey and interview with town planners in the various approval offices, their standard and criteria for approval drawing assessment are listed below.

1) They make sure that the rules for setbacks are followed. That is 3m for sides and back of all buildings with 4.5m for the front for residential development and 6m for commercial development.
2) They make sure building project go along with the existing scheme. Whether the area is just for bungalow or maisonette.
3) Check the ventilation standard whether it is cross ventilated.
4) Check the comfortability of the room in terms of the room length and width of not less than 3m and the toilet provision.
5) Height of the building in relation to the density of the area.
6) Zoning and the prevailing land use ordinance of the proposed site.
7) Check the property line to avoid encroachment into any neighbouring site
8) Check the soak away and septic tank detail if it can meet the need of the development.

The whole vetting and approval process takes no longer than 3 months.

Site supervision and monitoring

Table 2; frequency of site visits and check list of local government town planning authority in Enugu metropolis

	Enugu south	Enugu east	Enugu north	Remark
Criteria of inspection	Setbacks. Septic tank and ventilation standard. Check if as built is as approved. Check materials on site.	Check if as built is as approved. Zoning regulation. Setbacks. Check materials on site.	Check if as built is as approved. Check materials on site. Building line and setbacks.	Uniform check list
Frequency of site visit	Often as possible but no regular routine for site visits	As much as possible	Site visits is at will but response faster to conflict sites	No scheduled time for site visit
Staff who visit site	Administrative staff	Administrative staff	Administrative staff	Same Staff

Source; researcher's field work

Table 2 shows the checklist for construction site visit and frequency of visit by Local Government Town Planning Authority in Enugu urban. The survey gathered that staff who undertake this assignment are administrative workers. For the 3 local government under study the checklist for inspection is the same likewise the fact

that there is no scheduled dates or period for site visit (supervision) and monitoring, but done according to their whims and caprices

Table 3; Reconnaissance survey obtained from 30 developers in ongoing construction projects in Enugu

Frequency of site visit	Enugu south LGA. building construction sites	Enugu east LGA. building construction sites	Enugu north LGA. building construction sites	Total number of site visited
Daily site visit	0	0	0	0
Weekly site visit	1	0	2	3
Monthly visit site	2	1	4	7
Never visited	7	9	4	20
Total	10	10	10	30

Source; researcher's field work

The Table above contains data of reconnaissance survey collected by means of interview from developers and site contractors to verify the frequency and effectiveness of local government town planning authority in discharging their duties of effective monitoring, supervision and implementation of building codes and regulation of ongoing construction project within their jurisdiction. Three out of 30 sites reported weekly visits, 7 reported monthly visit and 20 reported no visit at all after paying approval, sundry, and material testing fees.

FINDINGS

Ineffectiveness of regulatory agencies

i. Staffing
ii. Due diligence
iii. Enforcement

Government officials responsible for various links of the building chain, from plan approvals, monitoring, use of standard materials, skilled labour, professionals, sound safety and construction practices and procedures, often engage in corrupt practice, turn a blind eye to infractions, and also fraudulently grant approvals and certify unsafe processes. Additionally, the agencies do not effectively monitor approved procedures neither do they adequately enforce building codes. There is also lack of maintenance culture- buildings do deteriorate and weaken over time. Standard Organization of Nigeria (SON) in particular should step up and ensure substandard building materials do not enter the country, markets or building sites at all.

The various professional bodies, such as CORBON, QSRBN, ARCON, COREN, SURCON should sanction erring members appropriately, including withdrawal of licenses. Certainly penalties prescribed in the various laws are deterrent enough- what is lacking is adequate monitoring and enforcement. Yet rarely are the government agencies held liable for building failure. A couple of example suffice; Lekki gardens and Gwarimpa Abuja building collapse 2016.

DISCUSSION

Staff strength

The research conducted, evidently depicts that in our town planning and approval offices, lack of adequate and proper staffing or staff strength exist as seen in table 1. The existing staff strength in Enugu urban is 86 and only 8 staff carry out the responsibility of assessing, scrutinizing, evaluating and approving building document and construction drawing. Of the 8 professional who assess architectural working drawing used for the construction of buildings and grant approval, all are non-architects who have little or no knowledge about architectural designs and buildings. This calls for question.

How can a non – architect vet and approve architectural drawings? More so the planning offices do not have structural, electrical, mechanical and soil engineers. Therefore, who vets engineering designs? How can errors or omissions be identified from the working drawing by the planning and approval office that lack the necessary qualified staff for the job? This reflects a missing link in the government establishments and contributes to the reoccurrence of the menace of building collapse. It invariably indicts the government as the number one culprit of building collapse in Nigeria.

The result of the study pointing to the weakness of government and its agency as a Prime cause of reoccurring building collapse in Nigeria is in line with the research of Fagbenle and Oluwunmi, (2010) who blamed the high rate of building collapse on the very low level of compliance with approval of building plans before construction commencement, ineffective monitoring mechanism put in place by the relevant government agencies and the low level of awareness of the existing Building/Planning Regulations by clients/contractors.

Despite the fact that building collapse is flourishing in Nigeria, studies of Oyedele (2018) has shown that the rampant collapses are not due to the fact that control measures to avert building collapse are not in place. Both institutional and legal frameworks to obviate incessant building collapse exist in Nigeria. The building regulations has enough provisions to ensure that the developers and/or their agents on site do not try to cut corners but the supervisors from the government ministry are not adequate, lack logistics to efficiently monitor construction works and are corrupt.

Also in 2015, Kunle Awoboduin in his interview concluded that Low staff strength, bureaucracy, experience, poor methodology, sentiments, cowardliness, compromise, corruption and lack of enforcement are the major bane of physical planning and building control operations across Nigeria.

Folagbade, 2001 and Badejo, 2009 affirms that in Nigeria, the common causes of building collapse have been traced to lack of proper supervision, ineffective enforcement of building codes by the relevant Town Planning Authorities, lack of proper maintenance. Adeyemi E. (2002) believed that non-enforcement of building codes, non-professionals, unqualified builders and poor supervision from government agency among many other factors he listed contributes to building collapse in Nigeria. His studies further reveals that bad design is a cause of building collapse in Nigeria. This generates a very pertinent question. Where are the

planning and approval authorities in the government before the bad drawings gets to construction sites? It is crystal clear that the drawing were not properly assessed and scrutinized for errors or it was done by an incompetent professional.

Document required for building plan approval in enugu urban

Deduction from the findings of the survey on Document Required for Building Plan Approval in Enugu urban is that soil test examination for proposed development is not a requirement for granting building plan approval. From the above, it can be inferred and evident that building collapse have a strong connection right from Town Planning and Approval Office. One of the vital document which is supposed to be produced and thoroughly assessed before any building approval is given is the soil test and investigation result. They put no relevance neither do the planning authority place reference to soil test nor is it seen as a criteria for the assessment of construction drawing, because even though it is assumed that the soil investigation was conducted to enable consultant produce construction drawings, it is supposed to be submitted along with other document for verification against mal practices. I can boldly say that this is overlooked because there is absence of geotechnical Engineer in the approval offices to handle it. From the study, Geotechnics of site is treated as a trivial issues, in most cases not even considered. They are not concerned about what the prevailing soil condition or bearing capacity of soil is and its effect on the proposed structure. Their major concern is the tax and levy for the building project. If the soil bearing capacity is very low in comparison with the live and dead load of the building and no adequate safety factor is incorporated in the design of the building, such structure is bound to fail in subsequent years.

This is in line with the submission of Oloyede et al., 2010 who blame causes of building collapse as due to man's negligence in some vital areas in construction such as soil investigation, incorporating design for extra loads, stress from winds, earthquakes, uneven terrain, use of substandard building materials, poor monitoring and overall poor workmanship.

What the town planning office vet in drawings before giving approval

Using what the outcome from the survey as a criteria for development control standard, it is not adequate to serve as check list for certifying drawing fit for construction site work as these cannot put an end to future occurrence of building collapse. It is because the structural drawing which is like the chart showing the skeleton of the building is not even looked at, reinforcement details are skipped once some sheets of drawing paper are attached as calculation sheet. The material specification by the architect is not assessed neither is it questioned. The electrical and mechanical drawings are given express approval been that they are considered as not been too relevant forgetting that building collapse can result from fire expulsion. The inability of town planning authorities to ensure that architectural and engineering designs conform to design principles before approvals are given, encourage building failure. Furthermore the long chain of bureaucracy involved in the whole approval process is much, some developers due to time constraint move to site before the approval is given, knowing that their money will work it out from the town planning office. This criminal act have circumvent the whole approval process and renders it a mere formality and fulfilment of righteousness.

The view of Ayinuola et al, (2004) is more general, pointing accusing finger to all parties in the building industry, clients, architects, engineers, town planners in the local authorities and contractors stating that they have contributed to building failures in various dimensions.

Site supervision and monitoring

Table 2 present a uniform check list for building construction project within the local government areas. The Frequency of construction site visit was not specified, drawing to a conclusion that site monitoring and supervision is done arbitrary depending on when it is deemed fit to undertake the assignment. Their regular/attendance to site during construction is relatively low or poor as revealed by table 3 as 20 out of 30 site contractor interviewed reported that no staff of the local government town planning authority visited for inspection and monitoring after paying approval, sundry and or material testing fees. All these levies and fees put together was referred to by some contractor as "settlement fee".

Even if we pretend and turn blind eye to the inadequate staff strength to match up with the enormous task of development control and poor attendance to construction site for monitoring and supervision, the argument here is, what is the qualification and technical disposition or knowhow of the field workers that inspect construction works? If the foundation for drawing approval is faulty right from the government agencies then there are bound to be countless re-occurrence of this menace, building collapse. The result presented here will not be far different from most states in Nigeria because this is a government establishment that exists in all local government of the Federation.

The conclusions of government weakness in supervision and enforcement of right building practice as the fuel for continuous building collapse strongly support the assertion of Oyewande 1992 who said that almost all the tragic incidents recorded in Nigeria have been blamed on either the government agencies whose duty is to ensure compliance or the developers for failure to comply with building regulation or consultants instruction.

Studies by Akindoyeni (2002), Chinwokwu (2000), Dare (2000) and Ogunsemi (2002) on building collapse in Nigeria confirms that poor quality of materials and workmanship have a very large and positive causal effect on building collapse i.e. there is a very high causal relationship between them. Ogunsemi (2002) asserted that poor quality of materials and workmanship accounted for over 36% of building collapse in Nigeria. (the highest of all the examined factors from his studies) while Chinwokwu (2000) confirmed that failure to investigation the quality of materials and workmanship in Nigeria building industry will certainly continue to result into building collapse. These views above centers on the supervisory and inspection role government planning and development authorities and agencies have failed to execute and implement effectively.

RECOMMENDATION

Humans could also address environmental problems by using biomimicry — examining nature's solutions and applying them to building designs. (Okeke et al., 2017). Despite that, the government through the Town Planning Authorities in

collaboration with architects and building/structural engineers must intervene as a matter of pressing necessity to prevent this ill-fated trend of collapsed buildings in Nigeria. This can be achieved through the following ways;

- Adequate qualified staffing of Government Town Planning and Approval offices and agencies is necessary
- There is dare need to establish the design, inspection and enforcement mechanisms in place that would see to the detailed adherence to what we might call the 'textbook approach' to the construction of our buildings. This 'textbook approach' refers not just to design and building principles taught in schools but also includes building/construction principles that have been tried and tested over the years in several parts of the world.
- Government should, on one hand, embark on proactive steps by marshalling enough political will to allow the Town Planning Authorities to discharge their functions unfettered and on the other hand, develop a legal framework that can enhance and ensure smoother, less time-consuming and more flexible ways to conduct business in the functioning of law courts.
- The Nigerian government, as a major construction stakeholder should initiate sustainable construction practices and measures, ensuring its enforcement as best practice for the construction industry.
- The relevant authorities in the building and construction industry must eliminate quacks who parade themselves at building sites and put in place a strict regulation which insists that every building must be supervised by certified professionals.
- The press media should lay more emphasis on educating the general public on the dangers of the collapse of building and less on public emotions. Building owners should ensure that qualified and experienced professionals are been engaged to execute their building construction works.

CONCLUSION

The weakest links in the building chain and construction industry has been pointed out as inadequate staffing in town planning offices, non-monitoring compliance with approved plans, environment laws, existing codes, standards and non-enforcement of violations of these parameters. All lies within the duties of the government and its regulatory and statutory agencies. There is absolutely no doubt that the government at all levels has totally failed in its regulatory and supervisory roles when buildings are being erected or renovated. They are more concerned and interested in collecting monies for physical planning approval and sundry levies without adequate supervision of the building project. The officials who ought to exercise supervisory functions are busy seeking gratification from the builders and once this is gotten, they turn the other way. Considering the huge magnitude of human and material loss associated with building collapse and the ineffectiveness of the emergency management Agencies in Nigeria, there is need for immediate review of practical policy guidelines and staffing by the government which must be implemented to the latter to make Nigeria innocuous for living.

Sadly in Nigeria, when there is an unfortunate incident of building collapse, no one is held accountable, this evil and irresponsible trend must come to a halt. It would

be a shame that such occurrence continues to happen unchecked. Governments should rise to the responsibility of ensuring the safety of lives and property, if nothing is done to regulate the business of building and diligently prosecute defaulters as well as revoke the ownership of the property in question, then we should expect more of this national shame and embarrassment.

Limitation of studies

Secrecy: Most contractor interviewed were reluctant to give out information due to fear of the unknown. Also the Local Government Town Planning Authority dislike and dodge question or enquiries that appears trying to probe them. Information that otherwise should be made for public consumption is considered secret.

Further studies

The Study has highlighted the failure of Government and its regulatory agency as hoisting the flag of reoccurring causes of building collapse in Nigeria. Recommendations have been proposed. However, different aspects of this line of research have not been considered. I suggested further detailed studies on Government intervention as it regards to reducing the incidence of building collapse as is been rarely reported. Also Research on new building technology that will reduce building costs as needed to address the issue of poor funding as a result of client cutting corners.

REFERENCES

Abimbola, A. (2013). The report of Lagos State 2013 Tribunal of Enquiry on Building Collapse. The tribunal's report to Gov. Babatunde Fashola in Ikeja 20th May 2013. Available at: http://https://guardian.ng/features/lagos-ignites-new-vigour-against-building-collapse/ accessed 20 July, 2018.

Adenuga, A.O., (2012), Professionals in the built environment and the incidence of building collapse in Nigeria. Organization, Technology and Management in construction · an International journal · Vol 4, No. (2) 2012. pp 461 – 473

Adeyemi E. O (2002). An opening address on Building Collapse: Causes, prevention and Remedies. In ed. OgunsemiDR, Building Collapse: Causes, prevention and remedies. In Workshop organized by Ondo State Nigerian Institute of Building, Enugu-Nigeria.

Akindoyeni, A. (2002) Professionalism in Building Design and Construction. In D.R. Ogunsemi (Ed), Building Collapse cause, Prevention and remedies (pp 1-13). The Nigerian Institute of Building, Ondo State.

Alabi, O. M & Ahmad, R. R. (2013) The Study of Claims Arising from Building Collapses: Case Studies from Malaysia, Nigeria, Singapore and Thailand. Civil and Environmental Research Journal, ISSN 2224-5790 Vol.3, No.11, 2013

Ayinuola, G.M and Olalusi, O.O, (2004). Assessment of building failure in Nigeria. African Journal of Science and Technology, science and engineering series, Vol. 5, No 1

Badejo, E. (2009). Engineers, Others Urge Multi-Disciplinary Approach to Curb Building Collapse, The Guardian Newspaper, 13 July, pp 15-17.

Berg, Bruce L., (2009), Qualitative Research Methods for the Social Sciences. Seventh Edition. Boston MA: Pearson Education Inc.

Bolaji, E.O. (2002), Building Materials Specification and enforcement on site. In D.R. Ogunsemi (Ed),

Cement producers, builders seek solutions to building collapse. Available online: http://www.peoplesdaily-online.com/ accessed on 14 June 2017.

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. Vol.3, No.4, pp.41-49 ISSN 2055-6586.

Chinwokwu, G. (2000), The Role of Professionals in Averting Building Collapse. Proceedings of a workshop on building collapse; causes, Prevention and remedies (pp 12-27). The Nigerian Institute of Building, Lagos state.

Collapsed Building: Professionals Tackle Lagos State Government. Available online: http://www.tribune.com.ng/ (accessed on 14 June 2017).

Environmental law research institute (2011). A synopsis of laws and regulations on the environment in Nigeria. Retrieved online from http://www.elri-ng.org/newsandrelease2 on the 13th June 2017.

Fagbenle, O.I. and Oluwunmi, A.O. (2010) Building failure and collapse in Nigeria: The influence of the informal sector. J. Sustain. Dev. 2010, 3, 268–276.

Folagbade, S.O. (2001). Case studies of Building in Nigeria. Proceedings of a workshop on Building Collapse Causes, Prevention and Remedies. The Nigerian Institute of Building, Ondo State Chapter, 23-24 October.

Ikpo, I.Y (1998) Application of Weibull Distribution Technique in the Prediction (MTBF) of Building Component. Nigerian Journal of Constructions Technology and Management. Vol 1 No 1.P 79-87

Iyagba, R. O., (2005), The menace of sick buildings – a challenge to all for its prevention and treatment. An Inaugural lecture delivered at University of Lagos, Lagos in 2005.

Jibueze, J. (2015). Prosecute building laws violators. An article published in the nation newspaper October 26, 2015

Kunle A., (2015). Buhari Government Should Help Prevent Substandard Building Construction in Nigeria. An interview of President, Building Collapse Prevention Guild. Sept 22, 2015. [ONLINE] Available at: http://saharareporters.com [Accessed 20 July, 2018].

Ogunsemi, D.R. (2002) Cost control and quality standard of Building projects. In D.R. Ogunsemi (Ed).

Okeke F. O., Okekeogbu. C. J. and Adibe F. A., (2017) Biomimicry and Sustainable Architecture: A Review of Existing Literature /Journal of Environmental Management and Safety Vol. 8, No. 1, (2017) pp 11 – 24

Oloyede, S.A., Omoogun, C.B. and Akinjare O.A., (2010) Tackling Causes of Frequent Building Collapse in Nigeria, Journal of Sustainable Development Vol 3, No 3 ISSN 1913-9063

Omenihu, F.C., Onundi L.O. and Alkali, M.A. (2016), An Analysis of Building Collapsed in Nigeria (1971-2016): Challenges for Stakeholders. Annals of Borno, Volume XXVI, June 2016 pp 113– 140.

Onyema, K. (2017) Law and liability on building collapse. This day newspaper of 3rd January 2017, Lagos multidoor courthouse.

Oyedele, O. A. (2018), A Study of Control Measures of Building Collapse in Lagos State, Nigeria FIG Congress 2018; Embracing our smart world where the continents connect: enhancing the geospatial maturity of societies Istanbul, Turkey, May 6–11, pp 1– 2

Oyewande, B. (1992) A search for Quality in Construction Industry, Builders Magazine, June/July edition, Lagos, Nigeria.

Simire, M. (2008), Why buildings experience structural failure, Daily Independent (Friday 18th January 2008).

Yaqub, M. (2019) Almost 60 Buildings Collapsed in Nigeria in 4 years. But no one is taking it Seriously, Available online at https://www.africanliberty.org/2019/03/22/ accessed 19 June 2019.