IOSR Journal of Mechanical and Civil Engineering (IOSR-JMCE)
e-ISSN: 2278-1684,p-ISSN: 2320-334X, Volume 11, Issue 3 Ver. VII (May- Jun. 2014), PP 09-10
www.iosrjournals.org

Causes of building failures in Africa: A case study on collapsing structures in Kenya.

Jackson Musyoka Kioko
(A Bachelor of technology student & a Kenyan scholar, Civil Engineering department at National Institute of Technology-Warangal, India)

Abstract: *This article elaborates the various causes of building failure in Africa, particularly Kenya. In addition to various causes that lead to collapse of buildings, Lack of African code of practice can also be a factor that should be put in consideration. Most codes of practice used in African countries are foreign codes either from Britain or Indian codes yet we use local materials for construction.*
Keywords: *building; code of practice; collapse; Life & properties; materials.*

I. Introduction

The cases of building failures and consequent collapse of structures in Kenya had reached an alarming stage in the past few years. Reporting collapsed buildings in the country was comparable to flood disaster, earthquake and aeroplane clash considering the loss of life and destruction of property in different parts of the country. As I prepare this article, there is a sense of relief in the country as far as building collapsing is concern, not because people have stopped doing construction work, but as a result of safety measures currently being practiced in the construction industry along with tight government precautions. The aim of this article is to elaborate various cases that occurred in the country leading to loses of lives and properties. It also mentions the causes which could have caused such incidents, along with various suggestions which were not included in speculations.

II. Collapsed buildings.

A five-storey building under construction collapsed in the central business district in **Nairobi**, in January 2013. The building began to sway, then quickly collapsed, killing at least 11 and injuring dozens. More than 280 construction workers were inside when the unfinished structure in central Nairobi came down. Over 200 people were trapped under the debris of the collapsed structure. Several people remained trapped for hours and could be seen signalling for help from under the debris with their hands. At least 90 people were pulled out of the rubble alive, but six of those later died of their injuries Bystanders, including children, were injured by collapsing material.

Fig 2: collapsed five storey building in Nairobi

In **kisumu** city, a building adjacent to Imperial Hotel tumbled down when workers were preparing to call it a day. Most of the victims were day labourers and the construction manager was said to have run away immediately the incident occurred. Efforts to reach him remained futile as his phone was off after the incident. Scores of people were still trapped inside the debris even as rescue efforts led by the Kenya Red Cross, fire fighters and police continued overnight.

Fig 1: collapsed four storeys in kisumu, Kenya.

Another incident occurred in which a 4-storey building that was partly under use though under construction in **Mlolongo,** along Mombasa Road, collapsed in on Saturday 9th June 2012, leading to the deaths of five people and injury of ten others. It took the Fire Services ssUnit, the Kenya Police and other stakeholders an overnight search and rescue operation where by five bodies were finally retrieved from the rubbles and ten injured people rescued and taken to the Hospital. The operation took almost 36 hours.

III. Reasons suggested to have caused the failures

All the above incidences resulted to loss of lives and property, but the question that begs many answers is why do these buildings collapsed, and how will this be brought to an end?

A number of reasons had been given to explain why these buildings had collapsed and these include reasons like the concrete mix ratio being not right, lack of enough planking and strutting in place to uphold excavations, the column spacing being too wide, poor reinforcement, the slenderness ratio being too high, cost cutting by contractors by changing recommended concrete mix or reducing the amount of reinforcement recommended and a multitude of other reasons.

Fig 3: Trapped workers in a collapsed 4-storey building.

Generally, building failures occurs due to use of sub-standard building materials, poor workmanship by contractors, use of incompetent contractors, faulty construction methodology, heavy downpour, non compliance with specifications or standards by developers and contractors, lack of supervision, poor inspection & monitoring, structural defects, defective design/structure, illegal conversion and alterations.

IV. Recommendation and suggestions

As responsible professionals in the built environment, I think it is good for the construction companies to emphasize the need for use of qualified personnel in all construction activities as a step towards restoring sanity in the industry. The tragedies are likely to keep occurring if left unchecked as construction activities increase.

The inability of Kenyan construction industry of having its own code of practice is another factor that should be put into consideration. This would have taken into account the quality of the local materials used in construction. For instance, it is important for the aggregates used in making concrete to be free from impurities and the sand used to be free from silt and clay. Presence of impurities in concrete reduces its comprehensive strength hence this aspect should be highly monitored while doing construction.

V. Conclusion

In order to reduce the incidences of building collapse in any country, the national society of engineers and other government agencies should work on availing a code of practice which will match on the local materials used in a particular region. They should also make sure that the client employs a qualified engineer to supervise the project. The government should also play a key role of ensuring that all projects meet the required standards before they are laid on site. Any sort of corruption, poor governance or poor construction materials that do not meet the required standards of construction will always lead to loss of lives and properties.

References

[1] Kenya Red cross Society documentary 2013:- http://www.crisocial.net/index.php?option=com_hwdvideoshare&task=viewvideo&Itemid=8&video_id=584

[2] Kenya digital standard news on collapsed structures in the various parts of the country. http://www.standardmedia.co.ke/?articleID=2000075293

[3] 2012-2013: Concrete technology class-notes on major causes of building failure through various case studies on durability of concrete structure by Prof. Rathish Kumar Pancharathi, National Institute of Technology, Warangal, Department of Civil Engineering, India.

Author
Jackson M. Kioko
Civil Engineering Department,
506 004, National Institute of Technology, Warangal
Andhra Pradesh, India.
E-Mail: jackrosemk@gmail.com