Multidimensional Evaluation of Fire Risk Management in Informal Retail Markets: A Case Study of Ilorin, Nigeria

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Abstract- ***Fire outbreaks in informal retail markets pose significant threats to life, property, and economic stability, especially in rapidly urbanizing cities of developing nations. This study presents a multidimensional evaluation of fire risk management in selected informal retail markets within Ilorin Metropolis, Kwara State, Nigeria. Employing a mixed-methods approach that integrated surveys, field observations, and case studies, the research assessed the adequacy of existing fire safety infrastructure, identified likely causes of fire incidents, examined traders' awareness and preparedness levels, and proposed architectural based safety interventions. The findings revealed widespread deficiencies in fire safety provisions, with critical infrastructure such as extinguishers, alarms, fire exits, and escape routes either absent or poorly maintained. Over 80% of respondents lacked awareness of emergency fire procedures, while electrical faults were identified as the predominant cause of market fires. Architectural recommendations including improved electrical installations, use of fire-resistant materials, wider walkways, and designated fire exits were proposed to enhance market safety. The study concludes that effective fire risk mitigation in informal markets requires integrated interventions spanning infrastructure, awareness, architectural design, and regulatory enforcement. The recommendations offer practical solutions for policymakers, architects, market authorities, and urban safety planners in Nigeria and other developing contexts.***

Indexed Terms- ***Fire safety, Fire risk mitigation, Urban planning, Architectural safety design, Ilorin Metropolis, Nigeria***

I. INTRODUCTION

Fire safety is an essential component of urban risk management, particularly in informal commercial environments where infrastructural and regulatory weaknesses often expose occupants to elevated hazards. In many developing nations, markets function not only as trade centres but also as vital economic engines that support the livelihoods of thousands of urban dwellers. However, in such densely populated and informally structured environments, fire outbreaks pose significant threats to life and property. This is especially true in Kwara State, Nigeria, where key retail markets such as Ilorin Central Market, Offa Market, and Irewolede Estate Market are highly vulnerable to fire incidents due to poor planning, lack of emergency infrastructure, and limited regulatory enforcement (Ogunleye et al., 2020).

Despite their socio-economic importance, these markets often lack even the most basic fire safety installations such as fire alarms, extinguishers, sprinkler systems, and clear evacuation routes. Moreover, there is usually little to no coordination in emergency response planning, compounding the risks during actual fire incidents (Adedeji et al., 2022). The congested nature of these trading zones, combined with overcrowding and the storage of flammable materials, further exacerbates the likelihood of devastating fires. As Ojo and Akinola (2019) noted, many informal markets in Kwara State continue to operate without established safety procedures or compliance with fire codes, putting traders and customers in jeopardy. These conditions highlight the urgent need for a systematic evaluation of existing fire safety practices within such markets.

The challenges of fire risk management in retail markets are not unique to Kwara State. However,

studies that address fire outbreaks in Nigerian markets have been largely underdeveloped in academic literature. Previous research has focused on related but contextually different environments such as filling stations (Leo, 2019), student hostels (Odinaka, 2014), and office buildings (Oladokun & Emmanuel, 2014), with each study emphasizing factors such as electrical faults, improper storage of flammable materials, negligence, and lack of fire safety training. While these findings are valuable, they fail to directly address the complex dynamics of fire safety within open, unregulated, and overcrowded retail marketplaces.

For example, Leo (2019) criticized the tendency of architects and developers to ignore fire-resistant design elements during construction, yet his study omitted market environments entirely. Similarly, Odinaka (2014) identified causes of fires in student residences but did not extend these insights to commercial settings. Oladokun and Emmanuel (2014) emphasized the importance of routine checks and fire prevention training in office buildings, yet their work also neglected market-based risk factors. Furthermore, a 2012 IFC survey found that fire safety awareness among residents in Nigeria was critically low, indicating a broader national issue that may be even more pronounced in informal trade environments (IFC, 2018).

This study provide a comprehensive, multidimensional evaluation of fire safety in retail markets in Ilorin Metropolis, Kwara State which aim to examine existing fire safety infrastructure, identify the root causes of fire outbreaks, assess traders' awareness and preparedness levels, and evaluate the degree of compliance with applicable fire safety regulations. By doing so, the study contributes recommendations for improving fire safety performance in similar market environments across Nigeria and other developing regions (Adegbite, 2021; Nwogugu et al., 2021).

The findings of this research are expected to benefit architects, urban planners and market authorities by identifying systemic weaknesses and offering actionable design and regulatory strategies. In the face of recurring fire incidents and increasing market congestion, an integrated understanding of these issues is crucial to protecting lives, properties, and the economic functions of Nigeria's informal urban markets (Adewole, 2022; Steve, 2020).

II. LITERATURE REVIEW

Concept of Fire Safety in Urban Market Environments

Fire safety encompasses all strategies aimed at preventing, detecting, managing, and reducing fire incidents in built environments. According to Cote and Bugbee (2019), fire safety is not limited to emergency responses but also includes proactive design and infrastructure planning, that reduce fire risks in public spaces. In urban marketplaces, particularly in developing economies, these safety measures are crucial due to high population density, mixed-use functions, and the often informal and congested spatial arrangements.

Retail markets in Nigeria are particularly prone to fire hazards, given the combination of combustible goods, poor electrical installations, and absence of fireproofing materials (Abubakar, 2020). Kwara State's major markets, such as Ilorin Central Market and Offa Market, are typified by wooden stalls, overcrowded trading corridors, and informal power connections conditions that increase both the likelihood and severity of fire outbreaks (Adedeji et al., 2022). This highlights the urgent need for systemic fire safety planning, especially in rapidly urbanizing African cities.

Regulatory Frameworks and Compliance Gaps

Globally, fire safety codes such as the International Fire Code (IFC, 2018) and the National Fire Protection Association (NFPA, 2020) provide a structured framework for fire prevention and control, outlining standards for fire alarms, extinguishers, exit routes, and suppression systems. In Nigeria, the National Building Code and guidelines from the Federal Fire Service prescribe safety standards for public buildings, including markets.

However, regulatory enforcement in Nigeria remains weak, especially in informal and semi-formal markets. Studies have shown that many traders and market administrators are unaware of fire safety policies or choose to ignore them due to cost,

negligence, or lack of monitoring (Nnodim, 2020; Cvetković et al., 2022). Adebayo (2019) notes that while some markets in major cities like Lagos may attempt to meet fire safety requirements, most markets in states like Kwara have no active fire protection infrastructure or enforcement mechanisms in place.

Furthermore, federal or state agencies responsible for inspections are often underfunded or understaffed, leading to inconsistent enforcement (Abubakar, 2020). This creates a situation where buildings continue to operate without basic fire protection systems, even in densely populated commercial hubs.

Architectural and Spatial Design Factors

The architectural layout of markets plays a critical role in determining their vulnerability to fire. Informal and overcrowded markets often suffer from a lack of spatial planning, which makes it difficult to isolate fire-prone areas or implement effective emergency exits. Jang (2020) emphasizes that markets without designated escape routes, ventilation channels, or spatial zoning are more prone to widespread fire disasters.

In the case of Ilorin and other markets in Kwara State, stalls are commonly built with temporary or flammable materials such as plywood, tarpaulins, and plastics. Many of these structures are built close together without setbacks or firebreaks (Adebayo, 2019). Moreover, illegal electrical connections are rampant, often leading to electrical overloads or short-circuits, which are primary causes of market fires in Nigeria (Abiodun, 2019).

Architectural fire safety also entails integrating fire-resistant materials, safe building orientation, and access for fire trucks all of which are lacking in Kwara markets. The absence of proper mechanical ventilation exacerbates the risks, allowing smoke and flames to travel quickly during an outbreak (Jang, 2020).

Fire Safety Infrastructure and Prevention Strategies

Effective fire safety systems are multifaceted and include the installation of fire alarms, smoke detectors, sprinkler systems, fire extinguishers, and emergency signage. According to Zhang (2023), the effectiveness of these systems depends not just on their availability but also on routine maintenance and proper user training.

In many Nigerian markets, however, fire protection infrastructure is either completely absent or grossly under-maintained. Abubakar (2020) found that only 10–15% of surveyed markets in North-Central Nigeria had functioning fire extinguishers, and less than 5and had ever conducted fire drills. Adebayo (2019) added that market administrators often cite budget constraints or apathy from traders as barriers to installing or maintaining fire protection systems.

Preventive measures also extend to operational protocols such as regulating the use of generators, storage of flammable goods, and waste management practices. Unfortunately, these are rarely enforced. Traders often store petroleum products within market stalls and use open flames or faulty generators for lighting and cooking, significantly increasing fire risks (Olawale, 2018).

Fire Risk Awareness and Emergency Preparedness

Awareness and preparedness are crucial components of fire safety management. Studies have shown that occupants' knowledge of fire protocols, use of extinguishers, and emergency response actions significantly affect the outcome of fire incidents (Spinardi and Law, 2019). In a study by the International Fire Code Council (2018), low fire safety awareness among market traders was identified as a key contributing factor to the severity of fire disasters in informal markets.

Nnodim (2020) noted that many traders in Kwara markets had never received fire safety training or participated in evacuation drills. This lack of knowledge leads to panic and disorganized responses when fires occur. Aderonmu et al. (2023) stress the importance of public education and the involvement of community-based organizations in building safety awareness, especially in informal urban settings.

Empirical Lessons from Fire Incidents in Nigeria

Several high-profile fire incidents in Nigerian markets have underscored the devastating impact of poor fire risk management. The 2019 Balogun Market inferno in Lagos, for instance, led to massive

property loss and was traced to illegal electrical connections and inadequate emergency access routes. Similarly, the 2020 fire at Ilorin Central Market exposed systemic gaps in Kwara State's emergency response capabilities (Popoola et al., 2016; Steve, 2020).

Post-incident reports consistently point to the same root causes: electrical faults, use of flammable construction materials, poor spatial planning, lack of fire equipment, and insufficient trader awareness. While temporary relief and rebuilding efforts often follow, long-term fire risk reduction strategies remain minimal or poorly implemented.

Spinardi and Law (2019) argue that sustainable fire safety management in informal markets must be rooted in institutional reform, community involvement, and integration of fire safety in architectural design. This reinforces the importance of conducting localized studies, like the present one in Ilorin, to provide evidence-based recommendations for policy, design, and urban management.

III. RESEARCH METHODOLOGY

Research Design

This study adopted a quantitative strategies to provide a comprehensive understanding of fire safety management in informal retail markets within Ilorin Metropolis, Kwara State. The research utilized descriptive survey techniques, structured to examine the availability, functionality, and effectiveness of fire safety infrastructure, as well as the awareness and preparedness of market users.

The design enabled triangulation of findings, which enhanced the reliability and depth of the analysis. Quantitative data were collected using structured questionnaires administered to market users.

Study Area and Target Population

The research was conducted in Ilorin Metropolis, Kwara State, Nigeria, which hosts several major markets prone to fire outbreaks due to congestion, unregulated building practices, and insufficient fire safety infrastructure. The target population consisted of retail market occupants including traders, customers, and market officials in selected markets such as Oja Tuntun (Baboko), Alanamu Market, Ipata Market, and Yoruba Road Market.

Sampling Frame and Technique

The sampling frame included ten key markets in Ilorin Metropolis drawn from various Local Government Areas (LGAs), with a focus on those known to be high-risk zones for fire outbreaks (e.g., Ilorin West, East, and South LGAs). A multistage sampling technique was used:

1. First, markets were stratified by LGA,
2. Then, purposive sampling was employed to select four major markets based on size, level of commercial activity, and history of fire incidents, in alignment with the study's objectives (Oluigbo, 2010).

Sample Size

The sample size was determined using 10and of the total retail store count in each selected market, as shown below:

Market	Total Stores	10and Sample Size
Oja Tuntun	1,090	109
Alanamu Market	136	14
Ipata Market	687	69
Yoruba Road Market	77	8
Total	—	200

Source: Kwara State Inland Revenue Service (2025)

Data Types and Sources

Two categories of data were employed:

1. Primary Data: Collected through field questionnaires and direct observations from market traders, officials, and customers. This included data on causes of fire outbreaks, availability of fire safety infrastructure, emergency preparedness, and user awareness.
2. Secondary Data: Sourced from academic literature, official reports, government publications, fire incident records. These provided historical and contextual perspectives on fire safety management in Nigerian urban markets.

Instruments of Data Collection

1. Observation Checklist: A structured checklist was used to assess physical fire safety elements within the selected markets. These included the presence and functionality of fire extinguishers, emergency exits, signage, water hydrants, evacuation plans, and general compliance with safety protocols.
2. Questionnaire: A structured, closed-ended questionnaire was distributed to respondents to capture data on fire safety awareness, individual preparedness, training history, and opinions about market safety. The questionnaire ensured consistency in responses and was statistically analyzable.

Research Variables

The study evaluated the following variables based on the research objectives:

1. Fire Outbreak Causes (e.g., electrical faults, smoking, storage of flammable liquids)
2. Availability of Fire Safety Equipment
3. Building Materials and Layout
4. Occupants' Awareness and Preparedness
5. Fire Safety Training and Drills
6. Compliance with Fire Safety Regulations

Data Analysis and Presentation

Quantitative data collected from the questionnaires were analyzed using descriptive statistics, including frequency counts and percentages. Findings were presented using tables and charts to highlight trends and comparisons across the different markets.

IV. RESULTS OF FINDINGS AND DISCUSSION

Discussion on Adequacy of Fire Safety Measures in Selected Markets

The adequacy of fire safety measures within informal retail markets is a direct determinant of how well occupants can respond to fire emergencies. This study evaluated key fire safety indicators using a Fire Safety Measure Index (FSMI), including escape routes, fire extinguishers, heat detectors, walkways, fire hoses, alarm systems, and the general condition of the market infrastructure.

Among these, escape routes (FSMI = 2.47) ranked highest but still fall below standard adequacy levels, implying most markets do not have well-demarcated or functional emergency exits. The overall market condition (FSMI = 2.46) followed closely, pointing to poor physical and safety-related infrastructure. Critical equipment such as fire extinguishers (FSMI = 2.13), fire hoses (2.01), and heat detectors (2.10) were found grossly inadequate. The most alarming indicators were fire alarm systems (1.91) and walkways (1.98), which are essential for early detection and evacuation, but were insufficient or non-existent in most markets studied.

This lack of critical fire safety elements indicates high vulnerability and poor readiness in the event of fire outbreaks. The situation reflects broader systemic issues such as lack of regulatory enforcement, absence of planning controls, and inadequate investments in public safety infrastructure. The findings align with previous studies (e.g., Olawale & Ajayi, 2020; Ibrahim, 2021), which found Nigerian urban markets to be hotspots for fire risks due to similar shortcomings.

Table 2: Adequacy of Fire Safety Measures in Selected Markets (FSMI)

Fire Safety Element	Total Weighted Value (TWV)	Respondents (N)	FSMI (TWV/N)	Rank
Escape Route	446	180	2.47	1st
Overall Market Condition	445	180	2.46	2nd
Fire Extinguisher	384	180	2.13	3rd
Heat Detector	374	180	2.10	4th
Fire Hose	361	180	2.01	5th
Walkways	356	180	1.98	6th
Fire Alarm System	345	180	1.91	7th

Source: Authors Field Compilation (2025)

Discussion on Traders' Awareness of Fire Emergency Contact Procedures

One of the core aspects of fire preparedness is occupants' awareness of emergency communication channels, particularly fire service numbers. The study found that a significant majority of market users (80.6%) were completely unaware of any fire emergency numbers. Only 0.5% of respondents reported full awareness, while the rest were either slightly aware or entirely neutral.

This points to a dangerous deficiency in public awareness campaigns and a failure in market leadership to educate traders on basic fire emergency protocols. The low levels of awareness amplify the risk of late reporting during fire outbreaks, potentially escalating property losses and fatalities. These results corroborate previous research by Nwogugu et al. (2021), which highlighted the lack of community-level training as a primary contributor to uncontrolled market fire incidents in Nigeria.

Table 3: Traders' Awareness of Fire Emergency Telephone Numbers

Awareness Level	Frequency	Percentage
None	145	80.6%
A little	11	6.2%
Neutral	16	8.9%
Some	7	3.8%
A lot	1	0.5%
Total	180	100%

Source: Authors Field Compilation (2025)

Discussion on Likely Causes of Fire Outbreaks

Understanding the root causes of market fires is essential for prevention planning. The study asked respondents to identify what they believe are the most likely causes of fire outbreaks in their respective markets. A significant 71.8% of respondents identified electrical faults as the primary cause especially overloaded circuits, illegal connections, and poor wiring.

Other reported causes included intentional burning (10.6%), storage of flammable liquids (8.8%), and general negligence (8.8%). The overwhelming consensus on electrical faults underscores the urgent need for licensed electrical installations and periodic inspection protocols. These results affirm Gbenga's (2019) assertion that electrical malfunctions account for the majority of fire incidents in Nigerian markets, and highlight the need for infrastructural overhaul and fire code enforcement.

Table 4: Likely Causes of Fire Outbreaks in Markets

Cause	Frequency	Percentage
Electrical Fault	129	71.8%
Intentional Burning	19	10.6%
Storage of Flammable Liquid	16	8.8%
Negligence	16	8.8%
Total	180	100%

Source: Authors Field Compilation (2025)

Discussion on Architectural Recommendations for Fire Safety

Informed by both the deficiencies observed in the study and respondent feedback, the research explored traders' preferences for architectural features that could enhance fire safety in market design. The four main features identified were improvement in electrical wiring (FSMI = 4.40), designated fire exits (4.39), fire-resistant building materials (4.30), and wider walkways (4.17).

These proposed interventions not only address physical infrastructure but also consider the spatial and material aspects of fire resilience. Wider walkways would improve circulation and evacuation, while designated fire exits would enhance emergency responsiveness. Fire-resistant materials help limit fire spread, and updated wiring mitigates the primary risk of electrical faults.

These improvements are consistent with international best practices in market fire safety design (see IFRC, 2020), and should form the basis of any new market development or retrofitting plan in urban Nigeria.

Table 5: Suggested Architectural Improvements to Enhance Fire Safety (AIEFSVI)

Architectural Element	TWV	Respondents (N)	FSMI (TWV/N)	Rank
Improved	793	180	4.40	1st

Electrical Wiring				
Designated Fire Exits	791	180	4.39	2nd
Fire-Resistant Building Materials	775	180	4.30	3rd
Wider Walkways	751	180	4.17	4th

Source: Authors Field Compilation (2025)

CONCLUSION

This study critically examined the state of fire safety in selected informal retail markets within Ilorin Metropolis, focusing on the adequacy of existing safety measures, the level of awareness among occupants, the likely causes of fire outbreaks, and potential architectural solutions. The findings reveal a significant gap in both infrastructure and human preparedness for fire emergencies.

Escape routes, fire extinguishers, heat detectors, fire hoses, and alarm systems were all found to be grossly inadequate across the surveyed markets, suggesting a systemic neglect of fire safety infrastructure. In parallel, market users demonstrated low levels of awareness and training in fire response procedures, with over 80% unaware of emergency contact numbers and unfamiliar with evacuation protocols.
The study also established that electrical faults are the predominant cause of fire outbreaks, confirming the urgent need for professional electrical installations and compliance monitoring. Furthermore, respondents proposed practical architectural improvements such as fire-resistant materials, wider walkways, and designated exits which are crucial for fire-resilient market design.

Collectively, these insights reveal a clear and urgent need for policy reforms, infrastructural upgrades, and occupant education to mitigate the recurring fire incidents in Nigerian markets. Addressing these gaps is not only a matter of public safety but also of protecting livelihoods and urban commercial heritage.

RECOMMENDATION

To improve fire safety in Ilorin's informal markets, the study recommends a comprehensive approach that includes upgrading market infrastructure with essential fire safety equipment like extinguishers, alarms, and escape routes. Regular maintenance and inspection of these facilities are crucial. Fire safety education and awareness programs should be implemented in local languages, alongside routine emergency drills. Electrical installations must be handled by certified professionals and monitored to prevent faults, the leading cause of fires. Architecturally, markets should be redesigned to include fire exits, wider walkways, and fire-resistant materials. Additionally, markets should be supported with nearby fire stations or mini-units, and emergency numbers should be publicly displayed. A dedicated fire safety committee in each market is also recommended to ensure compliance and effective response coordination. All these efforts should be integrated into broader urban safety and disaster management strategies.

REFERENCES

[1] Abiodun, T. (2019).*Electrical Infrastructure in Nigerian Markets: Risks and Recommendations*. *Journal of Engineering and Safety*, 12(4), 233-245.

[2] Abubakar, S. (2020).*Fire Safety Challenges in Kwara State Retail Markets: An Analysis of Compliance Issues.* Journal of Safety and Risk Management, 11(4), 50-63.

[3] Abubakar, M. (2020).*Fire Risks in Retail Markets: An Analysis of Structural Vulnerabilities. International Journal of Urban Planning and Architecture*, 8(2), 145-167.

[4] Adebayo, K. (2019). *Fire Prevention and Safety in Developing Countries: A Nigerian Perspective*. *Safety Science Review*, 14(1), 34-49.

[5] Adegbite, J. (2021). Fire Safety Challenges in Informal Retail Markets: A Review of Safety Measures and Policies. *Journal of Fire Protection Engineering*, 18(3), 45-59.

[6] Adedeji, T., Ogunbiyi, R., & Kareem, B. (2022).The Influence of Poor Fire Safety

Measures in Nigerian Retail Markets: A Case Study of Kwara State. *International Journal of Risk Assessment and Management*, 24(2), 137-150.

[7] Aderonmu, P., Erebor, E. M., Omwanghe, S., and Eghobamien, O.V. (2023). Curbing Fire Outbreaks in Public Places; Case Studies of Selected Markets in Lagos Curbing Fire Outbreaks in Public Places.*Archiculture.*2636-6747.

[8] Ageboba, P. A., Laar, S.K., and Dinye., A. (2023). Reducing the Risk of Fire Outbreak in Compliance with Fire Safety Regulations in Ghana. *Journal of Education and Practice.*14(13):60-69.

[9] Akashah, F. W., Baaki, T. K., Anuar, M. F., Azmi., N. F., Yahya., Z. (2020). Factors Affecting Adoption of Emergency Evacuation Strategies in High-Rise Office Buildings. *Journal of Design and Built Environment.*10.2245/jdbe.vol20no3.1.

[10] Alao, M. K., Yahya, B. M., Mahmood, Aliu, I. (2020). Fire Safety Protection and Prevention Measures in Nigeria Office Buildings. *International Journal of Managements and Humanities.*4(5):109-115.

[11] Bibri, S. E., Krogstie, J., and Kärrholm, M. (2020).Compact City Planning and Development: Emerging Practices and Strategies for Achieving the Goals of Sustainability. *Developments in the Built Environment*. Volume 4, November 2020, 100021.

[12] Bollettino, I., Alcayna-Stevensa, T, Sharma, M., Dy, P., Phama,P., and Vinck, P. (2019). Environmental Impacts of Household Appliances in Europe and Scenarios for their Impact Reduction.*Journal of Cleaner Production, Volume 267*, 10 September 2020, 121952.

[13] Cote, A. E., &Bugbee, P. A. (2019).*Principles of Fire Protection*.*Jones & Bartlett Learning*.

[14] Cote, A. E., & Bugbee, P. J. (2019).*Fire Protection Handbook*(20th ed.). *National Fire Protection Association.*

[15] Chukwudum, C., & Okafor, A. (2023).Evaluating Fire Safety Documents and Regulatory Compliance in Nigerian Markets. *Safety Science Journal*, 29(4), 123-136.

[16] Cvetković, M, V., Dragašević, A., Protić, D., Janković, B., Nikolić, N., and Miloševic, P. (2022). Fire Safety Behavior Model for Residential Buildings: Implications for Disaster Risk Reduction. *International Journal of Disaster Risk Reduction.* Volume 76, 15 June 2022, 102981.

[17] European Commission.(2016). *Construction Products Regulation (CPR) and Eurocodes*.*European Commission*.

[18] Federal Fire Service.(2021). *National Fire Safety Code*. *Federal Fire Service of Nigeria.*

[19] Gbenga, A. (2014). *Analysis of Fire Incidents in Nigerian Markets and the Role of Electrical Faults*. *Fire Safety Journal*, 12(3), 55-69.

[20] Hsiao, C. and Hsieh, S. (2023). Real-time Fire Protection System Architecture for Building Safety.Journal of Building Engineering. Volume 67, 15 May 2023, 105913.

[21] Ibrahim, T., Bako, F., Raheem, M., & Abdulyekeen, O. (2014).*Population Growth and Socioeconomic Development in Ilorin Metropolis. Journal of Urban Development*, 8(2), 134-148.

[22] Ilodiuba, N., Nwaogazie, I. L., and Ugbebor, J. (2020). Causes and Strategies od Curbing Market Fire in Nigeria. *Emerging Issues in Science and Technology, Vol. 2. 10.9734/bpi/elst/v2.*

[23] International Code Council (ICC).(2018). *International Fire Code*. *International Code Council*.

[24] Jang, H. (2020). *Design and Safety: Managing Fire Risks in Retail Environments*. *Fire Safety Journal, 48(3), 190-203.*

[25] Jude, B. (2024). Fire Safety Design Options in Residential Building. *International Journal of Innovative Environmental Studies Research*. 11(3):83-87.

[26] Kabara, Ad; Sahabo, M. M., Habibu, A. S. (2023).Assessment of Fire Safety Preparedness in Muhammad AbubakarRimi Market (SabonGari) Kano, Nigeria. *Journal of Applied*

Science and Environment. Vol. 27 (8) 1857-1864.

[27] Kwara State Diary.(2008). *Kwara State at a Glance*. *Kwara State Government Press*.

[28] Mann, T. (2010).*Causes of Fire Outbreaks in Nigerian Markets: A Comprehensive Study*. *Nigerian Fire Safety Review, 15(4), 89-102.*

[29] National Fire Protection Association (NFPA). (2020). *NFPA 1: Fire code*. *National Fire Protection Association.*

[30] Nnodim, O. (2020). *Challenges in Enforcing the Fire Safety Act in Nigerian Markets*. *Nigerian Journal of Fire Safety, 7(2), 22-30.*

[31] Nnodim, O. (2020). *Fire Hazards and Safety Measures in Nigerian Retail Markets: A Case Study of Kwara State Journal of Risk Management*, 15(2), 89-101.

[32] Nwogugu, M., Eze, C., & Obikwelu, I. (2021).Fire Prevention Strategies and Policy Implications in Developing Countries. *Journal of Safety Research and Development*, 33(7), 214-228.

[33] Ogunleye, S., Adebayo, K., &Aliyu, J. (2020).Fire Risk and Preparedness in Urban Retail Markets: Insights from Kwara State, Nigeria. *Journal of Urban Safety and Emergency Management*, 15(2), 98-112

[34] Ojo, A., & Akinola, D. (2019).Fire Safety in Informal Markets: Case Studies from Kwara State. *African Journal of Safety and Environmental Studies*, 11(4), 200-216.

[35] Olaiya, P. (2013). *Electrical Faults and Fire Outbreaks in Nigeria: A Retrospective Analysis*. *Journal of Electrical Safety*, 9(1), 22-29.

[36] Olawale, A. (2018). *Fire Incidents in Nigerian Markets: Prevention and Response Mechanisms. Nigerian Fire Journal*, 13(3), 67-78.

[37] Popoola, A., Adekalu, O. B., and Abiodun, A. A. (2016).Analysis of Causes and Characteristics of Market Fires in Lagos State, Nigeria. *International Journal of Agricand Rural Development.*19(1): 2407-2421.

[38] Rahardjo, H. A. and Prihanton, M. (2019).The Most Critical Issues and Challenges of Fire Safety for Building Sustainability in Jakarta. *Journal of Building Engineering*. 2019.101133.

[39] Spinardi, G and Law, A. (2019).Beyond the stable door: *Hackitt* and the future of fire safety regulation in the UK. *Fire Safety Journal.*Firesafe.2019.102856.

[40] Taherdoost, H. (2017). Determining Sample Size; How to Calculate Survey Sample Size. *International Journal of Economics and Management Systems*, 2, 237-239.

[41] Yun, H., Nam, D., and Hwang, W. (2020). An Experimental Study on the Fire Spread Rate and Separation Distance Between Facing Stores in Passage-Type Traditional Market. *Energies. 13(17):4458.*

[42] Zhang, C. (2023). Review of Structural Fire Hazards, Challenges, and Prevention Strategies. Multidisciplinary Digital Publishing Institute. 10.3390.