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ANALYSIS OF INCIDENCES OF COLLAPSED BUILDINGS IN
LAGOS METROPOLIS, NIGERIA

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ABSTRACT. Building collapses in Lagos metropolis have become worrisome to residents, developers, and Government. This study examined the incidences of collapsed buildings in Lagos metropolis over a thirty-year period. Time series analysis was carried out to determine the past and predict direction of the future occurrences. In addition, a process of inference from reports on investigations of past occurrences was adopted to establish causes of building collapses in the study area. Spatial analysis of the collapses showed high concentration in swampy terrain that was reclaimed in the past. The study recommends, amongst other things, comprehensive investigation of the geophysical characteristics of the affected locations towards finding lasting solution to the menace.

KEYWORDS: Collapsed building; Disaster; Distressed building; Spatial analysis; Lagos; Nigeria

1. INTRODUCTION

Buildings are expected to have certain characteristics that make them attractive for many uses which may be residential, commercial, institutional, educational, and industrial to meet people's daily needs. Characteristics of a good building include provision of security, safety to lives and properties, convenience, in addition to social, psychological and economic satisfactions derived by occupiers. In some cases, buildings that are expected to meet the people's daily needs have become source of great concerns to occupiers, owners, developers, governments, and physical development planning authorities, consequent upon their incessant failure and collapses.

Building failure, according to Ayininuola and Olanusi (2004), is an unacceptable difference between expected and observed performance of building components. They identified two types of failure in building, which are cosmetic and structural types. Cosmetic failure occurs when something has been added to or subtracted from the building, thus affecting the structures' outlooks. On the other hand, structural failure affects both the outlook and structural stability of the building.

Roddis (1993) considered failure as occurring in building components when they can no longer be relied upon to fulfill their principal functions. He distinguished between defect and failure in buildings. Defect is deflection in a building causing certain amount of cracking or distortion while excessive deflection that results in serious damage to partitions, ceilings and floor finishes is referred to as building failure. A distressed building exhibits defects in its component and foundation, causing partial or total collapse. These more often than not destroy the structural stability that was checked, resulting in failure.

Failure, according to Ippiriono (2003), occurs when all structural facility that is built is no longer as expected, as specified in the design requirements. Building failure is the failure of all or part of a building, where full or partial demolition is needed. Citing Centre tower as one of the cases, Bazant and Veletsos (1983) expressed great concern for tall buildings, explosions, earthquakes, and foundations, and suggested that all building demolitions are dangerous.

According to Ippiriono (2003), collapse failure in a building occurs when a part of a structural component that is supposed to support the building falls down or the structural capacity is exceeded. Collapse suggests a complete loss of support for a part of a structure, which results in total collapse of the structure. Collapse is usually a consequence of structural instability. Failure of all the primary structural components has been identified as the cause of un-serviceability of a building. Thus, the collapse may be due to components that may result in total collapse, and refers to a sudden, vertical failure of the structure with partial or total loss of integrity.

Incidence of collapses are global, and it is estimated that Nigeria is not spared. For example, a number of buildings have collapsed in Lagos, including:

- Ronan Point: a residential building in London, where kitchen...
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