



**Assessment of Measures and Procedures in Mitigating Fire Outbreaks in Commercial Buildings in Lagos Island, Lagos Nigeria**

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**ABSTRACT**

*Fire outbreaks in commercial buildings remain a persistent urban safety challenge on Lagos Island, Nigeria, resulting in recurrent loss of lives, property damage and economic disruption (NFPA 2022). While policy responses have largely focused on emergency firefighting capacity and post-incident management, contemporary fire-safety scholarship emphasizes that fire risk and severity are significantly influenced by architectural design decisions made at planning and construction stages (Meacham 2016, Cowlard et al 2013). This study critically assesses the architectural measures and procedures deployed in commercial buildings on Lagos Island to mitigate fire outbreaks, with emphasis on design-based fire prevention and containment strategies. Using a qualitative research approach, data were gathered through systematic field observations, supported by photographic documentation across selected commercial districts on Lagos Island, complemented by a review of relevant fire-safety regulations, international best practices and synthesized stakeholder responses derived from observed construction practices and regulatory frameworks (Olusola and Babatunde 2016). Findings revealed widespread deficiencies in compartmentation, means of egress and escape, fire-rated materials, service integration and facade treatment which collectively increase the likelihood of fire incidents escalating into uncontrolled outbreaks (Torero 2012, Watts and Hall 2012). The study concludes that architectural interventions, where properly regulated, enforced and integrated at design level and construction stages, play a critical role in curtailing fire incidents in commercial environments. Recommendations are made for design-oriented policy enforcement, improved regulatory compliance and context-sensitive fire safety planning in Lagos Island commercial developments. This study contributes to architectural criticism and urban fire safety discourse within rapidly urbanizing contexts in the Global South.*

**Keywords:** fire outbreaks, architectural design, commercial buildings, Lagos Island, fire mitigation, urban safety

**INTRODUCTION**

In a rapidly urbanizing city, especially within developing economies, Fire outbreaks remain a persistent and destructive danger and threat to lives and properties in mid-rise to high-rise commercial buildings with attendant economic disruption particularly within rapidly urbanizing cities (World bank 2020). Commercial buildings are particularly under constant threat due to high occupational density, extensive electrical installations and mechanical services, as well as, diverse profile of users (Hall 2015, NFPA 2021). In Lagos state, Nigeria's foremost commercial hub, fire outbreaks have become a recurring urban challenge, especially within densely developed commercial districts. Lagos Island, as a historic and contemporary centre of commerce -with its high developmental density, ageing building stock, and extensive informal building modifications- experiences intense daily occupancy and infrastructural pressure, making fire safety a key concern in its built environment (Olusola and Babatunde 2016).

In Nigeria, responses to fire outbreaks have historically prioritized post-incident emergency measures (including firefighting response capacity and disaster management operations). However, international fire safety research increasingly recognizes that fire outcomes are largely determined at the

architectural design stage through decisions relating to spatial configuration, material selection and passive fire protection systems (Meacham 2016). passive fire protection measures -such as compartmentation, protected egress and means of escape, fire resistant construction and facade fire control- are particularly critical in commercial buildings where occupant loads and combustible contents are high (NFPA 2021). Field observations across commercial buildings on Lagos Island reveal architectural conditions that undermine these principles, including narrow staircases without fire-rated enclosures, absence of dedicated fire exits, exposed electrical installations, use of non-rated iron doors and combustible interior finishes. Similar deficiencies have been documented in studies assessing fire safety management practices in Nigerian public and commercial buildings where regulatory provisions exist but are weakly implemented in practice (Oke et al 2018; Olusola and Babatunde 2016). Furthermore, continuous building masses without fire separation and facade treatments incorporating aluminium composite panels of uncertain fire performance create pathways for rapid horizontal and vertical fire spread (Torero 2012). These conditions raise critical questions about the effectiveness of architectural fire mitigation strategies in Lagos Island's commercial developments. This study therefore focuses on the assessment of measures and procedures employed to mitigate fire outbreaks by curtailing fire incidents in commercial buildings on Lagos Island, Lagos, Nigeria

### **Problem Statement**

Although regulatory frameworks such as the Nigerian National Building Code and Lagos state fire safety provisions exist, a significant gap persists between prescribed fire-safety requirements and the reality of their implementation, maintenance and enforcement in commercial buildings on Lagos Island. (Adeleke et al. 2020; Watts et al 2016; Kobes et al. 2010). This gap raises critical concerns about the effectiveness of existing measures and procedures in mitigating fire outbreaks before they develop into large-scale disasters. Fires, indeed, can start within buildings but fire outbreaks are not entirely inevitable. While existing studies have focused largely on technical and regulatory aspects of making a building resilient in case of outbreaks, little attention have been given to architectural design decisions, informal adaptations and human behaviour interaction and how they shape fire outbreak outcomes (Lawson 2016; Babrauskas et al 2017). with proper architectural measures and operational procedures, a fire can be detected early, contained at source and extinguished early before it escalates into a full fire outbreak. This gap underlines the need for a critical design-context assessment of fire mitigation measures and procedures in commercial buildings on Lagos Island in order to identify systemic weaknesses, deficiencies, understanding their architectural implications and propose context-responsive solutions and strategies for improving fire outbreak prevention within the built environment

### **Aim**

The aim of this study is to assess critically, the effectiveness of architectural measures and operational procedures employed in mitigating fire outbreaks in commercial buildings on Lagos Island, Lagos state, Nigeria, with a view of preventing the escalation of fire incidents into major fire disasters

### **Objectives**

1. To identify the architectural fire-safety measures incorporated in selected commercial buildings on Lagos Island for the purpose of fire outbreak mitigation
2. To examine the operational and management procedures adopted within these buildings to prevent the escalation of fire incidents into full-scale outbreaks
3. To assess the level of compliance of commercial buildings with established fire-safety regulations and standards in relation to outbreak prevention
4. To evaluate the effectiveness of existing measures and procedures based on observed conditions and recorded fire incidents
5. To propose architectural and procedural strategies for improving fire-outbreak mitigation in commercial buildings on Lagos Island

## **LITERATURE REVIEW**

### **Conceptual Clarification of Fire and Fire Outbreaks in Commercial Buildings**

Fire outbreaks in commercial buildings are seen more of the way architectural design, construction implementations, regulatory enforcements and human behaviours interact with one another (Babrauskas et al 2017, Buchanan et al 2019). While fire incidents may occur due to electrical fluctuations or human error, outbreaks are seen to be largely a result of conditions embedded within the built environment. Hall (2015) mentioned that commercial buildings are characterized by intensive electrical loads, high occupant density, diverse activities and prolonged operational hours which makes them highly vulnerable to fire incidents. Within the Nigerian context, studies showed that ageing markets, informally-modified office complexes and high density mixed-use developments are major contributors to urban fire outbreak profile (Adeleke et al 2020). Furthermore, Odefadehan (2011, 2015), argued that building failures (including fire outbreaks), are seldomly accidental but can arise from systemic deficiencies in design, construction and regulatory enforcement. To this end, it becomes imperative to critically assess fire outbreak mitigation measures beyond normal regulatory compliance

### **MEASURES and PROCEDURES in ARCHITECTURE that help CURTAIL FIRE INCIDENTS to PREVENT THEM from SNOWBALLING into FIRE OUTBREAKS**

International fire safety literature emphasized that architecture constitutes the first line of defence against fire spread, smoke propagation and occupant fatalities, particularly in high-density commercial environments (Drysdale 2011). Buchanan and Abu (2017) & (Meacham 2018) noted that fire ignition may occur due to electrical faults, human error or mechanical failure. However, the extent to which such incidents escalate is largely determined by the following architectural decisions. Compartmentation - This is the subdividing of a building into fire-resistant zones to curtail the spread of fire or smoke in case of an ignition. Fire compartments are created using fire-rated walls, floors and structural elements that maintain integrity and insulation during a fire event (Drysdale 2011).

Building layout - Kobes et al (2010) showed that the absence of fire compartment boundaries significantly increases fire severity and response difficulty, especially where buildings share party walls without fire separation and that effective compartmentation requires deliberate spatial planning, continuity of fire barriers and proper detailing at junctions, service penetrations and facade interfaces. Where these measures are absent or compromised, minor fire incidents can escalate into fatal outbreaks, consuming whole block or building. Means Of Egress And Escape - Architectural procedures for effective egress design include protected stair enclosures, smoke-proof lobbies, outward-opening exit doors and visual legibility of escape routes. When such measures are ignored during design or compromised during construction and post-occupancy alterations, fire incidents that could otherwise be survivable often result in mass casualties (NFPA 2021; IBC 2021).

Material selection - Babrauskas and Peacock (2018) noted that building materials contribute to the behaviour of fire during an incident. Use of highly combustible finishes and non-certified fire resistant materials increase fire load and accelerates the growth. This is often linked to cost-driven construction practices and weak enforcement mechanisms in developing contexts (Odefadehan 2015).

Electrical Safety - Meacham (2018) stresses that architectural coordination of building services is a passive fire mitigation strategy, requiring fire-stopped penetrations, protected service shafts and spatial allowance for safe installation and maintenance. When electrical services are treated as afterthoughts rather than integrated design components, fire incidents are more likely to escalate. Fire Suppression and Detection Provisions - Although these are active fire protection measures, their effectiveness rely heavily upon architectural provision. Sprinkler systems, hose reels and fire alarm devices require adequate spatial planning, ceiling coordination, access routes and water supply integration (NFPA 2021).

Fire Doors and Openings Protection - Fire doors are designed to maintain compartment integrity by resisting fire and smoke for a specified period, unlike conventional metal or iron doors that lack certified fire performance (NFPA 2021). Properly specified fire doors incorporate intumescent seals, self-closing mechanisms and tested fire resistance ratings. Architectural oversight in door specification undermines compartmentation strategies and facilitates rapid fire spread through circulation routes and exit corridors, transforming localized fires into building wide outbreaks.

Collectively, these architectural measures and procedures form a passive fire mitigation framework that determines whether fire incidents remain localized or escalate into destructive outbreaks, literature consistently demonstrates that failures in architectural design, detailing and regulatory compliance, not merely ignition sources, are central to fire disaster outcomes in commercial buildings.

This framework provides the analytical benchmark against which existing commercial buildings on Lagos Island are assessed in subsequent chapters

### **Regulatory Frameworks and Enforcement**

In Nigeria, the National Building Code, coupled with state-level regulations, help to provide minimum guidelines to serve as safety standards enforceable by law (Adeleke et al 2020).

### **Human Behaviour and Operational Preparedness**

Kobes et al (2010), Proulx (2018) and Agyekum et al (2021) all allude to a combination of lack of clear signage, regular fire drills and trained personnel coupled with poor maintenance culture, irregular servicing of fire equipment and lack of accountability among building managers, contribute to delay response, underestimating of fire-incident risks and following familiar, rather than designated escape routes during fire emergencies. These findings reinforce the narrative that fire incident mitigation should be a continuous process that requires operational commitment rather than a one-time design intervention

### **Fire Safety in Dense Urban and Historic Commercial Districts**

Urban form and morphology is seen as critical to curtailing fire incidents. Lawson (2016) argued that for historic commercial districts (such as Lagos Island), it is imperative to balance sensitive architectural solutions (both active and passive) for ageing buildings to ensure safety, functionality and heritage value of the buildings are not compromised

### **Summary and Relevance to the Study**

In reviewing the different literature, curtailing fire incidents, in order to mitigate fire outbreaks, is a multidimensional challenge involving architectural design, regulatory enforcement, technological systems and human behaviour. Failure in design, material selection, construction practices and regulatory enforcement collectively determine whether a fire remains contained or escalates into a major outbreak, providing the basis for critically assessing fire mitigation measures in commercial buildings on Lagos Island

## **RESEARCH METHOD**

A qualitative comparative field observation design, supported by descriptive and evaluative methods were considered appropriate because they allow for identification of recurring architectural conditions influencing fire outbreak risks. The investigation was conducted in Lagos Island, Lagos state, Nigeria, a historic commercial hub characterized by high building density, mixed-use commercial developments, ageing building stock, frequent remodeling of use and the ugly trend of recurring fire incidents. These traits combined, make Lagos Island a suitable location for assessing fire-outbreak mitigation measures in commercial buildings. The study population comprises commercial buildings on Lagos Island, Lagos state, particularly those that accommodate retail, office, mixed-use and trading activities. These buildings typically experience high occupancy levels, intense electrical loads, and continuous human activity, making them especially vulnerable to fire incidents and subsequent outbreaks. The population also conceptually includes key stakeholders involved in the design, construction, regulation and operation of these buildings, whose practices influence fire-safety outcomes.

A purposive sampling technique was adopted to select buildings exhibiting relevant architectural fire-safety conditions. Rather than focusing on individual case studies, the study analyzed recurring architectural features observed across multiple buildings. The unit of analysis was therefore fire-safety conditions within the built environment, while stakeholder perspectives were synthesized from field observations, literature and regulatory review

Selection criteria included

- Buildings used for commercial or mixed-use purposes
- Mid-rise and low-rise buildings with multiple occupants
- Buildings exhibiting visible fire-safety features of deficiencies
- Buildings located within high-density commercial corridors on Lagos Island

Data collection methods include direct field observation and photographic documentation as well as, review of fire safety regulations and literature. By integrating these sources, the study produces, analytically, robust findings that reflect prevailing conditions rather than isolated cases

The primary research instrument is a Fire-safety evaluation checklist structured to assess the following;

- i. Passive fire safety measures
- ii. Active fire safety systems
- iii. Occupancy and use control
- iv. Fire safety management procedures
- v. Regulatory compliance

The checklist enables systematic comparison across case-study buildings

Data analysis is carried out using

- Qualitative descriptive analysis to interpret observed conditions
- Comparative analysis to evaluate differences between case-study buildings
- Critical assessment comparing observed practices with regulatory requirements and best-practice standards

Findings are presented using photographs and narrative discussions

## RESULTS AND DISCUSSIONS

### Absence of Fire-Rated Staircase Enclosures

Field observations revealed the wide spread use of narrow staircases in mid-rise mixed-use buildings on Lagos Island.



Stairwell 1



Stairwell 2

In several cases, a single stairway of inadequate width, served multiple floors and mixed occupancy. Such stair configurations fall short of established fire-safety principles which require adequately sized and protected means of escape proportional to occupant load and building height. During fire incidents, these narrow staircases are prone to congestion and rapid smoke infiltration, thereby, increasing evacuation time and enabling fire incidents to morph into major outbreaks. Furthermore, the staircases observed, reveal that many buildings have inadequately-sized and unprotected stairwells that typically open to adjoining commercial spaces and lack fire-rated enclosures or doors, thus, allowing smoke and heat to rapidly infiltrate escape routes during fire incidents, As a result, stairways intended for evacuation may become unusable at early stages of a fire, significantly increasing evacuation difficulty and contributing to the escalation of fire incidents into large-scale outbreaks.

### Building Planning, Layout and Compartmentation

Field observations showed several instances where originally distinct commercial buildings had become physically joined through informal extensions and shared structural elements.



*Conjoined buildings on Nnamdi Azikiwe Street, Lagos Island*

The absence of fire-rated separation walls and minimum spacing between buildings eliminates horizontal fire containment, allowing fires to spread rapidly from one structure to another. Such conditions undermine the fundamental principle of compartmentation at both building and urban scales and significantly contribute to the escalation of isolated fire incidents into large-scale fire outbreaks on Lagos Island. In other words, on Lagos Island, fire outbreaks are not merely building failures but block-level architectural failures caused by the erosion of fire separation between adjacent properties

#### **Fire Suppression and Detection Provisions**

Field observations revealed that some commercial and mixed use buildings under construction or nearing completion, lacked viable active fire protection systems such as sprinklers or hose reels.



*Ongoing buildings under construction along Kosoko street, Lagos Island*

This indicates that fire safety considerations are often omitted at the design and construction stages, rather than being solely a legacy issue of older buildings. The absence of these systems in new developments suggests weaknesses in regulatory enforcement, professional practice and approval processes, thereby perpetuating conditions that allow fire-incidents to escalate into fire outbreaks. Fires start small and with no suppressants, it grows rapidly and coupled with buildings joined at the seams and narrow unprotected stairwells, a fire outbreak occurs. In other words, the absence of active fire protection systems in newly-constructed commercial buildings demonstrates that fire risk on Lagos Island is not merely inherited but continuously regenerated through design and regulatory failures. Furthermore, field observations indicate that many commercial buildings on Lagos Island are constructed using hollow block masonry walls and reinforced concrete structural frames which are inherently non-combustible and provide a degree of passive fire resistance.

#### **Fire Doors and Openings Protection**

Field observations here revealed widespread use of metal security doors as the primary access point to commercial shops on Lagos Island. Welded steel plate doors, roll-down metal shutters or locally-fabricated iron doors are used based on the assumption that they are fire-rated because they are made of metal primarily for security



### *Mixed-use buildings on Lagos Island*

While steel doors are non-combustible and may offer some resistance to fire spread, their use as the sole means of escape raises significant life-safety concerns. In the event of a fire, heat-induced deformation, smoke accumulation or locked shutters can impede occupant evacuation, increasing the likelihood of fatalities before fire outbreaks are externally contained. . Furthermore, despite being metallic, the doors lack fire-rating certification, intumescent seals and self-closing mechanisms, rendering it ineffective as a fire-resistant barrier (Vtrotech (2025))

The prioritization of security over fire-rated egress design reflects a critical gap in architectural safe planning. Security-driven shopfront designs, when unaccompanied by secondary escape routes or fire-rated doors, can transform non-combustible elements into life-threatening barriers during fire incidents

### **Means of Escape and Egress Design**

Field observations revealed that many commercial buildings on Lagos Island lack secondary fire exits, relying solely on a single shopfront entrance for occupant escape in case of fire incidents.



### *Narrow streets with shopfronts opening into them Back of building along Nnamdi Azikiwe street*

This configuration contravenes international best practice, which recommends multiple independent means of egress for commercial occupancy. In the event of a fire, the absence of alternative escape routes increases evacuation time, heightens panic and elevates the risk of fatalities, thereby, allowing otherwise manageable fire incidents to escalate into major fire outbreaks. The absence of secondary exits represents one of the most direct architectural pathways through which fire incidents on Lagos Island escalate into large-scale outbreaks

## Material Selection and Fire Performance

Field observations equally reveal the the extensive use of PVC ceiling panels and timber wall finishes within several commercial shops on Lagos Island. These materials significantly increase internal fire load and smoke production, thereby accelerating fire growth and reducing safe evacuation time in the event of ignition



*Shops along Kosoko street*

## Analysis of Field Observations and Photographic Documentation: Assessment of Architectural Fire-Safety Measures

### Compartmentation

Compartmentation was largely inadequate across the case studies. Fire-rated walls and doors were either absent or compromised through unregulated alterations. Open-plan layouts dominated most of the commercial spaces with no visible fire-resistant separation between individual units.

### Means of Escape

Observation across the case-study buildings reveal varying levels of provision for means of escape. While some buildings provided multiple exit points, several exits were observed to be either non-existent, partially obstructed or inadequately sized relative to the occupant. In the market complexes observed, escape routes were encroached upon by temporary stalls and storage of combustible materials, significantly increasing evacuation difficulty during emergencies. Such conditions undermine the effectiveness of escape design and increase the likelihood of panic during a fire incident

### Vertical Fire Separation

Protected staircases, though seemingly present in some of the buildings, were often poorly maintained with non fire-rated doors or open access points that allow smoke penetration. In some cases, stairwells doubled as storage spaces, defeating their function as protected escape routes

### Active Fire-Safety Systems

Fire extinguishers were the most commonly observed fire-safety provision across some of the buildings observed. However, their placement, maintenance status and accessibility varied significantly. The extinguishers were, however, expired and needed revamping. Others were either blocked by furniture or goods. Some detection and alarm systems were either absent or non-functional in most buildings. The lack of early warning significantly reduces response time and increases the likelihood of fire escalation

### Operational and Management Procedures

Findings indicate that fire-safety management procedures are largely informal or non-existent. Building occupants demonstrated limited awareness of emergency response protocols. Fire drills were

not conducted in any of the buildings observed and no documented fire-safety plans were observed. This lack of preparedness suggests that even where architectural measures exist, procedural deficiencies may render them ineffective during emergencies

### **Compliance with Fire-Safety Regulations**

A comparison of observed conditions with provisions of the Nigerian National Building Code and Lagos state fire safety requirements revealed widespread non-compliance. Key areas of non-compliance include;

- Inadequate means of escape
- Lack of fire detection systems
- Compromised compartmentation
- Absence of post-occupancy inspections

These findings highlight a disconnect between regulatory provisions and on-ground implementation in commercial buildings on Lagos Island

### **Effectiveness of Measures and Procedures in Mitigating Fire Outbreaks**

Although certain fire-safety measures are present in the observed buildings, their effectiveness in mitigating fire outbreaks is significantly limited by;

- Poor maintenance
- Unauthorized building alterations
- Lack of enforcement
- Weak fire-safety culture

Consequently, many buildings remain vulnerable to rapid fire spread, despite nominal compliance through the provision of basic equipment such as fire extinguishers

### **Summary of Key findings**

The findings of this study reinforce the argument that fire outbreaks in Commercial buildings on Lagos Island are less a result of fire ignition and more a consequence of systemic failures in Architectural design, management procedures and regulatory enforcement. The dominance of open-plan commercial layouts without compensatory fire-control measures, coupled with overcrowding and informal modifications, create conditions conducive to rapid fire escalation. This aligns with documented fire incidents in Lagos Island where fires spread quickly due to inadequate containment and delayed responses

## **CONCLUSION**

This study assessed the architectural measures and procedures employed to mitigate fire outbreaks in commercial buildings on Lagos Island, Lagos state, Nigeria. Drawing on fire safety literature, regulatory frameworks, visual field, observations and synthesized stakeholder responses, the study demonstrates that fire outbreaks within the study area are not merely the result of ignition sources but are significantly shaped by architectural and procedural deficiencies embedded within the built environment

Findings reveal that while fire incidents may be inevitable in dense commercial settings due to electrical faults, human activity or equipment failure, their escalation into destructive outbreaks is largely influenced by design decisions. The widespread absence of compartmentation, inadequate means of escape, unprotected staircases, use of highly-combustible materials for interior finishes, compromised facade systems, exposed electrical services and lack of architectural provision for active fire systems collectively create conditions conducive to rapid fire spread and delayed evacuation.

The study further establishes a pronounced disconnect between fire safety regulations and actual building practices on Lagos Island. Although national and state-level codes articulate clear architectural requirements for fire mitigation, selective compliance, informal construction practices, post-approval alterations and weak enforcement undermine their effectiveness. As a result, fire safety is often treated as an add-on or operational concern rather than an integral component of architectural design.

Through architectural criticism, consistent with findings of Odefadehan C T, this study reposition fire outbreaks as a design and governance failure rather than an isolated emergency response problem. It highlights that the built form itself -through layout material choice, detailing and system integration-either constrains or amplifies fire risks. Consequently, meaningful mitigation of fire outbreaks in commercial buildings must prioritize architectural interventions that prevent escalation, protect occupants and support emergency response.

## RECOMMENDATIONS

### 1. Architectural Design and Planning

- a) Fire compartmentation should be restated as a core architectural principle in commercial building design with clear separation between shops, floors and adjoining structures using certified fire-rated construction
- b) Means of escape should be designed in strict accordance with regulatory standards, including adequate stair widths, multiple escape routes and protected fire-rated stair enclosures to ensure tenable evacuation conditions
- c) Architectural layouts should prioritize life safety by balancing spatial efficiency with fire risk reduction, particularly in high-occupancy and mixed-use developments

### 2. Material specification and Construction practices

- a) The use of combustible interior finishes such as PVC panels and untreated timber should be minimized with preference given to materials with certified fire resistance and low smoke toxicity
- b) Facade systems including aluminum composite panels, should be subjected to rigorous fire performance assessment, and only non-combustible or fire-rated systems should be approved for commercial buildings
- c) Openings, doors and service penetrations within fire-rated elements, should be detailed and constructed to preserve compartment integrity

### 3. Integration of Fire safety systems

- a) Architectural designs should make provision for the integration of active fire safety systems, including sprinkle, hose reels, fire alarms and smoke control mechanisms from the initial design stage
- b) Dedicated service zones and ceiling coordination should be incorporated to enable effective installation maintenance and retrofitting of fire protection systems

### 4. Regulatory Enforcement and Professional Practice

- a) Regulatory agencies should strengthen enforcement mechanisms to ensure sustained compliance beyond planning approval, including periodic post-occupancy fire safety results
- b) Architects and building professionals should assume greater responsibility for fire safety outcomes by embedding passive fire protection strategies into design proposals rather than deferring to firefighting interventions
- c) Public awareness campaigns targeting building owners and occupants should emphasize the role of architectural design in preventing fire outbreaks

### 5. Future Research

- a) Further studies should adopt building-specific case study approaches to correlate architectural deficiencies with documented fire incidents
- b) Quantitative assessment of the fire risk levels in relation to specific design variables would enhance predictive capacity
- c) Comparative studies between Lagos Island and other commercial districts could provide broader insights into urban fire safety governance

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