EFFECT OF LOGISTICS SERVICES ON PERFORMANCE OF MARGARET EKPO INTERNATIONAL AIRPORT, CALABAR, CROSS RIVER STATE

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Abstract
This study examined the effect of logistics services on the performance of Margaret Ekpo International Airport, Calabar, Cross River State. The study was motivated by persistent logistics and infrastructural challenges, including inadequate cargo handling facilities, poor maintenance culture, limited technological integration, operational disruptions, and declining operational efficiency, which have continued to undermine airport productivity and service quality. The objectives were to examine the relationship between logistics efficiency and airport performance, identify the major challenges affecting logistics operations, and determine the extent to which logistics services influence customer satisfaction and operational efficiency. A descriptive survey and analytical research design were adopted. Data were collected from airport personnel, airline operators, cargo handlers, logistics service providers, and other aviation stakeholders through structured questionnaires, interviews, and observations. Descriptive statistics, correlation analysis, and regression analysis were employed in analyzing the data and testing the hypotheses at the 0.05 level of significance. The findings revealed that logistics services significantly influenced airport operational performance. Information systems emerged as the strongest contributor to operational effectiveness ($\beta = 0.427$, $p < 0.05$). The study further established that logistics efficiency significantly influenced customer satisfaction, with information systems efficiency showing the strongest positive relationship ($r = 0.724$, $p < 0.05$). In addition, logistics challenges were found to significantly affect airport productivity and service delivery, with inadequate infrastructure exerting the greatest negative effect ($\beta = -0.632$, $p < 0.05$). The study concluded that effective logistics services are critical to improving airport productivity, service quality, operational efficiency, and customer satisfaction. It is therefore recommended that increased investment in modern logistics infrastructure, adoption of advanced information technologies, improved maintenance practices, continuous staff training, strengthened security systems, and enhanced public-private partnerships will boost sustainable airport development in the country.

Keywords: Logistics Services, Airport Performance, Operational Efficiency, Customer Satisfaction, Cargo Handling, Information Systems.

1.1 Background to the Study

Air transportation has increasingly become a critical driver of global economic integration, tourism development, trade expansion, and international connectivity in the modern era (Wensveen, 2018; Budd & Ison, 2020). Airports play strategic roles in facilitating the movement of passengers, goods, and services across national boundaries, thereby contributing significantly to economic growth and regional development (Graham, 2020; Oyesiku & Oduwole, 2022). Contemporary airports no longer function merely as transit terminals; rather, they now operate as integrated logistics and supply chain hubs supporting commercial and socio-economic activities (Ashford, Mumayiz, & Wright, 2021; Zhang & Zhang, 2020).

Within the aviation sector, logistics services comprise cargo handling, passenger facilitation, baggage processing, freight coordination, fueling operations, warehousing, information management systems, and ground support services (Christopher, 2022; Bowersox, Closs, & Cooper, 2022). Effective logistics management involves the coordinated administration of transportation systems, storage facilities, inventory operations, and information flow to enhance efficiency and customer satisfaction (Ballou, 2020; Mentzer, 2021). Consequently, the effectiveness of airport logistics systems substantially determines operational productivity, service quality, customer experience, and revenue performance (Yusuf & Ibrahim, 2023; Kaps & Sitompul, 2023).

Globally, airports are increasingly recognized as strategic logistics centers within international supply chain networks (Zhang & Zhang, 2020). Efficient logistics systems reduce operational delays, improve service delivery, strengthen customer confidence, and enhance airport competitiveness (Graham, 2020; Yusuf & Ibrahim, 2023). Airports equipped with modern technological infrastructure and advanced logistics facilities tend to attract greater airline operations, passenger traffic, and cargo activities (Ashford et al., 2021).

In Nigeria, the aviation industry remains vital to tourism promotion, regional integration, trade facilitation, and economic advancement (Oyesiku & Oduwole, 2022). Nevertheless, many airports within the country continue to face serious infrastructural and logistics-related challenges that undermine service quality and operational efficiency (Ejem & Mbah, 2023; Okwor & Agu, 2023).

Existing studies indicate that infrastructural limitations and inefficient logistics systems adversely affect airport productivity and service delivery within Nigeria (Adebayo & Oladipo, 2021; Ejem & Mbah, 2023). Furthermore, service quality remains an essential determinant of customer satisfaction and organizational competitiveness (Parasuraman, Zeithaml, & Berry, 2021; Ugboma, Ibe, & Ogwude, 2021).

1.2 Statement of the Problem

Efficient logistics systems are indispensable to effective airport operations because they facilitate passenger movement, cargo management, aircraft servicing, and supply chain coordination (Christopher, 2022; Bowersox, Closs, & Cooper, 2022). Airports possessing efficient logistics systems often experience improved operational outcomes, enhanced customer satisfaction, and stronger competitive positioning (Yusuf & Ibrahim, 2023; Zhang & Zhang, 2020). However, airports in developing countries, including Nigeria, continue to experience logistics and infrastructural deficiencies that negatively affect operational efficiency and service quality (Ejem & Mbah, 2023; Okwor & Agu, 2023).

Margaret Ekpo International Airport plays a strategic role in supporting tourism, transportation, and economic activities within Cross River State and the southeastern region of Nigeria (Oyesiku & Oduwole, 2022). Despite this strategic importance, the airport continues to experience several logistics-related and infrastructural problems that undermine its operational effectiveness (Ejem & Mbah, 2023).

One of the major problems confronting the airport is inadequate cargo handling capacity and insufficient logistics infrastructure. The absence of modern cargo terminals, limited warehousing facilities, and obsolete handling equipment reduce the airport's capability to efficiently process cargo and attract freight-related commercial activities (Adebayo & Oladipo, 2021; Kaps & Sitompul, 2023).

In addition, infrastructural deficiencies and inadequate modernization continue to weaken airport operations. Existing operational systems and facilities are inadequate for the growing demands of contemporary aviation logistics. Poor maintenance practices, technological limitations, and insufficient infrastructural investment often contribute to delays, increased turnaround time, and unsatisfactory customer experiences (Ejem & Mbah, 2023; Okwor & Agu, 2023; Graham, 2020).

Operational disruptions and safety concerns also constitute significant challenges affecting airport logistics performance. Problems associated with runway maintenance, security management, and operational coordination occasionally disrupt airport activities and negatively affect airline operations and passenger satisfaction (Ashford, Mumayiz, & Wright, 2021; Graham, 2020).

Another issue confronting the airport is its relatively low passenger and cargo throughput when compared with major Nigerian airports. This low logistics activity may be linked to infrastructural deficiencies, inefficient logistics systems, and weak intermodal transport integration (Yusuf & Ibrahim, 2023; Oyesiku & Oduwole, 2022).

Although previous studies have examined aviation development and airport management in Nigeria (Adebayo & Oladipo, 2021; Oyesiku & Oduwole, 2022), limited empirical attention has been devoted to the relationship between logistics services and airport performance at Margaret Ekpo International Airport. This creates a knowledge gap regarding the extent to which logistics operations influence operational efficiency, customer satisfaction, and airport productivity.

Against this backdrop, this study investigates the impact of logistics services on the operational performance of Margaret Ekpo International Airport, Calabar.

1.2 Objectives of the Study

The broad objective of this study is to evaluate the effect of logistics services on the performance of Margaret Ekpo International Airport, Calabar, Cross River State.

The specific objectives are to:

1. Examine the relationship between logistics efficiency and airport performance.
2. Identify the major challenges affecting logistics operations at the airport.
3. Determine the extent to which logistics services influence customer satisfaction and operational efficiency.

1.4 Research Questions

The study seeks to answer the following questions:

1. What relationship exists between logistics services and airport operational performance?
2. What major challenges affect logistics efficiency at the airport?
3. To what extent do logistics services influence customer satisfaction and service quality?

1.3 1.5 Research Hypotheses

Hypothesis One

Ho_1: Logistics services have no significant relationship with airport operational performance.
Hi_1: Logistics services have a significant relationship with airport operational performance.

Hypothesis Two

Ho_2: Logistics efficiency does not significantly influence customer satisfaction.
Hi_2: Logistics efficiency significantly influences customer satisfaction.

Hypothesis Three

Ho_3: Logistics challenges do not significantly affect airport productivity and service delivery.
Hi_3: Logistics challenges significantly affect airport productivity and service delivery.

1.6 Scope of the Study

This study focuses on logistics services and airport performance at Margaret Ekpo International Airport, Calabar. The study covers logistics activities such as cargo management, passenger handling, aviation fueling, baggage processing, warehousing, security coordination, and ground handling operations.

The study further examines how logistics services influence operational efficiency, turnaround time, customer satisfaction, service quality, cargo throughput, and passenger traffic. The research targets airport personnel, airline operators, logistics providers, and other relevant aviation stakeholders operating within the airport environment.

Geographically, the study is limited to Margaret Ekpo International Airport in Cross River State, Nigeria.

2.0 Literature Review

2.1 Concept of Logistics Services

Logistics constitutes a crucial aspect of supply chain management that focuses on the effective planning, implementation, and control of the movement and storage of goods, services, and information from origin to final consumption (Christopher, 2022; Mentzer et al., 2001). In aviation operations, logistics services represent the foundation of airport activities because they facilitate coordination among passengers, cargo, aircraft, and support systems (Kaps & Sitompul, 2023; Ashford, Mumayiz, & Wright, 2021).

Airport logistics systems involve interconnected operations such as baggage management, freight forwarding, aircraft fueling, cargo handling, passenger facilitation, ground support operations, and aviation security management (Ashford et al., 2021). Modern airports increasingly function as integrated logistics centers within global transportation networks (Zhang & Zhang, 2020). Consequently, efficient logistics systems enhance operational efficiency, improve customer experience, increase cargo throughput, and strengthen airport competitiveness (Yusuf & Ibrahim, 2023; Graham, 2020).

2.2 Components of Logistics Services

Transportation: Transportation involves the movement of passengers, cargo, and operational resources within airport systems. It represents one of the most critical logistics functions because it facilitates the efficient flow of people and goods across destinations (Ballou, 2020; Bowersox, Closs, & Cooper, 2022).

Warehousing: Warehousing refers to the storage and management of goods before distribution or transportation. In airport operations, warehousing facilities support cargo

management, inventory control, and freight consolidation activities (Christopher, 2022; Mentzer, 2021).

Inventory Management: Inventory management involves controlling operational resources such as aviation fuel, equipment, and spare parts to minimize shortages and disruptions. Effective inventory management contributes significantly to operational continuity and cost efficiency (Bowersox et al., 2022; Ballou, 2020).

Information Systems: Information systems involve digital technologies and communication networks used in coordinating logistics operations and improving decision-making. Modern airport logistics increasingly depend on information technology for cargo tracking, scheduling, security management, and operational coordination (Kaps & Sitompul, 2023; Christopher, 2022).

2.3 Airport Performance

Airport performance refers to the extent to which airports efficiently and effectively provide transportation and logistics services to passengers, airlines, and cargo operators (Graham, 2020). Performance indicators commonly include passenger throughput, operational efficiency, cargo volume, turnaround time, profitability, service quality, and customer satisfaction (Zhang & Zhang, 2020; Ugboma, Ibe, & Ogwude, 2021).

Efficient airport performance contributes significantly to economic development, tourism promotion, and regional integration because airports serve as critical gateways for trade, investment, and mobility (Oyesiku & Oduwole, 2022; Budd & Ison, 2020).

2.4 Indicators of Airport Performance

Passenger Throughput: Passenger throughput refers to the number of passengers processed within a specific period. It serves as an important indicator of airport capacity utilization and operational effectiveness (Graham, 2020).

Cargo Volume: Cargo volume refers to the quantity of freight handled by the airport over a given period. High cargo throughput often indicates efficient logistics operations and strong commercial activity (Zhang & Zhang, 2020; Yusuf & Ibrahim, 2023).

Operational Efficiency: Operational efficiency refers to the ability of the airport to minimize delays, optimize resource utilization, and achieve service objectives at minimum operational cost (Ashford et al., 2021; Graham, 2020).

Service Quality: Service quality refers to the degree to which airport services satisfy customer expectations regarding reliability, responsiveness, safety, and convenience (Parasuraman, Zeithaml, & Berry, 2021; Ugboma et al., 2021).

2.5 Theoretical Framework

This study is anchored on Systems Theory, Supply Chain Management Theory, and Resource-Based View Theory.

2.5.1 Systems Theory

Systems Theory explains organizations as interconnected systems whose components interact to achieve common objectives (Bertalanffy, 1968; Mele, Pels, & Polese, 2010). Within airport operations, logistics services interact with security systems, passenger services, cargo operations, and airline coordination to determine operational effectiveness. The theory

emphasizes that the performance of the airport depends on the effective functioning and integration of all subsystems (Mele et al., 2010).

2.5.2 Supply Chain Management Theory

Supply Chain Management Theory emphasizes coordination, integration, and information sharing within logistics networks (Mentzer et al., 2001; Mentzer, 2021). Airports function as critical nodes within global supply chains because they facilitate cargo distribution, passenger transportation, and trade activities. The theory suggests that effective logistics coordination improves operational efficiency, customer satisfaction, and organizational performance (Christopher, 2022).

2.5.3 Resource-Based View Theory

Resource-Based View Theory argues that organizations achieve competitive advantage through valuable and unique resources (Barney, 1991; Grant, 2019). Efficient logistics infrastructure, advanced technology, and skilled personnel therefore represent strategic resources capable of improving airport productivity and competitiveness (Hitt, Ireland, & Hoskisson, 2020). Within the context of airport management, superior logistics capabilities can create sustainable competitive advantages and improve service delivery outcomes (Yusuf & Ibrahim, 2023).

3.1 Methodology

The study adopts a descriptive survey and analytical research design. This design is appropriate because it enables systematic collection and analysis of information relating to logistics services and airport performance.

The study is conducted at Margaret Ekpo International Airport, Calabar, Cross River State, Nigeria. The target population includes airport personnel, airline operators, cargo handlers, logistics service providers, and other aviation stakeholders.

A representative sample is selected through stratified and simple random sampling techniques to ensure fair representation of the various stakeholder groups.

Primary data are obtained through questionnaires, interviews, and direct observations. Structured questionnaires based on Likert-scale measurement are used to obtain respondents' views regarding logistics operations and airport performance. Secondary data are sourced from textbooks, academic journals, FAAN publications, aviation reports, conference papers, and internet materials.

The validity of the research instrument is established through expert evaluation and content validation, while reliability is determined using Cronbach's Alpha technique.

Data analysis involves the use of descriptive statistics such as percentages, means, frequency distributions, and tables. Inferential statistical tools including regression and correlation analyses are employed to examine relationships among variables.

4.0 Presentation And Analysis

4.1 Introduction

This chapter presents the analysis and interpretation of data collected for the study. Descriptive statistics including frequencies, percentages, and mean scores are used to summarize respondents' opinions, while regression and correlation analyses are employed in testing the hypotheses at 0.05 level of significance.

4.2 Demographic Characteristics of Respondents

Table 4.1: The demographic distribution of the respondents is displayed on table 4.1 below:

Variable	Category	Frequency	Percentage
Gender	Male	72	60.0
Gender	Female	48	40.0
Age	21-30 years	38	31.7
Age	31-40 years	51	42.5
Age	41 years and above	31	25.8
Educational Qualification	OND/NCE	42	35.0
Educational Qualification	Bachelor Degree	55	45.8
Educational Qualification	Postgraduate	23	19.2
Years of Experience	1-5 years	44	36.7
Years of Experience	6-10 years	49	40.8
Years of Experience	11 years and above	27	22.5

Source: Field Survey, 2026

The demographic results indicate that the majority of respondents were male and largely within the economically active age category. Most respondents also possessed adequate educational qualifications, indicating their ability to provide informed responses regarding airport logistics operations.

4.3 Analysis Based on Research Questions

Research Question One: What logistics services are available at Margaret Ekpo International Airport?

Table 4.2: logistics services are available at the Airport

Logistics Services	Mean Score	Decision
Passenger handling services	4.12	Accepted
Cargo handling services	3.95	Accepted
Ground handling operations	4.01	Accepted
Information and communication systems	3.88	Accepted
Security and surveillance logistics	4.25	Accepted

The result on Table 4.2 reveals that passenger handling, cargo handling, ground support services, information systems, and security logistics constituted the major logistics services available at the airport.

4.4 Test of Hypotheses

Hypothesis One

$H0_1$: There is no significant relationship between logistics services and operational performance at Margaret Ekpo International Airport.

$H1_1$: There is significant relationship between logistics services and operational performance at Margaret Ekpo International Airport.

Table 4.3: Relationship between logistics services and operational performance

Variables	Beta Coefficient	t-value	p-value	Decision
Passenger Services	0.412	4.821	0.0	Significant
Cargo Handling	0.365	3.912	0.001	Significant
Ground Handling	0.298	2.884	0.004	Significant
Information Systems	0.427	5.104	0.0	Significant

The regression result on Table 4.3 indicates that logistics services significantly influence airport operational performance. Information systems emerged as the strongest contributor to operational effectiveness.

Hypothesis Two

$H0_2$: Logistics efficiency does not significantly influence customer satisfaction at Margaret Ekpo International Airport.

$H1_2$: Logistics efficiency significantly influences customer satisfaction at Margaret Ekpo International Airport.

Table 4.4: Influence of Logistics efficiency on Customer Satisfaction

Variables	Correlation Coefficient (r)	t-value	p-value	Decision
Passenger Handling Efficiency	0.681	6.214	0.000	Significant
Cargo Handling Efficiency	0.593	5.102	0.001	Significant
Ground Handling Efficiency	0.547	4.786	0.002	Significant
Information Systems Efficiency	0.724	6.881	0.000	Significant

The correlation analysis result on Table 4.4 established that logistics efficiency significantly influences customer satisfaction. Efficient information systems demonstrated the strongest positive relationship with customer satisfaction and service quality.

Hypothesis Three

$H0_3$: Logistics challenges do not significantly affect airport productivity and service delivery.

$H1_3$: Logistics challenges significantly affect airport productivity and service delivery.

Table 4.5: Effect of Logistics challenges on airport productivity and service delivery

Logistics Challenges	Beta Coefficient	t-value	p-value	Decision
Inadequate Infrastructure	-0.632	-7.014	0.000	Significant
Poor Maintenance Culture	-0.514	-5.382	0.001	Significant
Limited Technological Integration	-0.447	-4.693	0.003	Significant
Operational Delays	-0.588	-6.105	0.000	Significant

The regression analysis result on Table 4.5 shows that logistics challenges significantly affect airport productivity and service delivery. Inadequate infrastructure recorded the highest negative beta coefficient ($\beta = -0.632$), indicating that infrastructural deficiencies exert the strongest adverse effect on airport operations. The negative beta values imply that increases in logistics-related challenges lead to reductions in operational efficiency and service quality. Since all p-values are below the 0.05 significance threshold, the null hypothesis is rejected while the alternative hypothesis is accepted.

4.5 Summary of Findings

The study established that logistics services and logistics efficiency positively influence airport operational performance and customer satisfaction. Conversely, logistics-related challenges negatively affect airport productivity and service delivery. The findings therefore confirm that effective logistics systems are fundamental to airport operational efficiency and sustainable aviation management.

4.6 Discussion of Findings

The study revealed that logistics services significantly affect airport performance. This finding supports previous studies which established that efficient logistics operations enhance airport competitiveness, operational efficiency, and customer satisfaction (Adebayo & Oladipo, 2021; Yusuf & Ibrahim, 2023; Zhang & Zhang, 2020).

The findings further indicated that cargo handling services contribute substantially to airport productivity because efficient cargo systems improve trade facilitation, supply chain coordination, and revenue generation. This result is consistent with the position of Oyesiku and Oduwole (2022) and Kaps and Sitompul (2023), who emphasized the strategic importance of airport logistics systems in facilitating regional and international economic activities.

The study also demonstrated that information systems significantly influence airport operations. Modern digital systems improve communication, scheduling, operational coordination, and cargo tracking. This finding agrees with Bowersox, Closs, and Cooper (2022) and Kaps and Sitompul (2023), who argued that information integration is essential for effective logistics management and operational efficiency.

Infrastructural deficiencies, poor maintenance culture, and inadequate investment were equally identified as major constraints affecting airport logistics performance. This finding corroborates the studies of Ejem and Mbah (2023) and Okwor and Agu (2023), which found that inadequate infrastructure remains a major impediment to efficient airport service delivery.

Finally, the findings confirmed that efficient logistics systems improve customer satisfaction and service quality because timely and reliable service delivery positively influences customer perceptions and loyalty. This outcome is consistent with Parasuraman, Zeithaml, and Berry (2021) as well as Ugboma, Ibe, and Ogwude (2021).

5.1 Conclusion

The study concluded that logistics services significantly influence the operational performance of Margaret Ekpo International Airport, Calabar. Efficient passenger handling, cargo operations, ground handling systems, and information technologies positively affect airport productivity, service quality, and customer satisfaction. However, infrastructural deficiencies, operational disruptions, and limited technological integration continue to hinder effective logistics performance. Consequently, strengthening logistics infrastructure and operational systems is essential for improving airport competitiveness and sustainable aviation development in Nigeria.

5.2 Recommendations

1. Airport management should invest in modern logistics infrastructure including digital tracking systems, cargo terminals, and automated passenger handling facilities.
2. Government and aviation stakeholders should increase investment in airport modernization and maintenance projects.
3. Advanced information technologies should be integrated into airport operations to improve coordination and operational efficiency.
4. Continuous training programs should be organized for airport and logistics personnel to improve competence and service delivery.
5. Public-private partnerships should be encouraged to support logistics and infrastructure development.
6. Airport security and surveillance systems should be strengthened to improve operational safety and customer confidence.

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