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Assessment of Disaster Risk Preparedness and Response in Public Markets in Dar es Salaam City, Tanzania

Nicholaus Mwageni[1] and Fredrick Salukele[1]

ABSTRACT

The increase in self-employment opportunities through small business in major public markets has led to overcrowding, which in turn increases exposure to disaster risks. Although a variety of initiatives have been implemented, little is known about the level of disaster preparedness and response in Tanzania's public markets. This study aimed to assess disaster risk preparedness and response in public market settings. A descriptive cross-sectional mixed-methods design was adopted. A stratified random sampling technique was applied across the four markets, with proportional allocation of respondents. The study used a sample of 205 market users. Data were collected using questionnaires, physical observations, interviews, and document review. Findings revealed that public markets are exposed to electrical, psychosocial, biological, and environmental hazards, resulting in emergencies such as robbery, disease outbreaks, fire incidents, and environmental pollution. Environmental hazards were the most prevalent, followed by biological hazards, while electrical and psychosocial hazards were less frequent but still significant. Preparedness levels were generally moderate for environmental and fire risks but low for disease outbreaks and robbery. The study recommends strengthening disaster risk awareness and training, improving security systems, enhancing sanitation and waste management, and implementing regularly tested disaster preparedness and response plans.

Keywords: Hazard; Emergency; Informal; Urban vulnerability; Management**.**

INTRODUCTION

Importance of disaster risk management in public markets has gained global attention in recent decades. This is largely driven by the increasing frequency and severity of disasters, which have resulted in substantial economic losses worldwide (CRED, 2021; Coronese et al., 2019; Seneviratne et al., 2021; Swiss Re Institute, 2021). In this context, public markets in developing countries are often characterized by unsafe, unhealthy, and poorly regulated working environments (Mboma, 2022; Philavong et al., 2020). These conditions are primarily driven by rapid urbanization and population pressure that exceeds the carrying capacity of market infrastructure, coupled with limited institutional capacity to regulate operations and maintain facilities. Consequently, market users are exposed to multiple hazards, including disease outbreaks, fire risks, crime, weather-related discomfort, and inadequate sanitation services (Madhav et al., 2017; Mboma, 2022; Tanzania Government, 2022). These hazardous conditions necessitate the development of structured emergency preparedness and response plans to reduce exposure to disaster risks (Mboma, 2022).

[1] Nicholaus Mwageni is a member of academic staff at the School of Engineering and Environmental Studies, Ardhi University, Tanzania. P. O. Box 35176, Dar es Salaam, Tanzania. His email address is nicholaus.mwageni@aru.ac.tz

The disaster risk in urban markets in Tanzania and other developing countries, is often linked to inadequate infrastructure, electrical faults, low risk awareness, and poor maintenance practices. Studies on market fire disasters highlight that such environments are highly vulnerable due to dense trading structures, informal electrical connections, and limited enforcement of safety regulations (Hatmoko & Larassati, 2021; Mwakatage, 2024; Mboma, 2022). These structural and behavioral deficiencies significantly increase the likelihood of fire ignition and rapid spread in market settings. More broadly, Tanzania, like many developing countries, continues to face both natural and man-made disasters, with significant impacts on lives and property. A critical constraint in strengthening emergency response systems is the shortage of trained personnel and limited institutional capacity (Mboma, 2022; Mushi, Salukele, & Mwageni, 2024). Despite the high population exposure to disaster risks in public markets and the recurring fire incidents, there remains limited empirical evidence on disaster risk preparedness and response in these settings within the Tanzanian context. Therefore, this study seeks to assess disaster risk preparedness and response in selected public markets in Dar es Salaam city with the aims of informing the improvements in public health, safety, and urban market management systems through evidence-based recommendations.

METHODOLOGY

Case Area Study Selection

The case study for this research was Dar es Salaam City. The city has a total of 87 markets managed by its five municipalities, with Ilala overseeing 18 markets, Temeke 27, Ubungo 13, Kinondoni 22, and Kigamboni 7, reflecting a highly decentralized network of local public markets across the city (Habitat Media, 2024). This study focused on four public markets namely: Temeke Stereo market in Temeke municipality, Machinga Complex market in Ilala municipality, Mwananyamala market in Kinondoni municipality, and Shekilango market in Ubungo municipality, which were purposively selected to represent different municipalities across the city. Figure 1 presents the geographical locations of the selected markets within Dar es Salaam city, illustrating their spatial distribution across the study area. The selection criteria of the markets were based on the following criteria: availability of permanent infrastructure, high trader population density, and long duration of operation (at least 15 years of continuous operation) to ensure adequate temporal exposure to recurrent disaster events, infrastructure changes, and evolving risk management practices within urban markets.

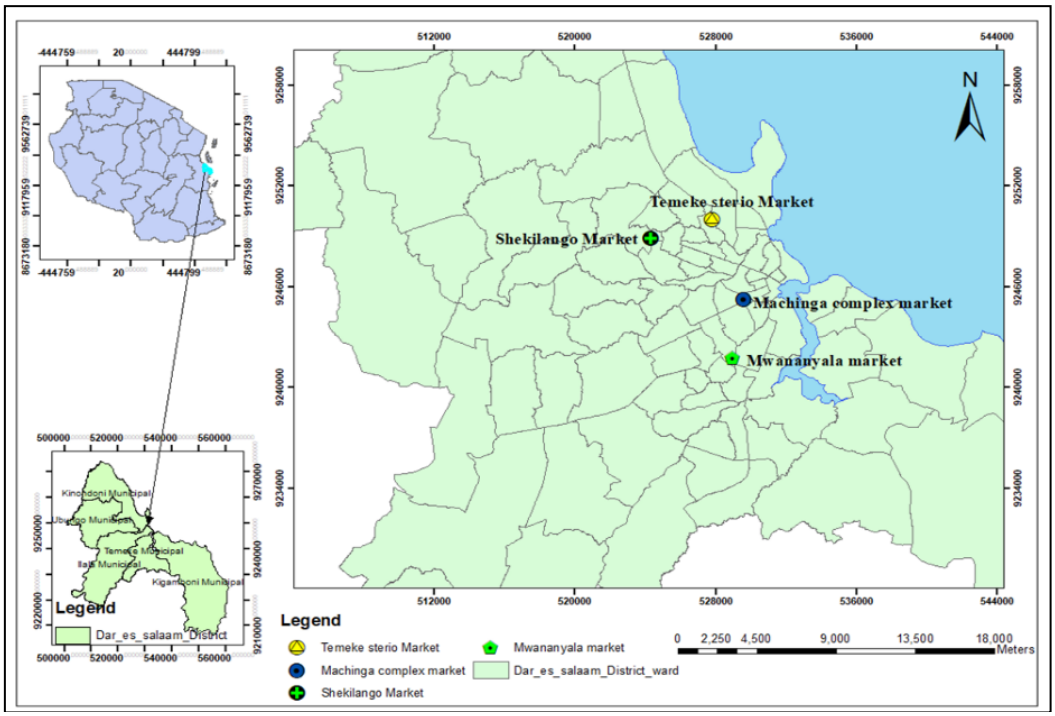


Figure 1: Map of Dar es Salaam Showing selected Public Markets area

Sampling techniques

The sample size for the population of sellers in the four public markets was 205. The sample was proportionally allocated across the selected markets, resulting in 61 respondents for Temeke stereo market, 50 for Mwananyamala market, 52 for Machinga complex market, and 42 for Shekilango market. The overall sample size was determined using Cochran's sample size formula for finite populations:

$$n = \frac{Z^2 P(1-P)}{e^2} \quad \text{..... (eqn i)}$$

Where:

- **n** = required sample size;
- **N** = total population size of market sellers (440);
- **Z** = confidence level at 95% (1.96);
- **P** = estimated population proportion or maximum variability (0.5); and
- **e** = margin of error (0.05).

The initial sample size was first determined using Cochran's formula and subsequently adjusted using the finite population correction factor due to the known total population size. A stratified random sampling technique was employed, whereby each selected market constituted a stratum. Within each stratum, respondents (sellers) were selected through simple random sampling to ensure equal probability of selection and minimize sampling bias.

Data Collection and Analysis Method

The study employed physical observations, interviews, questionnaires, and document review for data collection. Data analysis was conducted using Microsoft Excel and SPSS for descriptive and inferential statistical analysis. The questionnaire comprised both closed-ended questions. The Likert-scale items were designed to capture respondents' perceptions of disaster risk preparedness and response in public markets, and was developed based on literature and aligned with the study objectives to ensure content validity. Its validity was further strengthened through expert review and pilot testing in a non-sampled market, while reliability was

assessed using Cronbach's Alpha coefficient with a threshold of ≥ 0.70 considered acceptable for internal consistency. Data collection was conducted over a defined period of 8 weeks encompassing field observations, interviews, and questionnaire administration across the selected markets.

Hazard and Risk Identification

Two main steps of hazard identification were used in analyzing hazards in selected markets. Identified hazards were based on a review of relevant literature on urban market hazards and disaster risk management studies in developing countries, as well as primary field data collected during fieldwork. Hazard assessment was conducted to determine hazard severity and was based on frequency of occurrence, spatial coverage, duration of event, likelihood of occurrence, triggering factors, and degree of predictability. Frequency refers to how often a hazard occurs, while predictability refers to the extent to which a hazard can be anticipated from historical or observable patterns. Based on interviews, questionnaires and focus group information, a scale was established to represent the level of severity (0, 1, 2, and 3 representing no exposure, low, medium, and high severity respectively). The scale was adopted as a simplified ordinal classification commonly used in qualitative disaster risk assessment frameworks, allowing consistent interpretation of hazard intensity across multiple data sources. A risk severity score was calculated as the mean of the values obtained from interviews, questionnaires, and focus group discussions.

Risk evaluation

The methodology for risk evaluation was adopted from Luvanda et al (2023), whereby risk evaluation is done based on likelihood of occurrence and consequences. Likelihood of occurrence was classified into five ordinal categories: rare, unlikely, moderate, likely, and almost certain, representing increasing probability of hazard occurrence. Additionally, the consequence was classified into five levels: insignificant, minor, moderate, major, and catastrophic, reflecting increasing severity of potential impact on people, property, and operations. The likelihood and consequences were combined using a risk matrix approach, where each likelihood category (1–5) was multiplied by the corresponding consequence category (1–5) to generate a risk score ranging from 1 to 25 (Table 1). The risk was classified based on score ranges, where scores of 1–4 represented acceptable risk, 5–9 moderate risk, 10–15 tolerable risk, and 16–25 unacceptable risk (Table 2).

Table 1: Ranking Criteria for Risk Matrix

LIKELIHOOD		CONSEQUENCES				
		Insignificant	Minor	Moderate	Major	Catastrophic
		1	2	3	4	5
Almost certain	5	5	10	12	20	25
Likely	4	4	8	12	16	20
Moderate	3	3	6	9	12	15
Unlikely	2	2	4	6	8	10
Rare	1	1	2	3	4	5

Table 2: Risk Score Classification

Risk Score	
Unacceptable 16-25	Discontinue operation and requires immediate improvement
Tolerable 10 – 15	Corrective action needed. Action in short time is appropriate
Moderate 5 – 9	Regular monitoring
Acceptable 1- 4	No further action but ensure control are maintained

Assessment of Preparedness Level

For each category of risk in the chosen markets, four levels of preparedness were evaluated by assigning values between 0 and 3, where 0 denoted no preparedness measure at all, 1 denoted a low level of preparedness, 2 denoted a moderate level of preparedness, and 3 denoted a high level of preparedness. After comparing the actual market implementation with standard preparedness guidelines for market safety (including relevant disaster risk management and occupational safety standards such as WHO (2021) and fire safety guidelines (Kodur, 2020)), the level was determined. Fire hazard preparedness was assessed using indicators such as availability of fire extinguishers, presence of emergency assembly points, fire extinguisher user training, and availability of emergency escape routes or evacuation plans. Indicators used to assess robbery risk included verification of identification cards, availability of CCTV cameras, perimeter fencing, and presence of security personnel. Environmental pollution risk was assessed using indicators such as cleanliness frequency, waste disposal frequency, and availability of clean water for restrooms and toilets. For disease outbreak risk, indicators included availability of nearby dispensary services, first aid provision, presence of trained first aid attendants, and availability of medical aid services within or near the market. Each risk category's preparedness level was calculated as a simple mean of the indicator scores to determine the overall level of preparedness for that risk category.

RESULTS AND DISCUSSION

Hazards Identified at Selected Markets

The study revealed that sellers and customers are exposed to several hazards which are classified into four categories: environmental, technological, biological, and psychosocial hazards as shown in Figure 2. The results show that the environmental hazards in local public markets consisted of poor waste management which included clogged waste water channels and inadequate number of sanitation facilities based on user demand. Electrical hazards include exposed electrical wires, loose wiring, and potential overloads. It was also revealed that biological hazards were poor sanitation management, exposure to epidemic diseases, poor management of wastes, and lack of enough potable water. Psychosocial hazards included overcrowding, inadequate security, poor lighting, and poorly visible or concealed areas within the markets.

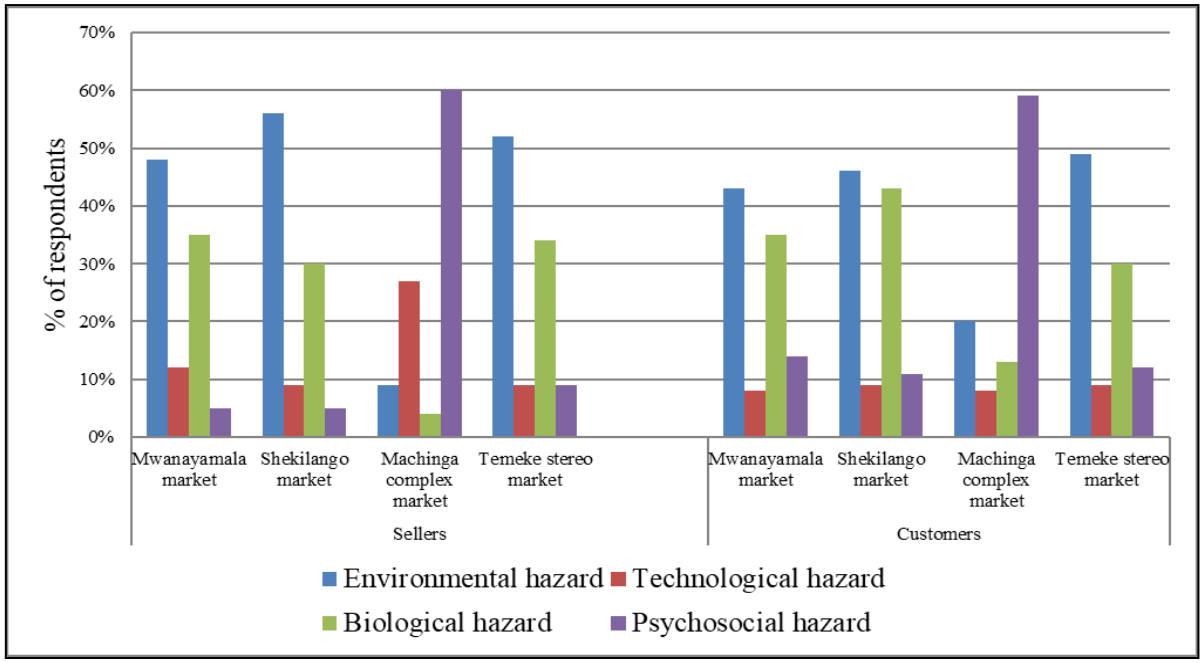


Figure 2: Hazards identified in selected markets

Environmental hazards were consistently the most dominant across all selected markets, with high proportions of sellers and customers exposed, ranging from 9%–56% among sellers and 20%–49% among customers depending on the market. This dominance reflects persistent poor waste management systems, inadequate sanitation facilities, and overcrowding, which collectively intensify environmental hazards in market spaces. Biological hazards were the second most prevalent category, with exposure levels ranging from 4%–35% among sellers and 13%–37% among customers. This pattern is largely associated with poor sanitation management, limited access to clean water, and high population density, which facilitate disease transmission in confined market environments.

*On the other hand, p*sychosocial hazards showed a contrasting pattern, with Machinga Complex Market exhibiting the highest exposure levels (up to 59–60% among sellers and customers) and ranging 5%-14% among sellers and customers in other markets. The highest levels observed in Machinga Complex Market is mainly attributed to high congestion, intense economic competition, and insecurity conditions, which increase stress levels and perceived vulnerability among market users. Electrical hazards, although less dominant compared to environmental and biological hazards, remain consistently present across all markets ranging from 9%–27% among sellers and 8%–9% among customers, indicating weak enforcement of electrical safety standards and aging infrastructure. These findings reveal that environmental hazards are the most common followed by biological and electrical hazards while psychosocial hazards fluctuate by market. This trend corresponds with several studies in developing countries, showing environmental and biological hazards as the top two hazards within informal market contexts due to poor infrastructure, which facilitates waste accumulation and improper sanitation practices, thereby creating health and safety violations within the seller and customer population (Kuboka et al., 2024; Sepadi & Nkosi, 2023). While psychosocial hazards were low in prevalence in most markets, Machinga complex market was found to lead in prevalence relative to other hazards. This finding corresponds with evidence that,

congestion and competition in informal market environments leads to stress and insecurity. The importance of investing in market infrastructure is important since poor facilities inhibit safety protocols practice. Upgrading market infrastructure reduces exposure to health and environmental hazards (Dickson-Gómez et al., 2023).

Disaster Risks at Selected Market

Based on the identified environmental, technological, biological, and psychosocial hazards, the markets were found to be disproportionately exposed to various disaster risks which are i) environmental pollution due to poor sanitation practice, ii) Fire outbreak, iii) Disease outbreaks such as cholera, typhoid, diarrhea, influenza, and cough-related illnesses, and iv) Robbery. The results revealed that environmental risks are higher than other risk categories. This indicates that the risk is embedded in the daily operating conditions of the most markets, rather than occurring as isolated event. The distribution of the disaster risks across the selected markets is presented in Figure 3.

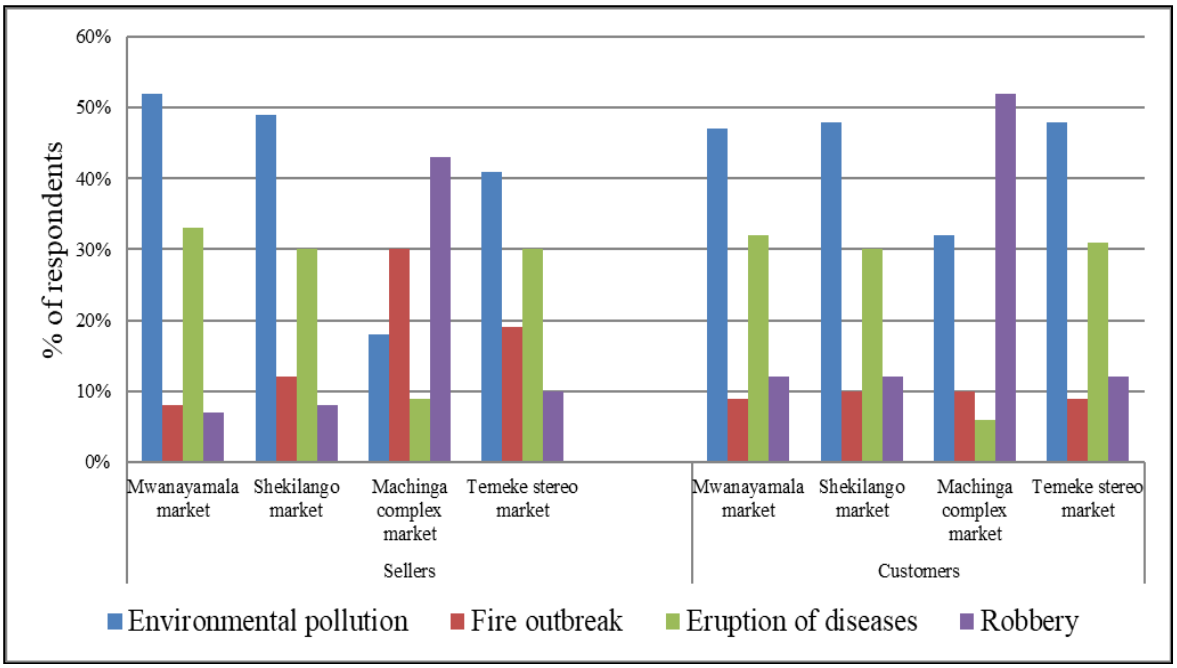


Figure 3: Distribution of Disaster Risks in Selected Markets

Environmental pollution emerged as the most prevalent risk across the selected markets, with exposure levels among sellers recorded at 52% (Mwananyamala), 49% (Shekilango), and 41% (Temeke Stereo), and comparatively lower at 18% in Machinga Complex. Similarly, customer exposure to environmental pollution remained high across markets, with 47% (Mwananyamala), 48% (Shekilango), and 48% (Temeke Stereo), but slightly lower at 32% in Machinga Complex. This generally indicate a consistent inadequate waste management systems, poor sanitation infrastructure, and high user density. This observation corresponds with previous studies, which report that more than 50% of market vendors operate under conditions that increase exposure to environmental pollution (Nyampundu et al., 2020; Sepadi & Nkosi, 2023). Disease outbreaks were the second most common risk, with seller exposure levels of 33% (Mwananyamala), 30% (Shekilango), and 30% (Temeke Stereo), but considerably lower at 9% in Machinga Complex. Customer exposure followed a similar pattern, with 32%, 30%, and 31% in Mwananyamala, Shekilango, and Temeke Stereo respectively, compared to only 6% in Machinga Complex. This

suggests that biological risks are strongly associated with sanitation conditions in specific markets. This aligns with existing literature, which attributes the spread of infectious diseases in market environments to inadequate hygiene conditions and high population density (Moyo et al., 2023; Naguib et al., 2021).

Fire outbreak risks were relatively moderate across the markets, with seller exposure ranging from 8% (Mwananyamala) to 30% (Machinga Complex), while customer exposure ranged from 9% to 10% in most markets. Fire outbreaks, although reported less frequently across the markets, pose significant consequences when they occur. The Tanzania Fire and Rescue Force reported 2,076 fire incidents nationwide, with 38 fatalities and 146 injuries (Kajubi, 2024). Market areas were identified among the key hotspots contributing significantly to these incidents due to high congestion and infrastructural constraints. This highlights that, despite lower frequency, fire hazards represent high-impact risks and indicate gaps in fire preparedness and response measures within market environments. In contrast, robbery risk showed a markedly different distribution, with relatively low exposure in Mwananyamala (7% sellers; 12% customers), Shekilango (8%; 12%), and Temeke Stereo (10%; 12%), but significantly higher levels in Machinga Complex (43% sellers; 52% customers). This highlighting a distinct security risk profile in that market due to congestion, limited spatial organization, and inadequate security measures which contribute to increased vulnerability to theft. National crime statistics indicate that theft-related crimes increased by 7.6%, from 21,767 to 23,414 cases in 2023, including armed robbery and burglary (National Bureau of Statistics, 2023), reinforcing the observed pattern of rising security risks in densely populated urban markets.

Disaster Risk Evaluation at Selected Markets

The disaster risk profile for the selected markets indicates that while fire outbreaks, disease outbreaks, and environmental pollution are categorized as tolerable risks (based on the adopted risk scale) in Temeke Stereo, Mwananyamala, and Shekilango markets, robbery is rated as a moderate risk in all three. In contrast, the Machinga Complex market has a higher risk profile; robberies are considered an unacceptable risk (score 16), while environmental pollution, disease outbreaks, and fires are considered tolerable (Table 3). Although environmental pollution and disease outbreaks are the most frequently reported risks in all markets (highest frequency), they are considered acceptable or tolerable based on the likelihood and consequence. Risks, therefore, are frequent (high frequency) but have a less immediate impact than high-consequence events such as fires and robberies. Thus, although environmental and biological risks are widespread, their overall risk rating is low due to their moderate severity. The difference between the frequency of occurrence and risk level is emphasized in the distinction between occurrence and overall risk.

Table 3: Disaster Risk Profile at the Selected Market.

Market	Hazard Type	Specific Risk	Likelihood (1–5)	Consequence (1–5)	Risk Score	Risk Rating
Temeke Stereo Market	Technological hazard	Fire outbreak	3	5	15	Tolerable
	Biological hazard	Disease outbreak	3	5	15	Tolerable
	Environmental hazard	Environmental pollution	4	3	12	Tolerable
	Psychosocial hazard	Robbery	2	4	8	Moderate
Mwananyamala Market	Biological hazard	Disease outbreak	3	5	15	Tolerable
	Environmental hazard	Environmental pollution	4	3	12	Tolerable
	Psychosocial hazard	Robbery	2	4	8	Moderate
	Technological hazard	Fire outbreak	2	5	10	Tolerable
Shekilango Market	Biological hazard	Disease outbreak	3	5	15	Tolerable
	Technological hazard	Fire outbreak	2	5	10	Tolerable
	Environmental hazard	Environmental pollution	4	3	12	Tolerable
	Psychosocial hazard	Robbery	2	4	8	Moderate
Machinga Complex Market	Technological hazard	Fire outbreak	3	5	15	Tolerable
	Psychosocial hazard	Robbery	4	4	16	Unacceptable
	Environmental hazard	Environmental pollution	4	3	12	Tolerable
	Biological hazard	Disease outbreak	2	5	10	Tolerable

Vulnerability Assessment

Two groups were identified as most vulnerable to the disaster risks in selected public markets, namely sellers and customers. The study shows that, sellers in the public markets are observed to be more vulnerable compared to customers (Figure 4). This difference is attributed by time they spend in the market and products they sell in markets. Machinga Complex Market recorded the highest vulnerability among sellers, followed by Mwananyamala Market, while customers in these markets exhibited comparatively lower vulnerability levels. This suggests that sellers have inadequate coping mechanisms, so market authorities should enhance infrastructure provision and implement targeted risk reduction measures for sellers' safety and resilience. This pattern indicates that vulnerability is closely linked to exposure duration and occupational conditions within market environments.

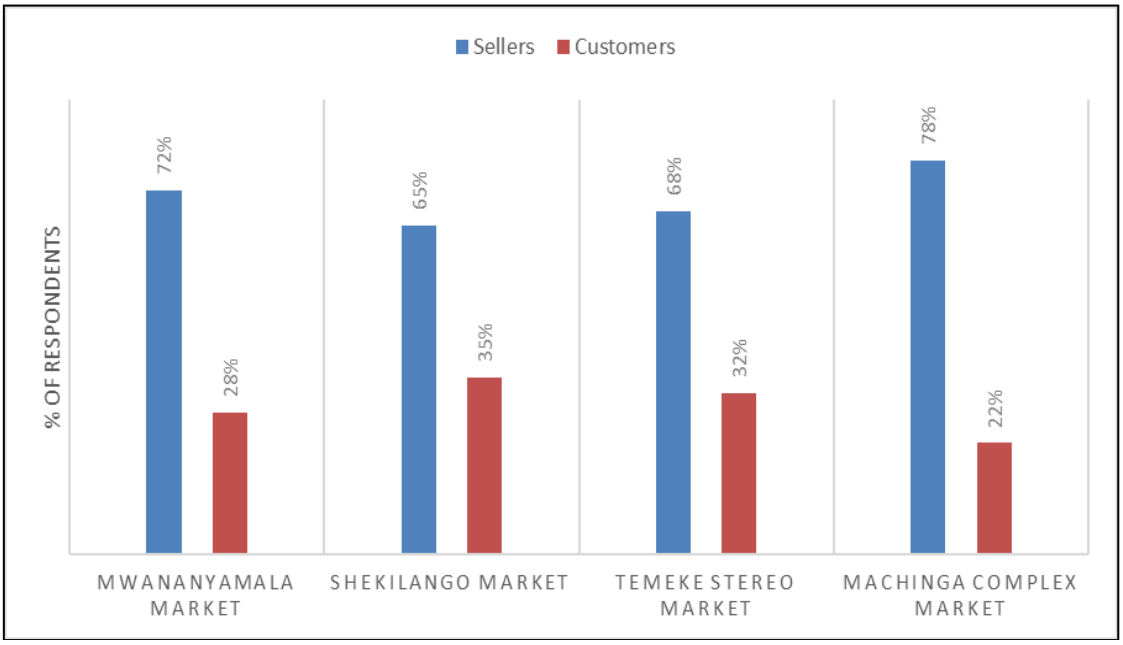


Figure 4: Vulnerability Assessments of Selected Public Markets

Emergency Preparedness and Response Level at Selected Public Market

All markets have a moderate level of fire risk preparedness due to the presence of fire extinguishers, but are constrained by limited emergency knowledge and inadequate firefighting skills among users. Temeke Stereo Market was the only market with an assembly point while the other markets lacked such facilities. With the exception of Shekilango market, all markets are moderately prepared to manage disease outbreak risks. This rating is based on the presence of nearby health facilities and availability of first aid supplies; however, first aid providers lack adequate training, and access to medical assistance-ambulance services is limited. At Shekilango Market, the level of preparedness is low due to the absence of adequate nearby health, lack of first aid kits, insufficient first aid training, and absence of medical aid.

On the other hand, the level of robbery risk preparedness in all markets was found to be low except for Mwananyamala market whose rate was moderate.The low preparedness is attributed by insufficient number of security personnel, absence of security fencing, lack of CCTV surveillance systems, and absence of formal identification systems for sellers. Furthermore, the level of preparedness to risk of environmental pollution across all markets is moderate. This is because all markets have similar characteristics including, delayed waste removal, inefficient cleaning practices, and availability of clean water in sanitation facilities. The existing situation of preparedness in markets reveals that the provision of a safe working environment for all market users is critically needed. The implementation of preventive and mitigation measures for emergencies is essential for the sustainability of market operations. This indicates that while basic preparedness measures are in place, they remain insufficient to effectively reduce disaster risks across the selected markets.

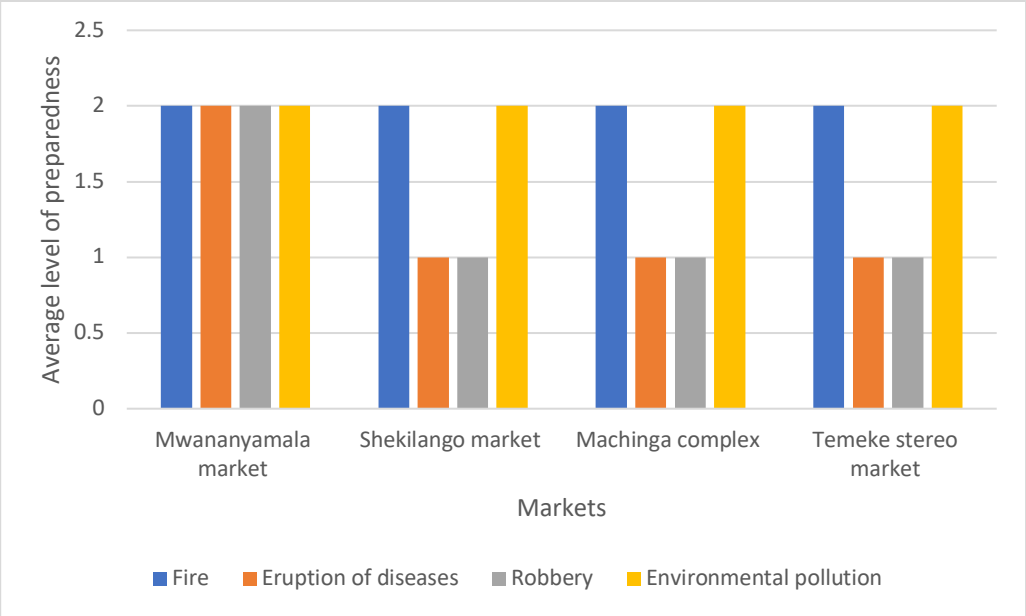


Figure 5: Level of Emergency Preparedness at Each Selected Market

CONCLUSION

The study revealed that both sellers and customers identify environmental pollution as the primary risk of concern in marketplaces followed by disease outbreak. Fire outbreaks and robbery were also identified, particularly in specific markets, indicating infrastructure and security deficiencies. Variations in risk perception highlight the need for targeted interventions across different market settings. From the risk ranking fire outbreaks, disease outbreaks and environmental pollution were rated as tolerable while robbery was rated as moderate risk at all selected public markets except at Machinga complex market where it is rated as unacceptable risk. Further, assessment of emergency preparedness levels showed that fire outbreaks and environmental pollution had moderate levels of preparedness, while disease outbreaks and robbery had low levels of preparedness.

This indicates that although basic preparedness measures exist, they are insufficient to effectively reduce disaster risks across the markets. Therefore, the study recommends that awareness and training programs be strengthened, security systems such as CCTV and controlled access be installed, and appropriate engineering controls be implemented. In addition, adequate provision of clean water and sanitation services should be ensured, alongside the development and implementation of comprehensive disaster risk preparedness plans that provide essential guidance for both the pre-emergency and response phases, clearly defining roles and responsibilities of stakeholders within the marketplaces. Furthermore, these preparedness plan should be tailored to address the specific disaster risks identified within each market context. Future research should expand the scope to include more markets and incorporate longitudinal or quantitative modeling approaches to better understand the dynamics of disaster risk and preparedness over time.

REFERENCE

Centre for Research on the Epidemiology of Disasters (CRED). (2021). *EM-DAT: Disasters 2021—Executive summary*. CRED / UCLouvain. https://www.cred.be/sites/default/files/2021_EMDAT_report.pdf

Coronese, M., Lamperti, F., Keller, K., Chiaromonte, F., & Roventini, A. (2019). Evidence for sharp increase in the economic damages of extreme natural disasters. Proceedings of the National Academy of Sciences, 116(43), 21450–21455. https://doi.org/10.1073/pnas.1907826116

Dickson-Gómez, J., Nyabigambo, A., Rudd, A., Ssentongo, J., Kiconco, A., & Mayega, R. W. (2023). Water, sanitation, and hygiene challenges in informal settlements in Kampala, Uganda: A qualitative study. International Journal of Environmental Research and Public Health, 20(12), 6181. https://doi.org/10.3390/ijerph20126181

Habitat Media. (2024, August 2). The silent health crisis in Dar es Salaam's food markets and the resulting revenue losses. https://habitatmedia.co.tz/the-silent-health-crisis-in-dar-es-salaams-food-markets-and-the-resulting-revenue-losses/

Hatmoko, A. U., & Larassati, A. (2021). Fire risk in traditional market buildings: Causes and mitigation strategies. EAI Endorsed Transactions on Energy Web, 8(33). https://doi.org/10.4108/eai.17-7-2020.2303033

Kajubi, F. (2024, June 28). Revealed: Unplanned settlements jeopardise firefighting operations. The Guardian. https://ippmedia.co.tz/the-

guardian/business/read/revealed-unplanned-settlements-jeopardise-firefighting-operations-2024-06-28-131857

Kuboka, M., Grace, D., Artursson, K., Lindahl, J., Carlsson, G., & Mutua, F. (2024). Food safety in informal public markets in Kenya: Perceptions of stakeholders in the food chain. Frontiers in Sustainable Food Systems, 8, Article 1411318. https://doi.org/10.3389/fsufs.2024.1411318

Kodur, V., Kumar, P., & Rafi, M. M. (2020). Fire hazard in buildings: review, assessment and strategies for improving fire safety. PSU research review, 4(1), 1-23. https://doi.org/10.1108/PRR-12-2018-0033

Luvanda, F., Sweya, L. N., & Mwageni, N. (2023). Health and safety risks among informal solid waste pickers in Kinondoni Municipality, Dar es Salaam Region, Tanzania. The Journal of Solid Waste Technology and Management, 49(4), 365–375. https://doi.org/10.5276/jswtm/iswmaw/494/2023.365

Madhav, N., Oppenheim, B., Gallivan, M., Mulembakani, P. M., Rubin, E., & Wolfe, N. (2017). Pandemics: Risks, impacts, and mitigation. In D. T. Jamison et al. (Eds.), Disease control priorities: Major infectious diseases (3rd ed.). The World Bank. https://www.dcp-3.org/sites/default/files/chapters/DCP3%20Volume%209_Ch%2017.pdf

Mboma, W. L. (2022). Assessment of markets' fire emergency preparedness in Tanzania: A case study of six markets in Ilala City Council, Dar es Salaam. World Research of Business Administration Journal, 2(2), 81–106. https://scipubhouse.com/wp-content/uploads/2022/08/WRBAJ-VOL2No2-1.pdf

Mushi, N., Salukele, F., & Mwageni, N. F. (2024). Awareness of disaster risk management and emergency response legislations and strategies in Tanzania: A case of Dar es Salaam City. International Journal of Business Management and Economic Review, 7(6), 221–230. https://doi.org/10.35409/IJBMER.2024.3636

Mwakatage, B. J., & Golyama, B. (2024). Examining the role of attitudinal factors in shaping fire prevention intentions: A study of response efficacy in public markets of Tanzania. South Asian Journal of Social Studies and Economics, 21(1), 10–20. https://ssrn.com/abstract=4749609

National Bureau of Statistics. (2023). Crime and traffic incidents statistics report: January–December 2023. https://nbs.go.tz/uploads/statistics/documents/en-1719756357-Crime%20and%20Traffic%20Incidents%20Statistics%20Report%20%E2%80%93%20January%20to%20December%2C2023.pdf

Naguib, M. M., Li, R., Ling, J., Grace, D., Nguyen-Viet, H., & Lindahl, J. F. (2021). Live and wet markets: Food access versus the risk of disease emergence. Trends in Microbiology, 29(7), 573–581. https://doi.org/10.1016/j.tim.2021.02.007

Nyampundu, K., Mwegoha, W. J. S., & Millanzi, W. C. (2020). Sustainable solid waste management measures in Tanzania: An exploratory descriptive case study among vendors at Majengo market in Dodoma City. BMC Public Health, 20, Article 1075. https://doi.org/10.1186/s12889-020-08670-0

Philavong, C., Pruvot, M., Reinharz, D., Mayxay, M., Khammavong, K., Milavong, P., Rattanavong, S., Horwood, P. F., Dussart, P., Douangngeun, B., Theppangna, W., Fine, A. E., Robinson, M. T., & Newton, P. N. (2020). Perception of health risks in Lao market vendors.

Zoonoses and Public Health, 67(7), 796–804. https://doi.org/10.1111/zph.12759

Seneviratne, S. I., Zhang, X., Adnan, M., et al. (2021). Weather and climate extreme events in a changing climate. In V. Masson-Delmotte et al. (Eds.), Climate change 2021: The physical science basis. Cambridge University Press. https://doi.org/10.1017/9781009157896.013

Sepadi, M. M., & Nkosi, V. (2023). Health risk assessment of informal food vendors: A comparative study in Johannesburg, South Africa. International Journal of Environmental Research and Public Health, 20(3), 2736. https://doi.org/10.3390/ijerph20032736

Swiss Re Institute. (2021). Natural catastrophes in 2020: Secondary perils in the spotlight, but don't forget primary-peril risks (sigma No. 1/2021). https://www.swissre.com/dam/jcr:ebd39a3b-dc55-4b34-9246-6dd8e5715c8b/sigma-1-2021-en.pdf

Tanzania Government. (2022). National disaster management strategy (2022–2027). Prime Minister's Office – Disaster Management Department. https://www.pmo.go.tz/uploads/documents/sw-1677564328-National%20Disaster%20Management%20Strategy%202022%20%E2%80%93%202027.pdf

World Health Organization. (2021). COVID-19: occupational health and safety for health workers: interim guidance, 2 February 2021 (No. WHO/2019-nCoV/HCW_advice/2021.1). World Health Organization. https://iris.who.int/handle/10665/339151