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MARKET FIRE DISASTERS AND EFFECTIVENESS OF ADAPTIVE STRATEGIES OF NIGERIAN GOVERNMENTS: A STUDY OF SELECTED STATES OF NORTH-WESTERN NIGERIA

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ABSTRACT

Frequent fire disasters that affects markets across Nigeria has devastating economic and social consequences on businesses, households and authorities. Regularities of markets fire disasters in every part of this country, has made the need to evolve adaptive strategies very imperative. This study investigated the problems related to markets fire disasters in Nigeria generally and specifically in North-western Nigeria. The problem of recurring fire disasters in Sokoto Central market and Sabon-gari market in Kano, Nigeria was interrogated. An elaborate methodology has been developed which facilitates inquiry. The data generated both primary and secondary was analyzed using appropriate statistical tools that usher in empirical findings that help draw a logical conclusion about the effectiveness or otherwise of the adaptive strategies of government on markets fire disasters in the selected states of North-western Nigeria. The research work also develop an empirical postulations for resilience and rehabilitation for disaster-prone communities and businesses. The study also made workable recommendations aimed at enhancing the adaptive strategies of managing markets fire disasters in Nigeria with a view to make them more effective so as to mitigates these recurring disasters.

KEYWORDS: Market Fire Disasters, Adaptive Strategies, North-Western Nigeria.

1.1 INTRODUCTION

Disasters which cause loss of lives and massive destruction of properties are a recurring phenomenon in human societies. Globally, disasters are two-edged. On one edge is the natural and man-induced mishap or the trigger mechanism which could be flooding, erosion, earthquake, tremor, thunder/windstorm, landslide, land subsidence, technological disasters, among others (Wahab et al., 2013). On the other edge, the receiving end, are the damages done to the built environment, the injuries and losses of lives and properties. Market fire happens to belong to the second category. Fire disasters are among the most destructive because of the speed and ferocity with which they consume victims. Fire disasters are more dangerous in market places because of the concentration of persons and merchandise in relatively small areas. The Northwestern part of Nigeria, just like the entire nation, has had its fair share of market fire disasters. From Birnin Kebbi to Kano, Gusau to Katsina and from Sokoto to Kaduna, market fire disasters had become a recurring decimal annually with very devastating effects. In each of these cases, the respective state Governments were confronted with policy problems of mitigating and coping with the impact. Combinations of measures ranging from mitigation, rehabilitation to reconstruction were usually employed. However, these intervention strategies have always been fraught with problems; which in effect, undermined their efficacy as adaptive strategies. Against this background, the study intends to examine the adaptive strategies of selected State governments in the Northwestern Nigeria in the wake of fire disasters in the last few years. The ultimate objective is to assess their efficacy, strengths and weaknesses with a view to proffering recommendations for managing similar future occurrences.

The adaptive strategies of coping with market fire disasters employed by most state governments in Northwestern Nigeria have not always succeeded in assuaging the plight of the victims and reducing the rate of outbreaks. The strategies also do not help in hastening reconstruction and rehabilitation of burnt markets which often result into prolonged and sometimes endless suffering of the people and loss of government revenue caused by reduced commercial activities. Nigerian markets have been rocked by incidences of fires throughout the earlier decades. Fire disaster challenges in the markets are exacerbated by inter alia: late arrival of emergency responders at the scenes of these conflagrations as well as the inadequacy of facilities to combat the inferno has seen some market fires burn for over twenty hours. This has heightened the losses incurred during fire outbreaks at markets. Some traders have died not from severe burns but from the shock of watching their means of

livelihood being obliterated while watching helplessly. Many of these traders have little or no preparedness for fire eventualities. They lack fire extinguishers, sand buckets or any other fire combating implements. The first indigenous response to fire outbreaks has always been handy water and an improvised anti-fire (soapy substance) solutions to manage or put out the fire. More so the culture of insuring businesses and properties are alien to most traders in our markets across the country which has made their situation hopeless in the event of fire disaster.

The imperative for this study stem from the quest for coming up with cutting edge solutions that will form the basis for developing an adaptive strategy of coping with recurring markets fire disasters in Nigeria. Market fires are essentially human-induced disasters. This implies that it is avoidable and can be mitigated. It is imperative therefore, in an attempt to mitigate fire incidents, to identify all immediate causes and root causes. The immediate causes are the conditions or actions occurring immediately prior to the fire outbreak while the root causes are the underlying preconditions categorized into personal (human) factors and job (environmental) factors (Wahab et al., 2013). This implies that some factors are the culprits of fire disasters while others enhance the events and this is what the study intends to interrogates.

In broad term the aim of this study is to evaluate the effectiveness of adaptive strategies employed by Nigerian governments to respond to markets fire disasters. Specifically, this study intends to achieve the following objectives:

1. Undertake a thorough review settings and conditions of the markets and existing market fire disaster's adaptive strategies in the Northwestern states of Nigeria and
2. Based on findings, make recommendations towards addressing the problems identified, especially in the event of future incidences of market fire disasters.

Accordingly, this study seeks to answer the following research questions:

1. To what extent does recurring market fire disasters affect the effectiveness of adaptive strategies of Nigerian government in selected states of North west Nigeria,
2. To what extent does existing adaptive strategies curb the frequent market fire disasters in the selected states of North-west Nigeria.

Hypothesis

That, the adaptive strategies in selected states of North west Nigeria has no significant effect on recurring market fire disasters in the area.

2.1 Literature Review

Disasters and adaptive capacity of governments have been extensively discussed in literature by many scholars. In more specific terms, there is a growing body of literature on how to mitigate and cope with disasters. The works of the following authors will be reviewed in great detail. Jeff (2005) dwells on natural disasters and adaptive capacity. His work could provide a conceptual framework for understanding disasters, and an overview of innovative proposals aimed at mitigating disaster risks; UNISDR (2002) work is an exposition on living with risk, by making a global review of disaster reduction initiatives which examine strategies employed in different countries to cope with large scale disasters; and UNDP (2004), examines strategies for reducing disaster risk and promoting development and discusses measures that could help in ameliorating risks posed by large- scale disasters. OECD (2004) discusses cases of large-scale disasters in different parts of the globe and types of lessons learn from the disasters that occur in terms of mitigation and coping. Ayala (2002) examines the geomorphology of countries and its relationship with natural disasters. He discussed vulnerability and prevention of natural disasters in developing countries. Anderson (2000) discusses the impact of large-scale disasters on the poor, while Bibbee *et al* (2000) surveys economic effects of large-scale disasters, using the 1999 Turkish earthquakes disaster and its economic effect as a case study. Finally, Holzmann and Jorgensen (2001) have reviewed social risk management techniques, as a conceptual framework for social protection and beyond.

The frequency of fire outbreaks chiefly in Nigeria markets in the past few years had become very alarming and worrisome. For instance, on April 30, 2025, fire outbreak destroyed over 500 lock-up shops, at the popular Jos Terminus Market in Plateau State, with losses estimated at more than N1 billion, according to market authorities (The Guardian news, 30/4/2025). Again, in November 2024, a mid-night fire gutted Katako Timber Market in Jos North local government area of Plateau State. The fire destroyed goods worth millions of naira, including about 107 shops. Over 200 people were affected, the majority of whom were carpenters (The Punch news, 10/11/2024). Similarly, on December 11, 2024, another fire outbreak was recorded at the Old Airport Junction in Jos, the Plateau State. The fire destroyed several Vitafoam shops, offices and 12 other shops, leaving the traders and business owners counting their losses (Businessday news, 11/12/2024). In Sokoto State, an inferno broke out at Kara Market in the metropolis in December 2024. Though no life was lost in the incident, about 50 shops were destroyed with 132 grinding machines, as well as significant quantities of food items, including rice, millet, and beans, worth millions of naira. Market fires in Nigeria are

often linked to several factors (Oladokun & Ishola, 2010; Twum-Barima, 2014), including shop owners' negligence in handling electrical appliances, faulty wiring, unsafe storage of flammable materials, poor attitudes toward fire safety, and limited knowledge of fire disaster response (Adamu et al., 2020; Okwuonu et al., 2022; Isah et al., 2023; Oluwunmi, 2023). Although fire emergency preparedness is critical, Okwuonu et al., (2022) observed that such practices are frequently overlooked in many public facilities across the country.

Globally, disasters are two edged. On one edge is the natural and man-induced mishap or the trigger mechanism which could be flooding, erosion, earthquake, tremor, thunder/windstorm, landslide, land subsidence, technological disasters among others (Wahab and Falola, 2018). On the other edge, the receiving end, are the damage done to the built environment, the injuries and losses of lives and properties. Markets fire happens to belong to the second category. The spatial arrangement within many markets is disorderly and remains unplanned. The “unplanlessness” is characterize by poor accessibility zero air spacing of stores in relation to one another and absence of firefighting facilities has added to the devastation of markets by fire in developing countries. Vulnerability of Nigerian markets to recurring infernos is a cause for concern among stakeholders. Vulnerability is described by Blaikie, Cannon, Davis and Wisner (1994) entails disaster preparedness, coping, prevention, response and recovery mechanism features of a settlement or group of people (traders in this setting). It does not include susceptibility to natural mishap alone but also involved inability to recover from man-induced disasters. Three dimensions of vulnerability are identified: economic, social and ecological (Schmidt-Thome 2005, Kumpulaine 2006). In distinguishing between the dimensions, Kumpulaine (2006) saw the economic dimension to represent the risk to production, distribution and consumption while the social dimension entails the vulnerability of people from the perspective of coping capacity (capacity in this instance can be a weak or poor citizen). In explaining the relevance of capacity to vulnerability, smaller villages, rural settlements and unplanned places such as markets are more vulnerable due to their weak and limited preparedness in the advent of disaster such as fire. (Cross, 2001; Pyne, 2012). The major point of concern in this study however, is the post-disaster response and recovery processes engaged after a fire outbreak in the market.

2.2 Empirical Review

This section reviews empirical studies on the relationship between market fire disasters and effectiveness of adoptive strategies of the Nigerian governments, drawing on global, African, and Nigerian evidence to situate the specific gap this study fills. Mitigation and adaptation are concepts with distinct and even contradictory definitions in different research fields. For

the United Nations Office for Disaster Risk Reduction (UNISDR), mitigation can be understood as “the lessening or limitation of the adverse impacts of hazards and related disasters”, while adaptation is “the adjustment in natural or human systems in response to actual or expected stimuli or their effects, which moderates harm or exploits beneficial opportunities” (UNISDR, 2009). Accordingly, the term adaptation is used, in this paper, for action aimed at decreasing the exposure and vulnerability of people and goods to fires. The heuristic power of the mitigation-adaptation dichotomy is not jeopardized by the fact that some particular actions may contribute for both mitigation and adaptation.

A common refrain in the literature and disaster resilience policy is that although there are numerous studies defining and discussing “community resilience”, few studies have actually provided practical models or assessments that enable its measurement (Ostadtaghizadeh et al. 2015).

The Norris et al. (2008) model incorporates four key components of resilience -economic development, social capital, information and communication and community competence. The authors identified key attributes of these components, “networked adaptive capacities”, which communities draw upon in times of disruption to assist their return to an equilibrium state Norris et al. (2008). In the context of socio-ecological systems, adaptiveness is generally considered an institution’s ability to deal with complexities and uncertainties emerging from both current and future disasters (Djalante et al. 2013).

An alternative model of community resilience was developed by Cutter et al. (2008), which offers a place-based view of community resilience. The Disaster Resilience of Place (DROP) model incorporates social systems, the built environment and natural systems as system attributes that influence and interact with the inherent resilience and vulnerability of a community (Cutter et al. 2008). In contrast to the Norris et al. (2008) model, the DROP model reflects the connection between social systems and their built and natural environmental systems. The DROP model explicitly recognizes that disasters happen to people in places (Boon et al. 2012; Cutter et al. 2008; Zhou et al. 2010). Consequently, place matters as much as the people involved when considering disaster resilience. The inclusion of social and natural systems and the built environment enables the consideration of institutional, infrastructure and ecological components as aspects of resilience (Adger 2000; Bruneau et al. 2003).

A number of studies discuss the participation of indigenous populations in promoting resilience. The literature identifies two major advantages to incorporating indigenous populations in the disaster risk reduction process. First, the social structure of indigenous

populations can be harnessed to improve community resilience and response. Kenney et al. (2015) contend that the Indigenous population were able to draw on their cultural norms and social structures as a coping capacity following disasters. Second, and perhaps more prominent in the literature, is the use of local knowledge in implementing risk reduction strategies (Clarke and Mayer 2017; Gaillard and Mercer 2013; Mavhura et al. 2013). The recognition of the importance of indigenous knowledge and acknowledgement of local adaptive capacities reflects the ongoing movement towards incorporating local knowledge into formal resilience building activities. A study by Alabi, et al, (2021) using secondary data and mixed methodology confirmed that, fire incidents within the markets mostly occurs at night which hampers effective response and there is the fear that market fire incidents are not any way near its end as significant efforts has not been made to check its occurrence. This is because many markets still looks vulnerable to fire accidents in structure and equipping.

Markets have been one of the most vulnerable sections of the urban centres to fire disaster. Losses due

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2.3 Theoretical Framework

This study is anchored in Complex Adaptive System(CAS) to conceptualize disasters. According to Burger, Kennedy, and Crooks (2021), disaster should be seen as emergent phenomena resulting from the dynamic interaction of physical, social, and individual systems. The CAS framework embraces properties such as heterogeneity, non linearity, and self-organization, offering a more nuanced understanding of how disasters emerge, evolve, and eventually subside. This perspective has important implications for both theory and practice even as it challenges traditional, linear models of risk and response (Burger et al., 2021).

In addition to the aforementioned models, the body of literature has embraced integrative economics, environmental science, and engineering have enriched the discourse on disaster management. Shi et al. (2020) offer a geographical perspective that examines the spatial dimensions of risk, while others have incorporated sociological insights into the study of community resilience and adaptive capacity. These integrative approaches underscore a shared recognition that disasters are multifactorially determined phenomena that demand analytical perspectives spanning multiple levels—from individual behavior to global governance (Shi et al., 2020; Lavell et al., 2012).

Applied to this study CAS predict a direct, positive relationship between recurring market fire disasters and adaptive strategies employed by Nigerian government, to the extent that tiers of government view market fires as emergencies that requires series of adaptive strategies aimed at mitigating, rehabilitating that will engender resilience for the affected communities, consistent with H₁, CAS is preferred here over alternative frameworks such as Chaos theory because it links a single, well-validated perceptual construct directly to causal - relation effect, and generates a precise, directional, and readily testable hypotheses suited to the regression design adopted in this study. Building on CAS and empirical review, this study proposes that recurring market fire disasters directly and positively predicts adaptive strategies of Nigerian governments as presented in Figure 1.



Figure 1: Research Model.

Source: Compile from empirical review (2026)

3.1 METHODOLOGY

This study adopted a mixed method, comprising quantitative and qualitative cross-sectional survey research design to examine the effectiveness of adaptive strategies of Nigerian governments on market fire disasters in Sokoto central market and Sabon-gari market in Kano. The mixed method approach enables objective measurement and statistical hypothesis testing (Sekaran and Bougie, 2020). All the seven states of Northwestern Nigeria and all the major markets in those states constitute the population of this study. In all of these states, at least one major market must have experienced a fire disaster in the last ten years. The research adopted a multi-stage sampling technique, which comprises of purposive, convenience and random methods. These methods are adopted to ensure that some high-profile markets that experienced fire outbreaks are captured in the study, and non-biased sample of respondents is also selected. The states where some markets are situated are purposively selected and those markets are selected largely on the basis of their importance and convenience. Thereafter, a sample of traders of the different markets was selected based on random sampling methods. In addition, the researchers held discussions with state governments' officials, whose responsibilities have bearing on the management of the markets and officials of State Emergency Management Agencies. Based on this criteria, the states selected are Sokoto and Kano. The sample of markets are; Sokoto Central Market and Sabon-gari market in Kano. In this study only traders who owned a permanent stalls in the two markets are considered part of the study population which stands at 3,562 stalls. 347 was determined as sample size using the Krejcie and Morgan (1970) sample determination table. Also General Managers of the two markets and Director - Generals of Sokoto and Kano states emergency management Agencies were also interviewed. Data were collected using structured questionnaire adapted from validated scale

The key variables to be examined are state Governments disaster management policies, mitigation strategies for market fire disasters, rehabilitation Programme and victims as well as community resilience.

Primary data were collected via questionnaires administered on sampled traders at the two markets and the interview schedule used in interviewing head government agencies responsible for emergency situations. Furthermore, the instruments underwent expert content-validity review by three experts, followed by pilot study of 30 traders at Gusau central market in Zamfara state, a market comparable to Sokoto and Kano markets but not selected for this study.

Data were analyzed in SPSS version 27. Descriptive statistics (mean, standard deviation) summarized respondents' perception of the study variables. Prior to hypothesis testing, regression assumptions were verified through normality diagnostics. Simple linear regression analysis then estimated the effectiveness of adaptive strategies of Nigerian governments on market fire disasters. All tests were conducted at the 0.05 significance level.

4.1 RESULTS AND DISCUSSION

This section reports the descriptive diagnostic, and inferential analyses used to answer the research questions and test hypothesis. Out of the 347 questionnaires distributed 345 were retrieved and 343 were valid for analysis, an effective response rate of 98.8% well above the threshold recommended for social science research (Baruch & Holtom, 2008).

4.2 Descriptive Statistics

Descriptive statistics were computed to provide an overview of respondents' perception of the study variables. Given that the study adopted a five-point Likert scale, a mean score of 3.0 was considered the benchmark for assessing the level of respondents agreement with the measured constructs. Mean values above 3.0 indicate favourable perceptions, whereas value below 3.0 indicates unfavourable perceptions.

Table 1: Descriptive Statistics.

Variable	N	Min	Max	Mean	Std Dev
Market Fire Disasters	343	1.84	5.00	3.316	0.645
Effectiveness of Adaptive Strategies	343	2.58	5.00	4.154	0.387

Source: SPSS Output. (2026)

Table 1 reveals that recurring market fire disasters ($M = 3.316$, $SD = 0.645$) sits in the moderate range, above the neutral midpoint but well short of the scale ceiling, indicating that market fire disasters become a recurring decimal. Effectiveness of adaptive strategies of Nigerian government, by contrast is rated considerably higher ($M = 4.154$, $SD = 0.387$) with

comparatively low dispersion suggesting that market fire disasters continue to occur the existence of adaptive strategies.

4.3 Preliminary Diagnostic Tests

Prior to hypothesis testing, preliminary diagnostic analyses were conducted to assess whether the data satisfied the assumptions underlying regression analysis. Test of normality, linearity, homoscedasticity and independence of errors were performed to determine the suitability of the data for the subsequent simple linear regression analysis

4.3.1 Normality Test

Skewness and Kurtosis were used to assess distributional normality. Following Hair et al (2019), skewness within ± 2 and kurtosis within ± 7 indicate acceptable normality for regression analysis.

Table 2: Normality Test.

Variable	Skewness	Kurtosis	Decision
Market Fire Disasters	-0.210	-0.190	Normal
Effectiveness of Adaptive Strategies	-1.481	2.102	Acceptable

Source: SPSS Output. (2026)

Table 2 indicates that all values fall within the acceptable threshold recommended by Hair et al (2019). These results indicate that the data do not exhibit substantial deviations from normality, supporting the use of parametric statistical techniques in the subsequent analysis.

4.3.2 Linearity, Homoscedasticity, and Independence of Errors

The assumption of linearity and homoscedasticity were examined through visual inspection of scatter plot of standardized residuals against standardized predicted values, which showed a random, evenly distributed pattern around zero with no funnel shape or curvature, supporting a linear relationship between market fire disasters and effectiveness of adaptive strategies of Nigerian Governments and a constant error variance across the range of predicted values. The normal probability plot (P - P plot) of regression standardized residuals followed the diagonal reference line closely, corroborating the normality result already established in Table 2. Independence of residuals was assessed through the Durbin - Watson statistic ($d = 1.842$), which fell within the generally accepted range of 1.5 to 2.5 indicating no serious auto correlation among the residuals. Taken together these checks confirm that the data satisfy the full set of classical assumptions required for the ordinary least square (OLS) regression analysis.

4. 4 Inferential Analysis: Correlation and Regression Results

Simple linear regression analysis estimated the strength, direction and statistical significance of the effect of adaptive strategies of Nigerian governments on recurring market fire disasters.

Table 3: Model Summary.

Model	R	R Square	Adjusted R square	Std Error of the estimate
1	.420 ^a	.175	.172	.3538

a. Predictors: (Constant), Adaptive Strategies of Nigerian Governments

Source: SPSS Output. (2026)

Table 4: ANOVA Result

Model		Sum of Squares			df	Mean Square
F	Sig					
1	Regression	6.534	1	6.534	52.251	.000
	Residual	30.392	242	0.123		
	Total	36.926.	243			

a. Dependent Variable: Market Fire Disasters

b. Predictors (Constant) Adaptive Strategies of Nigerian Governments

Source: SPSS Ootput (2026)

Table 5: Multiple Regression Coefficient.

		Unstandardized Coefficients		Standardized Coefficients		
Model		B	std. Error	Beta	t	
Sig						
1	(Constant)	3.314	.115		28.32	.000
	AS	.251	.033	.420	7.226	.000

a. Dependent Variable: Market Fire Disasters

Source: SPSS Output (2026)

Table 5 presents the results of the simple linear regression analysis examining the effectiveness of adaptive strategies of Nigerian government on market fire disasters. The regression model is statistically significant, $F(1, 242) = 52.251$, $p < .001$, indicating that recurring market fire disasters is a significant predictor of adaptive strategies of Nigerian governments. The model explained 17.5 % of the variation in adaptive strategies of Nigerian governments ($R^2 = .175$; Adjusted $R^2 = .172$). Specifically, adaptive strategies of Nigerian Governments had significant positive effect on market fire disasters ($B = .251$, $\beta = .420$, $t = 7.226$, $p < .000$). Accordingly, H_1 is accepted. The regression equation market fire disaster = $3.314 + 0.251$ (Adaptive Strategies), indicates that a one-unit increase in market fire disasters

is associated with a 0.251-unit increase in in adaptive strategies of Nigerian government, holding other factors constant.

4.5 DISCUSSION OF FINDINGS

The Findings demonstrate that, the frequent market fire disaster compels Nigerian governments to adopts strategies aimed at mitigating, rehabilitating and fostering resilience.. This supports Complex Adaptive System, which argues that, governments naturally take adaptive strategies through implementation of measures to cope with disasters. The result also align with recent empirical studies conducted in India (Kumar, et a, 2022), Tanzania (Mboma, 2022) and Nigeria (Egharevba, 2024), all which reported that, recurring market fire disasters engendered adaptive strategies by Nigerian governments. By establishing this relationship among selected states in Northwest Nigeria, this study extends the existing literature to the entire six geo-political zones in Nigeria, where empirical literature is evolving.

Although recurring market fire disasters significantly influenced adaptive strategies of Nigerian governments, it account for only 17.5 % of the variation in mitigation and rehabilitation strategies of Nigerian governments. This suggests that while market fire disasters is an important factor, it is not the sole driver of wider government's adoptive strategies. Interestingly governments reported a relatively high level of adoptive strategies despite drop in market fire disasters at certain period. Consequently improving adaptive strategies by Nigerian governments is likely to reduce recurring market fire disaster induce by either man made behaviour or climate change.

5. CONCLUSION

This study examined the market fire disaster and effectiveness of adaptive strategies of Nigerian Governments, focusing of selected states in North western Nigeria. The findings revealed that the recurring fire disasters has a significant and positive effect on the effectiveness of the adaptive strategies of Nigerian governments, confirming that that states are ramping up mitigation and rehabilitation strategies with a view to foster the resilience of affected traders. Although market fire disasters explain a modest proportion (17.5%) of the variation in adaptive strategies, the findings indicate that other factors also contribute substantially to the government proactive steps in mitigating disasters generally. The findings therefore reinforce the significance of effective adaptive strategies while highlighting the

need for synergy between government and community in managing market fire in particular and disasters in general.

6. Recommendations

Based on the findings, the selected states of Sokoto and Kano of North western Nigeria should developed comprehensive disaster management policy that will provide for effective adaptive strategies for all categories of disasters with specific provisions for market fire disaster. There is the need to work out strategies for market fire prevention through long term and short-term goals. The short- term goals include measures of safety that can be added to the existing infrastructure through education, awareness and introduction of rules. Whereas, the long-term goals include the change in the decision-making process, passing of laws and the development of planned infrastructure that supports and safeguards the lives and properties in the markets. Traders and stakeholders need to imbibe safety culture, nonchalant attitude to fire safety and congestion in the markets as well as lack of preparedness amongst the people regarding fire safety are also cause for concern.

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