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Abstract

Purpose: This study assessed the functionality of existing disaster preparedness strategies, namely early warning systems and resource preparedness, for maintaining service continuity at Julius Nyerere International Airport (JNIA), Tanzania's busiest aviation hub.

Design/methodology/approach: A mixed-methods, cross-sectional descriptive design guided by High Reliability Theory, the Resource-Based View and Crisis Management Theory was used. Questionnaires were completed by 187 respondents, including Tanzania Airports Authority managers, air traffic controllers, security, fire and rescue and operational staff and frequent passengers, and 14 key informants were interviewed. Incident reports, safety committee minutes and policy documents were reviewed. Data were analysed using descriptive statistics and thematic analysis.

Findings: Early warning systems were moderately effective (M = 3.39): radar and communication redundancy (M = 3.46) and scheduled testing (M = 3.44) were rated high, but simultaneous alert dissemination (M = 3.35), failure logging (M = 3.35) and backup communication (M = 3.32) lagged. Resource preparedness was the weakest construct (M = 3.06), with dedicated and consistently disbursed budget lines rated lowest of all items (M = 2.99). Interviews revealed postponed testing, fragile backup communications, deferred maintenance and recurring causes of incidents seven years apart.

Research limitations/implications: Findings rely partly on self-reported perceptions at a single airport and on documents released by aviation authorities.

Practical implications: JNIA preparedness is partially functional but structurally fragile; ring-fenced budgets, protected testing schedules, resilient backup communications and enforced closure of incident recommendations are required.

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INTRODUCTION

Airports are critical national infrastructure that support global transportation, international trade, and economic development. Because airport operations rely on complex, interdependent systems ranging from air traffic management and passenger processing to security and cargo handling even minor disruptions can cascade into severe operational, financial, and safety consequences. Airports face different hazards such as, Natural (floods, extreme weather), technological (system failures), and human-induced disasters such as terrorism, pandemics). These threats challenge not only safety but also the ability to sustain continuous service delivery which is defined as the measurable capacity to maintain or rapidly restore flight operations, passenger processing, cargo handling, and safety protocols during and after any disruptive event.

International standards require airports to prepare for such disruptions. ICAO Annex 14 obliges member states to establish and maintain Airport Emergency Plans, conduct full-scale exercises and maintain redundant communication and power systems (International Civil Aviation Organization [ICAO], 2025). Global experience shows, however, that the existence of a plan does not guarantee continuity: preparedness must be tested, resourced and embedded in routine operations. Airports in the United States and Japan have invested heavily in system redundancy and proactive response mechanisms, whereas many African airports have adopted ICAO standards on paper but continue to face infrastructural deficits, underinvestment and fragmented multi-agency coordination (Ndlovu, 2024; Kenya Airports Authority, 2025).

Turning to the Tanzanian context, the government has taken deliberate legislative steps to institutionalise disaster preparedness and public sector resilience. Historically, disaster management in Tanzania was reactive, ad hoc, and lacked a cohesive legal framework. However, the enactment of the Disaster Management Act of 2022, alongside the National Disaster Preparedness and Response Plan, marked a paradigm shift. The Act mandates that critical infrastructure including airports maintain operational readiness, technical redundancy, and coordinated multi-agency response mechanisms. This legal framework is cascaded down through the Tanzania Airports Authority Act (CAP 371, Revised 2019), which requires the TAA to ensure the safety and continuity of airport operations.

Julius Nyerere International Airport (JNIA) is the centrepiece of this national strategy. It is the country's busiest gateway, handling over six million passengers annually and roughly 70% of the country's air cargo, and it is a central node in the national emergency operations network. Yet its ability to maintain service continuity has repeatedly been tested. A fuel hydrant failure in 2018 caused 14 flight delays over nine hours (Tanzania Civil Aviation Authority [TCAA], 2019); heavy rainfall has flooded access roads and parts of the runway, extending passenger processing times from 45 minutes to two or three hours (Tanzania Airports Authority [TAA], 2022); a runway lighting failure in 2023 suspended night operations for four hours; and a baggage system breakdown in 2025 affected 22 international flights. In 2024, an aircraft returned to JNIA after engine smoke was detected, exposing weaknesses in crisis communication and passenger management (The Citizen, 2024).

A major barrier to effective service continuity is the existence of "Digital Silos" fragmented information systems that prevent real-time data sharing between these distinct agencies. The World Bank (2025), in its assessment of Tanzania's emergency preparedness, noted that security, medical teams, and airport management often operate on separate, non-integrated databases. During an emergency, this lack of integration means that critical information (such as passenger manifests, health screening data, or security alerts) cannot be shared instantly. Instead, agencies rely on manual handovers and phone calls, leading to delayed responses and prolonged operational paralysis.

These incidents suggest a policy paradox: Tanzania has a comprehensive legal framework for disaster management, and JNIA possesses a written Airport Emergency Plan, yet plans do not consistently translate into



reliable service continuity. Previous studies of disaster preparedness in African airports (Mashauri, 2025; Ndlovu, 2024; Owino, 2024) have relied largely on descriptive or qualitative analyses and have rarely assessed how well specific preparedness strategies function in practice. This article reports the first objective of a broader study on the effectiveness of disaster preparedness on service continuity at JNIA: to assess the functionality of existing disaster preparedness strategies for maintaining service continuity.

Theoretical Framework

High Reliability Theory

High Reliability Theory (HRT) was developed by LaPorte, Rochlin, and Roberts in the 1980s following their study of organisations that operate complex, high-risk technologies yet maintain remarkably low accident rates (LaPorte et al., 1987). The researchers studied US Navy aircraft carriers, nuclear power plants, and air traffic control systems. HRT posits that High Reliability Organisations (HROs) cultivate five practices. First, preoccupation with failure: treating every near-miss as a potential symptom of systemic failure. Second, reluctance to simplify interpretations: seeking multiple perspectives rather than taking shortcuts. Third, sensitivity to operations: maintaining real-time awareness and empowering frontline personnel. Fourth, commitment to resilience: developing capacity to detect, contain, and recover from errors. Fifth, deference to expertise: shifting decision-making authority to those with relevant expertise during crises, regardless of rank.

Airports are archetypal high reliability organisations in which small errors can have catastrophic consequences. The theory is relevant to this study because it implies that the functionality of preparedness depends not only on the existence of detection systems but also on whether failures are logged, reviewed and learned from, and whether operations remain sensitive to weak signals of breakdown (LaPorte et al., 1987).

Resource-Based View and Crisis Management Theory

The Resource-Based View holds that organisational performance and resilience depend on internal resources that are valuable, rare, inimitable and non-substitutable, including physical assets, human capital and organisational capabilities (Barney, 1991). Applied to disaster preparedness, the theory distinguishes between possessing a resource, such as a backup generator or an emergency operations centre, and possessing a reliable capability to use it when a crisis strikes. Crisis Management Theory views crises as unfolding through stages of signal detection, preparation and prevention, damage containment, recovery and learning (Mitroff, 2005; Coombs, 2015). It therefore provides a framework for assessing whether JNIA's preparedness strategies function across the entire crisis cycle rather than at a single stage.

Empirical Literature

Consistent with Specific Objective 1, Kumar and Wallace (2024) conducted a quantitative study of 47 Airports across 12 countries to determine the relationship between communication redundancy and recovery time after system failures. They found that airports with automated backup communication and satellite-linked monitoring systems recovered 40% faster than those relying on single-layer systems. The study is methodologically strong, utilising regression analysis to control for Airport size and budget, but is geographically limited to high-income countries.

Chen and Liu (2025) took a different approach, focusing on institutional coordination rather than just hardware. In a comparative study of 18 Asian airports, they found that Airports with integrated meteorological data-sharing agreements with national weather agencies reduced false alarms by 45% and improved response lead times by an average of 35 minutes. Their study highlights that early warning functionality depends on inter-agency data-sharing protocols as much as on physical technology.



Bianchi and Müller (2022) challenged the technological focus of the above studies. In a comparative case study of 12 European airports, they found that Airports conducting full-scale emergency exercises every two years showed stronger service continuity outcomes than those with advanced technology but infrequent drills. Their qualitative data revealed that written procedures often concealed communication breakdowns that only emerged during physical simulations.

Rodriguez (2023) surveyed 85 airports in 23 developing economies to assess resource adequacy. The study found that 67% of airports lacked sufficient reserve equipment for simultaneous hazard events, demonstrating that operating at near-capacity prevents the redistribution of resources during crises. However, the study's reliance on self-reported data from airport managers limits the validity of its findings.

Owino (2024) addressed the measurement problem in Rodriguez's study by focusing on equipment reliability rather than mere presence. In a study of 15 African Airports, Owino developed a "functionality score" that weighted equipment age, maintenance records, and recent test results. He found that response vehicles older than 15 years showed mechanical failure rates 3.2 times higher during peak operational stress.

A clear pattern emerges from these studies: the functionality of disaster preparedness is not solely dependent on the existence of physical infrastructure. Both Kumar and Wallace (2024) and Chen and Liu (2025) agree that technological integration and data-sharing are critical for early warning systems. However, Bianchi and Müller (2022) add a vital nuance, demonstrating that technology without regular human rehearsal is ineffective. Furthermore, the work of Rodriguez (2023) and Owino (2024) establishes a pattern that resource adequacy is not about the number of assets an airport possesses, but about their reliability and maintenance over time.

Despite this rich body of work, a significant gap remains. The studies by Kumar, Chen, and Bianchi were conducted in Europe, Asia, and North America, where airports operate under high-budget, high-staffing conditions. The studies by Rodriguez and Owino focused on developing economies, but did not specifically examine East African airports. No study has evaluated the specific interplay of early warning systems, resource maintenance, and staff training at JNIA.

Regional studies point to similar challenges. Williams and Okafor (2025) proposed a preparedness functionality index for sub-Saharan African airports, emphasising that functionality should be judged by the condition and readiness of resources rather than their mere presence. Van der Merwe and Nkosi (2024) highlighted the importance of inter-agency coordination in South African airport emergencies, and Mrema (2025) identified a gap between policy and practice in the implementation of Tanzania's Disaster Management Act. Together, these studies suggest that an assessment of preparedness at JNIA should examine both technical systems and the institutional arrangements that keep them functional.

METHOD

Research Approach and Design

The study adopted a mixed-methods approach that integrated quantitative and qualitative data to provide a holistic understanding of preparedness (Creswell & Creswell, 2025). The quantitative strand measured preparedness indicators, such as the reliability of technical systems and the adequacy of resources, while the qualitative strand provided insights into how and why these systems function as they do. A cross-sectional descriptive design was used to document existing conditions, practices and perceptions at JNIA during the data collection period of June to July 2026.

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Study Area

The study was conducted at JNIA in Dar es Salaam, which was purposively selected because it is Tanzania's largest and busiest aviation hub and primary international gateway. As a coastal facility exposed to flooding and handling most of the nation's air traffic, JNIA presents a high-stakes environment in which disaster preparedness is a matter of national security and economic stability.

Population, Sample and Sampling

The target population of about 350 comprised Tanzania Airports Authority senior management, air traffic controllers, airport security officers, fire and rescue services personnel, operational support staff and regular passengers. Using Slovin's formula with a 5% margin of error, a sample of 187 was determined (Table 1). Senior managers and air traffic controllers were selected purposively for their expert knowledge of emergency coordination and crisis protocols; security, fire and rescue and operational support staff were selected by simple random sampling from human resources registries; and frequent passengers who had used JNIA at least five times in the previous 12 months were selected by convenience sampling at Terminal III on different days and at different times.

Table 1. Target population, sample size and sampling technique

Type of Respondents	Target Population	Sample Size	Sampling Technique
TAA Senior Management	10	05	Purposive Sampling
Air Traffic Controllers (ATC)	05	03	Purposive Sampling
Airport Security Officers	100	54	Simple Random Sampling
Fire and Rescue Services (FRS)	60	31	Simple Random Sampling
Operational Support Staff	75	40	Simple Random Sampling
Regular Passengers (frequent flyers ,flights from JNIA	100	54	Convenience sampling
Total	350	187	—

Source: Field data (2026).

Data Collection

Structured questionnaires with five-point Likert-scale items measured preparedness constructs. Early warning systems were measured by six items on radar and communication redundancy, real-time use of meteorological information, scheduled testing, simultaneous alert dissemination, backup communication and the logging and review of system failures. Resource preparedness was measured by six items on knowledge of the Airport Emergency Plan, fire-suppression and rescue equipment, backup power, dedicated budget lines, emergency medical equipment and the Emergency Operations Centre. Semi-structured interviews were conducted with 14 key informants, including the airport manager, air traffic controllers, fire and rescue officers and operations staff. The documentary review covered incident investigation reports, the Disaster Management Act (2022), the Airport Emergency Plan, training records, an exercise after-action report and safety committee minutes for the period 2016–2026.

Validity and Reliability

Content validity was ensured by review of the instruments by academic supervisors and subject-matter experts at the Tanzania Civil Aviation Authority, and face validity through a pilot study with 10 staff members at a smaller airfield. Internal consistency was assessed using Cronbach's alpha, with 0.70 as the minimum threshold (Field, 2018); the early warning systems and resource preparedness sub-scales recorded alphas of 0.835 and 0.842, respectively. For the qualitative data, triangulation with documents and member checking, in which participants verified the accuracy of their interview records, were used to enhance credibility.



Data Analysis

Quantitative data were analysed using descriptive statistics, including frequencies, percentages, means and standard deviations. Mean scores were interpreted as very low (1.00–1.80), low (1.81–2.60), moderate (2.61–3.40), high (3.41–4.20) and very high (4.21–5.00). All 24 preparedness items were also ranked to identify the strongest and weakest aspects across constructs. Interview and documentary data were analysed thematically, and the results were integrated with the quantitative findings.

Ethical Considerations

Research clearance was obtained from Kampala International University in Tanzania, and permission to collect data was granted by the Tanzania Airports Authority. Participants gave informed consent, participation was voluntary and anonymity was protected by using role codes rather than names. Only summary training records were reviewed, and sensitive security information was not reported.

RESULTS

Response Rate

All 187 questionnaires were completed and returned, giving a 100% response rate across every respondent category: 5 senior managers, 3 air traffic controllers, 54 security officers, 31 fire and rescue personnel, 40 operational support staff and 54 regular passengers. The preparedness scales were answered by 179 respondents. In addition, 14 key-informant interviews were conducted.

Functionality of Early Warning Systems

Table 2. Descriptive statistics for early warning systems (n = 179)

Statement	SD (1)	D (2)	N (3)	A (4)	SA (5)	Mean	SD
Functioning early warning systems (radar/comms redundancy)	0 (0.0%)	15 (8.3%)	91 (50.8%)	49 (27.3%)	24 (13.4%)	3.46	0.83
Meteorological information received (acted on in real time)	0 (0.0%)	15 (8.3%)	91 (50.8%)	59 (32.9%)	14 (7.2%)	3.40	0.75
Systems tested on a defined schedule (≥ quarterly parameters)	0 (0.0%)	14 (7.8%)	93 (51.9%)	52 (29.0%)	20 (11.1%)	3.44	0.79
Alerts disseminated simultaneously (notified to all agencies)	0 (0.0%)	20 (11.1%)	93 (51.9%)	48 (26.8%)	18 (10.0%)	3.35	0.81
Reliable backup communication (alternative backup channels)	0 (0.0%)	20 (11.1%)	93 (51.9%)	54 (30.1%)	12 (6.7%)	3.32	0.77
System failures logged and reviewed (tracked and updated)	0 (0.0%)	22 (12.2%)	91 (50.8%)	47 (26.2%)	19 (10.6%)	3.35	0.83

Note. Frequencies (percentages). Source: Field data (2026).

A nuanced examination of the Early Warning Systems (EWS) data reveals a construct mean of 3.39 (SD = 0.83), categorising it as "Moderately Effective." However, this aggregate score conceals a critical bifurcation. The technological hardware—specifically functioning radar redundancy (M = 3.46, SD = 0.83) and quarterly system tests (M = 3.44, SD = 0.79)—achieved "High" effectiveness. In stark contrast, the administrative processes lagged: simultaneous dissemination of alerts to all agencies (M = 3.35, SD = 0.81), the logging and review of system failures (M = 3.35, SD = 0.83), and the reliability of backup communication channels (M = 3.32, SD = 0.77) all fell into the "Moderate" category.



Functionality of Resource Preparedness

Table 3. Descriptive statistics for resource preparedness (n = 179)

Statement	SD (1)	D (2)	N (3)	A (4)	SA (5)	Mean	SD
Current, documented AEP known to staff (operational protocol availability)	6 (3.3%)	33 (18.4%)	75 (41.9%)	53 (29.6%)	12 (6.7%)	3.07	0.87
Fire-suppression/rescue equipment sufficient (suppression asset volume readiness)	12 (6.7%)	35 (19.5%)	62 (34.6%)	52 (29.0%)	18 (10.0%)	3.08	0.97
Backup power tested and functions (electrical redundancies during outages)	10 (5.5%)	34 (18.9%)	67 (37.4%)	55 (30.7%)	13 (7.2%)	3.04	0.93
Dedicated budget lines exist and disbursed (financial asset allocation flow)	10 (5.5%)	36 (20.1%)	71 (39.6%)	52 (29.0%)	10 (5.5%)	2.99	0.92
Emergency medical equipment adequate (first-aid deployment supplies in date)	9 (5.0%)	31 (17.3%)	65 (36.3%)	54 (30.1%)	20 (11.1%)	3.13	0.94
Dedicated EOC equipped and staffed (Emergency Operations Centre status)	4 (2.2%)	32 (17.8%)	82 (45.8%)	52 (29.0%)	9 (5.0%)	3.08	0.85

Note. AEP = Airport Emergency Plan; EOC = Emergency Operations Centre. Source: Field data (2026).

This bifurcation is even more pronounced in Resource Preparedness, which yielded the lowest overall mean in the study at 3.06 (SD = 0.68). No single indicator crossed into high effectiveness. While emergency medical equipment was rated highest (M = 3.13, SD = 0.94), the foundational elements were rated lowest: the Emergency Operations Centre (EOC) (M = 3.08, SD = 0.85), backup power functionality (M = 3.04, SD = 0.93), and critically, dedicated and consistently disbursed budget lines, which was the single lowest-rated item across the entire questionnaire (M = 2.99, SD = 0.92).

Responses to the resource items were also characterised by a large share of neutral answers (34.6%–45.8%), and at least one in five respondents disagreed with each item. Only 36.3% agreed that the Airport Emergency Plan was current, documented and known to staff, and only 34.5% agreed that dedicated budget lines existed and were disbursed. These results indicate that the material and financial foundations of preparedness were uncertain to a substantial proportion of staff.

Cross-Construct Ranking of Preparedness Items

To place the two objective-one constructs in context, all 24 preparedness items were ranked by mean score. Table 4 presents the five highest- and five lowest-rated items.

Table 4. Five highest- and five lowest-rated preparedness items across all sub-scales (n = 179)

Rank	Statement	Construct	Mean	SD
1	Roles/responsibilities clearly defined	Staff Training & Competency	3.64	0.70
2	New staff receive induction training	Staff Training & Competency	3.63	0.76
3	Regular emergency response training provided	Staff Training & Competency	3.62	0.74
4	Training content reviewed/updated after new threats	Staff Training & Competency	3.62	0.79
5	Formal competency assessment conducted annually	Staff Training & Competency	3.60	0.79
20	Formal MOUs/SOPs with external agencies exist	Inter-Agency Coordination	2.87	0.92
21	Post-event debriefs include all agencies, actionable	Inter-Agency Coordination	2.90	0.91
22	Real-time information sharing is effective	Inter-Agency Coordination	2.91	0.88
23	Recent inter-agency communication timely/accurate	Inter-Agency Coordination	2.93	0.88
24	Agency roles clearly defined, not duplicated	Inter-Agency Coordination	2.95	0.98

Source: Field data (2026).

This distribution is analytically significant. It demonstrates that JNIA's workforce is highly trained to understand their individual roles and execute their specific duties, but the organisational architecture required



to connect those roles across agencies is fundamentally fractured. It suggests a paradox: the airport possesses the human capital necessary for an effective emergency response, but it lacks the systemic infrastructure (formal agreements, shared databases, and dedicated funding) required to deploy that capital cohesively. This finding provides the empirical justification for the prioritisation of coordination and financial resourcing in the recommendations developed in Chapter Five.

Qualitative Findings

Thematic analysis of fourteen interviews, triangulated with documentary evidence, generated the overarching theme of The Paradox of Technological Readiness and Institutional Fragility.

Technological Redundancy versus Procedural Breakdown

Participants acknowledged robust detection technology but described the fragility of the procedures surrounding it. An air traffic controller explained: "Testing schedules exist on paper for early warning systems, yet in practice the tests are often postponed when the airport is busy, which is most of the year. When a system has not been tested for two or three months, nobody can say with confidence that it will behave correctly the day it is genuinely needed" (ATC-01). A fire and rescue officer described the vulnerability of backup communications: "During the last heavy storm, two of the handsets in the fire unit could not pick up a signal near the cargo apron, and the team had to rely on mobile phones, which is not ideal when the network itself can become congested during an emergency" (FRS-03).

The Unfunded Mandate

The low rating for dedicated budget lines was explained by a senior manager: "The dedicated budget line for preparedness exists, but disbursement is not consistent throughout the year, so departments sometimes delay routine maintenance to stretch what funds are already available. This means backup generators or medical supplies can go longer than they should between proper servicing" (MGR-04). A fire and rescue respondent added that "our fire vehicles are getting older, and while they still pass inspection, older engines fail more often under sustained pressure" (FRS-01). Interviews also revealed that the Emergency Operations Centre, although equipped, was not staffed around the clock and functioned mainly during announced drills.

Institutional Amnesia

An operations respondent observed that "the plan being current on paper is one thing, the plan being genuinely internalised by everybody who might need to act on it during a crisis is a separate and, frankly, more difficult achievement" (OPS-02). The documentary review showed that the underlying causes of the 2018 fuel hydrant failure, namely delayed maintenance and unclear ownership of checks, were identical to those of the 2025 baggage system breakdown, despite each investigation recommending changes. This repetition indicates that the functionality gaps at JNIA are structural rather than incidental.

DISCUSSION

Partially Functional but Structurally Fragile

The integrated findings indicate that JNIA's disaster preparedness strategies are partially functional but structurally fragile. Technological infrastructure, such as radar redundancy and scheduled testing, was rated comparatively highly, whereas the administrative processes required to operationalise it—simultaneous dissemination of alerts, logging and review of failures and reliable backup communication—lagged. Resource preparedness was weaker still, and the lowest-rated item in the entire questionnaire concerned the disbursement of dedicated preparedness budgets. The qualitative evidence shows that even the higher scores conceal procedural weaknesses, as when testing is postponed during busy periods.



Through the lens of High Reliability Theory (HRT), JNIA demonstrates "sensitivity to operations" (the scheduled testing), but it fundamentally fails the HRT principle of "preoccupation with failure." The qualitative theme of institutional amnesia proves that JNIA does not possess a learning culture; it identifies failures but does not learn from them.

The Resource-Based View (RBV) explained the financial findings: possessing a resource (a backup generator or a radio) is not the same as possessing a capability. Because the qualitative data reveals erratic budget disbursements, these resources are not consistently maintained, meaning they fail to meet RBV's criteria of being reliably "valuable" when a crisis strikes.

Crisis Management Theory (CMT) maps perfectly onto the qualitative and quantitative divide: JNIA is strong at signal detection (high radar scores) but demonstrably weak at damage containment (failing backup comms) and severely deficient in the learning stage (institutional amnesia).

Comparison with Previous Studies

The qualitative theme of the "unfunded mandate" strongly aligns with Mrema (2025), who identified a policy-to-practice gap in Tanzania's implementation of the Disaster Management Act. The finding that JNIA relies on fragile communication workarounds corroborates Kumar and Wallace (2024) and Chen and Liu (2025), who found that communication redundancy is as critical as physical technology. Furthermore, the documentary finding of recurring maintenance failures echoes Owino (2024), who associated ageing equipment and poor maintenance with higher failure rates at African airports.

The findings also support Bianchi and Müller (2022), who showed that written procedures can conceal communication breakdowns that emerge only during physical exercises, and Rodriguez (2023), who found that many airports in developing economies lack sufficient reserve equipment for simultaneous hazards. The observation that the Emergency Operations Centre exists physically but is not staffed continuously suggests that JNIA has invested in the visible symbols of preparedness that satisfy audits, while the less visible operational infrastructure remains under-resourced.

Implications

Theoretically, the study demonstrates the value of combining High Reliability Theory, the Resource-Based View and Crisis Management Theory: together they explain why the existence of systems, plans and facilities does not amount to functional preparedness unless resources are maintained, failures are learned from and every stage of the crisis cycle is addressed. Practically, the findings suggest that the Disaster Management Act (2022) needs to be accompanied by predictable financing and by mechanisms that ensure incident recommendations are implemented.

Limitations

The reliance on self-reported Likert-scale data may introduce social desirability bias, and the large share of neutral responses suggests that some respondents were uncertain about aspects of preparedness outside their own units. The qualitative sample and the number of senior managers were small, and the documentary review relied on documents released by the Tanzania Airports Authority and the Tanzania Civil Aviation Authority. Future research could track the implementation of safety recommendations over several years and examine the relationship between public budget cycles and airport resilience.



CONCLUSION

This study assessed the functionality of existing disaster preparedness strategies for maintaining service continuity at JNIA. It concludes that preparedness is partially functional but structurally fragile. Early warning technology is comparatively well established, but the procedures for disseminating alerts, maintaining backup communications and learning from failures are weak. Resource preparedness is the weakest area, constrained above all by inconsistent disbursement of preparedness budgets, ageing equipment and an Emergency Operations Centre that is not continuously operational. The recurrence of identical causes across incidents seven years apart shows that JNIA identifies failures but does not consistently learn from them.

Recommendations

i. The Government and the Tanzania Airports Authority should ring-fence disaster preparedness budgets for JNIA and guarantee quarterly disbursements to prevent deferred maintenance of generators, fire vehicles and medical supplies.
ii. JNIA management should protect testing schedules for early warning and backup communication systems so that tests are not postponed during busy periods, and should invest in resilient backup communication channels for fire and rescue units.
iii. A simultaneous, cross-department alert dissemination protocol should be established and rehearsed through regular full-scale exercises involving all agencies.
iv. The Tanzania Civil Aviation Authority and JNIA should introduce a formal tracking and closure mechanism for incident and safety committee recommendations, with assigned owners, deadlines and funding.
v. The Emergency Operations Centre should be staffed and operational on a continuous basis rather than only during announced drills.

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Conflict of Interest

The authors declare no conflict of interest.

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