A study of control measures of building collapse in Lagos State, Nigeria

Olufemi Adedamola Oyedele, ND Building Technology, BSc. Estate Management, MSc. Housing Development and Management, MSc. International Project Management, MPhil. Construction Management, ANIVS, RSV.

ABSTRACT

Building collapse is a regular occurrence in Lagos State in Nigeria. In 2016, more than six (6) cases of fatal building collapses were recorded in Lagos State alone. This high incidence may be a reflection of high population of Lagos State and not necessarily due to its weaker building process and/or poor physical development control. Building collapse is a situation where building which has been completed but not occupied, completed and occupied and under construction, tears apart without the influence of any party or agent. Building collapse in Lagos State is a waste of financial resources; in some cases, wastes of human life; waste of time invested in construction and clearing of debris on site after collapse; and waste of building materials. In the cases experienced over the years, it was found out that majority of building collapses were due to substandard building materials, bad design, wrong foundation, wrong site, bad usage of the structure, poor technology and inexperienced contractor. In most cases, the buildings do not have approved building plans from either the local government or state ministry of Land and Physical Planning. This paper will adopt the mixed method of researches to espouse the control measures put in place in Lagos State, Nigeria, to avert the high incidence of building collapse. Questionnaires and direct interviews were engaged for mining of primary data as well as searching newspapers, journals and newsletter of ministries, departments and agencies (MDAs) in Lagos State.

Key words: Building Control, Building Process, Building Regulations, Causes of Building Collapse, Function of Physical Planning Department.
1. INTRODUCTION

Building collapse (BC) in Nigeria is becoming a regular occurrence, each recording great casualties in the number of lives and materials lost. Building collapse is a situation where building which has been completed and occupied, completed but not occupied or under construction, collapses on its own due to action or inaction of man or due to natural event like earthquake, storm, flooding, tsunami or wildfire. It is different from building demolition.

There are various causes of building collapse and each case requires expert judgment to decide the cause of its collapse. Rate of building collapse is a reflection of the level of organization, the performance of the building control activities and degree of sophistication of the construction professionals in a country.

Different countries have different building control measures. Most countries control building construction through regulations and codes. The UK’s Building regulations are statutory instruments that seek to ensure that the policies set out in the relevant legislation are carried out. Building regulations approval is required for most building work in the UK. Building regulations that apply across England and Wales are set out in the Building Act 1984, while those that apply across Scotland are set out in the Building (Scotland) Act 2003. All Acts specify how construction is to be carried out and the standard of construction materials. It also stipulates how approval for woks will be given.

Oyedele (2016), explored the use of case study by examining the causes of six (6) collapsed buildings (CB) across Nigeria. Samples of materials from the sites of the collapsed buildings were taken for testing and analysis, while critical observations were made at the sites to note the conditions of the ground (building base). The study found out that majority of the building collapses in Nigeria were due to poor workmanship, sub-standard building materials, followed by bad building base and poor design. The National Building Code 2006 is not effective due to lack of enforcement and the Physical Development Departments of states and Federal Capital Territory are just mere agents of corruption allowing all types of construction without building approvals.

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. If not controlled, building collapse can be disastrous. This situation necessitated the evolvement of National Building Code in 2006. This paper studied the building collapse control measures put in place by the Lagos State government to avert the incessant building collapse in Nigeria.
2. LITERATURE REVIEW ON CONTROL MEASURE OF BUILDING COLLAPSE

Ihua-Madueyi (2017) reported that “Professional builders in the country have called on the government to speed up the passage of the National Building Code in order to check some of the discrepancies in the industry”. The National Building Code, is a set of minimum standards on building pre-design, design, construction and post-construction stages with a view to ensuring quality, safety and proficiency in the building industry. Non-provision of this code and its non-adherence leads to building collapse. The passage of National Building Code bill which has been submitted to the National Assembly since 2006, would help in the building production management process, improve building training, safety, quality and value management for the benefit of the country.

Eleven foreign workers were killed in a landslide at a construction site in northwest Malaysia. The landslide occurred at a site where 49-storey condominium towers are being built (Zee News, 2017). The collapsed building was as a result of landslide due to the location of the construction. These are common occurrences in the construction industry of third world nations. Dunia (2017) stated that “A prosecution witness in the ongoing trial of the Managing Director of Lekki Gardens Estate Ltd., Richard Nyong, has told a Lagos High Court in Igbosere that the five-storey building that collapsed on March 8, 2016, and left 30 people dead, has no building approval.”

In Kenya, in 2015, eight buildings collapsed at the height of the `rainy season recording more than 15 deaths. In a six story building collapse in Nairobi in 2016, more than 50 people were dead. In Nigeria, in 2015, more than 32 people were killed in a collapsed building in Lekki, Lagos State. There were 33 building collapses in Lagos and 22 in Abuja in 2012; 17 buildings collapsed in Lagos and 20 in Abuja in 2013 and 13 building collapses in Lagos and 2 in Abuja in 2014. Building collapse is now as constant as northern star in Nigeria due to lack of physical development and building regulations enforcement. In the first quarter of 2016 alone, the toll in Lagos was 5 collapses. One important issue which is noteworthy about building collapse in Nigeria is that collapses usually occur in buildings with two floors up to five floors.

Collapses do not usually occur in bungalows and buildings with more than five floors except where buildings collapse was due to erosion. This is because bungalows are non-load bearing structures requiring simple strip foundation and in some cases like made-up ground, raft or pad foundation. If the floors are more than three in a made-up ground, pile foundation will need to be introduced. Buildings with more than five floors are complex structures requiring professionals with many years of construction experience. They involve a lot of money to construct and this may be the reason for their thorough observations of building regulations.
“Over the years, Lagosians have witnessed consistent building collapse leading to fatalities, litigations, regulatory actions, pains, injuries, delayed schedules, bad reputations and loss of properties, etc” (Fowode, 2016). Building collapses always bring with them a lot of costs in the form of death, loss of money, loss of time, loss of equipment and wasted building materials. It also affects the reputation of the construction industry of the area where it occurs. The six-storey building which collapsed at Synagogue Church of All Nations (SCOAN) in Lagos State recorded 116 lost lives in November 2015.

The one at Lekki Gardens in April 2016 resulted in over 30 casualties. According to Nwannekanma (2016), “tragedy struck yesterday morning when a five-story building collapsed in the Lekki area of Lagos. At least 18 persons died while 12 others were rescued alive from the rubble”. Clients or building construction promoters have three requirements of their buildings. These are: (i) that they are constructed within cost (budget), (ii) that they are constructed within time (schedule) and (iii) that they are constructed to acceptable quality (standard). Corruption and greed are the major debacles of these requirements.

Collapsed buildings are those that the qualities have been compromised either due to the materials used, faulty design in place or the ground on which the buildings were erected, were badly made-up. Some projects in Nigeria are planned to fail because the project owners or sponsors refused to employ competent project managers, engineers and builders. It is a known fact that traditionally, projects start with the client who engages, in most cases, his architect to design the project. He then contracts a project manager to oversee the design and construction. For any project that is more than one floor, structural engineer must be engaged to design and supervise the structures.

According to Fowode (2016), “building projects start well before ground is broken”. Failure to recruit the appropriate team for a project is invitation of failure in project delivery. Geological survey needs to be carried out in order to determine the appropriate type and depth of foundation which will carry the superstructure. In most cases, expert judgment is used to determine the type of foundation for buildings, especially in bungalows and buildings up to three floors which are common in Nigeria. Transfer of idea from one site to another may not work because different sites have different geology (sub-soil).

Unplanned falling of building is usually referred to as building collapse, while planned falling of building is referred to as demolition. Buildings are erected to stand and to be functional for its intended use throughout its lifespan. The ubiquitous building collapse in Nigeria is a cause for concern. According to Oloyede, Omoogun and Akinjare (2010), “in recent times, the incidence of building collapse in the country’s major cities of Lagos, Abuja and Port Harcourt have been alarming”. Building collapse can be partial like the one that occurred at NIDB Building on Broad Street, Lagos State in 2008, or total like the Lekki Garden building collapse.
According to Ige (2016), the building collapse in Abeokuta on Friday, May 13, 2016, could have been prevented if due process has been followed by the construction teams. Building construction process involves professionalism in the planning, design, and execution of the project. Engineering consultants must be involved in the design and supervision of construction works. The design structural engineer must visit the site regularly and a sub-soil investigation of the site carried out by a geo-technical professional, followed by a foundation design by an engineer based on the engineer’s knowledge of the terrain and the results of geotechnical survey. A general arrangement of the structural element and production of design calculations, drawings and job scheduling are carried out before signing off for construction.

Construction is not a child’s play. It involves the collaboration of different professionals who have been taught the art and science of the process. The land surveyors determine the shape, geographical orientation and the size of the site. The architects’ duties involve the design of the structure. Structural engineers are in charge of structural design, stating the type, size and number of reinforcement bars to be used in slab, lintels and columns and the spacing of stirrups after considering the length of lintel, columns and unsupported span of slab. The town planners must make sure that the building codes stating set-backs, height of buildings, building lines, room sizes, fire exit etc, are incorporated in the building.

It is the duty of the quantity surveyors to estimate the probable amount that will complete the house and to issue payment certificates at milestones. Quantity surveyors bill of quantities (BOQ) are also good bases for job planning and scheduling. The estate surveyors take control of the building for management after it has been completed. These professionals should ensure that buildings are professionally built and avoid the incessant collapses in Nigeria. In most cases, quacks do take charge of building process and deceive house owners who do not observe due diligence like visiting construction professional bodies (Nigerian Institute of Architects, Nigerian Institute of Building, Nigerian Institute of Civil Engineers etc) in choosing their consultants and contractors.

“Before casting concrete, the engineer inspects each element to be cast, issues a written instruction that checked the reinforcement and found same to be in agreement with the structural drawings, and gives the contractor the authority to cast the concrete element in question. This time-tested method is not always followed on many projects, because of our Nigerianess” (Ige, 2016). There is no control on building process in Nigeria. To pass cube test, concrete are re-mixed by most contractors who add more cement to the mixture and dip the cube inside water for some time for adequate curing before taken to the concrete laboratory for analysis.

According to Nucera and Pucinotti (2009), ”the assessment of in-situ compression strength of a reinforced concrete structure, plays a key role in the evaluation of its safety”. Completed buildings are sometimes subjected to integrity test to determine their strength. Recent innovations provide clear rules for assessing the safety and conduct of static strengthening on
existing buildings. Malek and Kaouther (2014) stated that “it is often necessary to test concrete structures after the concrete has hardened to determine whether the structure is suitable for its designed use”. Concrete has also been tested where there is disagreement on cost between client and contractors.

3. HOW TO GET BUILDING APPROVAL IN LAGOS STATE

According to Kolawole (2015), “A building plan is a graphical representation of what a building will look like after construction, used by builders and contractors to construct buildings of all kinds. Building plans are also useful when it comes to estimating how much a project will cost, and preparing project budgets. In most countries, including Nigeria, it is customary to obtain a permit or approval from appropriate authorities, for example, Ministry of Physical Planning, State Secretariat, Alausa, Ikeja. A building plan approval is necessary before construction can commence.

This is to ensure that a building complies with building laws and codes and to prevent people from just constructing as they deem fit. The first thing to do when you want to commence construction in Lagos is to obtain a development permit from the Lagos State Physical Planning and Urban Development Authority (LASPPDA), a parastatal under the Ministry of Physical Planning and Urban Development.

Approval Process
The first step is to submit architectural design for inspection to confirm if design is in conformity with the approval standards and order for the area which the land is located. If your documents are found satisfactory, assessment will be given. The assessment is based on the volume of your building multiplied by the rate applicable to your land location. Usually, bank drafts are made payable to the Lagos State Government, the relevant local planning authority of the land location and Lagos State Physical Planning Development Authority. You might also need to pay some additional fees to Lagos State Government depending on your proposal.

Before submission of your application, the site will be inspected. This is the first of various inspections that your site will be subjected to. The reason is to know if the site in question is the same as the one being proposed for development and also, that you have not commenced construction before building plan approval. The site will also be checked with the immediate environment to see if proposal is in conformity with the existing land use, and if the size of the plot is as presented in the survey plan and design proposal. If the inspection report is satisfactory, the application will then be registered, provided all documents have been submitted.
4. LAGOS STATE BUILDING CONTROL AGENCY (LASBCA)

LASBCA is located on Works Yard Road, via Oba Akinjobi Way, Old Secretariat, GRA, Ikeja, Lagos. Its functions are:

- Building control in all its ramifications.
- Approval to commence construction after obtaining development permit.
- Inspection and certification of various stages of building construction.
- Verification of your General Contractor’s All Risk and Building Insurance Policy.
- Issuance of certificate of completion of building construction and fitness for habitation.
- Identification and removal of distressed and non-conforming buildings.
- Public Health control in Buildings.
- Identification and removal of distressed buildings.

Departments/Units in Lagos State Building Control Agency

- Post Construction Audit
- Inspectorate & Quality Control
- Enforcement
- Building Admin. & Public Enlightenment
- Human Resources & Administration
- Research Statistic and Records
- Account
- Audit
- Budget and Planning
- Procurement
- Information and Communication Technology
- Legal
- Public Relations

National Building Code 2006

In 1987, the Defunct National Council of Works and Housing directed that a National Building Code be evolved for Nigeria. All the stakeholders in the Building Industry were duly contacted for input. Thereafter, the defunct Federal Ministry of Works and Housing organised a National Workshop at ASCON, Badagry - Lagos State in 1989. To further fine tune the Draft National Building Code, another workshop was held at the Gateway Hotel, Ijebu-Ode, Ogun State in 1990. The product of the Ijebu-Ode Code was approved by the then National...
Council on Housing in 1991. Unfortunately, this document was not ratified by the then Federal Executive Council for use.

The 1991 approved document was re-presented to the 2nd National Council on Housing and Urban Development held in Port-Harcourt, November, 2005 and the Council directed that the document be widely circulated to all stakeholders for input to facilitate the production of an acceptable National Building Code. Consequently, the Draft document underwent some restructuring from three (3) parts to four (4) parts as follows: (i) Part I changes from Administration and Environment to Administration; (ii) Part II forms Classifications and Requirements, subdivided into two major divisions: Sections 4 and 5 then Sections 6 - 12 respectively.

The second division charges the major stakeholders in the Building Industry to produce her own requirements as per the working tools from Sections 4 and 5. (iii) Part III forms the Enforcement part of the Codes. The entire Building Process is divided into four (4) convenient stages and developed under two (2) subheadings: (a) Pre-Design Stage - Requirements and Enforcement; (b) Design Stage - Requirements and Enforcement; (c) Construction Stage - Requirements and Enforcement; and (d) Post-Construction Stage - Requirements and Enforcement.

This approach does not only make the enforcement functional but its adaptability to the Nigerian situation makes it efficient (iv) Part IV is made up of a separate part namely, Schedules, where all supportive documents, data, tables, information and all sorts of relevant and approved application forms to Part I, II, and III can be found.

The need to evolve a National Building Code arose from the following existing conditions of our cities and environment: (a) The absence of planning of our towns and cities; (b) Incessant collapse of buildings, fire infernos, built environment abuse and other disasters; (c) Dearth of referenced design standards for professionals; (d) Use of non-professionals and quacks; (e) Use of untested products and materials; (f) Lack of maintenance culture.

In view of the above, the National Council on Housing and Urban Development deemed it necessary and initiated the process of evolving a National Building Code to put a stop to the NATIONAL BUILDING CODE ugly trends in the Building Industry.

5. TESTING CONCRETE, SAND, IRON BARS, WATER AND OTHER CONSTRUCTION MATERIALS ON SITE

Construction materials are tested before and during construction as a quality control measure and after construction for integrity test. There are various methods which can be used to test building materials on site. There are many types of construction materials used in Nigeria. These different materials have different strengths and resilience, e.g., reinforcement bars,
cement, sand, gravel, particle board, plywood, pine, oriented strand board (OSB), and drywall (gypsum board, SheetRock). The same cross-sectional area of each material must be used as sample in order to make fair comparisons during tests.

Some of the methods which are commonly used for quality control of structure will be discussed as follows:

Concrete: Concrete derives strength with increasing age up to 90 days (curing). The compressive strength of typical concrete with 1:2:4 cement: sand: aggregate ratio and good mix of water (0.5 water/cement ratio) is usually 30.5 GPa after 28 days and 32GPa after 90 and 120 days respectively (Malek & Kaouther, 2014). There are two methods of testing concrete; the destructive and non-destructive methods. The destructive tests include cube or cylindrical test (compression test), extraction of cores and the subsequent laboratory test (strength and carbonation test), pull-out test, extraction of rebars, corrosion test, pacometer test, loading test on floor slabs and radar surveys. The non-destructive tests include surface hardness test (Schmidt rebound hammer test), ultrasonic test (Ultrasonic Pulse Velocity System) and combined methods (SONREB method) (Malhotra and Carette, 1991).

In destructive method of test, carbonation depth may be used to test the uniformity of concrete test. The depth is usually 10cm in a normal concrete. In lean concrete, it will be more. What influence concrete strength are; the type and dosage of cement, the dimensions and nature of the aggregates, the superficial conditions of the concrete and the humidity and maturity. Concrete is very weak in tensile strength and have weak bending moment, but has high compressive strength. Since iron is very good in tensile strength, it is usually introduced in concrete to improve its bending moment.

The parameters which influence the velocity of propagation of ultrasound waves in concrete are: (i) the entity of the load (ii) the age of the concrete (iii) the form and the dimension of the structure (iv) the run length (v) the presence of metallic reinforcements (vi) the water/cement ratio (vii) the state of strength (viii) the temperature (ix) the humidity of the concrete (Pucinotti, 2006).

Sand and aggregates: Sieve test is usually done on sand and aggregates to determine the degree of fineness and coarseness of these materials.

Water: Drinkable water which is colourless and odourless with Ph7 must be used on site.

Iron bars: Bending strength of iron bars determines their strength. There are two types of bars, plain and twisted. There are different thickness and the usage and spacing of bars and stirrups depend on area of building and the span of space in which reinforcement concrete will be used. Addition of adulterated materials may compromise the strength of bars. Density test may be used to test iron rods.

A Study of Control Measures of Building Collapse in Lagos State, Nigeria (9284)
Olufemi Oyedele (Nigeria)

FIG Congress 2018
Embracing our smart world where the continents connect: enhancing the geospatial maturity of societies
Istanbul, Turkey, May 6–11, 2018
A Study of Control Measures of Building Collapse in Lagos State, Nigeria (9284)
Olufemi Oyedele (Nigeria)

FIG Congress 2018
Embracing our smart world where the continents connect: enhancing the geospatial maturity of societies
İstanbul, Turkey, May 6–11, 2018
6. CAUSES of Building Collapse

There are two major causes of building collapse, which are natural and artificial. The natural causes can be due to earthquake, hurricane, tremor, storm, typhoon, flooding, erosion, wildfire etc. The artificial or man-made causes can be due to action or inaction of man leading to tripping (inappropriate slenderness ratio and uneven distribution of load in one part of the structure), shearing due to weak structure (poor materials or bad workmanship), building on weak sub-soil (lack of development and building control), wrong choice of foundation leading to differential settlement of building (lack of professionals on site and lack of development control), bad structural design (lack of professionals on site and lack of control), addition to floor (lack of professionals on site and lack of control), inadequate curing (use of non-potable water for mixing concrete, use of sub-standard sand or cement, inadequate time allowed for curing), etc.

Buildings can also collapse when the building members fail to bond due to stress, strain or shear. In Nigeria, building failure have been attributed to the causes such as design faults (50%), faults on construction site (40%), and product failure (10%) (Oyewande, 1992; Ayininuola & Olalusi, 2004; Ayuba, Olagunju & Akande, 2012). Lack of maintenance and wrong usage of building leading to stress can lead to building collapse. Stress is pressure or tension exerted on a material object. Wind can also cause building collapse due to strain. Strain is a force tending to pull or stretch something to an extreme or damaging degree. Fatigue of structure can lead to collapse. Professionals in the built environment have been trained to design and construct structures that have enough strength to withstand extreme stress and strain. Improper distribution of loads during and after construction of building like communication mast, antennae, billboard and water reservoir can lead to shearing.

According to BBC News (2016), the five reasons why building collapse are either: the foundations are too weak, or the building materials are not strong enough or workers make mistakes or the load is heavier than expected or the strength is not tested.

7. QUALITY CONTROL IN CONSTRUCTION WORKS

Quality control is the part of quality management that ensures products and service comply with requirements and expectations. It is a work method that facilitates the measurement of the quality characteristics of a unit, compares them with the established standards, and analyses the differences between the results obtained and the expected results in order to make decisions which will correct any differences.

In construction procurement, the contract will stipulate how the job is to be carried out which will lead to expected standard. Technical specifications define the type of controls that must be carried out to ensure the construction works are carried out correctly. They include not only products materials, but also the process of execution and completion of the works.
Technical specification includes the buildings plans, structural plans, mechanical and electrical drawings (services drawings) and the Bill of Quantities.

One way of controlling quality is based on the inspection or verification of finished products. Most construction companies have their own Quality Control Department or, at least, Quality Control Officer who is in charge of quality control. The aim is to filter the products before they reach the client, so that products that do not comply with requirements are discarded or repaired. This reception control is usually carried out by people who were not involved in the production activities, which means that costs can be high, and preventative activities and improvement plans may not be effective. It is a final control, located between producer and client, and although it has the advantage of being impartial. Check list is usually handy during quality control of construction works.

A construction company must reduce the costs of bad quality jobs as much as possible to maintain a good image, and ensure that the results of its processes comply with the client's requirements. Both internal and external controls can be carried out on quality performance. For example, the inspection of concrete received by the contractor can be carried out by an consultant structural engineer; the execution of steelworks can be controlled by the project manager, or the local council area or state government can establish building control agency for execution of building works.

8. Methodology of research

Questionnaires and direct interviews were engaged for mining of primary data as well as searching newspapers, journals and newsletter of ministries, departments and agencies (MDAs) in Lagos State for secondary data. Survey population was forty-eight (48) as members of staff below the rank of Assistant Director were not allowed to participate in the study. The Questionnaires was designed to seek data on the control measures put in place by the Physical Development Department of the Lagos State Ministry of Physical Planning through the following suggestions to the respondents:

- Approval to commence construction after obtaining development permit.
- Inspection and certification of various stages of building construction.
- Verification of your General Contractor’ All Risk and Building Insurance Policy.
- Issuance of certificate of completion of building construction and fitness for habitation.
- Identification and removal of distressed and non-conforming buildings.
- Public Health control in Buildings.
- Advise on type of design and cost of construction

The Questionnaires also sought to find out the causes of poor performance of the control measures put in place against building collapse in Lagos State. The causes suggested by the
researcher which were analysed based on 5-point Likert Scale were: Corruption, Lack of staff, Lack of Logistics, Inadequate Equipment, Lack of Cooperation from other Stakeholders.

9. DISCUSSION OF FINDINGS

Table 1: Table of the Causes of Poor Performance of Control Measures of Building Collapse in Lagos State.

<table>
<thead>
<tr>
<th>S/N</th>
<th>Suggested Causes by the Researcher</th>
<th>Number of 5 point respondents</th>
<th>Number of 4 point respondents</th>
<th>Number of 3 point respondents</th>
<th>Number of 2 point respondents</th>
<th>Number of 1 point respondents</th>
<th>Total points of factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Corruption</td>
<td>23</td>
<td>18</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>202</td>
</tr>
<tr>
<td>2</td>
<td>Lack of adequate staff</td>
<td>25</td>
<td>17</td>
<td>4</td>
<td>1</td>
<td>1</td>
<td>208</td>
</tr>
<tr>
<td>3</td>
<td>Lack of Adequate Logistics</td>
<td>18</td>
<td>19</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>186</td>
</tr>
<tr>
<td>4</td>
<td>Inadequate Equipment</td>
<td>16</td>
<td>20</td>
<td>6</td>
<td>4</td>
<td>2</td>
<td>188</td>
</tr>
<tr>
<td>5</td>
<td>Lack of Cooperation from other Stakeholders</td>
<td>25</td>
<td>18</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>209</td>
</tr>
</tbody>
</table>

The respondents’ choices of the control measures put in place to avert incessant building collapses in Lagos State are: Approval to commence construction after obtaining development permit, Inspection and certification of various stages of building construction, Verification of your General Contractor’ All Risk and Building Insurance Policy, Issuance of certificate of completion of building construction and fitness for habitation, Identification and removal of distressed and non-conforming buildings, and Public Health control in Buildings.

The causes of poor performance of the control measures put in place, according to the respondents are shown in the table above.

The respondents agreed that “Lack of Cooperation from the Stakeholders” with 209 points is the greatest impediments to the control measure put in place for the aversion of building collapse in Lagos State. The second most important factor, according to the respondents, is “Lack of Adequate Staff” with 208 points. “Corruption” with 202 points was chosen as the third most important impediments. “Inadequate Equipment” has 188 points and was chosen as the fourth most important factor, while “Lack of Adequate Logistics” was chosen as the fifth most important factor.
10. CONCLUSION

Despite the fact that building collapse is very rampant in Nigeria, this study had shown that the rampant collapses are not due to the fact that control measures to avert building collapse were not in place. There are enough control measures both institutional and legal frameworks to avert incessant building collapse 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 by reducing the quantity of cement and number of iron rods used in concrete which will result in poor quality concrete but the supervisors from the government ministry are not adequate, lack logistics to efficiently monitor construction works in Lagos State and are corrupt.

In some construction sites, the site supervisors and workers are not experienced to determine the adequate columns that will carry the upper loads. It is the duty of the Engineers from the ministry to ensure that there is a qualified engineer, recognised by the Nigerian Society of Engineers, on site. In most cases, these ministry Engineers will collude with the site workers and collect money from them. The agency in charge of building control LABSCA lacks capacity to prosecute defaulters and can only refer contraveners to the Ministry of Justice of Lagos State Government. This process is cumbersome and time wasting.

The only punishment meted out to ‘unconnected’ owners of collapsed buildings in Lagos State is for the government to seize the land. There has never been compensation to the family of the victims. Government has also not prosecuted and incarcerate any owner of collapsed building in Lagos State even where lives were lost. Quackery is a crime that should be frowned at by all and government should criminalise this act in order to protect the poor citizens who work on these sites and the occupiers of completed badly-built buildings. Innocent souls have lost their lives.

The Lagos State Government should ensure that LABSCA operates from the Local Government secretariat where they will be closer to the property developers. This practice will reduce the distance that has to be travelled by members of LABSCA staff in Ikeja. There should be adequate training and awareness exercises for the members of the public to know that it is there duty to inform government agencies of bad and illegal construction. The National Building Code bill which has been presented to the National Assembly since 2006, should be passed into law as soon as possible.
REFERENCES


