

Why buildings collapse

There are frequent media reports of collapsed buildings. **Beatrice Nakibuuka** explores some of the reasons why and what measures can be taken to prevent it.

In April last year, Kyaseka building in Makerere collapsed killing one of the builders on spot. In May 2016, a six storey residential building collapsed in Kenya and more than 30 people were reported dead. Over 30 people were rescued alive after a building collapsed in Nyagatare, north-eastern Rwanda in 2013 but killing six.

More than 100 people most of whom were visitors from South Africa died when a church guesthouse collapsed in Nigeria in 2014. More deaths have happened elsewhere in the world and probably more will when a building collapses.

It could be about the personnel you hired for the construction because you want to cut costs by employing unskilled workers who are cheaper than trained builders or may be the materials you used. The reasons for collapsed buildings are many.

Weak foundation & structures

A weak foundation is likely to cause collapse of a building even before it is completed according to Rashid Senyonjo, a structural engineer at HIL Consult. While building the foundation, the solidity of the soil where the building is being built and the heaviness of the building (depending on what it will be used for) must be well considered.

He says, "A firm foundation may cost almost half of the cost of the whole construction especially in swampy areas. Even on firm areas a strong foundation is a must to ensure the strength of a building."

At all points of construction, the strength of the building should be tested according to the law but because of laziness, corruption and failure to enforce the law, it is not done.

That is a big problem, he says, when at every stage of construction there is someone with a strong motivation to save money or take money.

Incompetent engineers

There are many people in town who pose as engineers, according to Francis Munyambabazi, a freelance civil engineer. Incompetent engineers will do substandard work including improper concrete mixing yet concrete determines how long the building will last. Proper mixing gives a building proper durability.

Before it is used, the mixture of sand, cement, aggregate or stones and water must be first approved by the engineer for its strength. The approval is after the stages of batching, testing and curing have been tested.



A building that collapsed in Kampala last year due to the use of poor building materials. PHOTO BY ALEX ESAGALA

30

NUMBER OF PEOPLE KILLED WHEN A BUILDING COLLAPSED IN RWANDA IN 2013

Munyambabazi says, "Batching is the process of measuring and combining the ingredients of concrete as per the mix design. If the engineer does not know what to do, then the strength of the building will be questionable and likely to

collapse." During the drying process, it is important to maintain the moisture and temperature conditions of concrete so that the concrete develops hardened properties over time.

He warns that the concrete thereafter must be taken to the structure laboratories where it is tested to confirm whether the structure has reached the designed strength. Most engineers however are reluctant to take such measures as required thereby causing deaths from collapsed buildings.

Counterfeit material

Some building materials are just not strong enough because they are not genuine and therefore not suitable for building structures.

It is the responsibility of the

engineer to check the quality of materials and not leave it to the Uganda Bureau of Statistics. An experienced engineer will be able to identify fake from genuine building materials.

"Most building materials on the Ugandan market are counterfeit, ranging from the cement to steel bars. If the engineer is not cautious then a building will collapse because surely counterfeit cement and other fake materials can never guarantee a building's strength," says Munyambabazi.

Mistakes

Even when workers are given the right materials to make the concrete, they mix them incorrectly, if they are not trained. Hiring unskilled workers who are cheaper

Preventive measures

Avoid major alterations: Additional and illegal constructions should be monitored and banned. These add-ons put extra pressure on the weight holding capacity of the building giving rise to cracks on the walls. Also, in the cases of dilapidated establishments, the focus should be on its repair rather than on modifications which reduce the longevity.

Awareness of the construction area: Look for architectural designs that are common in your area of construction. For example, regions that receive heavy rainfall every year have houses with tiled roofs and effective drainage mechanism to avoid flooding and consequent weakening of the foundation.

It is crucial to choose strong and enduring homes that can stand the wear and tear of weather uncertainties. Be it rainfall, floods or earthquake, a robust construction will not budge, and last for ages. Also, with care and regular maintenance, you can easily protect your home from turning to ruins.

than trained builders is likely to ruin your building. This is one of the reasons put forward by civil engineers Henry Mwanaki Alinaitwe and Stephen Ekuu why a building in Uganda collapsed in 2004. Their research shows that the workers misunderstood the mixing ratios of the concrete.

Change in function

Buildings collapse when the load is beyond the strength of the building. Even if the foundations and the materials are strong enough for what they were originally built for, if the purpose changes to multipurpose yet it was built to serve a smaller population, it will eventually collapse.

Munyambabazi says, "If a building was designed to be a home but instead then turned into a library where boxes of books are piled up, more users in place and probably an extra storey added, the building will be strained in terms of weight."

If there are any changes a property owner must make on a building, they must first consult an engineer and surveyor to test the strength of the building and advise accordingly.

Natural calamities

Natural calamities have also led to collapse of a number of houses. On September 25, a heavy downpour in Nfasha Trading Centre, Ikamiro Parish, Rubanda District swept down nine houses. Also strong earthquakes, tsunamis and cyclones are some of the well-known calamities that destroy buildings which we may not have control over.