

# Joint Planning, Coordination and Stakeholder Training as Determinants of Operational Efficiency: Evidence from Julius Nyerere International Airport, Tanzania

Rehema Mlanzi<sup>1</sup>, Janet Mutebe<sup>2</sup> & Lucas Kisasa<sup>3</sup>

<sup>1,2,3</sup>Department of Social Sciences, Kampala International University, Tanzania

<sup>3</sup>Department of Social Sciences, Kampala International University, Tanzania

\*Corresponding author: rehemamlanzi78@gmail.com

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## Abstract

Operational efficiency is a critical performance requirement for modern airports, particularly in rapidly growing aviation markets such as Sub-Saharan Africa. This study examines the extent to which joint planning, coordination, and stakeholder training influence operational efficiency at Julius Nyerere International Airport (JNIA) in Tanzania. Drawing from quantitative data collected from 119 respondents comprising airport staff, ground handlers, airline representatives, and air traffic controllers and supported by qualitative interviews, the study provides empirical evidence on the contribution of collaborative practices to airport performance. Results indicate high levels of agreement among respondents that joint planning enhances operational alignment, minimizes disruptions, and improves service delivery (80% agreement, mean = 4.23). Coordination among airport stakeholders was identified as a critical determinant of efficiency, with 94% of respondents emphasizing its role in reducing delays, improving resource allocation, and strengthening real-time decision-making (mean = 4.34). Additionally, 75% of respondents affirmed that stakeholder training enhances the effectiveness of Airport Collaborative Decision-Making (A-CDM) processes (mean = 4.12). The findings align with Systems Theory and Stakeholder Theory, suggesting that efficient airport operations depend on integrated, interdependent stakeholder activities supported by continuous capacity-building. The study concludes that strengthening joint planning frameworks, enhancing coordination mechanisms, and institutionalizing structured training programs are essential for advancing JNIA's operational efficiency and competitiveness. Recommendations include investment in targeted capacity-building, integration of real-time communication systems, and adoption of collaborative planning protocols across airport units.

**Keywords:** Joint Planning, Coordination, Stakeholder Training, Operational Efficiency

## Introduction

Operational efficiency has become a central performance indicator for airports worldwide as air traffic continues to expand and operational environments grow increasingly complex. The aviation sector is characterized by interdependent activities involving multiple stakeholders including airlines, ground handling companies, air traffic control, security units, and airport operators whose coordination is essential for maintaining seamless passenger flows and minimizing delays (Graham, 2018). Effective collaboration among these actors supports efficient resource utilization and enhances service delivery, yet in many developing countries airports continue to face coordination gaps and communication challenges that undermine their operational performance (ICAO, 2018).

Julius Nyerere International Airport (JNIA), Tanzania's largest airport, handles more than four million passengers annually, creating heightened pressure to improve operational efficiency. As traffic volumes increase, persistent challenges such as fragmented stakeholder communication, reliance on manual processes, and limited technological integration contribute to operational inefficiencies (ICAO, 2021). Globally, evidence demonstrates that airport performance improves significantly when stakeholders jointly plan operations, coordinate decisions, and engage in structured training tailored to collaborative environments (Eurocontrol, 2020; IATA, 2020). Recent studies also indicate that collaborative operational systems and integrated communication platforms improve airport resilience, efficiency, and service delivery in rapidly growing aviation environments (Netto et al., 2020; Fahmi et al., 2025). For example, European airports implementing A-CDM have documented reductions in delays, enhanced predictability, and improved turnaround efficiency (Eurocontrol, 2021).

Despite these documented benefits, the implementation of Airport Collaborative Decision Making (A-CDM) remains uneven across many African airports, including JNIA. Weak coordination mechanisms, outdated information systems, and limited stakeholder engagement have hindered full adoption of collaborative frameworks, mirroring challenges noted in similar studies across developing aviation contexts (UNDP, 2016; ICAO, 2021). Strengthening collaborative working relationships is therefore essential as JNIA confronts rising passenger numbers and increasing pressure to align with global aviation standards (IATA, 2021).

Joint planning is widely recognized as a foundational practice in streamlining airport operations because it aligns stakeholder expectations, establishes shared operational goals, and helps anticipate bottlenecks that could disrupt service delivery (Chen et al., 2016). Similarly, effective coordination supports synchronized decision-making, reduces operational variability, and enhances responsiveness during irregular operations (Kaldasch, 2018; Verhoeff et al., 2019). Training remains a critical determinant of operational efficiency, as airports that invest in structured capacity-building programs demonstrate improved implementation of collaborative frameworks and greater adaptability in dynamic environments (Ritchie & Brindley, 2016; Johnson et al., 2018).

These perspectives are supported by established theoretical foundations. Systems Theory emphasizes the interdependence of organizational components and the need for integrated processes to maintain system stability and performance (Bertalanffy, 1968). Stakeholder Theory further highlights the importance of collaboration between actors with shared interests to enhance organizational outcomes (Freeman, 1984).

When applied to airport environments, these theories underscore the need for collective action, communication, and shared responsibility all essential elements of collaborative decision-making.

In Tanzania, empirical research examining how joint planning, coordination, and training influence airport operational efficiency remains limited. Previous studies have highlighted general challenges in the aviation sector but have not conducted comprehensive, data-driven assessments focusing on collaborative determinants of efficiency at major airports (Alem, 2020; Lee et al., 2019). This study addresses that gap by examining stakeholder perceptions of collaborative practices and assessing how these practices contribute to improved service delivery, reduced delays, and enhanced operational predictability at JNIA.

Therefore, the objective of this manuscript is to examine the influence of joint planning, stakeholder coordination, and training on operational efficiency at Julius Nyerere International Airport. By grounding the analysis in both quantitative and qualitative findings, the study contributes to broader discussions on strengthening collaborative decision-making frameworks in African airports, with implications for policy development, airport management, and aviation sector improvement.

## **Study Objectives**

### ***General Objective***

The general objective of the study was to assess the extent to which Airport Collaborative Decision-Making Framework is implemented or not in the provision of quality services at Julius Nyerere International Airport.

### ***Specific Objectives***

- To assess the impact of joint planning, coordination and training among stakeholders on operational efficiency at Julius Nyerere International Airport.
- To examine the roles of information sharing in collaborative decision making on service delivery at Julius Nyerere International airport.
- To identify the challenges that hinder the implementation of airport collaborative decision-making framework at Julius Nyerere International Airport.

### ***Research Questions***

- What is the impact of joint planning, coordination and training among stakeholders on operational efficiency at Julius Nyerere International Airport?
- What are the roles of information sharing in collaborative decision making on service delivery at Julius Nyerere International airport?
- What are the challenges faced during the implementation of airport collaborative decision-making framework to improve airport services at Julius Nyerere International Airport?

## Theoretical Framework

### Systems Theory

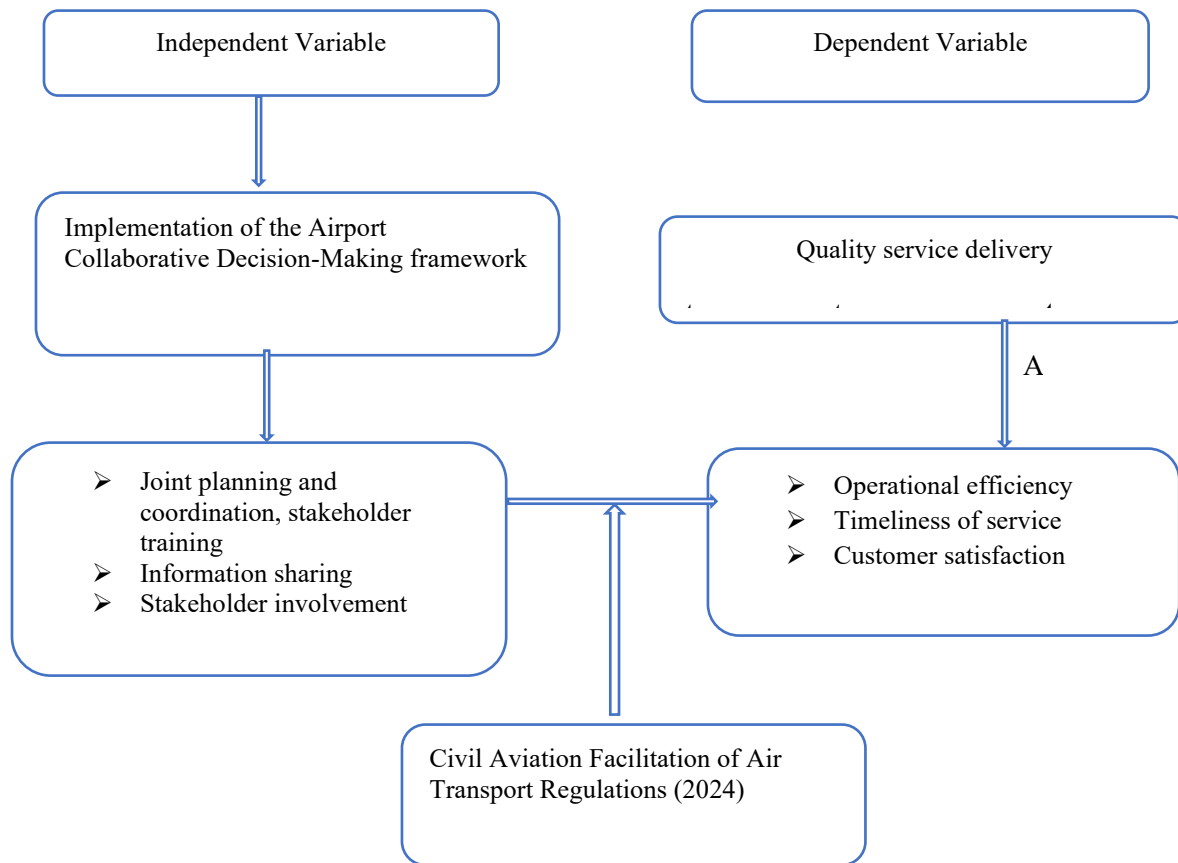
Systems Theory, proposed by Bertalanffy (1968), posits that organizations function as interconnected systems composed of interdependent components. The theory emphasizes that the performance of an organization depends on the effective interaction, communication, and coordination among its subsystems. In the context of airport operations, multiple units air traffic control, airlines, ground handling, security, immigration, and airport management operate as interlinked elements whose performance directly influences overall operational efficiency. Systems Theory, therefore, provides a conceptual foundation for understanding the need for integrated planning, information sharing, and collaborative decision-making within an airport environment. When stakeholders function cohesively, operational delays are minimized, processes are streamlined, and overall system performance improves (ICAO, 2018).

### Stakeholder Theory

Stakeholder Theory, founded by Freeman (1984), argues that organizations create value more effectively when they recognize and balance the interests of all relevant stakeholders. In airport operations, these include airlines, airport operators, regulatory authorities, ground handlers, passengers, and security agencies. The theory underscores the need for collaborative engagement, communication, and shared responsibility in achieving organizational goals. Applied to Airport Collaborative Decision Making (A-CDM), Stakeholder Theory highlights the importance of involving all operational actors in planning, coordination, and information exchange, thereby enhancing trust, reducing conflict, and improving efficiency (IATA, 2020; Eurocontrol, 2021). The theory thus provides a relevant lens for examining joint planning, coordination, and training shape operational efficiency at JNIA.

## Conceptual Framework

The conceptual framework illustrates the relationship between the independent variables and the dependent variable in the study. The independent variables include joint planning, stakeholder coordination, and stakeholder training, while the dependent variable is operational efficiency at Julius Nyerere International Airport.



*Figure 1: Airport Collaborative Decision-making Framework model*

Source: Researcher (2025)

Joint planning involves collaborative scheduling and shared operational decision-making among airport stakeholders. Stakeholder coordination includes communication, synchronized activities, and information sharing among airport operational units. Stakeholder training involves capacity-building, technical skills development, and operational preparedness among airport personnel.

These variables are expected to influence operational efficiency through improved service delivery, reduced delays, enhanced communication, and better resource utilization.

## Empirical Literature Review

### Joint Planning and Operational Efficiency

Joint planning is a critical element in airport operations, involving the alignment of stakeholders' expectations, shared goal setting, and coordinated scheduling of activities. Effective joint planning reduces uncertainty, enhances predictability, and optimizes resource utilization (Zhang & Zhao, 2017). Studies in European and Asian airports indicate that collaborative planning reduces bottlenecks, enhances operational flow, and leads to more efficient aircraft turnaround processes (Verhoeff et al., 2019; Chen et al., 2016).

Research further shows that airports that engage stakeholders in co-developing operational plans experience fewer disruptions, improved passenger handling, and enhanced service quality (Graham, 2018).

In African contexts, limited empirical work has explored joint planning in airport environments; however, existing assessments highlight challenges such as unclear communication protocols, fragmented planning procedures, and insufficient stakeholder engagement (UNDP, 2016). These weaknesses often result in operational delays and coordination inefficiencies. The limited research underscores the importance of examining how joint planning practices influence operational outcomes at airports such as JNIA.

### **Stakeholder Coordination and Operational Efficiency**

Coordination among airport stakeholders is a central determinant of operational efficiency. Effective coordination allows for real-time decision-making, synchronized workflows, and reduced variability in airport processes (Kaldasch, 2018). Research from well-established A-CDM airports demonstrates that strong coordination mechanisms can significantly reduce departure delays, improve flow management, and enhance situational awareness across operational units (Eurocontrol, 2020; ICAO, 2021).

Coordination challenges, however, remain prevalent in many developing countries, where communication infrastructures are often inadequate, and information flow is inconsistent (Alem, 2020). Fragmented coordination results in operational uncertainties, inefficient resource allocation, and frequent disruptions during irregular operations. Studies from East African airports similarly report that coordination gaps between airlines, ground handlers, and air navigation service providers lead to prolonged turnaround times and operational bottlenecks (Lee et al., 2019). These findings demonstrate the value of evaluating stakeholder coordination in shaping JNIA's operational efficiency.

Recent studies further show that integrated communication systems improve operational coordination, reduce disruptions, and strengthen decision-making across airport stakeholders (Williams & Brown, 2023).

### **Stakeholder Training and Operational Efficiency**

Training is essential for strengthening the capacity of airport personnel, enhancing situational awareness, and supporting the adoption of collaborative decision-making frameworks. Empirical evidence shows that airports investing in continuous training programs experience improved compliance with operational standards, better coordination during emergencies, and enhanced use of technology for real-time communication (Johnson et al., 2018; Ritchie & Brindley, 2016).

Training also plays a crucial role in facilitating A-CDM implementation by equipping stakeholders with the knowledge and skills needed to engage in collaborative planning, interpret real-time data, and respond to dynamic operational conditions (IATA, 2020). Studies from emerging aviation markets indicate that inadequate training contributes to inconsistency in operational performance, reduced adherence to standard operating procedures, and difficulties in integrating new technological systems (UNDP, 2016; Kihara, 2021). The literature thus demonstrates that structured training is a vital determinant of efficiency in airport settings, including at JNIA.

Recent aviation studies further emphasize that continuous training improves staff adaptability, operational preparedness, and implementation of collaborative decision-making systems in airport environments (Johnson et al., 2020).

## Synthesis and Knowledge Gap

The reviewed literature consistently highlights the importance of joint planning, coordination, and training in shaping airport operational efficiency. International research underscores that collaborative decision-making practices enhance predictability, reduce delays, and improve resource utilization. However, the majority of these studies originate from developed aviation systems in Europe, North America, and parts of Asia (Eurocontrol, 2020; ICAO, 2021). In contrast, empirical research in African airport contexts remains limited, with most studies focusing on general operational challenges rather than systematically assessing collaborative determinants of efficiency (Alem, 2020; Lee et al., 2019).

A clear gap exists in understanding how collaborative practices specifically joint planning, coordination, and training influence operational efficiency at major airports in Sub-Saharan Africa. This study addresses this gap by examining stakeholder perceptions at JNIA and empirically assessing the extent to which collaborative factors contribute to operational outcomes. The study therefore makes a novel contribution by generating evidence relevant for both policy and practice in Tanzania's aviation sector.

## Methodology

### Research Design

This study employed a descriptive research design to examine the influence of joint planning, stakeholder coordination, and training on operational efficiency at Julius Nyerere International Airport (JNIA). The design was appropriate because it allowed for systematic description of stakeholder perceptions and provided quantitative and qualitative data for assessing relationships between the independent variables and operational efficiency (Creswell, 2014). By integrating both approaches, the design facilitated a comprehensive understanding of how collaborative practices shape airport operations.

### Study Area

The study was conducted at Julius Nyerere International Airport, located in Dar es Salaam, Tanzania. JNIA is the country's largest airport, handling domestic, regional, and international passenger and cargo traffic. The airport operates through a network of stakeholders including airlines, the airport operator, ground handlers, air navigation service providers, security agencies, and regulatory bodies. These diverse stakeholders make JNIA an appropriate site for examining the role of collaboration in operational efficiency.

### Target Population

The target population comprised operational stakeholders working at JNIA, including airline personnel, ground handling staff, air traffic controllers, airport management personnel, security officers, and regulatory officials. These groups were selected because they are directly involved in planning, coordination, and execution of airport operations, and therefore possess relevant knowledge on collaborative processes and operational outcomes.

### Sample Size and Sampling Techniques

A total sample of 119 respondents was included in the study. Sample elements were selected using purposive and stratified sampling techniques. Purposive sampling enabled selection of stakeholders with

direct involvement in decision-making, planning, or operational coordination, while stratification ensured representation across stakeholder categories. This approach enhanced validity by capturing diverse perspectives on collaborative practices and efficiency at the airport.

### **Data Collection Methods**

Structured questionnaires were administered to respondents to capture their perceptions of joint planning, coordination, training, and operational efficiency. The questionnaire consisted of closed-ended items measured on a five-point Likert scale. This method allowed for systematic quantification of stakeholder attitudes and facilitated statistical analysis of relationships among study variables.

The questionnaire administered to the 119 respondents was structured according to the study objectives and research questions. The instrument specifically examined perceptions regarding joint planning, stakeholder coordination, stakeholder training, and operational efficiency at JNIA.

On the other hand, key informant interviews were conducted with senior operational staff, including airline managers, air traffic controllers, and airport operations officers. The interviews provided deeper insights into coordination mechanisms, planning challenges, and training practices at JNIA. Qualitative data helped contextualize quantitative findings and offered explanations for observed patterns.

### **Data Analysis**

Quantitative data were analyzed using descriptive statistics, including frequencies, percentages, means, and standard deviations. These statistics summarized respondent perceptions and highlighted dominant trends. Data were then synthesized to assess the extent to which joint planning, stakeholder coordination, and training contribute to operational efficiency.

Qualitative data were analyzed thematically, including transcription, coding, categorization, and interpretation of emerging themes. This approach enabled triangulation of quantitative findings and strengthened the validity of the conclusions.

### **Reliability and Validity**

To ensure reliability, the questionnaire was pre-tested with selected stakeholders to confirm clarity and consistency of items. Reliability coefficients (Cronbach's alpha) for key constructs exceeded the recommended 0.70 threshold, indicating acceptable internal consistency (Kline, 2016). Validity was enhanced through expert review of the instruments, alignment of questions with study objectives, and methodological triangulation involving both quantitative and qualitative data sources.

### **Ethical Considerations**

Ethical principles were observed throughout the study. Respondents were informed about the purpose of the research and gave verbal consent prior to participation. Anonymity and confidentiality were assured, and participants were allowed to withdraw from the study at any time. Access to JNIA was granted through official permission from airport authorities, ensuring adherence to institutional protocols.

## Results and Discussion

This section presents the findings related to Objective One: to examine the extent to which joint planning, coordination, and stakeholder training influence operational efficiency at Julius Nyerere International Airport (JNIA). The results are based on quantitative data from 119 respondents and complementary qualitative insights from key informant interviews.

### Quantitative Results

*Table 1: Influence of Joint Planning, Coordination and Training on Operational Efficiency*

| Variable                                              | Strongly Agree | Agree | Neutral | Disagree | Strongly Disagree | Mean | Std Dev |
|-------------------------------------------------------|----------------|-------|---------|----------|-------------------|------|---------|
| Joint planning influences operational efficiency      | 30%            | 50%   | 15%     | 2%       | 2%                | 4.23 | 0.89    |
| Collaboration is important for operational efficiency | 29%            | 65%   | 2%      | 2%       | 1%                | 4.34 | 0.65    |
| Training enhances A-CDM and operational efficiency    | 12%            | 63%   | 20%     | 3%       | 3%                | 4.12 | 0.62    |

#### *Joint Planning and Operational Efficiency*

Findings show that 80% of respondents (30% strongly agree; 50% agree) believe joint planning significantly enhances operational efficiency (Mean = 4.23; SD = 0.89). Only 4% disagreed. This suggests a strong consensus that coordinated planning among airport stakeholders is a key determinant of smooth operations at JNIA.

These results align with global evidence that joint planning improves operational predictability, reduces turnaround uncertainties, and enhances stakeholder alignment (Zhang & Zhao, 2017; Verhoeff et al., 2019). Respondents emphasized that improved collaborative planning reduces duplication of tasks, strengthens preparedness, and minimizes operational conflicts.

#### *Stakeholder Coordination and Operational Efficiency*

The highest level of agreement was recorded on coordination, with 94% of respondents (29% strongly agree; 65% agree) affirming that collaboration among stakeholders is essential for operational efficiency (Mean = 4.34; SD = 0.65). Only 3% disagreed.

This overwhelming consensus reinforces research showing that real-time coordination among airport actors improves decision-making quality, reduces delays, and enhances flow management (Eurocontrol, 2020; ICAO, 2021). The low standard deviation further indicates consistent responses across different stakeholder categories, suggesting coordination challenges and opportunities are widely experienced and recognized.

#### *Training and Operational Efficiency*

Regarding training, 75% of respondents (12% strongly agree; 63% agree) indicated that capacity-building enhances operational efficiency and supports Airport Collaborative Decision Making (A-CDM) implementation (Mean = 4.12; SD = 0.62). Only 6% disagreed.

This demonstrates that structured, frequent training is perceived as essential for improving staff competence, technological adaptation, and effective multi-stakeholder engagement. The findings reinforce international studies showing that training enhances operational readiness, situational awareness, and effective response to dynamic airport conditions (Johnson et al., 2018; Ritchie & Brindley, 2016).

## Qualitative Insights

### Joint Planning

Participants emphasized that joint planning ensures stakeholders work toward shared operational goals. One senior operations manager noted:

*“When all units sit together in planning meetings, we are able to anticipate challenges early. It reduces confusion and improves coordination on the day of operation.”*

This illustrates how collaborative planning mitigates fragmented task execution, consistent with Systems Theory’s emphasis on interconnected processes (Bertalanffy, 1968).

### Coordination

Coordination challenges were widely highlighted. An air traffic controller explained:

*“Sometimes decisions are made by one department without informing others. This affects flow management and leads to delays.”*

The statement aligns with empirical literature showing that communication breakdowns and siloed operations undermine airport efficiency, particularly in developing contexts (Alem, 2020; Lee et al., 2019). Respondents called for improved communication systems and structured coordination protocols.

### Training

Most interviewees stressed the need for continuous training, particularly on A-CDM, emerging technologies, and standard operating procedures. One key informant reported:

*“Training helps us understand new procedures and improve our response when situations change unexpectedly.”*

These perspectives affirm the role of training in strengthening decision-making, technology adoption, and cross-departmental cooperation (IATA, 2020).

## Discussion of Findings

The findings demonstrate a clear and consistent pattern: joint planning, coordination, and training significantly influence operational efficiency at JNIA.

The strong agreement across respondents reflects the interdependent nature of airport operations, validating Systems Theory’s assertion that system performance depends on the interaction of its components. Moreover, the positive perceptions align with Stakeholder Theory, which emphasizes shared responsibility, engagement, and cooperation in achieving organizational effectiveness (Freeman, 1984). The results are also consistent with global airport literature, where integration of collaborative decision-making

frameworks has been shown to reduce delays, streamline processes, and enhance predictability (Eurocontrol, 2021; ICAO, 2021). JNIA's context mirrors challenges identified in other emerging aviation markets, particularly regarding fragmented communication and inconsistent training. The findings affirm that operational efficiency at JNIA can be significantly enhanced by strengthening collaborative planning structures, improving stakeholder coordination, and institutionalizing comprehensive training programs.

## Conclusion

This study examined the extent to which joint planning, stakeholder coordination, and training influence operational efficiency at Julius Nyerere International Airport (JNIA). The findings demonstrate a strong consensus among respondents that collaborative practices play a central role in shaping the effectiveness of airport operations. Joint planning enhances predictability, reduces operational conflicts, and aligns stakeholder activities toward shared goals. Coordination emerged as the most influential factor, with respondents emphasizing its importance in synchronizing tasks, improving real-time decision-making, and reducing delays. Training was also shown to be essential in strengthening staff competence, improving the adoption of collaborative decision-making processes, and enhancing the ability of personnel to respond effectively to dynamic operational environments.

The results support Systems Theory and Stakeholder Theory, which highlight the interdependence of organizational actors and the need for shared responsibility in achieving operational outcomes. They also align with global empirical evidence demonstrating that collaborative frameworks such as Airport Collaborative Decision Making (A-CDM) significantly improve airport performance. Overall, the study concludes that enhanced joint planning, coordination, and structured stakeholder training are vital determinants of operational efficiency at JNIA.

## Recommendations

Based on the findings, the study makes the following recommendations:

- **Strengthen Joint Planning Frameworks:** Airport management should institutionalize regular multi-stakeholder planning sessions that bring together airlines, ground handlers, air traffic services, security agencies, and regulatory authorities. Such sessions should focus on shared operational goals, coordinated scheduling, and anticipatory planning to reduce uncertainties and improve resource utilization.
- **Enhance Coordination Mechanisms:** JNIA should adopt more integrated communication platforms that support real-time information sharing among stakeholders. Developing clear coordination protocols and establishing an operational coordination unit would reduce fragmentation, promote synchronized decision-making, and improve flow management during peak and irregular operations.
- **Institutionalize Continuous Training Programs:** Management should develop structured, periodic training programs focusing on A-CDM principles, technological tools, emergency response, and standard operating procedures. Continuous training will strengthen stakeholder competence, enhance operational consistency, and support the effective implementation of collaborative frameworks.

- Improve Technological Integration for A-CDM: Investment in digital tools that facilitate real-time data exchange such as automated flight information systems, collaborative planning dashboards, and incident reporting platforms would enhance situational awareness and decision-making accuracy across units.
- Strengthen Policy and Regulatory Support: The Tanzania Civil Aviation Authority (TCAA) and airport authorities should establish policies that mandate collaborative operational practices, information sharing, and minimum training requirements for personnel involved in key operational units.
- Promote Continuous Monitoring and Evaluation: Airport management should establish regular monitoring and evaluation mechanisms to assess the effectiveness of collaborative planning, coordination systems, and training programs. This would help identify operational gaps and support continuous improvement in airport efficiency.

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