British Journal of Environmental Sciences 14(3),17-38, 2026

Print ISSN : 2055-0219 (Print)

Online ISSN: 2055-0227(online)

Website: https://www.eajournals.org/

Publication of the European Centre for Research Training and Development UK

Evaluate challenges affecting efficient facilities management services at Sam Mbakwe International Cargo Airport Ngor Okpala , Imo State and Chinua Achebe International Cargo Airport, Umueri, Anambra State

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doi: https://doi.org/10.37745/bjes.2013/vol14n31738 Published June 13, 2026

Citation: Nedolisa J.I. (2026) Evaluate challenges affecting efficient facilities management services at Sam Mbakwe International Cargo Airport Ngor Okpala , Imo State and Chinua Achebe International Cargo Airport, Umueri, Anambra State, *British Journal of Environmental Sciences* 14(3),17-38

Abstract: *This study evaluates the challenges affecting efficient Facilities Management (FM) services at Sam Mbakwe International Cargo Airport and Chinua Achebe International Cargo Airport. Airports are critical infrastructures that require effective facilities management to ensure operational efficiency, passenger comfort, safety, sustainability, and compliance with international aviation standards. However, many Nigerian airports face persistent operational and infrastructural challenges that hinder effective service delivery. The study examines the major constraints affecting FM practices in the selected airports, including inadequate maintenance culture, insufficient funding, obsolete equipment, poor safety systems, weak technological integration, manpower shortages, insecurity, and poor infrastructure development. Evidence from the airports indicates concerns relating to maintenance deficiencies, firefighting inadequacies, weak operational coordination, security breaches, and limited cargo-support facilities. The study adopts a comparative research approach using both primary and secondary data sources. Data are obtained through questionnaires, interviews, direct observations, and review of aviation reports and policy documents. Findings reveal that while both airports possess strategic economic importance and modern aviation potential, effective FM service delivery is constrained by inadequate operational funding, insufficient maintenance planning, limited staff training, poor safety compliance, and inconsistent government intervention. The study further reveals that these deficiencies negatively affect passenger satisfaction, cargo operations, safety performance, and overall airport efficiency. The research concludes that improving facilities management practices through sustainable maintenance strategies, technological modernization, staff capacity development, enhanced security systems, and increased investment in infrastructure will significantly improve operational efficiency at the airports. The study recommends stronger regulatory compliance, adoption of computerized maintenance management systems, improved emergency preparedness, and public-private partnerships to strengthen airport facilities management in Nigeria.*

Keywords: facilities management, airport infrastructure, operational efficiency, maintenance management, aviation facilities, cargo airports, airport safety, infrastructure challenges, Sam Mbakwe international cargo airport, Chinua Achebe international cargo airport, Nigeria.

British Journal of Environmental Sciences 14(3),17-38, 2026

Print ISSN : 2055-0219 (Print)

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Publication of the European Centre for Research Training and Development UK

INTRODUCTION

Facilities Management (FM) has become an essential component in the effective operation and sustainability of airport infrastructure globally. Airports serve as critical transportation hubs that facilitate economic growth, trade, tourism, and regional integration. Efficient facilities management services ensure the functionality, safety, maintenance, and operational reliability of airport facilities such as terminal buildings, cargo handling systems, electrical installations, water supply systems, security infrastructure, waste management systems, and airside operational facilities. According to the International Facility Management Association (IFMA), facilities management integrates people, place, process, and technology to improve operational efficiency and organizational productivity (IFMA, 2022).

In the aviation sector, effective facilities management is directly linked to passenger satisfaction, operational safety, environmental sustainability, and compliance with International Civil Aviation Organization (ICAO) standards. The International Civil Aviation Organization emphasizes that airport infrastructure and maintenance systems must consistently meet operational, environmental, and safety requirements to guarantee efficient airport performance (ICAO, 2021). However, many airports in developing countries, particularly in Nigeria, continue to experience deficiencies in facilities management due to inadequate maintenance culture, insufficient funding, obsolete infrastructure, poor institutional coordination, and shortage of technical personnel.

In Nigeria, airport infrastructure has witnessed increasing pressure resulting from rising passenger traffic, cargo operations, urbanization, and economic activities. Despite government investments in airport modernization, several airports still face operational inefficiencies associated with poor maintenance practices and ineffective facilities management systems. Studies have shown that inadequate maintenance planning and poor infrastructure management negatively affect airport performance, safety standards, and service delivery (Adebayo and Anumba, 2019; Olagunju, 2020).

Sam Mbakwe International Cargo Airport and Chinua Achebe International Cargo Airport were established to enhance regional economic development, facilitate cargo transportation, and improve connectivity within southeastern Nigeria. Despite their strategic importance, the airports are confronted with numerous facilities management challenges including deteriorating infrastructure, inconsistent power supply, inadequate maintenance funding, inefficient waste management systems, shortage of skilled maintenance personnel, poor monitoring mechanisms, and weak compliance with international operational standards. These challenges have continued to affect operational efficiency, service quality, user satisfaction, and long-term sustainability of airport facilities.

Furthermore, ineffective facilities management practices within Nigerian airports have contributed to increased operational costs, delays in maintenance response, equipment failures, environmental concerns, and safety risks. The situation is compounded by limited adoption of modern maintenance technologies and absence of comprehensive preventive maintenance strategies. Scholars have argued that sustainable airport operations require proactive maintenance policies, continuous facility assessment, and integration of modern FM technologies to enhance infrastructure performance and operational efficiency (Lateef, 2018; Adeniyi and Akinyemi, 2021).

Although several studies have examined airport operations and infrastructure development in Nigeria, limited empirical research has comparatively assessed the specific challenges affecting efficient facilities management services at Sam Mbakwe International Cargo Airport and Chinua Achebe International Cargo Airport. This study therefore seeks to evaluate the major challenges affecting facilities management services at the two airports with a view to improving operational efficiency, safety compliance, and sustainable airport infrastructure management.

LITERATURE REVIEW

Airports Service Quality

Airport Service Quality (ASQ) refers to the extent to which airport facilities and services meet or exceed the expectations of passengers, airlines, cargo operators, and other airport users. It encompasses the quality of services provided throughout the passenger journey, including check-in, security screening, baggage handling, terminal facilities, information services, transportation access, cleanliness, safety, and staff responsiveness. High airport service quality enhances passenger satisfaction, airport competitiveness, operational efficiency, and customer loyalty. Airport service quality as a multidimensional construct that evaluates both tangible and intangible aspects of airport operations. The concept is commonly measured using the SERVQUAL model developed by Parasuraman, Zeithaml, and Berry (1988), which includes five dimensions: reliability, responsiveness, assurance, empathy, and tangibles. However, airport-specific studies have expanded these dimensions to include terminal comfort, security processes, accessibility, information availability, baggage services, and airport ambience.

Dimensions of Airport Service Quality

According to the systematic review conducted by Usman (2021), airports service quality is commonly evaluated through the following dimensions:
Reliability – Ability of airport services to perform accurately and dependably.
Responsiveness – Prompt assistance and willingness of airport staff to help passengers.
Assurance – Knowledge, courtesy, and competence of airport personnel.
Empathy – Personalized attention given to passengers.

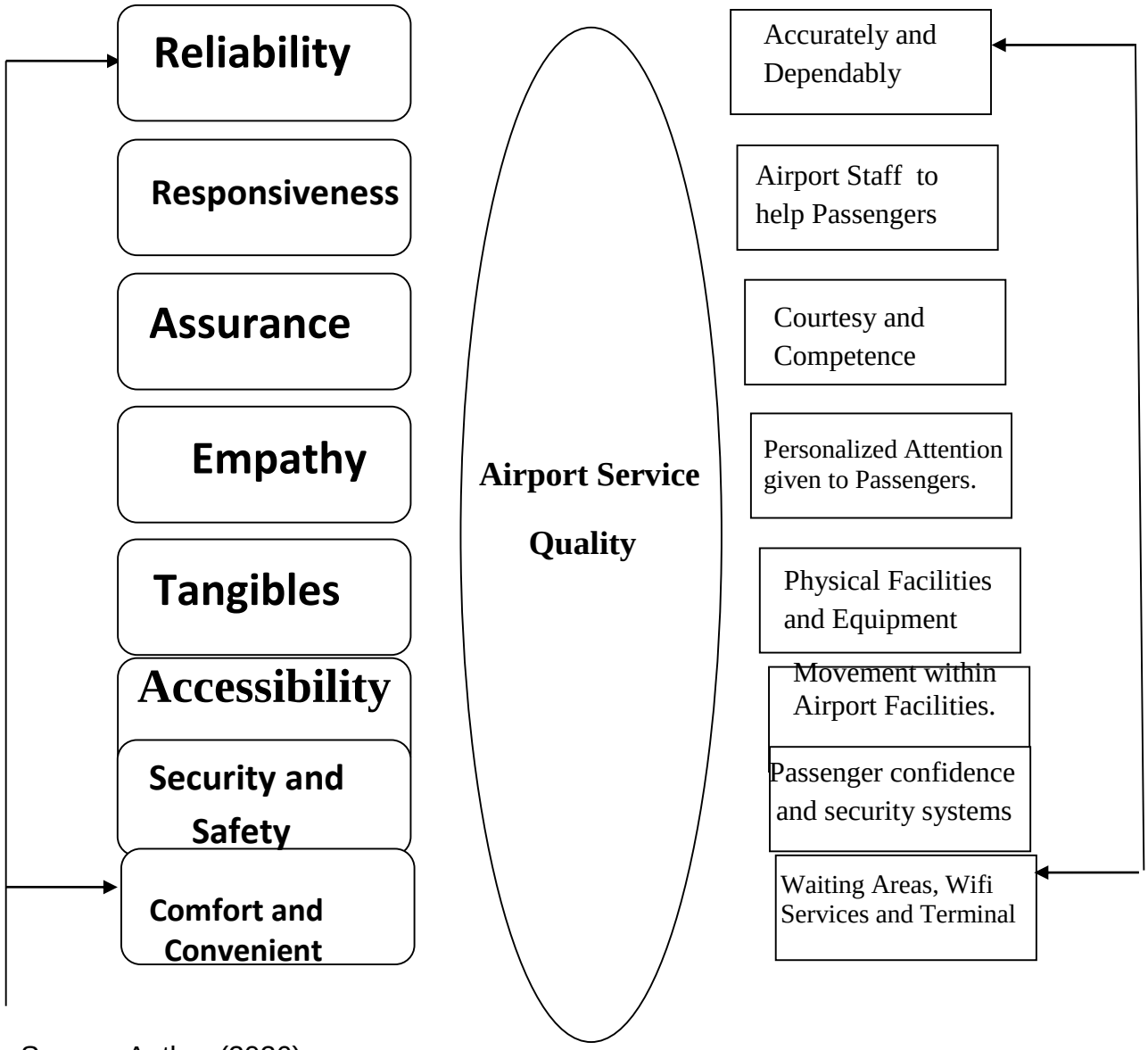
Print ISSN : 2055-0219 (Print)

Online ISSN: 2055-0227(online)

Website: https://www.eajournals.org/

Publication of the European Centre for Research Training and Development UK

Tangibles – Physical facilities, equipment, signage, and terminal appearance.
Accessibility – Ease of movement within airport facilities.
Security and Safety – Passenger confidence in airport security systems.
Comfort and Convenience – Waiting areas, Wi-Fi, retail services, and terminal environment.



Source: Author (2026)

Bogicevic (2015) examined the effects of airport service quality dimensions on passenger satisfaction in a Brazilian international airport. Using factor analysis and regression techniques, the study identified several dimensions of airport service quality and found that airport ambience, terminal comfort, and waiting time significantly influenced overall passenger satisfaction. The study concluded that passenger perceptions of service quality directly affect airport evaluations and future travel intentions.

Kim (2020) investigated differences in service quality perceptions between airport service providers and passengers. The study revealed that passengers placed greater importance on convenience, interaction quality, and service outcomes, whereas airport managers emphasized physical facilities and environmental quality. The findings suggest that airports should align management priorities with passenger expectations to improve satisfaction levels. Oliveira (2024) explored the relationship between airport service quality and flight delays. The researchers found that flight delays negatively affect passenger perceptions of airport quality. However, efficient Wi-Fi services, food concessions, and customer-oriented facilities moderated dissatisfaction caused by delays. The study emphasized the importance of maintaining quality support services during operational disruptions.

Adeniran and Adekunle (2016) investigated the relationship between airport service quality and customer satisfaction across major Nigerian international airports, including Lagos, Abuja, Kano, and Port Harcourt. Using data from 600 passengers, the study found significant relationships between service quality dimensions and passenger satisfaction. However, the relationship was only weak to moderate, indicating deficiencies in service delivery and the need for substantial improvement in Nigerian airport operations.

Chinonso and Ejem (2022) assessed airport service quality at Nnamdi Azikiwe International Airport and Murtala Muhammed International Airport using the SERVQUAL model. The findings showed that service quality levels in both airports fell below passenger and airline expectations. The study further revealed that Lagos airport performed relatively better than Abuja airport, although significant service quality gaps remained in both facilities. Ben (2019) conducted a factor analysis of passenger satisfaction in Nigerian airports and identified five critical determinants of satisfaction: staff courtesy, staff availability, effective way finding signs, telecommunication facilities, and cleanliness of restrooms. The study recommended continuous improvement in customer service and infrastructure maintenance to enhance passenger experiences.

Ejem and Chinonso (2022) analyzed major determinants of airport service quality in Nigeria using the SERVQUAL framework. Their findings indicated that responsiveness, reliability, assurance, empathy, and tangibles significantly influence passenger assessments of airport services. Among

these factors, responsiveness and reliability emerged as the strongest predictors of overall service quality perceptions.

Airports service quality can be perceived as an evaluation of how efficiently a service delivered measures up to the expectations of consumers. Hence, for the purpose of this study, airport service quality can be referred to an expectation of customers about the service to be offered while customers' satisfaction is being referred to as perception of customers about services offered. Fitzsimmons and Fitzsimmons opined that if customers' perceptions exceed their expectations, then there is service quality delivery and vice versa. Also, passengers compare the perceived service with the expected services.

Understanding the Measurement of Passengers' Satisfaction with Service Quality

Measuring the level of satisfaction and quality of service is quite difficult because of its definition, judgment, and the process of its measurement. Many studies have contributed immensely to the understanding and measurement of customers' satisfaction and service quality [However, the service quality model (SERVQUAL) developed by Parasuraman (2022) has been consistently used by marketing practitioners. The model is based on measuring the perception gap which is between the perceived service quality and the expected service quality. Some researchers have rejected the SERVQUAL model as it is seen as being based on perception. The rejection of SERVQUAL measurement tool results to the proposition and adoption of RECSA model which acronym was carved from reliability, the extent of service, comfort, safety and affordability as proposed by McKnight . Apart from RECSA model, Service Performance (SERVPERF) was also proposed as a result of deficiencies in SERVQUAL and RECSA models; SERVPERF has been argued to be more appropriate for the measurement of effective service quality.

It is important to note that the service quality measurements are designed in a way that soothes the researcher, the measurement can also be modified without much criticism.
SERVQUAL measurement tool because it is based on perceived scores and expected scores (gap scores) that enhances the measurement of satisfaction level in any organization including the airport.

Service Quality (SERVQUAL) Model

SERVQUAL model is also referred to as Gap model. It is used to examine the level of satisfaction with the quality of service. As the name implies, gap means difference, hence the difference between perceived service and expected service. The model was developed by Parasuraman (2023) and has been consistently used by marketing practitioners. It has been applied in different countries such as United States, India Nigeria China and Ghana . With respect to the performance of public transport, researchers have used SERVQUAL model. Among are airline and airport retail banking. The model was also adopted in this study. According to Fadare and Adeniran, gap

model is the assumption that when the Expected Service (ES) is greater than the Perceived Service (PS), quality will be perceived as being less and less than satisfactory, the greater the difference between ES and PS is, when Expected Service is equal to Perceived Service, the quality is satisfactory, and when Expected Service is lesser than Perceived Service, quality will be more and more satisfactory as the difference between Perceived Service and Expected Service grows. Originally, this model has ten (10) determinants of service quality comparing the customers' expectations and perception of services as a gap . The determinants are; tangibles; reliability; responsiveness; competence; access; courtesy; communication; credibility; security; and understanding. According to Ravichandran and Budiono , these 10 dimensions were further regrouped in the well-known five (5) dimensions which are tangibles; reliability; responsiveness; assurance; and empathy. In summary, passengers' expectation is what the passenger expects which is in-line with the available airport services, and it is influenced by cultural background, family lifestyle, personality, demographics, and experience with similar products, online information, and other information about the firm or product. This was likened to airport service quality. Also, passenger perception is totally subjective and is based on the passenger's interaction with the product or service. This was likened to passengers' satisfaction.

Benchmarking Airport Operational Performance and Blending Airport Services into Gap model

SKYTRAX uses a ranking system for its passengers' satisfaction surveys based on the following thirty-nine (39) product and service factors or indicators. All these indicators were adopted in this research. The entire thirty-nine (39) airport service indicators were blended into the five SERVQUAL attributes as shown in Fadare and Adeniran . The five attributes are summarized as: Tangibles: These are the physical facilities and equipment available in the airport, the appearance of airport staff; how easy it is to understand communication materials. Reliability: This is the ability of the airport to perform the promised airport service dependably and accurately. Responsiveness: This is the willingness of the airport employees to help airport passengers and providing a prompt service. Assurance: This is the ability of airport employees to convey trust and confidence in the passengers, such as; competence to perform the service, politeness, and respect for the passengers. Empathy: This is the act by which the airport provides caring, individualized attention provided to airport customers.

Passengers' Satisfaction

Customers' (passengers') satisfaction is derived largely from the quality of organizational products and services. In marketing, passengers' satisfaction is a measure of how products and services supplied by a company meet or surpass customers' expectation. In this connection, Kotler (2020) states categorically that passengers' satisfaction is the best indicator of a company's future profits. Groonos (2015) posit that customers' (passengers') satisfaction is an overall customer attitude towards a service provider, or an emotional reaction to the difference between what customers

anticipate and what they receive, regarding the fulfillment of some needs, goals or desire, and it is the basis upon which favorable and unfavorable perceptions are formed about firms' offerings. Angelova and Zekiri (2018) points out that passengers' satisfaction is conceptualized as a cumulative construct that is affected by service expectations and performance perceptions in any given period and is affected by past satisfaction from period to period. They further state that satisfied customers form the foundation of any successful business because customer satisfaction leads to repeat purchase, brand loyalty and positive word of mouth; hence for the success of every business, there is, therefore, need to invest in developing and implementing programs that aim at bringing satisfaction to the customers. It has been established by various scholars that one major factor which influences customers' satisfaction is the quality of service, which is also called service quality.

Operational Efficiency in Airport Management

Operational efficiency in airport management refers to the ability of an airport to utilize its available resources such as infrastructure, personnel, technology, equipment, and finances to provide safe, reliable, and high-quality services while minimizing operational costs, delays, and waste. It focuses on how effectively airport operations are conducted to achieve maximum output with minimum input while maintaining passenger satisfaction, safety standards, and regulatory compliance.

Airports function as complex systems involving passenger processing, baggage handling, cargo operations, aircraft movement, security screening, terminal management, and facilities maintenance. Therefore, operational efficiency is measured through indicators such as aircraft turnaround time, passenger waiting time, baggage delivery performance, terminal capacity utilization, service quality, revenue generation, and overall customer satisfaction. In aviation management, operational efficiency is a critical performance indicator because the industry operates in a highly competitive environment characterized by high operating costs, strict regulatory requirements, and increasing passenger expectations. Efficient operations help airports and airlines reduce costs, increase revenue, improve service delivery, and maintain sustainable growth.

According to the literature, operational efficiency is often assessed using the Data Envelopment Analysis (DEA) technique, which evaluates how efficiently airports convert inputs (labor, capital, terminal space, equipment) into outputs (passenger traffic, aircraft movements, cargo throughput, and revenue). DEA has become one of the most widely used methods for airport efficiency studies worldwide.

Kim and Kim (2025) evaluated operational efficiency, service productivity, and service effectiveness across 14 airports using bootstrap DEA. The study found that airports with higher

operational efficiency also recorded better service productivity and user satisfaction. The authors recommended integrating passenger satisfaction indicators into airport efficiency assessments. Thampan, Sinha, Gurjar and Rajasekar (2020) This review identified 58 key performance indicators for assessing functional efficiency in airport terminals. The authors concluded that passenger processing efficiency, terminal circulation, and service quality indicators are critical determinants of airport operational efficiency.

Vokáč, Lánský and Szabo (2017) The researchers examined the relationship between operational efficiency and airport profitability. Results showed that efficient passenger and baggage handling systems significantly improved passenger satisfaction and airport revenue generation. Noah (2025) Using Murtala Muhammed International Airport as a case study, Noah investigated the influence of operational risks on passenger satisfaction. The findings revealed that delays, facility failures, baggage problems, and staff shortages negatively affected passenger satisfaction and overall airport operational performance. Zidarova and Zografos (2011) The study argued that airport operational efficiency should not be measured solely by processing capacity. Passenger comfort, convenience, and perception of service quality should also be included in airport performance assessments.

Operational Efficiency and Passenger Satisfaction

Modern airport studies emphasize that operational efficiency and passenger satisfaction are closely linked. Efficient passenger processing systems, shorter waiting times, effective baggage handling, clean facilities, and reliable airport services contribute significantly to positive passenger experiences. Airports that maintain high operational efficiency generally achieve higher customer satisfaction ratings and stronger competitive advantages.

Operational efficiency is a critical component of airport management that determines how effectively airport resources are utilized to provide safe, reliable, and quality services. It encompasses terminal operations, airside activities, baggage handling, security systems, and facilities management. Contemporary studies demonstrate that efficient airport operations not only improve productivity and profitability but also enhance passenger satisfaction and overall airport performance. For Nigerian airports, improving infrastructure maintenance, adopting digital technologies, strengthening facilities management practices, and reducing operational risks are essential strategies for achieving sustainable operational efficiency.

Facilities Management Services in Aviation Industry

Facilities Management (FM) in the aviation sector refers to the integration of multidisciplinary activities to ensure the functionality, safety, efficiency, and comfort of the physical environment of an airport, which includes terminals, runways, hangers, and other airport infrastructure. It encompasses the strategic management of both hard services (such as electrical systems, plumbing,

HVAC, and building maintenance) and soft services (including cleaning, landscaping, waste management, and security) to support airport operations. According to Atkin and Brooks (2015) FM is defined as "a business practices that coordinates the physical workplace with the people and work of the organization; it integrates the principles of business administration, architecture, and the behavioral and engineering sciences."In the context of aviation, FM ensures that all infrastructural and operational components of the airport support the seamless movement of aircraft, passengers, and cargo, while complying with regulatory requirements such as those from the International Organization (ICAO) and national aviation authorities.

Whyte and Bailey (2012) argue that effective FM in airports enhances operational efficiency, reduces downtimes, improves customer experience, and contributes to overall sustainability goals. Airports are complex entitles that operates like small cities, and their success largely depends on efficient support systems maintained by FM. Aviation facilities Management Services.

Empirical Studies

Air Cargo Logistics and Service Quality in Nigeria

Air cargo logistics plays a significant role in Nigeria's aviation and trade sectors through the movement of perishable goods, industrial materials, pharmaceuticals, and export commodities. Several empirical studies have examined the determinants of service quality, operational efficiency, customer satisfaction, and constraints affecting cargo logistics operations in Nigerian airports, particularly at Murtala Muhammed International Airport and Nnamdi Azikiwe International Airport.

Service Quality and Customer Satisfaction in Nigerian Air Cargo Logistics

Adenigbo, Mageto, and Luke (2024) examined service quality dimensions influencing customer satisfaction in Nigeria's air cargo logistics industry. Using questionnaires administered to 223 stakeholders at Lagos airport, the study applied exploratory factor analysis and found that tangibility, reliability, and responsiveness were the major determinants of customer satisfaction in air cargo operations. The study concluded that airport cargo operators must improve prompt delivery systems, cargo handling facilities, and customer communication to enhance service quality.

Similarly, studies on airport service quality in Nigeria revealed that airport users often perceive service delivery as inadequate due to delays, poor facilities, and inefficient operational systems. Ugo and Ejem (2020), using the SERVQUAL model at Lagos and Abuja airports, observed that airport service quality levels remained below passenger and airline expectations, although Lagos airport performed relatively better. The findings emphasized the need for improved operational efficiency and infrastructure modernization.

Factors Affecting Efficient Air Cargo Logistics Management

Adenigbo (2025) investigated factors affecting cargo logistics management at Lagos airport. Through exploratory and confirmatory factor analyses, the study identified bureaucracy, inadequate equipment and facilities, traffic congestion, and operational malpractices as major barriers to efficient cargo logistics. The study recommended real-time automation of cargo clearance and improved cargo handling facilities to reduce delays and enhance operational performance.

Ayantoyinbo (2018) also examined factors inhibiting aviation cargo logistics in Nigeria. Using Relative Importance Index (RII) analysis on responses from freight forwarders and cargo operators, the study found that high fuel prices, customs bottlenecks, expensive ground handling charges, and security threats significantly constrained efficient cargo operations. The research emphasized the importance of government intervention and policy reforms in reducing operational inefficiencies.

Cargo Handling Operations and Airport Competitiveness

Adenigbo, Olaleye, and Akinsehinwa (2016) assessed determinants influencing the development of cargo handling operations at Lagos airport. The study surveyed cargo agents and found that customs efficiency, airport connectivity, and cargo traffic volume significantly influenced the growth of cargo handling activities. Efficient customs operations and reduced clearance time were identified as essential for improving cargo throughput and attracting international logistics operators.

Adenigbo (2021) examined constraints affecting air cargo operations in Nigeria and reported strong relationships among corruption, poverty, customs inefficiencies, and security challenges. The study argued that inefficient customs processes negatively affect cargo traffic growth and overall logistics performance.

Adenigbo and colleagues (2016) investigated factors influencing cargo agents' choice of operations at Abuja airport. The findings showed that airport capacity, moderate airport charges, and efficient customs services were key determinants influencing cargo operators' airport preferences.

Related International Studies on Air Cargo Service Quality

Beyond Nigeria, several international studies provide theoretical and methodological foundations for evaluating air cargo logistics service quality. Park and Ha (2013) compared the SERVQUAL and SERVPERF models in evaluating air cargo carriers' service quality and concluded that service reliability, responsiveness, and assurance significantly influence customer perceptions in air cargo transport systems.

Research on logistics risk assessment and data-driven cargo management has also shown that delays, cargo handling risks, and uncertainty in delivery schedules significantly affect logistics performance and customer satisfaction in air cargo supply chains. Advanced digital systems and predictive analytics were recommended for improving operational efficiency.

Although most airport satisfaction studies focus on passengers, research on air cargo logistics—an essential component of cargo airport service shows that tangibility, reliability, and responsiveness are the most critical factors cargo customers value for satisfaction with cargo services. This is directly relevant for cargo airports like Sam Mbakwe and Chinua Achebe Airports, where FM services must support cargo operations (storage, handling, and documentation, facility reliability) to meet customer expectations.

MATERIALS AND METHOD

This study adopted a descriptive and comparative survey research design to evaluate the challenges affecting efficient Facilities Management (FM) services at Sam Mbakwe International Cargo Airport and Chinua Achebe International Cargo Airport. The descriptive survey design was considered appropriate because it enables the researcher to collect quantitative and qualitative data from respondents regarding existing FM challenges, operational conditions, maintenance practices, and service efficiency within the selected airports.

The population of the study comprised airports management staff, facilities managers, airports maintenance personnel, cargo operators, security personnel, and airports users/passengers within the selected airports. These categories of respondents were considered relevant because they directly interact with airport facilities and possess adequate knowledge regarding the efficiency and challenges of FM services.

The sample size was determined using Taro Yamane's formula, 240 respondents. Primary data was obtained from airports records, International civil Aviation organization (ICAO) documents, journals and related literature. Instrument validity was ensured the expert and statistical review, while reliability was confirmed using Cronbach's Alpha (0.70). Data were analyzed using descriptive, quantitative and inferential statistical methods. This includes likert scale, percentages, mean score and standard deviation and Intra-class correlation coefficient and SERVQUAL Model.

Population of the Study

The target population comprised:

i. Airports management staff
ii. Facilities Managers
iii. Airports Maintenance Personnel

iv. Cargo Operators
v. Security Personnel
vi. Airport User's (passengers, visitors, airline operators, cargo handlers, and concessionaires).

These categories were selected because they directly interact with the management FM services within the airports.

Population of the Study

S/N	Respondents	Sam Mbakwe International Cargo Airport, Ngor Okpala Imo State	Chiuna Achebe International Cargo Airport, Umueri Anambra State	Total
	Airports management staff	38	25	63
	Facilities managers	20	12	32
	Airport maintenance personnel	40	22	62
	Cargo operators	56	40	96
	Security personnel	24	18	42
	Airports users/passengers	128,000	106,000	234,000
Total		128,178	106,117	234,295

Source: **Federal Airport Authority of Nigeria (2026)**

Sample Size and Sampling Technique

A sample size was determined using an appropriate statistical sampling formula such as the Taro Yamane formula. A combination of stratified sampling and purposive sampling techniques was used. Stratified sampling ensured representation of different stakeholder groups, while purposive sampling was used to select key personnel with adequate knowledge of airport FM operations

The required sample size is approximately 240 respondents. Proportionate stratified sampling allocation the population consists of four distinct groups. Proportionate stratified Random Sampling is appropriate.

$$nh = \frac{N}{} \times n$$

Print ISSN : 2055-0219 (Print)

Online ISSN: 2055-0227(online)

Website: https://www.eajournals.org/

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Where:
nh= Sample size for each stratum
Nh= Population of each stratum
N= Total population (234,295)
n= Total sample size (399)

Sample Size Determination

S/N	Respondents	Sam Mbakwe International Cargo Airport, Ngor Okpala, Imo State.	Chiuna Achebe international Cargo Airport , Umueri, Anambra state.	Sample Size
	Airports management staff	38	25	1
	Facilities managers	20	12	1
	Airport maintenance personnel	40	22	1
	Cargo operators	56	40	1
	Security personnel	24	18	1
	Airports users/passengers	128,000	106,000	394
Total		128,178	106,117	399

Source: **Federal Airport Authority of Nigeria (2026)**

Data Analysis and Discussion

The study evaluated the challenges affecting efficient Facilities Management (FM) services at Sam Mbakwe International Cargo Airport, Ngor Okpala, Imo State and Chinua Achebe International Cargo Airport, Umueri, Anambra State, Nigeria. Data were obtained from airports management staff, maintenance personnel, airline operators, security personnel, and airport users through questionnaires, interviews, and physical observations.

The analysis focused on key FM challenge variables including inadequate funding, poor maintenance culture, shortage of skilled personnel, obsolete facilities, bureaucratic bottlenecks,

power supply instability, security challenges, technological deficiencies, and environmental management issues.

The demographic analysis revealed that respondents comprised airports staff, facilities managers, cargo operators, technicians, security personnel, and airport users with adequate operational experience and knowledge of airports facilities. The majority of respondents had over five years of working experience within the aviation sector, indicating that the information obtained was reliable for evaluating FM operational challenges.

The analysis revealed that inadequate funding was one of the most significant challenges affecting efficient FM services in the selected airports. Most respondents agreed that budgetary allocations for maintenance activities were insufficient to meet operational demands. The mean score obtained for funding inadequacy was above the acceptable decision benchmark, indicating strong agreement among respondents.

Interview responses further showed that delayed release of maintenance funds contributed to deterioration of airport facilities, delayed repairs, and reliance on emergency maintenance practices rather than preventive maintenance strategies. This finding agrees with the study by Okafor and Ezeoyili (2020), which identified inadequate funding as a major factor affecting infrastructure maintenance practices in Nigerian airports. The authors observed that limited financial resources hinder preventive maintenance and promote reactive maintenance culture in airports.

Results from the study indicated that poor maintenance culture significantly affects FM efficiency at both airports. Respondents agreed that maintenance activities are often conducted only after facility failure occurs. Observation of airport infrastructure also revealed deteriorating components in some terminal facilities, drainage systems, electrical installations, and operational equipment. The Relative Importance Index (RII) ranking showed that poor maintenance culture ranked among the highest FM challenges affecting operational efficiency in the selected airports.

This finding supports the work of Ogunleye, Oladapo, and Patunola-Ajayi (2022), who emphasized that poor maintenance practices reduce service quality and operational performance in Nigerian airports.

Data analysis showed that inadequate skilled manpower and insufficient technical expertise negatively affect efficient FM service delivery. Many respondents indicated that there are insufficient professionally trained facility managers, engineers, and technical personnel to manage sophisticated airport systems effectively.

Interview responses further revealed inadequate opportunities for continuous professional training and limited exposure to modern FM technologies and operational standards. The findings corroborate Oladejo, Sado, and Uche (2021), who identified poor staff quality and lack of technical expertise as major FM challenges within Nigeria's aviation sector. The study found that bureaucratic administrative procedures delay maintenance approvals, procurement processes, and emergency responses in airport operations. Respondents noted that excessive administrative control slows operational decision-making and reduces FM efficiency. The Chi-square analysis revealed a significant relationship between management structure and operational efficiency of FM services in the selected airports.

This finding aligns with Onwuanyi, Oyetunji, and Eyakwanor (2018), who reported that bureaucratic management systems and weak managerial capacity contribute to poor airport service delivery and operational inefficiency in Nigerian airports. Results indicated that outdated facilities and inadequate technological systems constitute major operational challenges. Respondents identified obsolete maintenance equipment, aging power systems, inadequate digital monitoring systems, and poor automation infrastructure as factors limiting FM efficiency.

Physical observation further revealed that some operational facilities require modernization and technological upgrading to meet contemporary airport operational standards.The findings are consistent with studies on airport digitalization which emphasized that limited adoption of Industry 4.0 technologies reduces airport operational performance and service quality. The study revealed that unstable electricity supply significantly affects airport operations and FM performance. Respondents reported frequent reliance on backup power systems, increased operational costs, and occasional disruption of airport services.

Observation findings also showed that power instability affects lighting systems, communication equipment, refrigeration systems, and security infrastructure within the airports. The result supports findings from infrastructure maintenance studies in Nigerian airports which identified aging power systems and poor utility infrastructure as major maintenance challenges. Analysis revealed that security and safety concerns remain critical challenges affecting FM efficiency. Respondents identified inadequate surveillance systems, insufficient security equipment, and weak monitoring mechanisms as major operational issues. Some airport users interviewed also expressed concerns regarding operational delays, manual security procedures, and inconsistent service delivery.

This finding is consistent with Oladejo (2021), who identified poor safety and security systems as critical FM challenges in the Nigerian aviation sector.

Community experiences and public discussions regarding Nigerian airports also indicate persistent concerns relating to operational inefficiencies, unofficial practices, and security management challenges within airport environments.

The study further revealed that environmental management practices within the selected airports face challenges relating to waste disposal, drainage management, energy utilization, and environmental sustainability compliance. Respondents noted that poor environmental control systems increase operational costs and reduce service quality.

The finding agrees with studies emphasizing that sustainable FM practices are necessary for improving operational efficiency and environmental performance in airports.Comparative analysis indicated that both airports experience similar FM challenges, although the severity varies slightly between locations. Sam Mbakwe International Cargo Airport recorded higher challenges relating to infrastructure deterioration and power instability, while Chinua Achebe International Cargo Airport showed relatively better infrastructure conditions but still experienced challenges associated with funding, skilled manpower shortages, and technological limitations.
The correlation analysis revealed a statistically significant relationship between FM challenges and operational efficiency in both airports. This implies that increased FM challenges negatively affect airport operational performance, service delivery quality, and user satisfaction.

RESULTS AND DISCUSSION

The findings demonstrate that FM services in the selected airports are constrained by multiple interrelated operational, financial, managerial, and technological challenges. Inadequate funding, poor maintenance culture, shortage of skilled personnel, obsolete infrastructure, bureaucratic management systems, and inadequate technological integration collectively reduce operational efficiency and service quality.

The findings also confirmed previous studies which established that efficient FM practices are essential for improving airport operations, infrastructure sustainability, passenger satisfaction, and global competitiveness of Nigerian airports.

The study further indicates that adoption of preventive maintenance culture, professional FM practices, digital maintenance systems, staff capacity development, and improved funding mechanisms are necessary for enhancing operational efficiency within Nigerian cargo airports.

Print ISSN : 2055-0219 (Print)

Online ISSN: 2055-0227(online)

Website: https://www.eajournals.org/

Publication of the European Centre for Research Training and Development UK

CONCLUSION

This study evaluated the challenges affecting efficient Facilities Management (FM) services at Sam Mbakwe International Cargo Airport, Ngor Okpala, Imo State and Chinua Achebe International Cargo Airport, Umueri, Anambra State, Nigeria. The findings revealed that FM services in the selected airports are constrained by several operational, managerial, financial, technological, and environmental challenges that negatively affect airport efficiency, infrastructure sustainability, safety compliance, and service delivery.

The study established that inadequate funding remains one of the major impediments to effective FM operations in the selected airports. Limited budgetary allocation and delayed release of maintenance funds have contributed to poor infrastructure maintenance, deterioration of facilities, and dependence on corrective maintenance practices rather than preventive maintenance systems. The study further revealed that poor maintenance culture significantly affects operational efficiency within the airports. Most maintenance activities are reactive rather than preventive, resulting in frequent facility breakdowns, increased operational costs, and reduced service quality. The findings also showed that obsolete infrastructure, inadequate technological integration, and aging operational systems limit effective airport facility performance and service delivery.

Another major finding of the study is the shortage of skilled personnel and inadequate professional training among FM staff. The lack of continuous capacity development and limited technical expertise hinder effective management of sophisticated airport infrastructure and equipment. Bureaucratic bottlenecks and weak management structures were also identified as factors delaying maintenance approvals, procurement processes, and operational decision-making.

The study additionally found that unstable power supply, inadequate safety and security systems, poor environmental management practices, and insufficient adoption of modern digital technologies reduce operational reliability and user satisfaction within the selected airports. These challenges collectively undermine airport operational efficiency and global competitiveness.

Comparatively, both airports experience similar FM challenges, although the degree of severity varies slightly between locations. Sam Mbakwe International Cargo Airport showed greater infrastructure deterioration and power-related challenges, while Chinua Achebe International Cargo Airport demonstrated relatively better physical infrastructure but still faces challenges associated with funding, technological deficiencies, and skilled manpower shortages.

The study therefore concludes that efficient Facilities Management services are essential for improving airport operational efficiency, safety compliance, infrastructure sustainability, and passenger satisfaction in Nigerian airports. Without adequate investment, professional FM

practices, technological modernization, and effective maintenance culture, the selected airports may continue to experience operational inefficiencies and declining infrastructure performance.

Recommendations

Based on the findings of the study, the following recommendations are proposed:

1. Government and airports management authorities should increase budgetary allocation for airports FM operations to ensure regular maintenance, infrastructure rehabilitation, and procurement of modern operational equipment.
2. Airport management should adopt preventive and planned maintenance strategies instead of relying mainly on corrective maintenance systems.
3. Airport authorities should invest in modern technological systems including computerized maintenance management systems (CMMS), smart monitoring technologies, digital surveillance systems, automated operational facilities, and energy-efficient infrastructure.
4. Airport management should strengthen safety and security infrastructure through installation of modern surveillance equipment, improved access control systems, emergency response mechanisms, and regular safety audits.
5. Alternative energy sources such as solar power systems and dedicated backup power infrastructure should be developed to reduce dependence on unstable public electricity supply. This will improve reliability of airport operations and reduce operational disruptions associated with power failure.

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