

# Key Performance Indicators (KPIs) for Airport Facility Management Practice in Nigeria: The Case of Murtala Muhammed Airport, Lagos

**Ogunleye, M.B., Oladapo, R. A. & \*Patunola-Ajayi, B. J.**

Department of Estate Management and Valuation,  
Federal University of Technology, Akure, Ondo State, Nigeria

\*Corresponding Author: [bjpa2054@yahoo.com](mailto:bjpa2054@yahoo.com)

## Abstract

One of the keys to effective and successful management of airports is the measurement of airport facilities management performance through the formulation of KPIs. Despite the availability of a variety of KPIs, the problem of selecting pertinent KPIs using only cost- and revenue-driven metrics without considering other non-financial factors has long been recognized. Hence, this study examined the KPIs for efficient facility management in Nigeria. Structured questionnaire was administered to the Facility Managers while descriptive statistics and weighted mean scores were used to analyze the data. The study identified the benefits of KPIs to include the enhancement of benchmarking, communication and transparency. Furthermore, the usage of KPIs were constrained by their over-reliance on cost and revenue measures as well as their immeasurable character; hence, 49 KPIs were identified in 7 fundamental areas. The study concluded that assessment, implementation and review of KPIs has been found to be a subtly effective strategy to improving airport operational performance, standards, benchmarking, and best practices in facility management. It was recommended that airport operators, Facility Managers and the Government Agencies charged with the management and administration of airports should take a keen consideration of the different KPIs.

**Keywords:** Airports, Airport Facility Management, Facility Management, Key Performance Indicators, Performance.

## Introduction

Airports act as nodal hubs and are essential to the aviation sector thus aiding the smooth running of local and regional economies (Olukayode, Adebambo and Adewale, 2016). The potential of airports to boost national productivity, tourism growth, trade and direct foreign investment usually in conjunction with greater technology and innovation, has led to them being referred to as "powerful engines" (Sengutuvan, 2006). Graham (2009), Gilen (2011); George and Carlos (2016) viewed airports as not only enormous structures and public facilities, but also as a multifaceted service organization operating in a variety of ways

that are similar to those of commercial enterprises. Additionally, Katja (2014) pointed out that fundamental airport infrastructure includes facilities such as run strips; hangers, aprons; taxiway; terminals for passengers and freights; ground transportation interchanges among other facilities all which requires adequate and proper management. Hence, several researchers such as Humphreys and Francis (2002); Granberg and Munoz (2013); Yujin, Min and Jun (2018) have emphasized the significance of evaluating the performance of airport facilities with a bid to pinpointing areas of review, enhancement, upgrades amongst others. As a result, it's crucial to

consider airport facilities management practices from a wider angle by investigating the performance via Key Performance Indicators (KPIs).

According to Amaratunga and Baldry (2003) and Yujin *et.al* (2018), KPIs can improve management practices by revealing the mode of management, forms of decisions and the management of the environment and amenities. KPIs are thus the best way to appraise the performances of facilities in a bid to determining the efficacy of maintenance management practices. KPIs are, by definition, performance measures that are based on standards established through scholarly literature that is backed up by evidence or, in the absence of proof, through expert consensus (Yujin *et. al*, 2018). KPIs according to Parmenter (2007) are a group of measurements that concentrate on managerial assessment factors which are mostly important and intended for the organization's success in the present and future.

Today, KPI's have been recognized in private and governmental organizations across the country and airport facility management is not exempted in this regard. Furthermore, according to Cable and Davis (2004) and Lavy *et al*. (2014), developing KPIs with relevant indicators holistically aids in ensuring adequate performance and helps in the formation of critical decisions. DIN (2000) also highlighted the benefits of KPIs to include benchmarking and comparability between enterprises, improved communication foundations, improved transparency, increased organizational learning processes and certification eligibility. There is no doubt the fact that adoption of KPIs in Nigerian airports would bring about better efficiency and performance.

In the light of these benefits, it is imperative that holistic KPIs should also be garnered for airport facility management operation. Accordingly, Wyman (2012) and Airports Council International (2012) identified six (6) main Key Performance Areas (KPAs) for airport facility management practice

which includes Core/Fundamental Measures of Airport Facilities; Security and Safety Measures; Service Quality Measures; Productivity/Cost Effectiveness Measures; Financial/ Commercial Measures; and Environmental Measures. Humphreys and Francis (2002), from a different angle, divided airport facility indicators into four main categories: original measures, airport operating measures, airport environment measures, and service quality measures. Granberg and Munoz (2013) offered five basic components of airports' KPIs into operations; economy; environmental challenges; service and security; and customer service. Irrespective of the various classifications and categories, KPIs have not been well utilized in assessing the performance of Nigerian airports and facilities. More so, KPIs do, however, have some disadvantages.

Gana (2014) observed the difficulty of choosing pertinent KPIs using simply cost and revenue-driven metrics without considering other pertinent elements, despite the availability of a variety of KPIs. Although there is a long number of performance measurements, Shohet (2006) and Lavy, *et al*. (2010) stated that some of the indicators are redundant, may not be measured, or may not be appropriate. Pidun and Felden (2011) also highlighted some of the drawbacks to include an overreliance on generic frameworks, inadequate measurement of non-numeric performance indicators, and an inappropriate performance measurement framework. The adoption of KPIs would no doubt help in resolving some of the airport facility management problems.

Airport facility management is a growing field of study in recent years and without a doubt, one of the keys to effective and successful management of airports is the development of KPIs to measure airport facility management performance. However, the majority of KPIs adopted in most airports have mostly focused on costs, necessitating the development of a process for evaluating services in order to create

KPIs for airport facility management which is the prerogative of this research.

## Literature Review

### **Key Performance Indicators (KPIs)**

Varied individuals or organizational units have different definitions of what the term "KPIs" signifies. They consist of a series of actions that reorient an organization's focus on the areas that are most important to performance improvement for the organization's present and future success (Parmenter, 2007). KPIs are clear, important, and quantifiable norms that build on a small number of indications and are important because the consequential parts of interconnected pointers challenge persons, factions and the whole organization to focus their efforts and resources on accomplishing a single objective (McNeeney, 2005). KPIs also referred to as performance matrices are uniform performance measurements that are "adopted in comparing the performances of a benchmarking party to another (Ho *et al.*, 2000).

### **Categories of KPIs**

According to Douglas (1996), precise categorization of KPIs is necessary to show their wider relevance and potential utility. Despite the fact that research have created and developed lists of many different indicators, some of them are useless as a result of misclassification. Continuous or study-based evaluations are uninteresting to professionals who are concerned in short-term financial evaluation. In order to enable Facility Managers to choose the indicators of performance which they are mostly interested in from a selection of options; several modes and forms of categorization exists (Douglas, 1996; Gumbus, 2005).

KPIs were categorized into the following four groups by Amaratunga and Baldry (2003):

- Relations with customers;
- Internal FM procedures;
- Personal growth and education;
- Personal growth and education;

Augenbroe and Park (2005) further classified them into four groups namely; Energy, Lighting, Thermal Comfort and Maintenance. In another study Hinks and McNay (1999) grouped 172 KPIs into the following eight categories:

- Benefits of the business
- Available equipment
- Spaces
- Environmental Conditions;
- Changes
- Maintenance Services
- Consultancy
- The general category

Based on his interpretation of the balanced scorecard technique, Gumbus (2005) develops a list of performance indicators that are subdivided into four categories. An extensive and exact collection of KPIs that are broken down into eight categories is presented by Ho *et al.* (2000).

Lavy, Garcia, and Dixit (2010) analyzed academic papers on KPIs categorization matrices. The study found that while contemporary studies highlight the use of both cost-related and non-cost-related indicators of performance, KPIs created in previous researches primarily contained cost-related metrics. In another research, Lavy, Garcia, and Dixit (2014) identified KPIs for the evaluation of facility management performance. The study measured the performance of the facility using both quantitative and qualitative means and divided performance indicators into four main groups: survey-based, financial, physical, and functional. The study's KPIs were general and were not directly related to airport facility management.

Granberg and Munoz (2013) examined the development of KPIs for airports. After reviewing prior related literatures and researches, the study noted that airports are classified into five activity sectors (operations, economy, environmental issues, safety and security, and customer service), with an initial set of indicators based on the various sectors of the airports chosen for each area. Questionnaire based survey was then distributed to Airport

managers in Sweden and Spain to rank the various KPIs used to in measuring the performance of the airport facilities. With a focus on European countries, the study was of particular importance as it aided the formulation of KPIs for Nigerian airport services in this current research.

Gana (2014) selected financial KPIs using the aviation industry as a case study. Using data from the airline industry in all of the major markets in the world which were analysed using descriptive statistics and correlation analysis; the study showed that revenue or profit-driven KPIs, when consistently applied, will likely result in better financial performance without adequate consideration of other non-financial KPIs. This therefore necessitates a review of financial and non-financial KPIs which is the prerogative of this current research.

Ogbeifun, Mboluwa, and Pretorius (2016) used the Delphi technique to construct key performance indicators. The results showed that the generated KPIs were categorized into groups that serve as a roadmap for the service provider on how to allocate its resources to increase performance, client happiness, and institutional goals. Customer satisfaction was the solely chosen measure of key performance indicator while this study will take into account other non-satisfaction and financial based performance indicators for airport facility management. In another research, Dedy (2017) used a passenger-centered model to evaluate the effectiveness of airport services. Utilizing data from 215 passengers in 22 countries which were analyzed using both the passenger-centered model and qualitative data analysis; the study revealed two causal linkages between each set of airport domains (i.e., processing and non-processing domains) and total service performance. Numerous service factors and the underlying service attributes they reflect are used to represent these domains. The Airport Indicators of Passenger Experience (AIPEX) Model and its configuration of passenger-centered indicators were created

as a result of combining the data from the two assessments to improve the conceptual model.

In a different study, Lai and Man (2017) performed a state-of-the-art review on creating a performance evaluation system for engineering facilities in commercial buildings in Hong Kong. A total of 71 indicators were found and grouped into five categories: physical, financial, task- and equipment-related, environmental, and health, safety, and legal. Additionally, Shohet and Nobili (2017) examined the use of KPIs for clinic facility maintenance management. The study produced a set of seven hybrid KPIs that may be utilized for planning and controlling facility maintenance in both the leading and lagging analysis. The studies solely examined commercial buildings and medical facilities and did not investigate the creation of such KPIs for airport facility management practice which is the purview of this current research.

Yujin *et.al* (2018) created KPIs for the enhancement of university facility management services in Korea. The 44 pre-selected KPIs which were gathered through intensive analysis of primary literature related to facility management services as defined by the Balanced Scorecard (BSC), and the Delphi survey were used to identify KPIs. The Importance-Performance Analysis (IPA) and Kendall's W were then used to examine the data and the findings show that 5 of the 8 KPIs have high importance and performance values, indicating that the current management situation should be continually maintained and strengthened. While this study was based on the university system and not the airports, it is imperative to sustain and improve the current facility management practice in Nigerian Airports with a bid to enhancing effectiveness in airport facility management practice and overall airport operations.

## Materials and Methods

Murtala Muhammed Airport, the selected airport used as the case study is situated in Ikeja, Lagos State. It is Nigeria's main international airport and as well as the regional airlines' commercial hub; it is also the busiest and most often utilized airport in Nigeria. The airport has three terminal buildings namely, the International terminal, MM2 and local terminals. These three terminals are close to one another and have two shared runways that can accommodate various jets, planes and airliners. The airport is situated in the South-Western Coast of Nigeria along the Bight of Benin, roughly between latitudes 6<sup>0</sup>40' N and 4<sup>0</sup>30' of the Equator and between longitudes 2<sup>0</sup>05' W and 4<sup>0</sup>20' E of the Greenwich Meridian.

The research instrument was a well-designed questionnaire which was administered to airport Facility Managers saddled with the responsibility of managing various facilities and services in the airport. The sampling frame of the Facility Managers according to the records of the Federal Airport Authority of Nigeria (FAAN) (2022) showed that there are over 200 Facility Managers responsible for the management of the airport facilities and services in the study area. Due to the sizeable number of respondents, the total sampling frame of 200 was adopted as the sample size. Total census method was used to administer structured questionnaires to the Facility Managers while descriptive statistics and weighted mean score were used to analyze the retrieved data Major themes about the several KPIs for airport facility management as well as the importance and constraints associated with the KPIs were examined..

## Data Analysis and Discussions

### *Importance of KPIs for Airport Facility Management*

The study looked at the facility managers' perceptions of the importance of KPIs in the airport and the results are presented in Table 1 below. The study found that the respondents prioritized the fundamental need to demonstrate the wider relevance of various KPIs which was rated first with a mean value of 4.6916. The potential utility and significance of KPIs was ranked 2<sup>nd</sup> with a mean value of 4.6075. Improved Communication and Transparency in Practice was ranked third with a mean value of 4.5514 while benchmarking and comparable performance was placed 4<sup>th</sup> with a mean value of 4.5234. Additionally, with a mean value of 4.4860, increased organizational learning and solutions was ranked fifth overall.

In all, it's obvious that the usage and adoption of KPIs have significant benefits and importance in ensuring adequate coverage of all necessary operational areas in order to enhance performance, effectiveness and efficiency. The adoption of KPIs in Nigerian airports would no doubt aid in the identification and measurement of different areas of airport operations as well as the areas requiring reviews which would thus aid airport facility management performance.

**Table 1: Importance of KPIs for Airport Facility Management**

<b>Importance of KPIs for Airport Facility Management</b>	<b>SA</b>	<b>A</b>	<b>UD</b>	<b>DA</b>	<b>SDA</b>	<b>Mean</b>	<b>Std. Dev</b>	<b>Rank</b>
Shows wider relevance of various KPIs	370	132	-	-	-	4.6916	.46401	1 <sup>st</sup>
Potential Utility and significance of KPIs	375	88	30	-	-	4.6075	.65527	2 <sup>nd</sup>
Improved Communication and Transparency in practice	345	112	30	-	-	4.5514	.66210	3 <sup>rd</sup>
Benchmarking and Comparable Performance	300	172	12	-	-	4.5234	.57208	4 <sup>th</sup>
Increased Organisational learning and solutions	305	148	27	-	-	4.4860	.64959	5 <sup>th</sup>
Enhanced eligibility for more certifications	290	156	30	-	-	4.4486	.66210	6 <sup>th</sup>
Ability to monitor them over time and	330	92	54	-	-	4.4486	.76767	7 <sup>th</sup>
Enabling realization of future facility requirements	295	120	54	-	-	4.3832	.76040	8 <sup>th</sup>
Improved cost effectiveness	260	72	111	-	-	4.1402	.90542	9 <sup>th</sup>
Capacity to forecast results of current management decisions	245	88	102	-	2	4.0841	.97247	10 <sup>th</sup>

*Where: SA: Strongly Agree; A: Agree; UD: Undecided; DA: Disagree; SDA: Strongly Disagree*

### ***The Key Performance Indicators (KPI'S) Relative to Airport Facility Management Services***

The research looked more closely at the various KPI classifications. The six primary Key Performance Areas (KPAs) for airport facility management practice were identified by Wyman (2012) and Airports Council International (2012), from which the KPI classifications utilized for this study were adopted. The results analysis is shown in Table 2.

Therefore, the facility managers' opinions on the KPIs pertaining to airport facility management services are shown in Table 2 below. Airport key performance indicators were taken into consideration under seven major features, including the following: the Core/Fundamental Measures of Airport Activities; Safety and Security; Service Quality; Productivity/Cost-Effectiveness; Financial/Commercial; Environmental; and Operational Measures. Each of these features has additional sub-features or indicators.

The number of passengers (4.4579), the number of aircraft movements (4.4299), and the number of passengers departing from and arriving at the airport (4.2243) were placed first, second, and third, respectively. The safety and security measures include runway accidents, which came in first place with a mean score of 4.0187, public injuries came 2<sup>nd</sup> with a mean value of 3.7757 while bird strikes was 3<sup>rd</sup> with a mean value of 3.4579. This implied that the primary and most important indicators of airport performance, as revealed by the analysis, are primarily the volume of travelers, the mobility of planes, as well as the variety of travelers' final destinations and sites of origin. As a result, these characteristics have also been utilized to analyze the performance level of the airports as it relates to the other goals stated above.

The cleanliness of terminals and restrooms was ranked first with a mean value of 4.3925; hourly capacity which was ranked second with a mean value of 4.3458; security clearing time which was ranked

third with a mean value of 4.3171 and check-in gate time which was ranked fourth with a mean value of 4.3084; the value for customer satisfaction was 4.2897, which placed it fifth are all examples of service quality measures. The analysis's ramifications revealed that the respondents' opinions on the basic service quality indicators for airports included the cleanliness of the terminals, the availability of security, the convenience of clearing customs and checking in, as well as overall customer satisfaction factors.

Aircraft Movements Per Gate (4.5234), Aircraft Movements Per Employee (4.4860), Total Cost Per Movement (4.3832), Total Cost Per Passenger (4.2150), and Operating Cost Per Passenger (3.9907), which have been ranked first, second, third, fourth, and fifth respectively, are among the key performance indicators for productivity/cost-effectiveness measures, according to the research. By implication, the analysis demonstrated that the number of aircraft movements, total air movement costs, and operating costs were the most important productivity and cost-effectiveness factors to be taken into account in airport management and performance.

Revenue Per Movement, which was rated first with a mean value of 4.2150, Debt Service as a percentage of operating revenue, which was ranked 2<sup>nd</sup> with a mean value of 4.0187, and Non-Aeronautical Operating Revenue Per Total Operating Revenue, which was ranked third with a mean value of 4.0093, are some key performance indicators in relation to financial/commercial measures. The debt to earnings before interest, taxes, depreciation, and amortization (EBITDA) ratio was placed fifth with a mean score of 3.8785, while revenue per passenger was ranked fourth with a mean value of 3.9907. The study revealed that when examining airport operations and performance, the key financial and commercial measures were the total revenue made from passenger movement, which was mostly related to

aeronautical and non-aeronautical operations.

According to the airport facility managers' opinions of the environmental KPIs, the waste reduction percentage (4.0841), carbon footprint (4.0374), percentage of renewable energy purchased by the airport (3.4299), and utilities or energy usage per square meter (3.3738), which were ranked first through fourth, respectively, received the majority of their support. Air Traffic Movement per Hour (4.3925) and Number of Runways and Taxiways (4.3551) were placed first and second respectively in the operational measures. The consequences of these findings are that waste reduction, carbon management, and the accomplishment of renewable energy by the airports are the key metrics of examining environmental measures in airport performance indicators.

### ***Constraints Associated with the Use of KPIs in Airport Facility Management***

The study further examined the constraints associated with the use of KPIs in airport facility management. The use of cost and revenue metrics only (4.2617); the redundant nature of some KPIs (4.2150); the inappropriateness of some KPIs (4.2056); the immeasurable aspects of some KPIs (4.0748); and selection and identification issues (4.0561) were the major constraints identified by the Facility Managers which were ranked 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup> and 5<sup>th</sup> respectively. The over-reliance on financial measures only have resulted in the consideration of costs and revenues generated from airports operations without recourse to other measures such as service quality, productivity, environmental measures amongst others; thus, resulting into the low ratings of Nigerian airports as well as the decline in airport satisfaction ratings and the breakdown of most airplanes.



**Table 2: Opinion of Facility Managers on The Key Performance Indicators (KPI'S) Relative to Airport Facility Management Services**

KPI's	Key Performance Indicator Measures	SA	A	UD	DA	SDA	Mean	Std. Dev	Rank
<b>Core/Fundamental Measures</b>	Number Of Passengers	255	216	6	-	-	4.4579	.53694	1 <sup>st</sup>
	Number of passengers departing from and arriving at the airport	180	236	36	-	-	4.2243	.63407	3 <sup>rd</sup>
<b>Airport Activities</b>	Number Of Aircraft Movements	270	180	24	-	-	4.4299	.63114	2 <sup>nd</sup>
	Amount Of Freight Or Mail Loaded	70	220	114	-	-	3.7757	.66316	4 <sup>th</sup>
<b>Safety and Security Measures</b>	Runway Accidents	160	196	66	8	-	4.0187	.81242	1 <sup>st</sup>
	Runway Incursions	40	124	144	40	-	3.2523	.84779	6 <sup>th</sup>
	Bird Strikes	40	188	114	28	-	3.4579	.81588	3 <sup>rd</sup>
	Public Injuries	85	212	99	8	-	3.7757	.75621	2 <sup>nd</sup>
	Occupational Injuries	60	140	138	28	-	3.4206	.85823	4 <sup>th</sup>
	Loss Of Work Time From Employee Injuries	25	148	153	28	-	3.3084	.75749	5 <sup>th</sup>
<b>Service Quality Measures</b>	Hourly Capacity	215	232	18	-	-	4.3458	.58443	2 <sup>nd</sup>
	Gate Departure Delay	145	180	75	16	-	3.8879	.89366	9 <sup>th</sup>
	Taxi Departure Delay	55	176	126	20	-	3.5234	.80501	11 <sup>th</sup>
	Customer Satisfaction	215	208	36	-	-	4.2897	.65889	5 <sup>th</sup>
	Baggage Delivery Time	140	220	69	2	-	4.0280	.71977	8 <sup>th</sup>
	Security Clearing Time	185	272	6	-	-	4.3271	.50982	3 <sup>rd</sup>
	Border Control Clearing Time	110	172	126	-	-	3.8131	.75399	10 <sup>th</sup>
	Check-In Gate Time	215	216	30	-	-	4.3084	.63560	4 <sup>th</sup>
	Cleanliness of Terminals and Rest rooms	250	196	24	-	-	4.3925	.62581	1 <sup>st</sup>
	Airport Congestion Level	135	268	39	-	-	4.1308	.60006	6 <sup>th</sup>
Flight Delay	165	220	57	-	-	4.1308	.68796	6 <sup>th</sup>	
<b>Productivity/Cost-Effectiveness Measures</b>	Passengers Per Employee	55	168	123	26	-	3.4766	.83943	8 <sup>th</sup>
	Aircraft Movements Per Employee	305	148	27	-	-	4.4860	.64959	2 <sup>nd</sup>
	Aircraft Movement Per Gate	285	196	3	-	-	4.5234	.52026	1 <sup>st</sup>
	Total Cost Per Passenger	170	248	33	-	-	4.2150	.61473	4 <sup>th</sup>
	Total Cost Per Movement	245	200	24	-	-	4.3832	.62412	3 <sup>rd</sup>
	Total cost per Workload Unit (WLU)	45	224	123	2	-	3.6822	.63837	7 <sup>th</sup>
	Operating Cost Per Passenger	140	200	87	-	-	3.9907	.73324	5 <sup>th</sup>
	Operating Cost Per Movement	80	204	120	-	-	3.7757	.69103	6 <sup>th</sup>
Operating Cost Per WLU	-	220	126	20	-	3.4206	.65929	9 <sup>th</sup>	
<b>Financial/Commercial Measures</b>	Revenue Per Passenger	145	200	78	4	-	3.9907	.77088	4 <sup>th</sup>
	Revenue Per Movement	180	232	39	-	-	4.2150	.64469	1 <sup>st</sup>
	Non-Aeronautical Operating Revenue Per Total Operating Revenue	110	256	63	-	-	4.0093	.63685	3 <sup>rd</sup>
	Non-Aeronautical Operating Revenue Per Passenger	30	260	99	6	-	3.6916	.62058	7 <sup>th</sup>
	Debt Service As A Percentage Of Operating Revenue	120	244	66	-	-	4.0187	.65849	2 <sup>nd</sup>
	Long-Term DebtPer Passenger	35	124	93	76	-	3.0654	.95434	8 <sup>th</sup>

	Debt to Earnings Before Interest, Tax, Depreciation, and Amortisation (EBITDA) Ratio	80	248	87	-	-	3.8785	.64002	5 <sup>th</sup>
	EBITDA per passenger	60	256	81	8	-	3.7850	.68719	6 <sup>th</sup>
<b>Environmental Measures</b>	Carbon Footprint	90	304	36	2	-	4.0374	.56511	2 <sup>nd</sup>
	Waste Recycling	25	140	126	46	2	3.1682	.88473	6 <sup>th</sup>
	Waste Reduction Percentage	130	256	51	-	-	4.0841	.63128	1 <sup>st</sup>
	Percentage Of Renewable Energy Purchased By The Airport	90	108	135	34	-	3.4299	.95277	3 <sup>rd</sup>
	Utilities Or Energy Usage Per Square Metre	-	204	135	22	-	3.3738	.66621	4 <sup>th</sup>
	Water Consumption Per Passenger	-	196	138	24	-	3.3458	.67437	5 <sup>th</sup>
<b>Operational Measures</b>	Air Traffic Movement Per Hour	240	212	18	-	-	4.3925	.59490	1 <sup>st</sup>
	Inbound And Outbound Efficiency	230	204	30	-	-	4.3364	.64346	3 <sup>rd</sup>
	Number Of Runways And Taxiways	245	188	33	-	-	4.3551	.66236	2 <sup>nd</sup>

*Where: SA: Strongly Agree; A: Agree; UD: Undecided; DA: Disagree; SDA: Strongly Disagree*

**Table 3: Constraints Associated with the Use of KPIs in Airport Facility Management**

Constraints Associated with the Use of KPIs	SA	A	UD	DA	SDA	Mean	Std. Dev	Rank
Use of cost and revenue metrics only	255	176	12	10	3	4.2617	.94506	1 <sup>st</sup>
Redundant nature of some KPIs	230	196	12	10	3	4.2150	.93191	2 <sup>nd</sup>
Inappropriate nature of some KPIs	225	200	12	10	3	4.2056	.92897	3 <sup>rd</sup>
Immeasurable aspects of some KPIs	155	256	12	10	3	4.0748	.87632	4 <sup>th</sup>
Selection and Identification problems	245	124	42	20	2	4.0561	1.1060	5 <sup>th</sup>
Monitoring the Performance of the KPI	215	156	39	18	3	4.0280	1.0592	6 <sup>th</sup>
Difficulty of Choosing a Pertinent KPI	145	192	63	10	4	3.8692	.99132	7 <sup>th</sup>
Inadequate awareness on KPI evaluation Techniques	115	216	66	10	3	3.8318	.91616	8 <sup>th</sup>
Inappropriate Performance measurement framework	150	168	69	18	3	3.8131	1.0291	9 <sup>th</sup>
Inadequate measurement on non-numeric KPIs	145	195	81	18	3	3.7664	1.0332	10 <sup>th</sup>
Over-reliance on generic framework	230	80	36	52	3	3.7477	1.3110	11 <sup>th</sup>
Complexity in KPI evaluation tools	60	236	84	10	3	3.6729	.84424	12 <sup>th</sup>
Inability to speculate changes	75	208	84	18	3	3.6262	.92679	13 <sup>th</sup>
Over-concentration on some crucial aspects	60	240	57	26	3	3.6075	.93926	14 <sup>th</sup>
Difficulty in ascertaining the feasibility of KPIs	60	172	111	24	3	3.4579	.93446	15 <sup>th</sup>

*Where: SA: Strongly Agree; A: Agree; UD: Undecided; DA: Disagree; SDA: Strongly Disagree*

## Conclusion and Recommendation

Airport facility management poses a significant challenge in the field of facility management due to its diversity and wide extent. Hence, the establishment and generation of KPIs have been deemed crucial due to the need for assessing wider areas of measures besides revenue and cost driven motives as well as harnessing the potential advantages of benchmarking as well as the rising necessity of guaranteeing acceptable performance, efficiency and effectiveness of airport facility management. Without an examination and assessment of KPIs of airports, it would be difficult to determine which areas or factors to review with a view to enhancing effective airport facility management and performance. Therefore, 49 KPIs were examined in 7 fundamental areas which includes Core/Fundamental measures, Safety and Security, Service Quality, Productivity/Cost Effectiveness, Financial/Commercial measures, Environmental and Overall Operational Measures. As a result, it has been determined that applying, evaluating, monitoring and reviewing KPIs is a subtle

way to improve airport operational performance, standards, benchmarking, and best practices in facility management.

It is therefore imperative the airport operators, facility management and the Government agencies saddled with the management and administration of airports to take a keen consideration of the various KPIs in order to ensure improved communication, benchmarks and overall performance. More so, the Federal Airport Authority of Nigeria (FAAN) should ensure adequate review, implementation and creation of more data on the KPIs for better airport operation and performance.

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