ASSESSING FACILITY MANAGEMENT PRACTICES AND SALARIES: A MULTI-REGION STUDY

by

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ABSTRACT

NNEKA UBI. Assessing Facility Management Practices and Salaries: A Multi-Region Study.
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Over its extensive history, Facility Management (FM) has achieved significant milestones through associations like IFMA, GlobalFM, IWFM, and others, marking standardized practices, training programs, and growth in compensation. With a global perspective encompassing Africa, Asia, Europe, and North America, the research aims to assess the similarities and variations in various FM practices such as O&M practices, energy management, sustainability practices, and compensation structure.

The study leveraged a methodical approach that involves design of electronic survey and data standardization. Data was analyzed with both descriptive and inferential statistical analyses.

Key findings demonstrate significant regional variations in FM practices. Developed regions demonstrate advanced sustainability, energy management practices and higher O&M costs and compensation, indicative of economic development, technological adoption, and infrastructural advancement etc. Conversely, emerging FM markets in developing regions report lower salary structures and integration of sustainability practices. However, it was also found that while some regions (e.g., North America, Asia) reported higher nominal O&M costs, the proportion of the minimum wage allocated to cover these expenses is notably lower compared to other regions – Moreso, in Asia, FM salaries significantly exceed the minimum wage by up to 96% despite lower average salaries while in North America, where salaries are highest, the difference from the minimum wage is slightly lower.

By undertaking this multi-region study, the research contributes to an understanding of FM dynamics across regions, fostering opportunities for benchmarking and enhancing the global perspective on FM practices and compensation.

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Finally, I am immensely grateful to my immediate past employer and mentor, ESV. Obiora Okafor, whose encouragement, and support set the foundation for this journey.

DEDICATION

This thesis is dedicated to the cherished memory of my loving father, Evang. Emmanuel Emenyua Ubi (1958 - 2012). His remarkable fortitude, unwavering drive, steadfast determination, and deeply held values that were rooted in God continue to resonate within me. These qualities, instilled by his example, have been the guiding force and bedrock of my resilience and the source of strength that propelled me towards achieving this academic milestone. His legacy lives on through these attributes, inspiring and empowering me to pursue my goals with the same vigor and integrity that he exemplified throughout his life.

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List of Abbreviations

ABRAFAC - The Brazilian Facilities Association

AMV - Annual Minimum Wage

ANOVA - Analysis of Variance

BAS - Building Automation System

BIFM - British Institute of Facilities Management

BMS - Building Management System

FM - Facility or Facilities Management

HFMS - Hungarian Facility Management Society

IFMA - International Facility Management Association

ISO - International Standard Organization

IWFM - The Institute of Workplace and Facilities Management

MEFMA - Middle East Facility Management Association

O & M - Operations and Maintenance

RSF - Rentable Square Feet

SAFMA - South African Facilities Management Association

Chapter 1: Introduction

1.1 Overview

With a history spanning over four decades, the Facilities Management (FM) profession has witnessed significant milestones, exemplified by the establishment of global and regional associations such as the International Facility Management Association (IFMA) - the world's largest and most recognized association in this field; IWFM (The Institute of Workplace and Facilities Management) -1993; ABRAFAC (The Brazilian Facilities Association) -2004; HFMS (Hungarian Facility Management Society) – 2005; GlobalFM - 2006; MEFMA (Middle East Facility Management Association) - 2009; SAFMA (South African Facilities Management Association) - 2013 etc. These milestones encompass the continuous standardization of practices, formalized training programs, substantial growth in compensation packages, and the global expansion and acknowledgment of FM.

Despite these advancements, FM's global footprint exhibits significant disparities. In many regions, the profession is either in its nascent stages or remains largely unrecognized. This uneven global landscape of FM is evident in the workforce composition, practices, and compensation. Even with the widespread provision of facility management services (maintenance, janitorial services, waste management, groundskeeping, security, etc.) the term "FM" or "Facility Management" does not appear to be as established as the services it encompasses - in their research, Tay & Ooi (2001) opined that FM suffers from identity crises.

A study by Sullivan et al., (2010) on the state of the FM profession in the US revealed that only 26.8% specifically sought FM as a career path. This finding highlights the accounts of numerous FM professionals who stumbled upon the industry by chance and did not initially set out to pursue careers in this field.

The global disparity in FM's recognition and development consequently creates a research gap in the comparative performance and status of the FM profession across different nations. This research aims to fill this gap by comparing, unifying, and developing standardized benchmarks for FM practices in underrepresented countries while simultaneously analyzing key performance indicators in countries where FM has advanced significantly.

Finch (1992) accentuated the critical role of benchmarking, particularly for global organizations with widespread property holdings. They pointed out that such organizations rely heavily on benchmarks and performance indicators as essential tools for assessing and enhancing the operational effectiveness of their buildings. This emphasis on benchmarking is seen as vital for maintaining control over the efficiency of building operations across diverse geographical locations. In their study, Dodd et al. (2022), examined the state of benchmarking practices in FM and noted that these practices, though quite widely adopted, lacked depth and strategic alignment within organizational frameworks. The belief is that this situation arises from the dependence on self-reported data, without the backing of a specialized benchmarking team or the implementation of systematic benchmarking processes. This highlights the necessity for increased awareness and education regarding FM benchmarking. Sustained success will greatly contribute to the development and implementation of standardized benchmarks that are integrated into the strategic planning and operational processes of organizations, enhance the efficiency and effectiveness of FM practices, and elevate the role of FM within the broader organizational context, aligning it more closely with business objectives and long-term strategic goals – thereby making FM a vital component in organizational success, rather than a peripheral or support function.

Fadahunsi et al. (2019) conceptualized FM as an integral, multidisciplinary function within organizations, that blends aspects such as spatial management, infrastructure, workforce, and the overall dynamics of the organization. Facility managers are likened to 'property doctors,'

responsible for managing every aspect of a building, ensuring its continuous adjustment to technological advancements and overall extension of its lifecycle. With the occupancy phase of a building, accounting for a significant portion of a building's lifecycle, FM becomes an indispensable service to ensure the longevity of a building (*BUILDING OPERATIONS, MAINTENANCE & REPAIR ACTIVITIES*, n.d.). Finch's (1992) study highlights the strategic significance of FM in global competitiveness, where optimizing building resources is crucial for maintaining a competitive edge, particularly in industries with narrow profit margins. Furthering this perspective, Finch & Zhang (2013) emphasize the vital role of FM in harmonizing the intricate interplay of personnel, processes, and the physical workplace, pointing out its importance in organizational effectiveness (Figure 1.1).

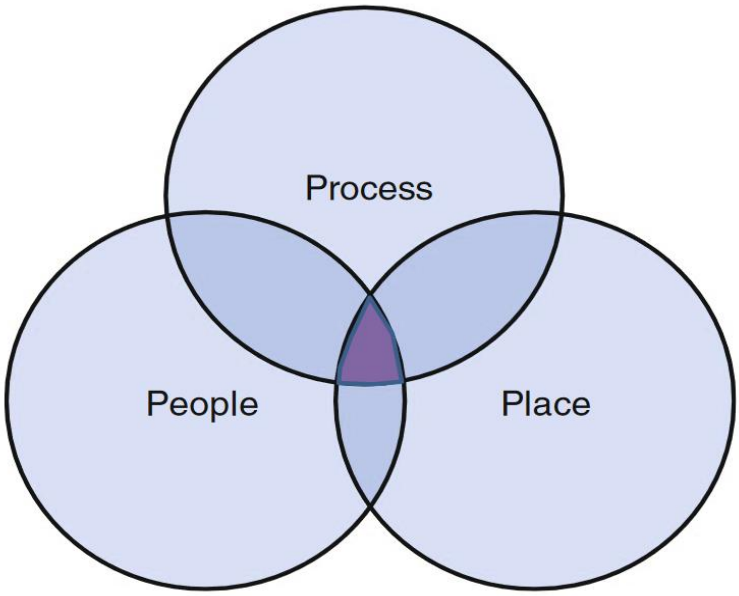

Figure 1.1 - The facilities management triumvirate (Finch & Zhang, 2013)

Litvin (2022) highlights that the fundamental goal of FM is to optimize support processes, minimize operational expenses, and boost the efficiency of primary business activities. Echoing

this perspective, Zawawi et al. (2016) states that FM involves a consistent process of delivering services that are geared towards bolstering the core business of the owner, with an emphasis on continual enhancement . As time has evolved, the role of facilities managers has progressed to encompass a strategic approach to maintaining, improving, and adapting buildings and support services to align with organizational objectives (Okoro & Musonda, 2019).

1.2 Purpose of Study

The scope of existing research on FM practices is often confined to specific countries or regions, leaving a gap in a global understanding of the field. This study aims to bridge this gap by providing a global perspective on FM practices and salary structures across multiple regions.

The primary goal of this research is to conduct a ***comparative analysis of FM performance indicators*** in selected countries across North America, Europe, Africa, and Asia. By examining these diverse geographical areas, the study seeks to uncover regional differences and similarities in FM practices, thereby contributing to a better understanding of the global FM landscape. This comparative approach is crucial for identifying the best practices and areas for improvement in FM across different cultural and economic contexts.

The findings of this research are expected to be of significant value to a wide range of stakeholders; global, national, and state-level FM associations can utilize these insights to inform policy decisions and strategic initiatives aimed at advancing the FM profession. For FM employers operating internationally, this study will provide benchmarking data for comparing and enhancing their practices, offering insights into compensation structures, operational practices, and workforce dynamics. Additionally, institutions of higher learning will gain insights into the potential of FM as a career choice, possibly leading to an increased inclusion in academic curricula and contributing to the profession's growth and development.

1.3 Scope and Objectives

This study focuses on four continents — Africa, Asia, Europe, and North America. The research spans 15 countries within these continents, including Botswana, Egypt, Ghana, Nigeria, and South Africa in Africa; China, Hong Kong, India, and Singapore in Asia; Hungary, Netherlands, Poland, and Switzerland in Europe; Canada, and the United States in North America. The selected countries represent diverse regions, attempting a broad perspective on FM practices and compensations across different cultural and economic landscapes.

The research objectives are designed to assess FM practices in a global context, focusing on:

a. Assessing operations and maintenance practices and associated costs in selected countries across Africa, Asia, and North America.
b. Evaluating energy management and sustainability practices in selected countries across Africa, Asia, and North America.
c. Evaluating the salaries and compensation structures of FM professionals in selected countries across Africa, Asia, Europe, and North America.

Based on the research objectives, three research questions were designed to guide the study.

- *Research Question 1 (RQ1):* How do operations and maintenance (O & M) practices and their associated costs compare across selected countries in Africa, Asia, and North America?
- *Research Question 2 (RQ2):* What are the prevailing energy management and sustainability practices among FM professionals in selected countries across Africa, Asia, and North America?
- *Research Question 3 (RQ3):* How do salaries and compensation structures for FM professionals vary across selected countries in Africa, Asia, Europe, and North America?

1.4 Research Hypotheses

Hypothesis statements, ***H1*** was developed to correspond with ***RQ1***, which explores the differences in operation and maintenance costs across regions; and ***H2***, corresponding with ***RQ3***, explores the variation in salaries and compensation structures across regions. These hypotheses aim to determine the extent to which there are significant differences in costs/salaries and regions. RQ2 investigates the types of energy management practices used across regions, sustainability programs deployed, green certification status per region, and examining the frequency of recycling programs prevalent in each region. This analysis (energy management, sustainability programs, and O & M practices) relies on descriptive statistics, rendering the formulation of a hypothesis unnecessary to derive conclusions.

Hypothesis 1:

Null Hypothesis (H_0) – There are no statistically significant differences in operations and maintenance costs in FM across Africa, Asia, and North America.

Alternate Hypothesis (H_1) - There are statistically significant differences in operations and maintenance costs in FM across Africa, Asia, and North America.

Hypothesis 2:

Null Hypothesis (H_0) – The compensation structures for FM professionals show no statistically significant variations across Africa, Asia, Europe, and North America.

Alternate Hypothesis (H_1) - The compensation structures for FM professionals show statistically significant variations across Africa, Asia, Europe, and North America.

1.5 Organization of Thesis

This thesis is organized into five chapters, each serving a distinct purpose in the progression of the research.

Chapter 1: Introduction - This chapter provides an overview of the research, the background and significance of the study. It outlines the primary purpose, scope and objectives. Additionally, this chapter outlines the research hypotheses, establishing the research questions that guide the study.

Chapter 2: Literature Review - In this chapter, a literature review is conducted. It looks at the historical evolution of the FM profession, and how it has developed over time. It also reviews standardized FM practices, energy management and sustainability practices within FM and salary structures in FM.

Chapter 3: Research Methodology - This chapter details the research strategy, outlining the methods used for data collection and analysis. It explains the rationale behind the chosen methodology.

Chapter 4: Data Analysis and Results - This chapter presents the findings of the study. It employs both statistical and descriptive analysis techniques to interpret the data, providing a clear and detailed presentation of the results.

Chapter 5: Discussion and Conclusion - The final chapter synthesizes the entire study, discussing the results and drawing conclusions based on the research findings. It provides a summary of the key insights and implications of the study. This chapter also discusses the limitations of the research, suggesting recommendations for future study.

Chapter 2: Literature Review

2.1 Facility Management Defined

Facility or Facilities Management (FM) is defined by IFMA (2023) and ISO (2023) as *"an organizational function that combines people, place, and process with the physical environment, with the objective of enhancing the quality of life and the core business efficiency."* Similarly, IBM (2024) defined it as "*the tools and services that support the functionality, safety, and sustainability of buildings, grounds, infrastructure, and real estate."*

Both definitions confirm that the profession has transcended its early perception as a mere maintenance department with its initial role as a mere custodian of bricks and mortar to becoming a multifaceted discipline woven into the very fabric of organizational success. This dynamic evolution is a testament to its adaptability and relevance in today's ever-shifting business landscape. This journey began with managing change in the face of building obsolescence, driven by both functional and technological revolutions (Finch, 1992). In its earliest form, FM was demonstrated in the management of public facilities like housing, schools, and hospitals, primarily under the control of governments as seen in Table 2.1. These activities, encompassing construction and upkeep, laid the foundation for what we now recognize as "maintenance and modernization," an early stage of the profession we know today (Quah, 1992). The evolution of FM over the years has been shaped by technological advancements, changes in legal and governmental requirements, an increase in outsourcing practices, the growth of the FM profession, and the involvement of private sector companies in public sector projects (Meng, 2015) – see Table 2.2

Tracing the legacy of FM is crucial for understanding its current prominence in the service industry especially as it is characterized by its multifaceted nature, appearing to be a convergence point for individuals from diverse disciplinary backgrounds - Tay & Ooi (2001) rightly described the profession as a *"Jack of all trades"* due to its diverse outlook.

Table 2.1 - Chronology of Events: Office of Facilities Management: A Historic Preservation (Nor et al., n.d.)

Year	Historic Event	Remarks
1811	*In 1811, the first domiciliary and medical facility for veterans was authorized by the Federal Government.*	*The word "Facility" was introduced. Space & People Services initiated. The "NEED" for facility management arises.*
1930	*Congress established the Veterans Administration on July 21, 1930, to "consolidate and coordinate government activities affecting war veterans." The VA experienced enormous growth near the end of World War II with the return of some 16 million veterans and the passing of the GI Bill and education and housing benefits.*	*All these require some sort of property Management but to this date the word "Facility Management" has still not been used. It's only implied through practice.*
1986	*In 1986, the Administrator announced his decision to place all facility-related programs into an independent organization by realigning the Department of Medicine and Surgery's Facilities Engineering, Planning, and Construction Office and the Office of Construction into the new Office of Facilities.*	*The first formal introduction of the term "Office of Facilities"*

Table 2.2 - Evolution of FM - A chronology of how FM has transformed (adapted from Alexander, 2009)

Period	Generation of FM	Activity	Level
1970s	1st	*Managed services, outsourcing, total facilities management, CAFM Operational*	*Operational*
1980s	2nd	*Quality management, management agency, benchmarking, FM process, FMIS*	*Tactical*
1990s	3rd	*Partnering, re-engineering processes, knowledge management, product innovation, sustainable facilities management*	*Strategic*
2000s	4th	*Business processes, open innovation, usability, service excellence outsourcing*	*Transformation*
2010 till date**	5th	*Process Automation e.g. introduction of robotic process automation (RPA) for repetitive tasks, Implementation of IoT (Internet of Things), AI-powered predictive maintenance systems, Smart building automation systems for energy efficiency and occupant comfort, Utilization of AI-driven algorithms for space utilization analysis and optimization, Implementation of digital twin technology for virtual simulation and management*	*Digital and AI*

***Represents an addition to the original author's table / findings*

This remarkable evolution is captured by Barrett & Baldry (2009), who defines FM as a holistic approach that seamlessly integrates building and service management with primary organizational goals. This integration fosters an environment that not only facilitates core operations but also serves as a springboard for continuous improvement.

Beyond mere upkeep, Baaki et al. (2016) emphasize FM's crucial role in bridging the gap between diverse service offerings and organizational objectives, imbuing each interaction with intrinsic value. Alexander (1994) adds another layer to this, characterizing FM as a business discipline dedicated to ensuring user needs are met within specific business contexts. This necessitates a balancing act between fulfilling organizational demands and providing the necessary facilities to drive effective operation.

In its contemporary form, FM embraces its collaborative nature, forging strategic partnerships to deliver high-quality services (Alexander, 1994). This market-driven landscape positions FM (though a cost-center) as a profit center, cultivating relationships that foster service development, continuous improvement, and maximizing value for money. Moreover, it compels FM to operate with a constant eye on cost reduction, ensuring organizational competitiveness in a volatile market characterized by rising costs (Dodd et al., 2018)

Tucker (2013) paints a picture of modern FM as the meticulous integration of non-core services, including those related to the premises, with the sole purpose of bolstering an organization's core objectives. This aligns seamlessly with the Institute of Workplace and Facilities Management (IWFM)'s definition, which views FM as the strategic orchestration of processes within an organization to maintain and develop services that amplify the effectiveness of its primary goals (*What Is Workplace and Facilities Management?*, n.d.). Echoing this definition, the International Facility Management Association (IFMA), the foremost global organization in the field, defines FM as a multi-faceted profession that leverages people, place, process, and

technology to ensure the optimal functionality of the built environment (IFMA, 2013). This holistic approach highlights the growing significance of FM in today's business landscape, particularly in its ability to provide organizations with strategic agility and enhanced value, especially in dynamic economic climates. Alexander (1992) articulates this shift, noting that organizations seeking a competitive edge are increasingly focusing on their core areas while recognizing the strategic necessity of their facilities. The success of FM, therefore, hinges on its ability to directly support business operations through effective facilities planning, high-quality service delivery, and robust management systems, regardless of whether these are internal or outsourced.

As FM transforms into a well-defined business sector, diverse firms, ranging from construction and property management to engineering services and catering, are positioning themselves to capitalize on the increasing opportunities within the FM sector. This shift, as Price & Akhlaghi (1999) observe, serves as an indication to the expanding scope and vital importance of FM across various industries and sectors.

Today's facility managers are no longer relegated to backstage tasks; they wield data, technology, and a deep understanding of organizational needs to actively shape the physical and functional spaces that empower organizational success. Their expertise ensures not only a cost-effective operating environment but also a dynamic and responsive ecosystem that fuels innovation and drives business growth. It signifies FM's metamorphosis from a fledgling field into a cornerstone of organizational strategy and operational effectiveness. Figure 2.1 provides an overview of the scope of FM services.

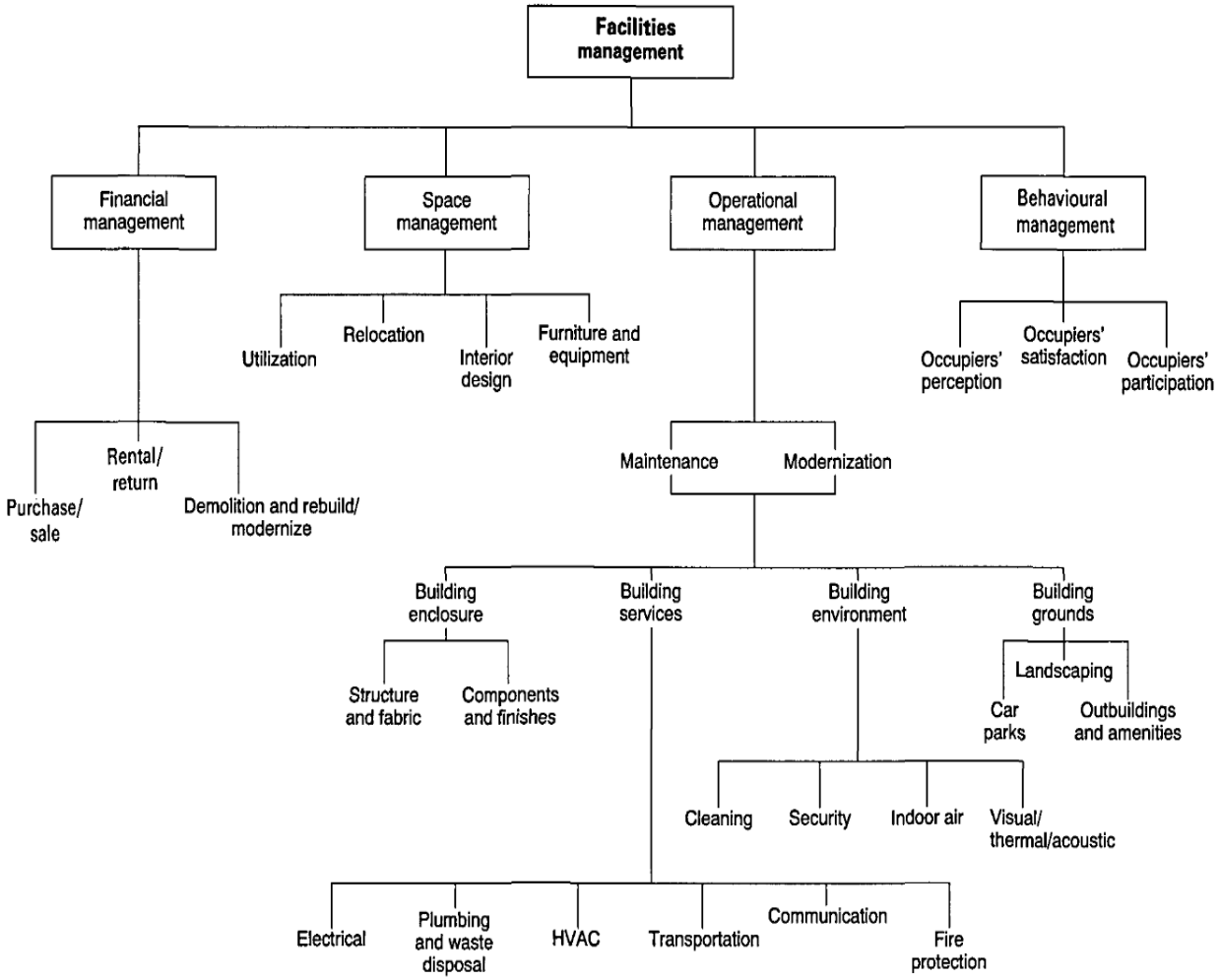

Figure 2.1: An Overview of the scope of facilities management activities (Quah, 1992)

2.2 FM in Developed and Developing Countries.

The classification of nations into advanced and less developed categories is a framework employed to evaluate and distinguish countries based on a range of socio-economic indicators. This delineation hinges on an evaluation of socio-economic criteria, encompassing factors such as gross domestic product (GDP), minimum wage, technological infrastructure, social services, and overall standard of living. Developed nations typically demonstrate a higher degree of economic prosperity, technological advancement, infrastructure development, and a well-established social welfare system. Conversely, developing nations may exhibit lower levels of economic stability, limited access to advanced technologies, and may face challenges in providing essential services to their populations, such as access to education, healthcare, and adequate living standards (United Nations, n.d.). This classification system serves as a valuable tool for global policymakers and analysts to comprehend and address the varying needs and challenges faced by countries at different stages of development. A 2014 report by the United Nations (World Economic Situation and Prospects) grouped countries of the world in three major categories; developed economies (e.g., Canada, United States, United Kingdom, Hungary, Netherlands, Poland, Switzerland, Japan etc.), Economies in Transition (Albania, Armenia, Belarus, Georgia, Russia, Ukraine etc.), and Developing Economies (Botswana, Egypt, Ghana, Nigeria, and South Africa, China, Hong Kong, India etc.).

The FM profession, while relatively new on the global stage, has experienced varied levels of development and establishment across different countries. In over three decades, FM's growth trajectory has been notably diverse between developed and developing nations (Baaki et al., 2016). Alexander (1994) noted that the spread of FM to both developed and developing countries has been driven by the need for business rationalization, cost reduction, and improved flexibility, further intensified by economic recessions. The development of professional qualifications and

dedicated education and training has supplemented the respect for individuals with specialized skills in coordinating diverse activities. IWFM alone with a network comprising over 78 organizations focused on FM, is fostering an exchange of information and experience – with the primary mission of advancing knowledge in FM in Europe through practice, education, and research, it has further solidified the profession's standing (Alexander, 2009).

Facility Management in developed and developing countries reflects the broader economic and infrastructural disparities between these two categories of nations - Sari (2018) noted that the practice of FM in developed countries like the USA and Europe differs significantly from that in developing countries in Asia and Africa. These differences include the quality of services, the number of FM standards in existence, and the volume of research published. However, similarities, such as financial constraints and challenges in implementing integrated FM exist across all regions. These shared challenges highlight the potential for knowledge transfer and collaborative approaches between developed and developing countries.

In developed countries, FM is often characterized by the use of advanced technologies, adherence to stringent environmental and safety standards, and a focus on sustainability and efficiency. Facilities in developed countries frequently incorporate smart technologies, energy-efficient systems, and sustainable practices. The FM industry in these countries is typically well-established, with a high degree of professionalism and a wide range of services offered. The FM professionals in these regions are also more versed in the latest technological advancements, regulatory compliance, and best practices in sustainability. Baaki et al., (2016) highlighted that countries such as the UK, US, Japan, Singapore, and Australia, FM has evolved into a robust sector noting that these nations have successfully established comprehensive FM practices, integrating advanced methodologies and technologies. Sari, (2018) observes that in Europe, the UK was the first country to experience growth in FM practices. The FM sector reportedly contributes over $1.0

billion yearly in the UK (Value Judgement, 2017). In both the USA and Europe, FM practices have broadened to include real estate development and building usage in both short and long-term perspectives (Sari, 2018; Finch 1992)

The growth of FM in these developed countries can be attributed to the constant development of complex infrastructures, the integration of advanced technologies in building management, the rapid advancement of technology, particularly in areas like building automation, energy efficiency, and smart systems, has significantly transformed FM, making it more efficient, data-driven, and responsive to the dynamic needs of modern infrastructures. As these nations continue to expand and modernize their infrastructural landscape, the demand for sophisticated FM services that can effectively manage these complex systems rises.

In contrast, FM in developing countries seem to still be at its nascent stage in countries such as Nigeria, Ghana, Botswana, Malaysia etc. While the sector is growing, it may face challenges such as limited access to cutting-edge technology, fewer resources for training and professional development, and less stringent regulatory environments. Syed Mustapa & Jusoff, (2009) observed that FM in Malaysia is still growing, noting that the growth of FM is highly likely dependent on the full maturity of the property management industry. Similarly, in Korea, FM is a relatively new term, with a survey by the Ministry of Industry and Trade revealing that only a small percentage of respondents were familiar with FM concepts. In developing countries, FM services may focus more on basic maintenance and operational efficiency, with a growing interest in adopting sustainable practices as resources allow. The industry in these regions presents unique opportunities for growth and innovation, often requiring FM professionals to be adaptable, resourceful, and proactive in addressing the specific challenges of their environments.

This global overview of FM practices highlights the varying stages of development and challenges faced by the FM profession across different regions. Overall, the practice of FM in

developed and developing countries mirrors the broader economic and infrastructural realities of these regions. While developed countries have advanced FM practices and pushing the boundaries of innovation and sustainability in FM, developing countries are still navigating the early stages of FM offering opportunities for growth, potential, and prospects for the FM industry.

2.3 Benchmarking in Facility Management

Benchmarking, a systematic process of comparing business processes and performance metrics, has become an essential tool in modern management and has evolved into a common and widely accepted practice in the business world (Mahmoud M. Yasin, 2002). It involves evaluating the industry's best practices and measuring an organization's strategies, operations, and performance against these standards. Wauters (2005) explained benchmarking as the process of comparing an organization's practices and processes with those of a best practice peer group with the goal of adopting similar approaches to enhance performance and organizational value. They noted that selecting an appropriate peer group is crucial for successful benchmarking. The primary goal is to identify areas where improvements can be made, fostering a culture of continuous improvement and competitive excellence. Beyond mere comparison, it is about understanding the underlying processes and practices that lead to superior performance - this involves analyzing how leading organizations achieve high performance, then adapting and implementing these methods to fit another organization's unique context and challenges. Benchmarking can be applied to various aspects of an organization, including operations, products, services, and overall strategies.

In their report, Smithwick & Ubi, (2023) and Yasin, (2002) classified benchmarking types into internal, competitive, and functional/process/(generic benchmarking). Benchmarking is not a one-time activity but an ongoing process. It requires regular monitoring and updating of benchmarks to ensure they remain relevant in a rapidly changing business environment. Dodd

(2021) noted that continuous improvement is crucial for achieving long-term sustainability goals and maintaining high performance in a swiftly evolving and competitive environment. Effective benchmarking also demands a commitment to learning and adapting, as well as a willingness to embrace change to achieve and maintain industry leadership, therefore, care should be taken to ensure that benchmarking is not confused with performance measurement (Wauters, 2005).

In FM, benchmarking plays a pivotal role in driving operational excellence and strategic alignment. With FM encompassing a wide range of activities, from maintenance, janitorial and space management to sustainability and safety etc., benchmarking in FM may entail comparing these activities against industry with the best practices to identify areas for improvement and innovation or also comparing a practice with another. In their study, Adewunmi_et al. (2017) explained that the essence and success of benchmarking depend on the specific aspects and the entities you compare it with. Comparing FM departments across different sectors or within the same sector constitutes competitive benchmarking. Comparisons within the same organization are internal benchmarking, while comparing with entities outside FM's scope is functional or general benchmarking. The process begins with defining specific FM functions and services to be benchmarked - this could include energy efficiency, maintenance costs, space utilization, or customer satisfaction. FM professionals then identify relevant benchmarks, which could be industry standards, best practices of leading organizations, or performance metrics of direct competitors. The insights gained inform the development of action plans to close performance gaps.

Facility managers are increasingly becoming champions of change in their organizations, involving activities such as space management revisions, construction delivery practices, maintenance programs, technology implementations, and more (Kasana et al., 2023), positioning them as notable stakeholders in FM benchmarking. One of the key benefits of benchmarking in

FM is the ability to make informed decisions based on data-driven insights. It allows FM professionals to prioritize resources and efforts on areas that will have the most significant impact on performance and value creation. Additionally, benchmarking can reveal innovative practices and technologies that can be adopted to enhance the efficiency and effectiveness of FM operations.

However, benchmarking in FM also presents unique challenges. Adewunmi et al., (2017) noted some of them to include employee resistance to change, poor knowledge of the process, challenges in accessing data from other organizations, and improper execution and planning. The diverse nature of facilities and the specific requirements of different organizations mean that benchmarks must be carefully selected and adapted to be truly relevant and useful. Moreover, the rapidly evolving nature of FM, driven by technological advancements and changing regulatory landscapes, requires continuous monitoring and updating of benchmarks.

2.4 Standardized Practices in Facility Management

Standardized practices in FM are pivotal in distinguishing well-managed facilities from mere support services. Alexander (1992) noted that the ultimate measure of service quality in FM is user satisfaction. This criterion challenges FM professionals to deliver services that users would actively choose, even in the presence of alternative options. In addition to user's satisfaction, commitment to standardization and effective facilities and property management tend to be recognized by national agencies, (e.g., the Glasgow Development Agency in the UK), (Alexander, 1994), hence, a facility manager should endeavor to maintain high standards of service and actively pursue certifications or acknowledgments that can validate their commitment to quality and efficiency in FM. This recognition not only enhances the reputation of the facility but also contributes to the broader goals of sustainable and responsible property management.

With the job of a facility manager requiring wearing multiple hats at the same time, Alexander (1992) highlighted that the complex nature of a facility manager's role, which often entails simultaneously managing diverse aspects of facility operations can present significant challenges in maintaining a uniform standard of service delivery, particularly at the client-contractor interface. The workings involved in balancing client expectations with contractor capabilities, while ensuring service quality and adherence to standards, highlight the demanding and dynamic nature of the facility manager's position. This complexity is further amplified by the need to navigate varying requirements and expectations across different projects and stakeholders.

Zawawi et al. (2016) highlight that there is no one-size-fits-all approach to managing facilities. Every organization, even those operating within the same industry sector, possesses its own set of distinct needs and requirements. Recognizing and comprehending these unique needs is a critical component for effective facilities management. The success of FM is fundamentally gauged by its ability to deliver optimal value, which involves tailoring services and strategies to meet the specific demands and objectives of each organization. This approach ensures that FM not only addresses the immediate operational requirements but also contributes to the overall strategic goals and long-term success of the organization. While there is no singular, universal method for managing facilities, the concept of standardization remains crucial in FM, just as it is in other industries. This is particularly pertinent in light of Zawawi et al. (2016) findings, which highlight a widespread lack of awareness within the FM industry about the importance of implementing standard practices. Standard practices in FM therefore serve as a crucial reference point, providing guidelines for FM professionals towards more effective and efficient management strategies.

In their effort to contribute to the standardization of practices in FM, Zawawi et al., (2016) outlined seven key maintenance strategies: Predictive Maintenance, Preventive Maintenance, Improvement Maintenance, Corrective Maintenance, and Breakdown or Emergency Maintenance.

In a similar vein, Smithwick (2017), in the IFMA Operations and Maintenance Report, delineates five distinct categories of building maintenance: External Building Maintenance, Interior Systems Maintenance, Roads and Grounds, Utility System Maintenance, and Process Treatment Maintenance. While Zawawi et al.'s classification focuses on the types of maintenance activities for a specific facility, Smithwick's approach segments a facility into various maintenance areas. Both categorizations are instrumental for benchmarking, allowing for a comprehensive analysis of maintenance costs, such as comparing expenses in preventive versus corrective maintenance or evaluating the cost differences between external and internal building maintenance.

It is imperative for FM professionals to conduct a thorough evaluation of existing practices and to formulate robust strategies. These strategies should not only address immediate operational needs but also be in harmony with the broader strategic objectives of the organization. This ensures that FM practices contribute significantly to the overall business plan, enhancing both operational efficiency and strategic coherence.

Despite FM increasing prominence, there is still a notable gap in recognition and uniformity of its roles and responsibilities, as observed by Nor et al. (n.d.). Considering this, this study aims to shed light on some of the essential services that Facility Managers provide, highlighting their importance and scope within the industry. A quick review of facilities related job postings identified some of the common job functions facility managers perform:

a. Operations and Maintenance (O&M): O&M in FM involves the day-to-day activities necessary to keep a facility functioning efficiently. This includes routine maintenance of systems and equipment, repairs, and ensuring that all aspects of the facility are operating as intended. O&M aims to prolong the life of facility assets, reduce downtime, and ensure a safe and comfortable environment for occupants.

b. Janitorial Services: This encompasses the cleaning and upkeep of facilities to maintain a hygiene and tidy environment. This service includes regular cleaning tasks, waste disposal, sanitization, and special cleaning projects. The goal is to provide a clean and healthy environment for employees and visitors, which is crucial for productivity and well-being.

c. Inventory and Asset Management: This involves tracking and managing all the assets within a facility, including equipment, furniture, and supplies etc. This service ensures that assets are properly maintained, accounted for, and utilized efficiently. It involves inventory control, asset tagging, lifecycle management, and planning for future asset needs.

d. Workplace Management: Workplace Management focuses on optimizing the physical workspace to enhance employee productivity and satisfaction. This includes designing and arranging workspaces to meet the needs of different teams, managing office layouts, and ensuring that the work environment is conducive to productivity and collaboration.

e. Space and Occupancy Management: Space and Occupancy Management involves the strategic planning and utilization of space within a facility. This service ensures that space is used efficiently and effectively, accommodating changes in staffing levels, team structures, and organizational needs. It includes space planning, allocation, and optimization to maximize the use of available space.

f. Energy and Sustainability Management: Energy and Sustainability Management in FM focuses on reducing energy consumption and promoting sustainable practices within a facility. This includes implementing energy-efficient technologies, monitoring energy usage, and developing sustainability initiatives. The goal is to minimize the environmental impact of the facility while reducing operational costs.

g. Facility Condition Assessment (FCA): FCA is a comprehensive evaluation of the condition of a facility's infrastructure and systems. It involves inspecting and assessing the state of

the building, identifying areas that require maintenance or upgrades, and planning for future improvements. FCA helps in prioritizing maintenance activities and budgeting for repairs and renovations (Hillestad et al., 2022).

h. Safety and Security: These services in FM ensure the protection, security and safety of the facility, its occupants, and assets. This includes implementing security measures, monitoring security systems, and ensuring compliance with safety regulations.

i. Vendor Management: This involves overseeing and coordinating external service providers and suppliers. This service ensures that vendors meet contractual obligations, deliver quality services, and provide value for money. It includes negotiating contracts, managing relationships, and evaluating vendor performance.

j. Emergency Response and Preparedness: This involves planning and implementing procedures to respond to emergencies such as fires, natural disasters, or security threats. This service ensures that the facility is prepared for emergencies, with plans for evacuation, emergency communication, and recovery. The goal is to minimize risk and ensure the safety of occupants during emergency situations.

These services reflect some of the roles of FM in supporting and enhancing the functionality of organizational environments.

2.5 Sustainability and Energy Management Practices

Sustainability and energy management have become increasingly critical in today's world, driven by environmental concerns, economic pressures, and societal shifts towards greener practices. These practices encompass a broad range of activities and strategies aimed at reducing environmental impact, optimizing energy use, ensuring long-term ecological balance, and marking a significant shift in the architectural and construction industries. As Finch & Zhang (2013)

highlight, this shift is not just about integrating sustainable principles into the design of new buildings but also about applying retrofit solutions throughout the building's lifecycle. This approach to sustainability in the built environment reflects a growing global consciousness about the importance of sustainable practices. Sari (2018) noted that FM, traditionally focused on building operation and maintenance, has expanded to include energy management and sustainability. The inefficiency in building operation and maintenance leading to higher energy consumption and CO2 emissions highlights the importance of integrating all components of the built environment, including people, processes, places, and technology, to optimize the system's performance.

At its core, sustainability involves practices that meet current needs without compromising the ability of future generations to meet their own. This involves careful consideration of resource use, waste management, and minimizing ecological footprints. In the business context, sustainability practices can range from implementing social and environmental programs e.g. recycling programs and reducing waste, minimizing carbon emissions aimed at improving the overall business performance and goal, see Figure 2.2. This is supported by Elmualim et al. (2010) who identified waste management, energy management, and carbon footprint as the main FM services prioritized in organizations' sustainability policies, noting that facilities managers play a crucial role in managing various aspects such as energy, water, waste, air quality, sustainable travel, maintenance, purchasing, and social sustainability. In a similar vein, IFMA (2011) urged facility managers who have yet to adopt sustainable practices to begin taking steps towards reducing energy consumption, waste, and collaborating closely with end-users to optimize these sustainability efforts.

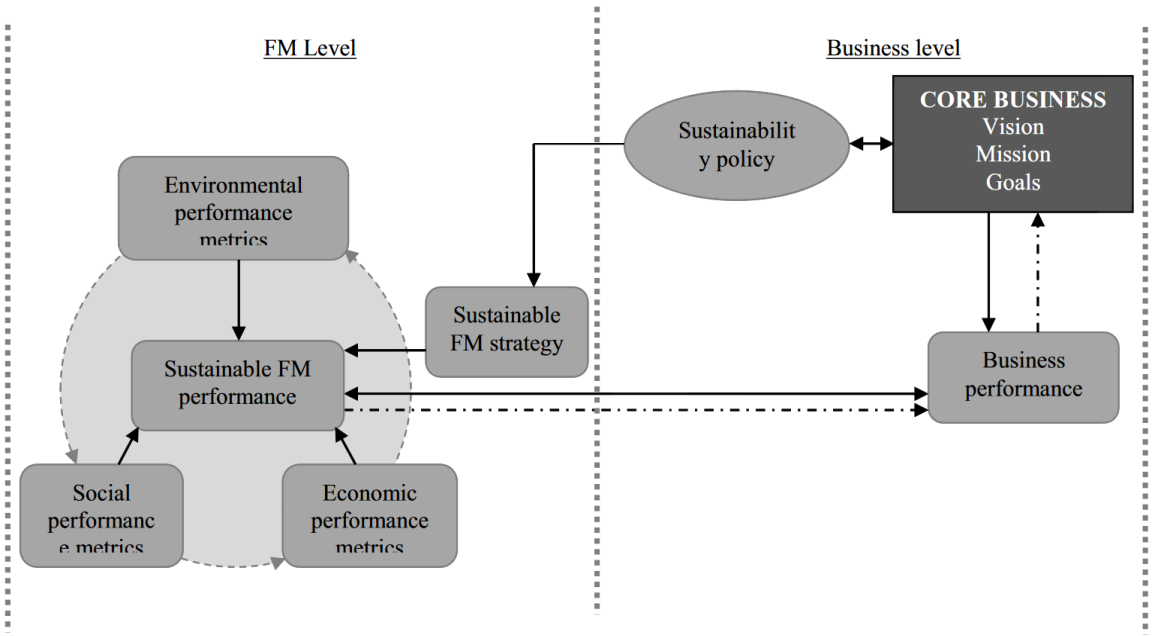

Figure 2.2 - Linking SFM performance with organizational core business conceptual framework (Baaki et al., 2016)

Energy management on the other hand is a key pillar of sustainability, focusing on the efficient use of energy to reduce costs and environmental impact. This includes practices like using renewable energy sources, improving insulation, building design to reduce energy consumption, and implementing energy-efficient appliances and systems. Energy management not only contributes to sustainability goals but also offers economic benefits through cost savings.

In FM, sustainability and energy management take on a specific and crucial role. FM professionals are key in influencing the sustainability and energy efficiency of buildings and facilities, which are significant consumers of energy and resources. Elmualim et al. (2010) highlighted the necessity for practical tools in sustainable FM noting the significant role that facility managers have in leading and advocating for sustainability initiatives within their organizations. In recent times, many stakeholders in the FM industry are now highlighting sustainability as a key competency area for FM professionals, reflecting the growing importance

of integrating FM functions with sustainability, addressing the environmental impact of buildings and the technical knowledge required for managing buildings (Baaki et al., 2016).

Integrating sustainability into FM requires a comprehensive approach that encompasses the environmental, economic, and social impacts of managing buildings and facilities. This holistic strategy spans the entire lifecycle of a facility, from its initial design and construction, through its daily operations, to its eventual decommissioning. Baaki et al. (2016) however, noted that sustainable FM does not necessitate entirely new functions for facility managers, but only the integration of environmental, economic, and social sustainability considerations into the existing scope of FM activities. This integration could involve the use of eco-friendly materials during construction, the implementation of effective waste management systems, and the maintenance of high indoor environmental quality to ensure the health and well-being of occupants. Similarly, the integration of energy management practices within FM focuses on optimizing the energy use of buildings and facilities. This can be achieved through various strategies such as implementing building automation systems for better control of heating, ventilation, and air conditioning (HVAC) systems, using energy-efficient lighting, and encouraging behaviors that reduce energy consumption. Advanced technologies like IoT (Internet of Things) sensors and AI (Artificial Intelligence) can also be employed for smarter energy management.

Researchers hold varied opinions on the drivers for sustainable FM; Elmualim et al. (2010) found that legislative requirements, the desire to enhance corporate image, and the ethos of the organization as the primary drivers; (Baaki et al., 2016) noted that the challenges of climate change and the environmental impact of built infrastructure are compelling organizations to adopt sustainability practices while Ikediashi et al. (2014) identified environmental, social and economic factors as the major drivers as detailed in Table 2.3. These findings collectively highlight the diverse yet interconnected reasons propelling the FM industry towards sustainable practices.

Table 2.3 - Drivers For Sustainable Facilities Management (Ikediashi et al., 2014) .

Category	Remark
Environmental	Reduction in energy consumption, Waste reduction, Increase productivity, Elimination of oil and air pollution, Sustainable urbanization, Reduction of deforestation, Reduction of carbon dioxide emissions.
Social	Enhance relation with stakeholders, Job creation for local communities, Government regulation corporate image, Pressure from clients, Pressure from senior management.
Economic	Financial gain, Investment drive, Life cycle cost reduction, Profitability, Remain competitive, Market expansion.

The benefits of incorporating sustainability and energy management practices in FM are manifold. They lead to reduced operational costs, enhanced reputation, compliance with regulations, and contribute to the fight against climate change. However, challenges such as initial investment costs, the need for specialized knowledge, and aligning these practices with organizational goals can pose hurdles. As awareness and technology continue to evolve, FM professionals will play a pivotal role in steering the built environment towards a more sustainable future, this is supported by Meng's, (2015) study which revealed that 80% of interviewees believed the FM industry is moving towards sustainability, with energy performance and waste management being key focuses.

The future of sustainability and energy management in FM looks towards greater integration of green technologies, smarter buildings, and a stronger emphasis on sustainability in all aspects of FM. Facilities managers are reimagining smarter office spaces that support inhabitants intelligently, promoting easier management, efficiency, productivity, (Fairchild, 2019) thereby, contributing to the overall global sustainability goals.

2.6 Salary and Compensation Structures

In Facility Management, just like many professions, salary and compensation structures are significantly influenced by the varying economic and social development stages of nations. This variation is not only a reflection of the economic health of a country but also mirrors the maturity and recognition of the given profession within that nation. In his study, Klaas, (2002) identified additional factors influencing compensation: the 'job' and the 'person.' He observed that traditional compensation systems primarily base pay grades on the job itself, often overlooking the individual value brought by the person performing the role. Conversely, in person-based pay systems, the individual's contributions and qualities become the main criteria for determining their pay.

Countries at different stages of development exhibit distinct patterns in FM compensation. In developed nations, where FM is often recognized as a strategic and integral part of business operations, salaries tend to be higher. This trend is illustrated in the The IFMA Global Salary and Compensation Report (Smithwick and Call, 2021), which shows that the average annual salary for facility managers in Nigeria is $38,000, compared to $79,754 in the Netherlands. This may be attributed to the advanced state of the FM industry, the complexity of tasks involved, and the higher cost of living. In these regions, FM professionals are typically expected to possess a higher level of expertise, particularly in areas like sustainability, technology integration, and strategic management, which are reflected in their compensation packages.

Conversely, in developing countries, where the FM industry may still be in its nascent stages, salaries are generally lower. This can be attributed to several factors, including the emerging state of the FM market, lower living costs, and less recognition and understanding of the FM role's strategic importance. In these regions, FM may still be viewed primarily as an operational or maintenance-focused role, rather than a strategic business function, which could impact the

compensation structures. The IFMA Global Salary and Compensation Report (2021), further reveals that salary levels vary widely across different global regions and increase with higher job responsibilities and levels, reflecting the diverse stages of FM industry development worldwide. While efforts are being made to bring uniformity in terms of practices and qualifications, the economic realities, and the varying degrees of professional recognition across countries pose significant challenges.

Furthermore, the compensation structures in FM are not only influenced by geographical location but also by factors such as the size and type of the organization, the complexity of the facilities managed, and the specific roles and responsibilities of the FM professionals. For instance, FM professionals working in large multinational corporations or managing complex facilities like hospitals or large campuses may command higher salaries compared to those working in smaller organizations or managing fewer complex facilities. The Report highlights that, while salary ranges across different FM job functions are generally similar, FM professionals whose primary job function is in Real Estate tend to have a higher base salary compared to those in other FM roles.

In addition to basic salaries, compensation structures in FM may also include various benefits such as health insurance, retirement plans, performance bonuses, and professional development opportunities. These benefits are often influenced by the standard practices within the country and the specific policies of the employing organization. A survey conducted by Smithwick & Ubi, (2023) in Poland revealed that a significant majority (89%) of facility managers were eligible for bonus payments, with the average bonus potential being around 31%, although this percentage varied by the job level.

As the FM profession continues to evolve globally, there is an increasing focus on aligning compensation structures with the value that FM professionals bring to an organization - linking

compensation with performance outcomes and the strategic impact of FM roles. In summary, salary and compensation structures in FM are influenced by a myriad of factors, including the stage of economic and social development of a country, the maturity of the FM market, the nature of the FM role, and the specific attributes of the employing organization. As the FM profession gains more recognition and becomes more standardized globally, it is likely that compensation structures will also become more uniform (subject to country's cost of living) and reflective of the strategic value that FM professionals bring to organizations.

Chapter 3: Research Methodology

3.1 Research Strategy

3.1.1 Survey Design

To collect detailed information from a broad and geographically diverse sample of over 100 individuals, the study adopted an electronic survey method. This approach was particularly suitable for collecting extensive data on the operations, maintenance, and salaries in the field of Facility Management. The choice of an electronic, self-administered survey was informed by its alignment with the quantitative nature of the research, allowing for a structured and systematic collection of data (Fink, 2003). Additionally, the method's suitability for confirmatory research, as noted by Rowley (2014) made it an ideal tool for this study. To ensure the relevance and accuracy of the survey questions, a committee consisting of IFMA volunteers, research staff, and IFMA's research department collaborated to out a meticulous review and refinement of questions used in previous surveys, tailoring them to meet the specific objectives of this study.

3.1.2 Pilot Study

Prior to the full deployment of the survey, a pilot test was conducted with a panel of Subject Matter Experts (SMEs) from each target region. This preliminary phase was crucial for validating the survey's design and content. It involved interviews with these SMEs, focusing on specific sections of the survey to facilitate the exchange of ideas and gather expert insights. Following these discussions, the SMEs independently reviewed the survey, providing feedback based on their expertise. The survey was then launched in a live environment for the SMEs, who filled it out and provided additional feedback based on their user experience. This iterative process of testing and refinement was instrumental in fine-tuning the survey before its broader release.

3.1.3 Data Collection

The survey was administered using the Qualtrics online platform, a choice driven by the need for wide geographical reach and the reduction of manual data entry errors. This digital approach enabled the participation of respondents from various locations, enhancing the diversity and representativeness of the data. Distribution channels included emails and LinkedIn, utilizing both IFMA's database and personal outreach to FM professionals. Notably, the survey for the African region was more concise, reflecting its inaugural implementation in this region, as opposed to the more extensive data collection conducted in other areas. To ensure the robustness and completeness of the data, key questions were made mandatory. The structure and outcomes of the survey are summarized in Table 3.1

Table 3.1: Data Source Background Information

Specifics	Africa (O&M)	Asia (O&M)	North America (O&M)	Global (Salary Data)
Pilot study	7 SMEs	12 SMEs	17 SMEs	6 SMEs
Survey Languages	English, French & Portuguese	English and Simplified Chinese	English	English
Target Industry	Facility Managers and related professionals	Facility Managers and related professionals	Facility Managers and related professionals	Facility Managers and related professionals
Regions	Targeted 52 countries, received responses from 28 countries	Targeted 48 countries, received responses from 8 countries	United States, Canada and Mexico	Targeted 44 countries, received responses from 11 countries
Participation Incentive	Free copy of the IFMA report	Free copy of the IFMA report	Free copy of the IFMA report	Free copy of the IFMA report
Responses Received	354	279	1,904	3,557
Survey Duration	January 2023 to May 2023	May 2021 to August 2021	April 2021 to August 2021	February 2021 to April 2021

Note: *The data in the 'Africa', 'Asia', and 'North America' columns are taken from benchmarking data for each region: Africa O&M Benchmarking Data, Asia O&M Benchmarking Data, and North America O&M Benchmarking Data, respectively. Meanwhile, the data in the 'Global' column is extracted from the Global Salary and Compensation Report.*

3.2 Data Preparation and Cleaning

Following data collection, the study progressed into the data preparation and cleaning phase. This involved downloading the various raw datasets from Qualtrics in an excel format. Thorough checks for accuracy and completeness were carried out to ensure the reliability of the dataset. This was aimed at identifying and rectifying any inconsistencies, errors, or missing information in the data. This phase was essential for ensuring the integrity of the research findings and preparing the dataset for detailed analysis.

3.2.1 Sampling

To achieve a balanced analysis, non-probability sampling was used. While the dataset collected by IFMA covered a broad range of countries and regions, the focus of this project was narrowed to a selection of 15 countries across four continents including Botswana, Egypt, Ghana, Nigeria, and South Africa from Africa; China, Hong Kong, India, and Singapore from Asia; Hungary, Netherlands, Poland, and Switzerland from Europe; and Canada and the United States from North America. The decision to limit the scope to these specific countries was driven by the need to maintain a manageable yet representative sample size that could yield meaningful insights. Each of these countries was chosen for its number of respondents, and its potential to provide diverse perspectives.

Unlike the African, Asian, and European regions, where the (repository) datasets ranged from 250 to 300 respondents, the North American region, encompassing Canada and the United States, presented a significantly larger dataset with over 1,500 respondents. To ensure a balanced comparison and avoid skewing the results due to this disparity, a purposive random sampling technique was employed for the North American data. This involved randomly selecting 307 respondents from the North America O&M Benchmarking Data and 270 from the Global Salary and Compensation Report to align the sample size more closely with those from the other regions. In total, there were 1,592 analyzed datapoint from all regions combined.

By adjusting the sample size for North America, the research provided a more equitable comparison across the continents, ensuring that the findings were not dominated by data from any single region. The purposive random sampling technique allowed for the inclusion of a diverse range of responses while maintaining the integrity and comparability of the data across different geographical contexts.

3.2.2 Multi-Region Data Compilation

In this research, the challenge of working with data collected from various times, regions, and under different parameters necessitated standardization. The goal was to bring a level of uniformity to the data, making it amenable for coherent analysis. To achieve this, Microsoft Excel was employed as the primary tool for organizing the collected data into a format suitable for analytical scrutiny.

A dedicated Excel file was created as the (new) repository for all responses sampled for this research. In this file, each response was carefully catalogued, a unique identification number was assigned to each respondent to streamline the tracking process and prevent any duplication of

responses. This methodical approach ensured that each data point could be accurately traced and verified, enhancing the reliability of the analysis.

3.3 Data Analysis

The data analysis phase included thorough verification of data and checks to ensure all variables and values were within acceptable ranges. Outliers that did not fit the expected patterns were either adjusted or excluded from the analysis. One of the critical aspects of the data standardization process involves adjusting various variables such as building age, maintenance costs, janitorial costs, and salaries to reflect current realities. This adjustment was crucial, especially considering the temporal differences in the data collection periods across different regions.

Given the global scope of the study, the cost data presented another layer of complexity due to its (cost) submission in various currencies by respondents from different geographical locations. To establish a consistent and comparable basis for analysis, all cost data was converted to the United States Dollars (USD). This conversion facilitated a uniform standard for cost comparison and allowed for a more straightforward interpretation of the financial aspects of the data. The conversion utilized the official exchange rates from the central, or reserve banks, as of the data collection dates as seen in Table 3.1 above. Considering the time difference in data collection, the United States Consumer Price Index (CPI) for January 2024 was applied to adjust the dollar-cost data for inflation across all currencies. While interpreting this data, users are encouraged to consider country-specific inflationary trends. See Appendix 1 for information on the currency conversion and inflation rates applied.

Two methods of data analysis were used: Descriptive Statistics and Inferential Statistics.

a. **Descriptive Statistics:** The descriptive analysis served as a foundation for understanding the basic trends and patterns in the data, summary overview of the data, frequency counts, mean, and cross-tabulations of responses. The presentation of data in absolute numbers, percentages, and mean averages was chosen to enhance the clarity and applicability of the research findings. Overall, as the sample size decreases (N) in many of the tables, the margin of error increases.

b. **Inferential Statistics (One-way Analysis of Variance, ANOVA):** This statistical technique was used to identify and analyze the variances between different groups and categories within the dataset. ANOVA was conducted at 95% confidence intervals to determine if statistically significant differences existed between the mean janitorial costs, maintenance costs and salaries across the selected groups. By applying ANOVA, the study aimed to find patterns and relationships that might not be immediately apparent through descriptive analysis alone. This method provided a framework for testing hypotheses on the relationships between different variables across various regions.

3.4 Methodological Design Summary

The survey design, pilot testing, data collection, preparation, cleaning, and analysis processes were all aligned to facilitate a comprehensive understanding of FM practices across different regions. The methodology was designed to capture a wide range of perspectives and provide a foundation for the study's findings in Figure 3.1.

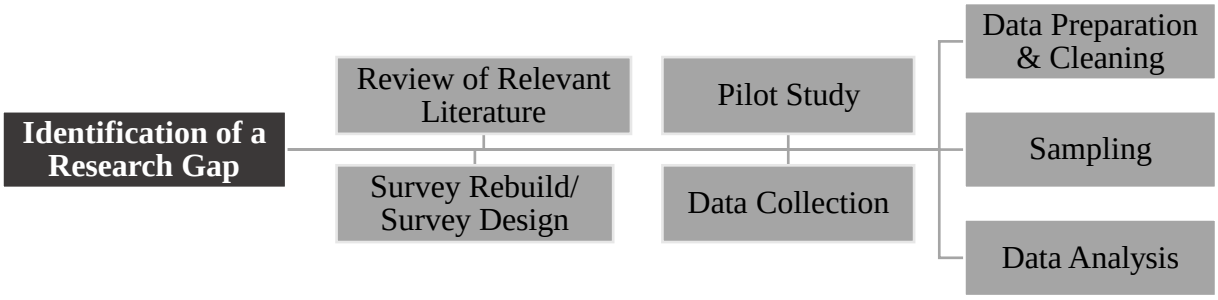

Figure 3.1 - Methodological Design Summary

Chapter 4: Analysis and Results

4.1 Facility Description

4.1.1 Industry Sector and Facility Use

Participants in the survey were asked to categorize their facilities into one of three major industry sectors: Services, Manufacturing, and Institutional. Within these categories, 33 sub-sections were provided to allow for more specific classification (Table 4.1.1). Respondents were also presented with a list of 29 different facility uses and were asked to specify the primary use of the facility they manage in Table 4.1.2.

A significant proportion of respondents from different regions indicated that their facilities were predominantly in the services industry. Specifically, in Africa, a notable 26% of the facilities managed by respondents were classified under the services sector. This trend was similarly observed in Asia, where 22% of respondents indicated their facilities were in the services industry. In North America, the percentage was slightly lower, with 12% of respondents managing facilities in this sector.

Table 4.1.1 – Number of Respondents by Industry Sector

Industry Sector	Africa	Asia	North America
Services	**167**	**140**	**73**
Banking (Consumer, Commercial, Savings, Credit Unions)	36	13	-
Health Care	8	11	18
Hospitality (Hotel, Restaurants, Hospitality-Related)	6	7	8
Information Services (Data Processing, Information Services, E- Commerce)	-	40	16
Insurance (Health, Life, Auto, Mutual, Casualty, Flood)	5	5	-
Investment Services (Securities and Investment Services)	-	3	3
Professional Services (Legal, Accounting, Consulting, Engineering, Architecture)	36	23	18
Residential	42	-	-
Telecommunications (Telecommunication, Internet Services/Products)	11	6	6
Trade (Wholesale, Retail)	4	13	-

Transportation (Transportation, Freight)	11	6	-
Utilities (Water, Gas, Electric, Energy Management)	8	13	4
Manufacturing	**23**	**25**	**22**
Aircraft/Industrial (industrial Equipment, Aerospace)	-	3	3
Building/Construction (Building, Construction Materials)	10	8	6
Chemical/Pharmaceutical (Chemical, Pharmaceutical, Biotech)	3	6	9
Computer (Computer hardware or software)	3	4	4
Energy (Energy related, mining, or distribution)	7	4	-
Institutional	**74**	**15**	**97**
Association (Association, Federation, Non-Profit Foundation, Society)	6	3	10
Charitable Foundation	3	-	4
City/County Government (Law Enforcement, Library, Parks / Public Open Space)	12	-	27
Cultural Facilities (Private, Institutions, Government)	6	-	5
Educational (Training Center, K-12, College / University)	22	12	25
Federal Government	15	-	6
Religious	3	-	10
State/Provincial Government	7	-	10
Grand Total	**264**	**180**	**192**

Table 4.1.2 – Number of Respondents by Facility Use

Facility Use	N	Africa	Asia	North America
Office	**330**	**135**	**127**	**68**
Branch/Regional Office	93	16	60	17
Headquarters	132	63	33	36
Mixed Use office	105	56	34	15
Industrial	**35**	**11**	**9**	**14**
Manufacturing	22	5	9	8
Warehouse	13	6	-	6
Assembly	**13**	**9**	**4**	-
Community/Recreation Center	10	6	4	-
Other	**150**	**99**	**30**	**15**
Education	41	22	10	9
Recreational	14	7	4	3
Healthcare	6	3	3	-

Multi-Family / Residential	46	40	5	-
Multi-use	9	4	4	-
Big Box/Department Store	9	5	4	-
Grand Total	**493**	**243**	**161**	**83**

4.1.2 Building Description

A key component of the survey involved understanding the types of facilities managed by respondents in terms of their physical structure and scale. Respondents were asked to classify their facilities as either a space within a building, a single building, a campus, or a portfolio of buildings. In Africa, the most common type of facility managed was a single building, with 32% of respondents indicating this. Asia reported the predominate facility type as a space within a building (35%), while North America reported portfolio (36%) as the most common. See Figure 4.1.1

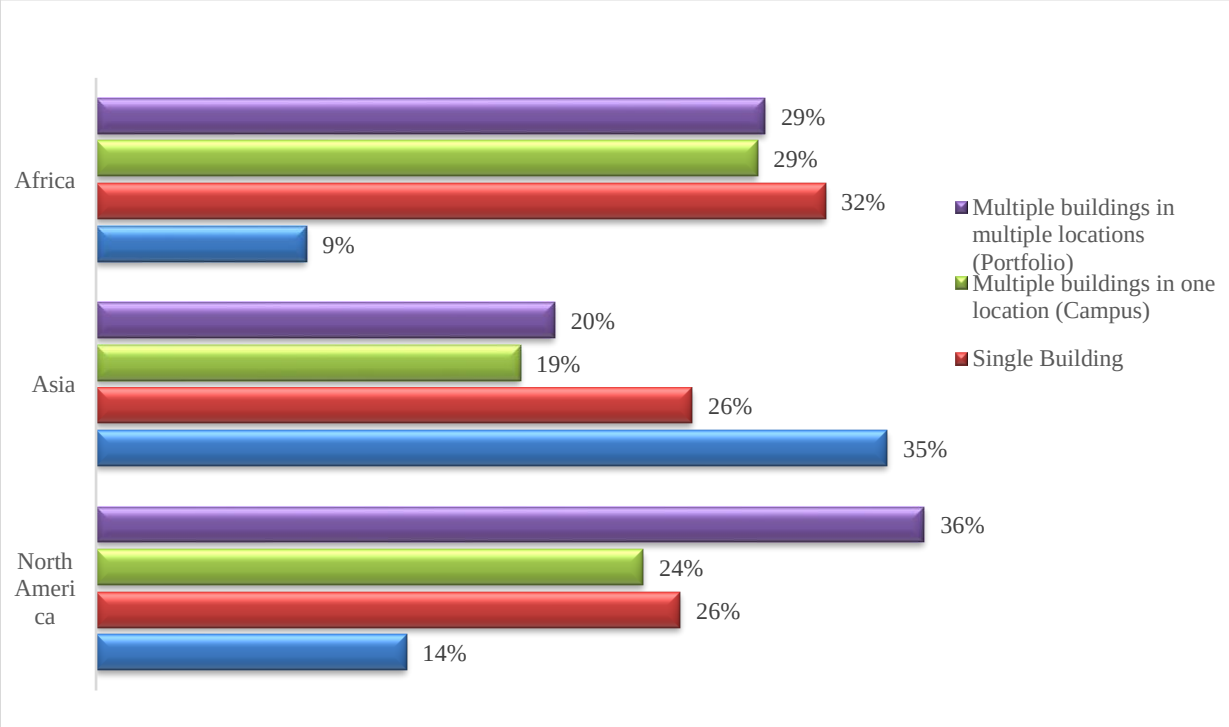

Figure 4.1.1 - Facility Building Description

4.1.3 Facility Distribution by Region

Of the 27,351 buildings reported in the survey, 61% were in North America, showcasing the region's significant contribution to the global FM landscape (Figure 4.1.2). Of the total respondents, 29% reported from Asia (Figure 4.1.3). Detailed country-specific distributions are provided in Table 4.1.3

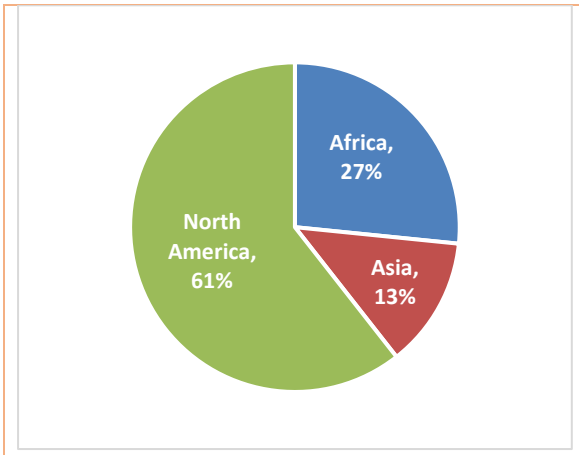

Figure 4.1.2 - Percentage of buildings by region

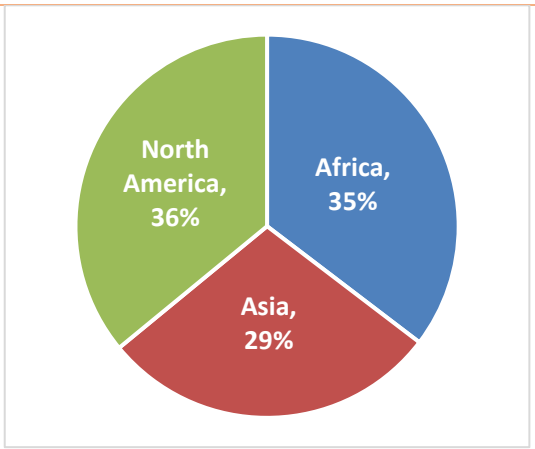

Figure 4.1.3 – Percentage of Respondents by Region

Table 4.1.3 – Respondents Distribution by Country

Location	N	Percentage (%)
Africa	**302**	**35%**
Botswana	16	2%
Egypt	19	2%
Ghana	70	8%
Nigeria	157	18%
South Africa	40	5%
Asia	**245**	**29%**
China	51	4%
Hong Kong	35	4%
India	159	18%
North America	**307**	**36%**
Canada	107	13%
United States	200	23%
Grand Total	**854**	**100%**

4.1.4 Facility Distribution by Age

In North America, 46% of the facilities were older buildings with barely 2% of facilities less than 5 years, suggesting a focus on maintenance and renovation in this region. Conversely, in Africa, 39% of facilities are less than 10years, indicating recent infrastructure development (Figure 4.1.4). The age distribution of facilities varies by industry sector, offering insights into sector-specific facility management challenges, as detailed in Table 4.1.4.

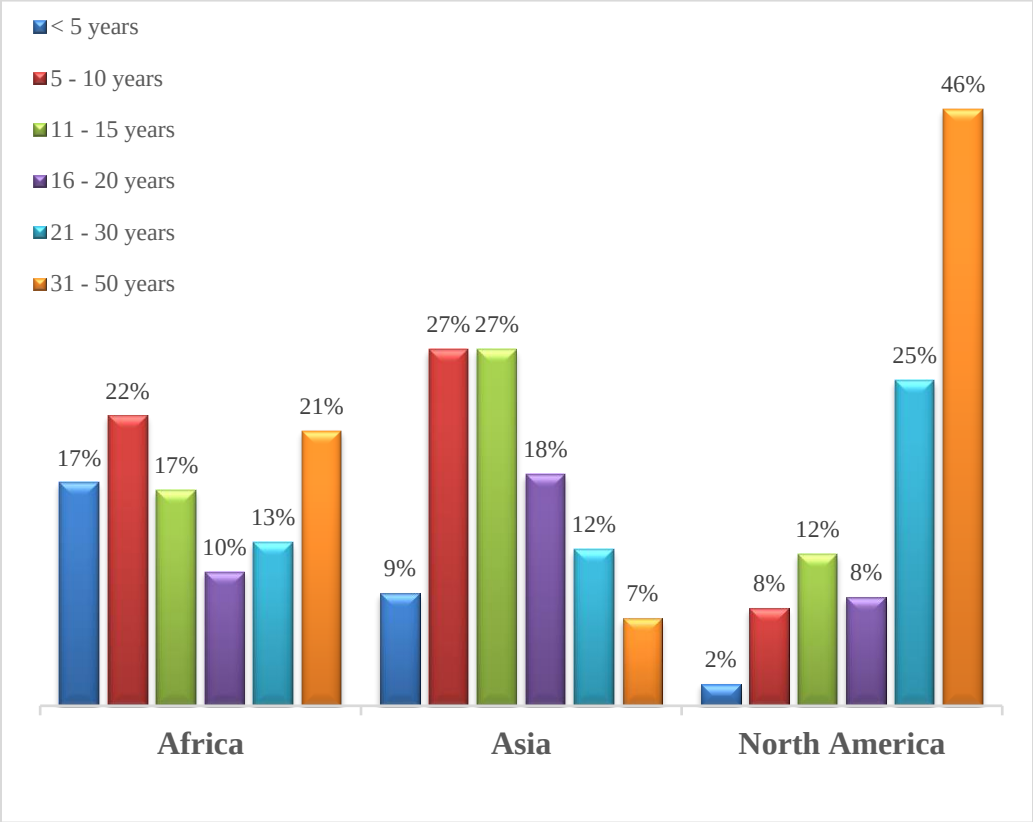

Figure 4.1.4 - Facility Age by Region (Years)

Table 4.1.4 - Facility Age by Industry Sector

Facility Age	Institutional	Manufacturing	Services
Africa	26%	11%	63%
< 5 years	23%	10%	67%
5 - 10 years	23%	10%	67%
11 - 15 years	24%	14%	62%
16 - 20 years	33%	6%	61%

21 - 30 years	23%	14%	64%
31 - 50 years	32%	14%	54%
51 - 100 years	20%	-	80%
> 100 years	50%	-	50%
Asia	23%	13%	64%
< 5 years	24%	18%	59%
5 - 10 years	25%	13%	62%
11 - 15 years	20%	9%	71%
16 - 20 years	25%	14%	61%
21 - 30 years	16%	20%	64%
31 - 50 years	23%	8%	69%
51 - 100 years	60%	-	40%
> 100 years	100%	-	-
North America	55%	14%	32%
< 5 years	50%	-	50%
5 - 10 years	56%	11%	33%
11 - 15 years	45%	9%	45%
16 - 20 years	20%	40%	40%
21 - 30 years	52%	12%	36%
31 - 50 years	51%	12%	37%
51 - 100 years	65%	14%	22%
> 100 years	89%	11%	-

4.1.5 Facility Distribution by Ownership

In Asia, the majority (60%) of facilities were leased, highlighting a trend towards flexible facility management solutions in this region. In contrast, North America showed a preference for ownership, with 55% of facilities being owned and occupied, suggesting long-term investment and strategic facility management (Figure 4.1.5). The breakdown of facility ownership by industry sectors, provided in Table 4.1.5, further elucidates these regional trends.

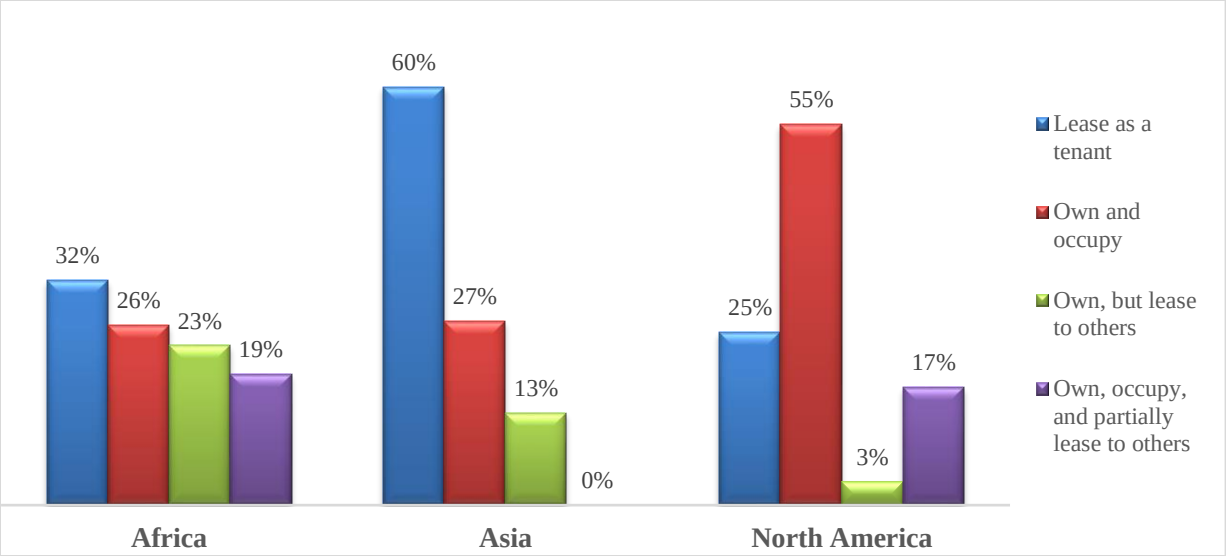

Figure 4.1.5 - Facility Ownership

Table 4.1.5 - Facility Ownership by Industry Sector

Facility Age	Institutional	Manufacturing	Services
Africa	43%	16%	41%
Own and occupy	24%	15%	62%
Lease as a tenant	25%	6%	69%
Own, occupy, and partially lease to others	21%	8%	72%
Own, but lease to others	22%	11%	67%
Asia	27%	14%	59%
Own and occupy	12%	10%	78%
Lease as a tenant	55%	9%	36%
Own, occupy, and partially lease to others	55%	12%	32%
North America	67%	15%	18%
Own and occupy	25%	11%	64%
Lease as a tenant	63%	7%	30%
Own, occupy, and partially lease to others	83%	-	17%
Own, but lease to others	43%	16%	41%

4.1.6 Regional Facility Size (Interior Area)

Facility managers in Africa reported managing an average interior area of 1,086,017 square feet, indicating the management of large-scale facilities in the region. In Asia, the average was 774,089 square feet, reflecting a diverse range of facility sizes. North America reported the largest average interior area at 4,669,528 square feet, suggesting the management of extensive and complex facilities (Table 4.1.6). Figure 4.1.6 shows the distribution of the interior area by region.

Table 4.1.6 – Interior Area by Percentile (SF)

Percentile	Africa (N = 192)	Asia (N = 214)	North America (N = 161)
99%	19,813,248	8,331,878	16,719,206
95%	3,766,542	3,370,000	4,000,000
90%	679,202	2,359,200	2,430,000
75%	139,931	600,000	828,351
50%	44,912	214,300	218,000
25%	12,917	61,488	70,000
10%	3,251	20,000	25,800
5%	1,600	10,000	15,538
1%	426	2,091	1,060
Mean	**1,086,017**	**774,089**	**4,669,528**

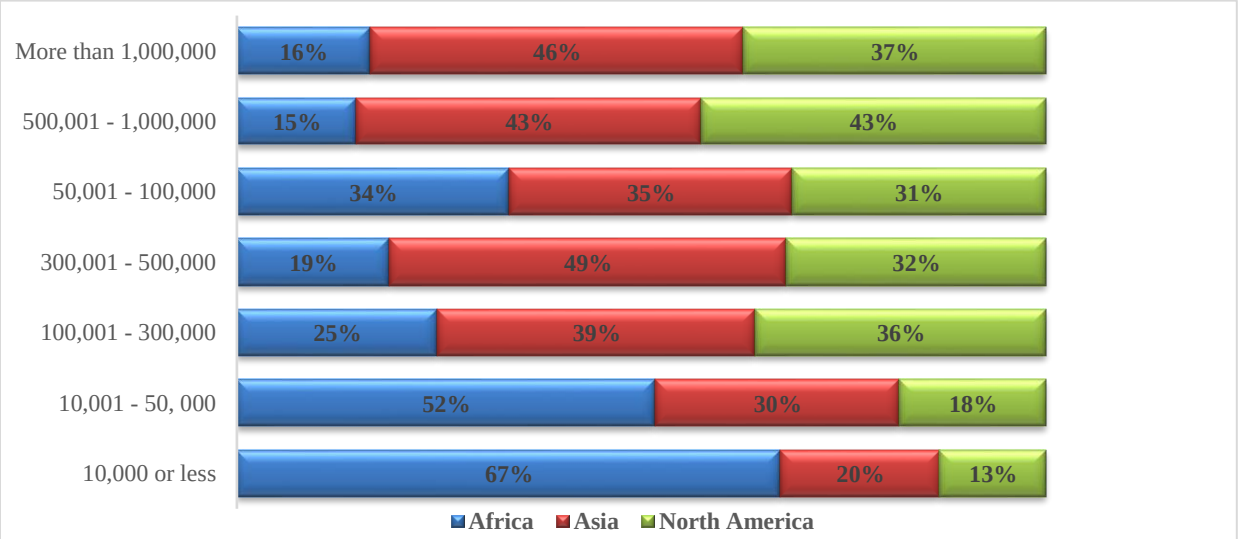

Figure 4.1.6 - Interior Gross floor Area by Region

4.1.7 Regional Facility Size (Plannable/Lettable Area)

The average plannable area in Africa was 520,514 square feet, while in Asia, it was slightly higher at 700,504 square feet, indicating the region's dense urban development. North America had the largest average plannable area at 4,230,674 square feet, aligning with its trend of managing extensive commercial facilities. This data, indicating North America's dominance in facility size, is further explored in Table 4.1.7 and the plannable area by region is shown in Figure 4.1.7.

Table 4.1.7 – Plannable Area by Percentile (SF)

Percentile	Africa (N = 192)	Asia (N = 166)	North America (N = 172)
99%	6,098,391	9,014,766	12,762,351
95%	805,812	3,150,000	2,698,029
90%	350,903	1,639,584	1,980,000
75%	98,536	400,000	690,575
50%	32,292	100,000	193,520
25%	9,599	30,766	70,000
10%	2,691	11,920	24,100
5%	1,136	5,050	16,990
1%	417	1,352	2,459
Mean	**520,514**	**700,504**	**4,230,674**

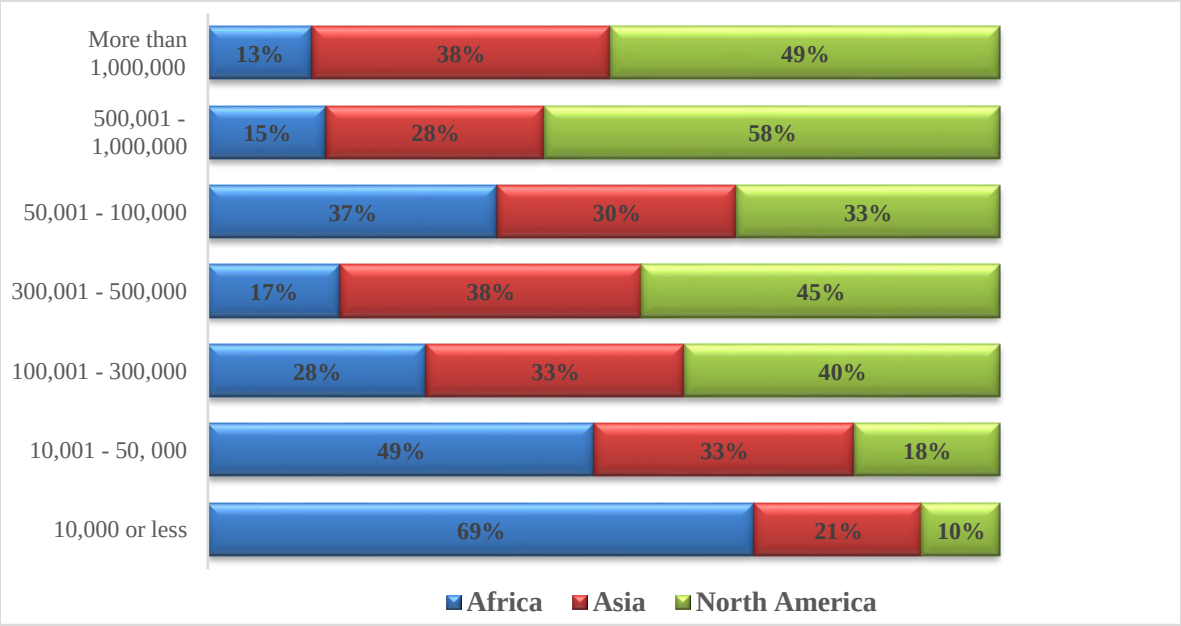

Figure 4.1.7 - Plannable / Lettable floor Area by Region

4.2 Regional Operation and Maintenance Practices

Operations and Maintenance (O&M) practices are essential components in the management of facilities and infrastructure, ensuring their optimal functioning, safety, and longevity. These practices encompass a wide range of activities aimed at keeping buildings and equipment in good working order and aligning them with organizational objectives. This research is, however, limited to only janitorial and maintenance practices which include heating and cooling, janitorial functions, cleaning hours, contract and supplies, staffing, maintenance tracking and utilities management.

4.2.1 Facility Heating and Cooling

The survey revealed distinct regional preferences in heating and cooling practices. In Asia, 80% of facilities use central plants, suggesting a regional preference for centralized systems. North America has 52% of facilities with central heating and cooling, while Africa has the least at 38%, as shown in Figure 4.2.1. This indicates varied adoption rates, likely influenced by regional climatic conditions and building types. Additionally, Figure 4.2.2 shows that North American facilities have the longest heating and cooling durations, averaging 15 hours per day, possibly due to longer operational hours or greater climate control requirements.

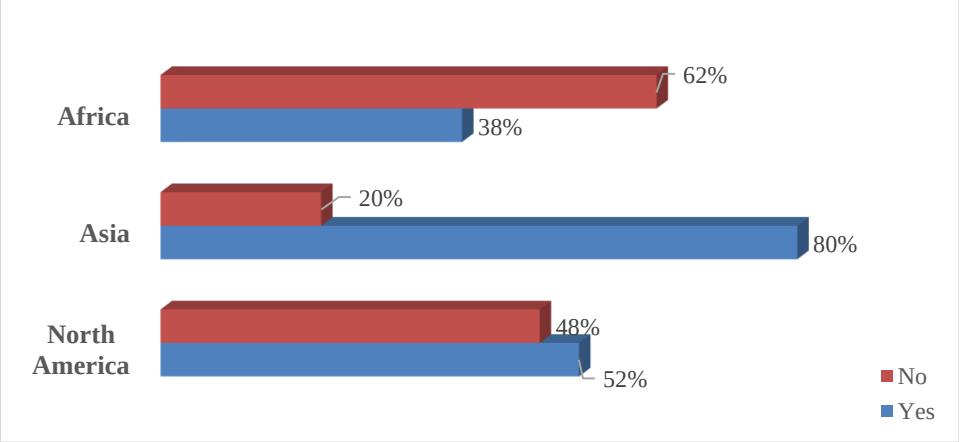

Figure 4.2.1 - Percentage of Facilities with a Central Plant

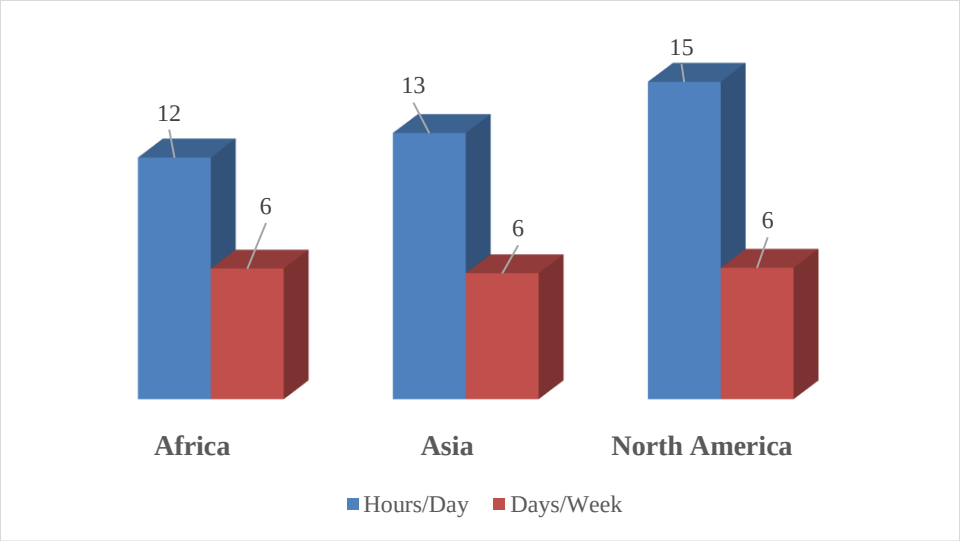

Figure 4.2.2 – Duration of Facility Heating and Cooling

4.2.2 Janitorial Function

The survey inquired whether janitorial duties were performed in-house or outsourced. Most facility managers across all regions reported outsourcing or contracting janitorial functions, with Asia having the highest rate at 82%. This trend in Figure 4.2.3 suggests a preference for outsourcing janitorial services, possibly for reasons of cost efficiency, flexibility, or specialized expertise.

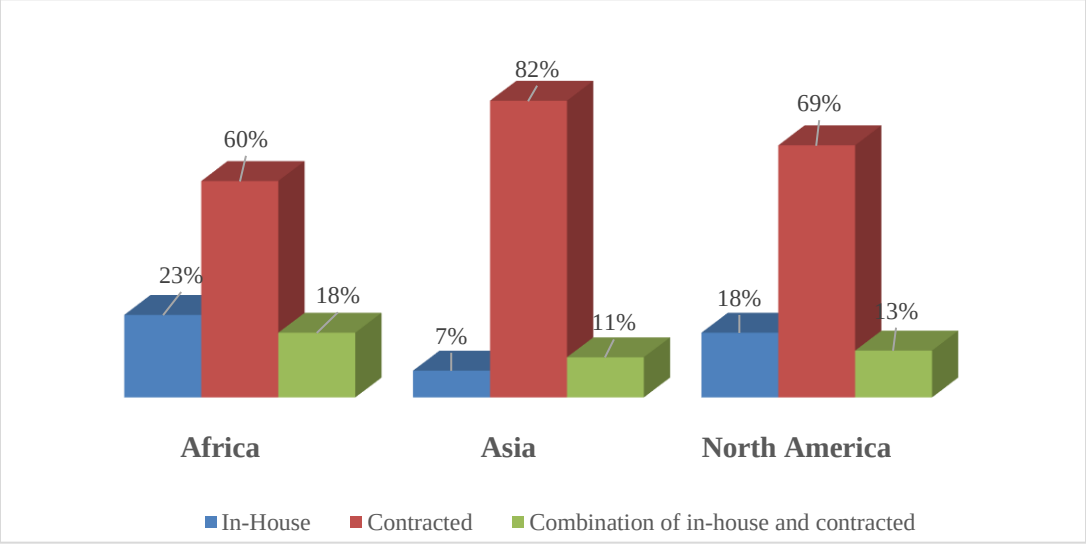

Figure 4.2.3 - Janitorial Function Performed By?

4.2.3 Janitorial Cleaning Hours

Most Facility Managers across the three regions indicated that cleaning occurs before or after work hours - 60% in Africa, 66% in Asia, and 67% in North America as shown in Figure 4.2.4. This preference for cleaning outside of regular working hours likely reflects efforts to minimize disruption to daily operations and maintain a clean environment for facility users.

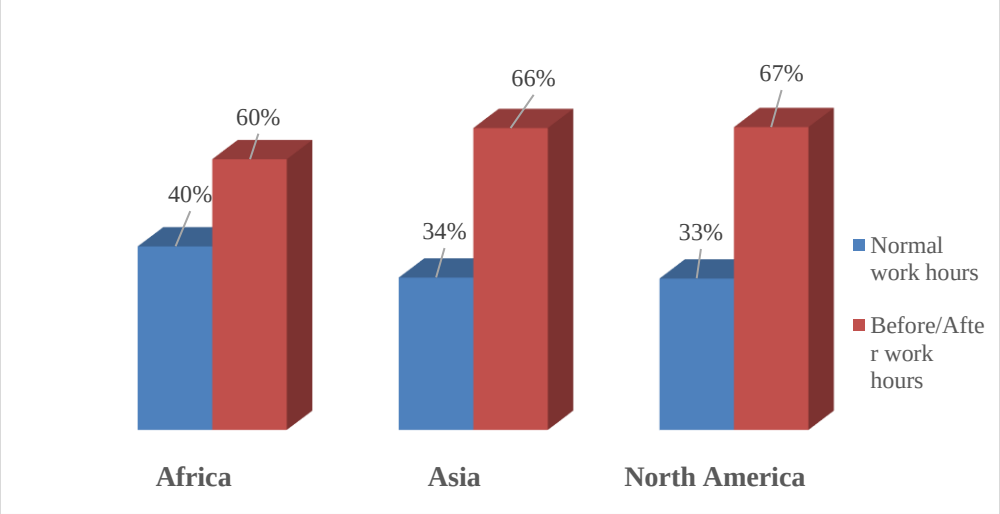

Figure 4.2.4 - Primary Cleaning Performed

4.2.4 Janitorial Cleaning Type

The survey revealed that the Team cleaning method is widely used across all three regions. In this approach, specialized personnel are assigned to clean specific areas, such as bathroom technicians and duster cleaners. The adoption rates were 68% in Africa, 85% in Asia, and 51% in North America, as illustrated in Figure 4.2.5. This method's popularity suggests a preference for specialized, efficient cleaning practices that can be tailored to the specific needs of different facility areas.

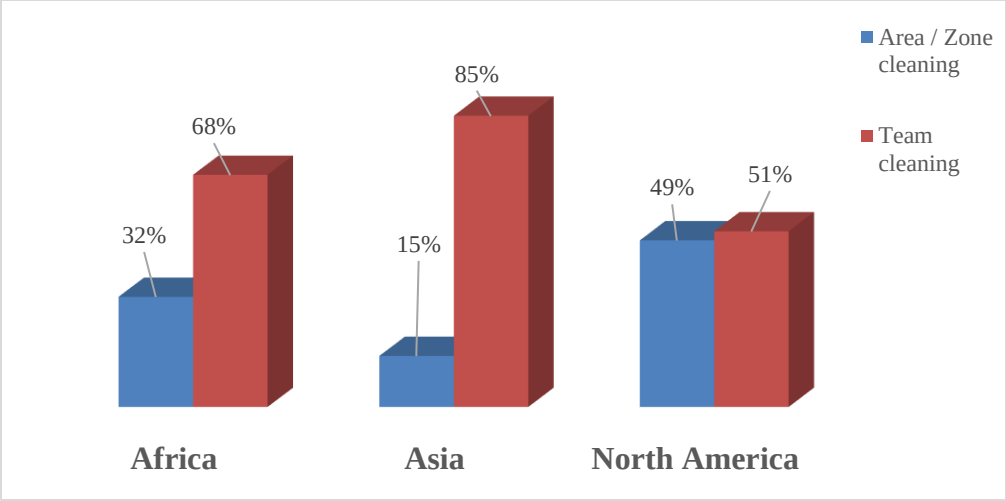

Figure 4.2.5 - Cleaning Assignment

4.2.5 Janitorial Contract

When asked about typical contract durations, facility managers in Africa mostly reported contracts lasting between 1 to 2 years (38%), while in North America, the majority (34%) had contracts spanning 2 to 3 years. Figure 4.2.6 provides a visual representation of these findings. The contracts often included provisions for janitorial supplies and training, as shown in Figure 4.2.7. These durations reflect regional preferences and practices in contract management for janitorial services.

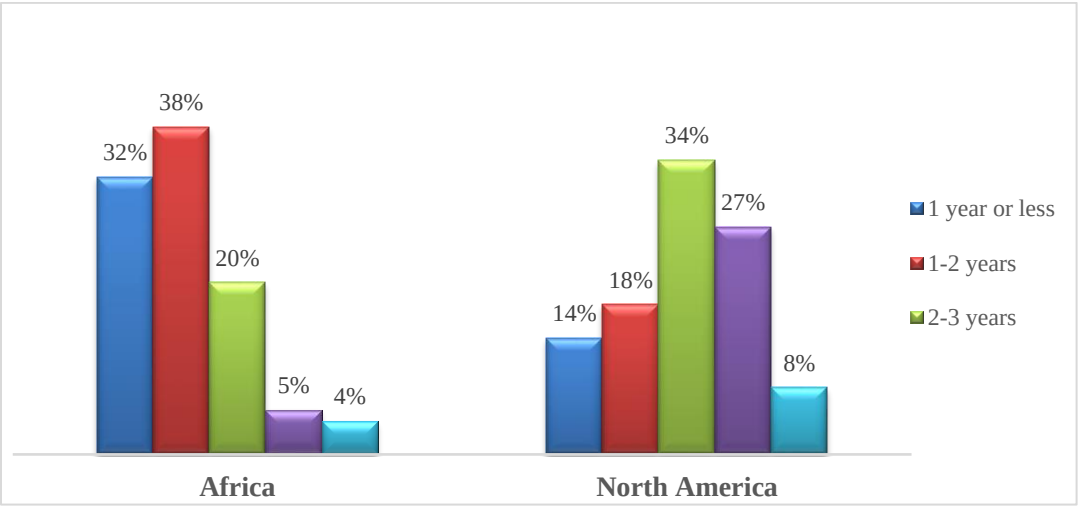

Figure 4.2.6 - Janitorial Contract Duration

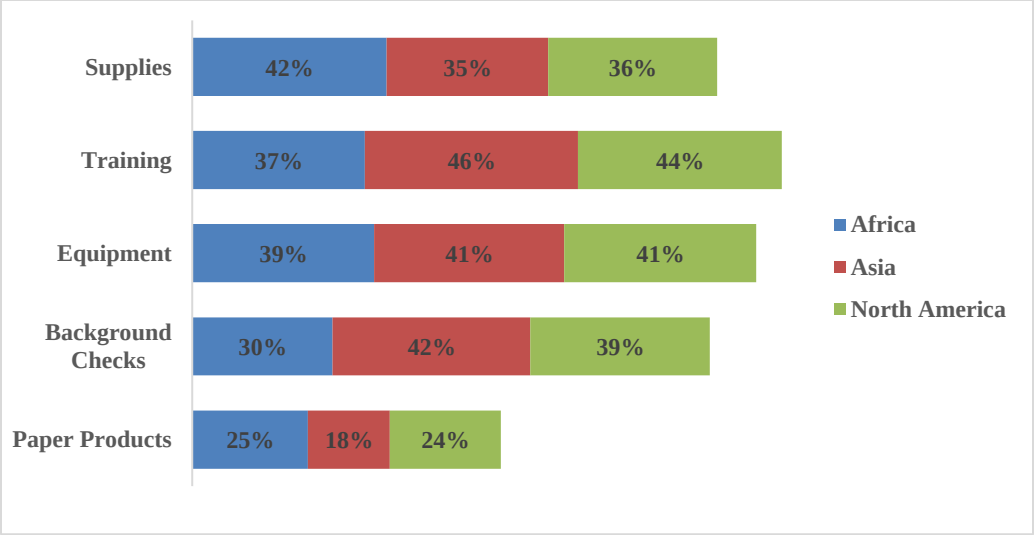

Figure 4.2.7 - Provided by Contractor

4.2.6 Janitorial Staffing

Figure 4.2.8 shows the average number of janitors, janitorial supervisors, and project cleaners (special cleaning or floor crew) across the regions. The reported staffing levels include both in-house and contracted janitorial services, providing insight into the human resource allocation for janitorial functions in different regions.

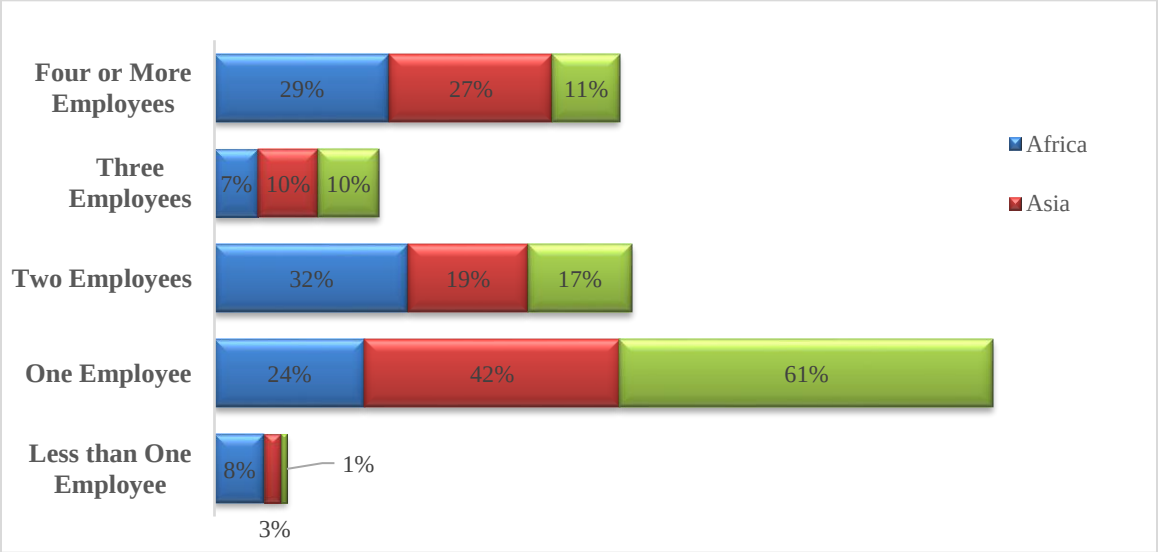

Figure 4.2.8 - In-House Employees Supervising Contract

4.2.7 Maintenance Tracking

Respondents reported on the software used for maintenance tracking, with most respondents in Africa (42%) and Asia (44%) indicating the use of Microsoft Excel. CMMS (37%) ranked the highest for North America. Table 4.2.1 illustrates these findings.

Table 4.2.1 - Tracking Maintenance Activities

Programs	Africa	Asia	North America
N	**255**	**217**	**225**
CAFM	16%	11%	10%
Capital Renewal	2%	0%	3%
CMMS	9%	13%	37%
ERP	9%	0%	4%
Microsoft Excel	42%	44%	23%
IWMS	7%	7%	15%
Manual	10%	25%	4%
Other	5%	0%	5%

4.2.8 Utility Management

The survey showed that most facility managers in Asia (60%) and North America (75%) utilize Building Automation Systems (BAS) and Building Management Systems (BMS) for utility management. In contrast, only 36% of respondents in Africa reported incorporating such software, as depicted in Figure 4.2.9. This difference suggests varying levels of technological adoption in utility management across regions.

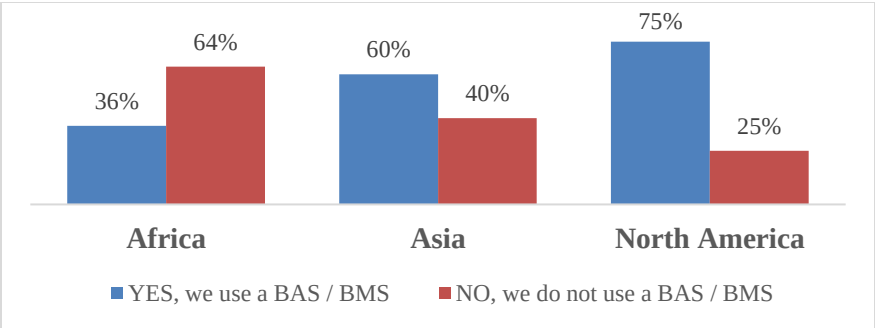

Figure 4.2.9 – Use of BAS / BMS

4.3 Regional Operation and Maintenance Costs

4.3.1 Janitorial Cost per Region

Janitorial costs, encompassing wages, benefits, staff support, supervision, administration, supplies, paper goods, and noncapital equipment, were also examined. Respondents provided data on the floor area cleaned and its relation to the plannable/rentable area. In Table 4.3.1, the average janitorial costs were found to be $0.93/sf in Africa, $1.43/sf in Asia, and $1.56/sf in North America.

Table 4.3.1 - Janitorial Costs by Region (Cost/RSF)

Region	Cost ($)	Annual Minimum Wage ($)	Cost as a % of Minimum Wage
Africa	**$0.93**	-	-
Botswana	$1.84	$1,124.23	0.16%
Egypt	$0.75	$1,358.95	0.05%
Ghana	$1.76	$382.57	0.46%
Nigeria	$0.48	$378.00	0.13%
South Africa	$0.68	$2,832.12	0.02%
Asia	**$1.43**	-	-
China	0.54	$3,268.28	0.02%
Hong Kong	3.20	$10,637.54	0.03%
India	1.50	$4,453.62	0.03%
North America	**$1.56**	-	-
Canada	$1.57	$25,775.21	0.01%
United States	$1.31	$15,600.00	0.01%

While some regions may have higher nominal janitorial costs, these costs appear to be relatively affordable when compared to the minimum wage. For example, Hong Kong with the highest janitorial cost per SF per annum demonstrates a relatively low percentage of the minimum wage expended on janitorial costs. Using an economic metric such as minimum wage provides insights into the economic peculiarities of each region such as prevailing labor standards and market conditions, therefore, allowing for a more realistic regional comparison. This provides a

baseline for benchmarking janitorial costs, enabling facility managers to make informed decisions regarding resource allocation and operational efficiency.

4.3.2 Janitorial Cost per Percentile

Table 4.3.2 presents an analysis of janitorial costs per rentable square foot (Cost/RSF). To account for inflation over the years, these costs were adjusted to reflect current values. All costs were converted to USD for consistency. The CPI Conversion Table and the Currency Conversion Table used are provided in Appendix 1 offering more insights into the conversion process used.

Table 4.3.2 - Janitorial Costs by Percentile (Cost/RSF)

Janitorial Costs by Percentile (Cost/RSF) N = 398			
Percentile	**Africa (N = 147)**	**Asia (N = 113)**	**North America (N = 104)**
99%	$3.49	$3.56	$4.37
95%	$2.85	$2.87	$3.13
90%	$1.69	$2.43	$2.59
75%	$0.75	$1.59	$2.06
50%	$0.22	$0.63	$1.28
25%	$0.06	$0.16	$0.66
10%	$0.01	$0.03	$0.21
5%	$0.005	$0.02	$0.14
1%	$0.0005	$0.004	$0.07
Mean	**0.59**	**0.97**	**1.28**

4.3.3 Maintenance Cost per Region

Maintenance costs reported include external building maintenance, interior systems maintenance, roads and grounds, utility system maintenance, and process treatment/environmental system maintenance. Additional costs outside these categories were also reported. In Table 4.3.3,

the average total maintenance costs were $1.16/sf in Africa, $2.61/sf in Asia, and $2.86/sf in North America, indicating regional variations in maintenance expenditure.

Table 4.3.3 - Maintenance Costs by Region (Cost/RSF)

Region	N	Costs (USD)	Annual Minimum Wage ($)	Cost as a % of Minimum Wage
Africa	**128**	**$1.16**	-	-
Botswana	3	$1.61	$1,124.23	0.14%
Egypt	8	$0.69	$1,358.95	0.05%
Ghana	31	$1.92	$382.57	0.50%
Nigeria	71	$0.83	$378.00	0.22%
South Africa	15	$1.32	$2,832.12	0.05%
Asia	**37**	**$2.61**	-	-
China	3	$1.21	$3,268.28	0.04%
Hong Kong	6	$5.70	$10,637.54	0.05%
India	28	$2.10	$4,453.62	0.05%
North America	**95**	**$2.86**	-	-
Canada	24	$4.00	$25,775.21	0.02%
United States	71	$2.47	$15,600.00	0.02%

When maintenance costs are compared across regions, the insights are better when related to an economic metric, e.g. annual minimum wage. Although North America and Hong Kong reported the highest average maintenance costs per square foot annually, the proportion of the minimum wage allocated to cover these expenses is notably lower compared to other regions. This observation suggests that maintenance costs are more economically efficient and affordable within the North American context, despite the seemingly higher nominal costs.

4.3.4 Maintenance Cost per Percentile

Table 4.3.4 presents maintenance costs per rentable square foot (Cost/RSF), adjusted for inflation to reflect current values. All costs are provided in USD for uniformity, with the CPI Conversion Table and Currency Conversion Table available in Appendix 1 for reference.

Table 4.3.4 - Maintenance Costs by Percentile (Cost/RSF)

Percentile	Africa	Asia	North America
99%	$10.16	$29.24	$29.24
95%	$4.49	$9.90	$9.90
90%	$3.12	$7.95	$7.95
75%	$1.39	$3.56	$3.56
50%	$0.65	$0.86	$0.86
25%	$0.18	$0.27	$0.27
10%	$0.05	$0.10	$0.10
5%	$0.016	$0.02	$0.02
1%	$0.0028	$0.003	$0.00
Mean	**1.70**	**2.73**	**4.49**

4.4 Regional Energy Management and Sustainability Practices

4.4.1 Energy Management Practices

The survey examined whether facility managers adopt at least one energy management practice (Table 4.4.1) and which practice they adopted to reduce utility consumption and enhance sustainability. Table 4.4.2 outlines the various energy management practices employed across regions, while Tables 4.4.3 to 4.4.9 provide a detailed breakdown of these practices in Africa and North America. The data indicated a lower adoption rate of energy management practices in Africa compared to North America, as reported in IFMA's North America O&M Benchmarking Report.

This suggests a potential growth area for energy management practices in Africa, with expectations of increased adoption over time.

Table 4.4.1 – Incorporation of Energy Management Practices (N = 852)

Response	Africa	Asia	North America
Yes	35%	31%	34%
No	36%	26%	38%

Table 4.4.2 - Energy Management Practices to Reduce Utility Usage (N = 854)

Practices	Africa	Asia	North America
Equipment and Controls	31%	29%	39%
Building and Envelope	13%	30%	57%
Water	33%	37%	31%
Lighting	33%	30%	37%
Renewable	34%	38%	28%
Employee and Tenant training	31%	34%	35%
Strategy Planning	29%	39%	32%
Implemented a dress code	44%	0%	56%
Other	44%	0%	56%

Table 4.4.3 - Equipment and Controls (N; Africa=89, NA=114)

Equipment and Controls	Africa 2023	North America 2021
Adjusted operating hours of HVAC	63%	80%
Installed variable speed drives for pumps and motors	21%	66%
Installed energy-efficient motors	34%	60%
Set back thermostat	11%	47%
Installed energy-efficient ventilation equipment	39%	50%
Installed energy-efficient heating equipment	20%	50%

Require the purchase of energy-efficient selections (e.g., Energy Star-related equipment)	37%	40%
Installed energy-efficient chillers	13%	45%
Recommissioned building systems	11%	39%
Installed energy-efficient air compressors	38%	38%
Increased the number of times monitored/controlled through building automation systems	28%	33%
Repaired compressed air and steam leaks	30%	25%
Change pneumatic controls to digital	5%	33%
Monitor power quality to balance loads and reduce waster heat	32%	28%
Implemented smart or automated demand response	15%	26%
Implemented smart metering	39%	23%
Installed electrical sub-metering for usage tracking of sub-units	52%	24%
Asset direct metering (e.g., pumps, motors, etc.)	16%	9%

Table 4.4.4 - Building Envelope (N; Africa=11, NA=49)

Building Envelope	Africa 2023	North America 2021
Performed thermal imaging study to detect sources of building heat loss (e.g., motors, electrical panels, and building envelope)	20%	54%
Improved building shell insulation	80%	46%
Installed energy efficient windows	30%	39%

Table 4.4.5 – Lighting (N; Africa=110, NA=127)

Lighting	Africa 2023	North America 2021
Replaced existing light fixtures with new light fixtures	64%	80%
Installed occupancy sensors	40%	71%
Retrofitted existing light fixtures	33%	69%
Adjusted operating hours of lighting	38%	45%
Implemented daylight harvesting	32%	32%
Installed Energy management System	33%	24%

Selectively reduced the number of lamps in over-lit areas	32%	17%
Other	2%	-

Table 4.4.6 – Water (N; Africa=68, NA=65)

Water	Africa 2023	North America 2021
Installed low flow water fixtures	57%	84%
Installed waterless urinals	12%	18%
Implemented cooling tower blowdown recycling	11%	23%
Implemented rain harvesting	26%	13%
Planted native/drought tolerant plants	38%	32%
Installed computerized irrigation controllers	11%	37%
Reduced or eliminated irrigation	18%	13%
Other:	20%	11%

Table 4.4.7 – Renewable (N; Africa=45, NA=39)

Renewable	Africa 2023	North America 2021
Has electric vehicle charging stations	2%	54%
Installed Solar Systems for Electric use	60%	46%
Uses alternative or renewable energy	42%	33%
Purchased green power from an outside source	2%	23%
Has onsite power generation	40%	18%
Installed a geo-thermal system	0%	15%
Installed solar systems for heat use	16%	8%
Solar power for hot water	21%	8%
Installed a wind generation system for electricity	5%	3%

Table 4.4.8 - Employee and Tenant Training (N; Africa=45, NA=52)

Employee and Tenant Training	Africa 2023	North America 2021
Hired an energy consultant to find ways to improve energy efficiency	87%	63%
Conducted energy related due diligence for new real estate	64%	67%

Table 4.4.9 - Strategy Planning (N; Africa=44, NA=51)

Strategy Planning	Africa 2023	North America 2021
Hired an energy consultant to find ways to improve energy efficiency	33%	41%
Conducted energy related due diligence for new real estate	28%	14%
Conducted an energy audit	65%	73%
Put into place a strategic energy management plan	40%	63%
Has a written plan for strategic energy management in place	44%	25%
Gained ISO 14001 or other certification	14%	8%
Other	0%	4%

4.4.2 Sustainability Programs

Respondents were presented with nine sustainability programs to identify which ones were integrated into their facility management. Like energy management practices, the adoption of sustainability programs was lower in Africa compared to North America. Figure 4.4.1 offers insights into the rate at which these programs are being incorporated, while Figure 4.4.2, Tables 4.4.10 and 4.4.11 highlight the specific sustainability programs used across regions, the rate of incorporation of green janitorial practices, and the green janitorial services implemented respectively.

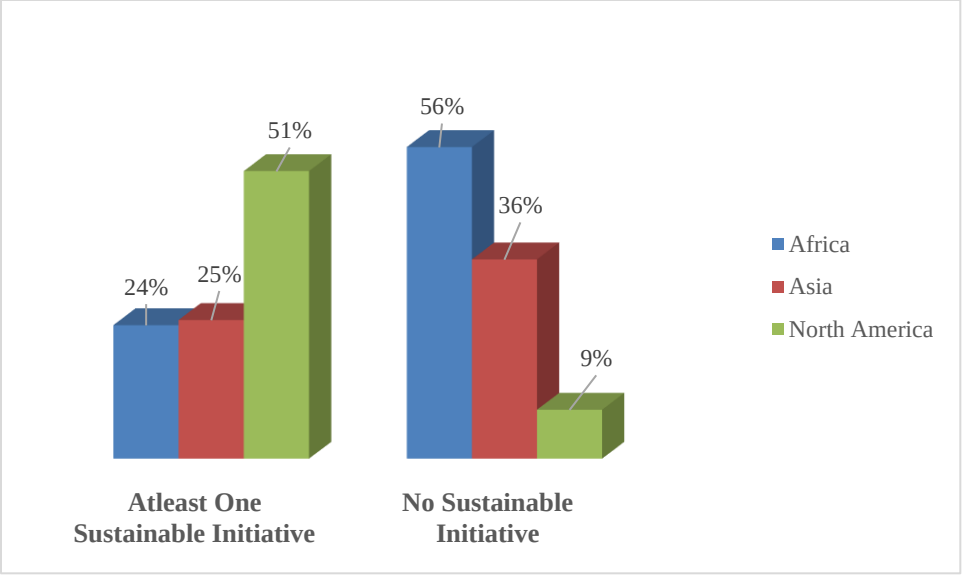

Figure 4.4.1 - Integration of Sustainability Initiatives

Table 4.4.10 - Sustainability Programs Used (N = 854)

Sustainability Programs	Africa	Asia	North America
Environmentally-preferred purchasing program	29%	38%	34%
Use of life cycle assessment for purchases	35%	31%	34%
A formal measuring and monitoring process	38%	40%	22%
ENERGY STAR and/or other energy monitoring programs	21%	23%	56%
WELL Building Standard	16%	14%	71%
LEED (Leadership in Energy and Environmental Design)	14%	35%	51%
Green Globes	15%	0%	85%
ISO14001	29%	0%	71%
Other sustainability program(s)	54%	0%	46%

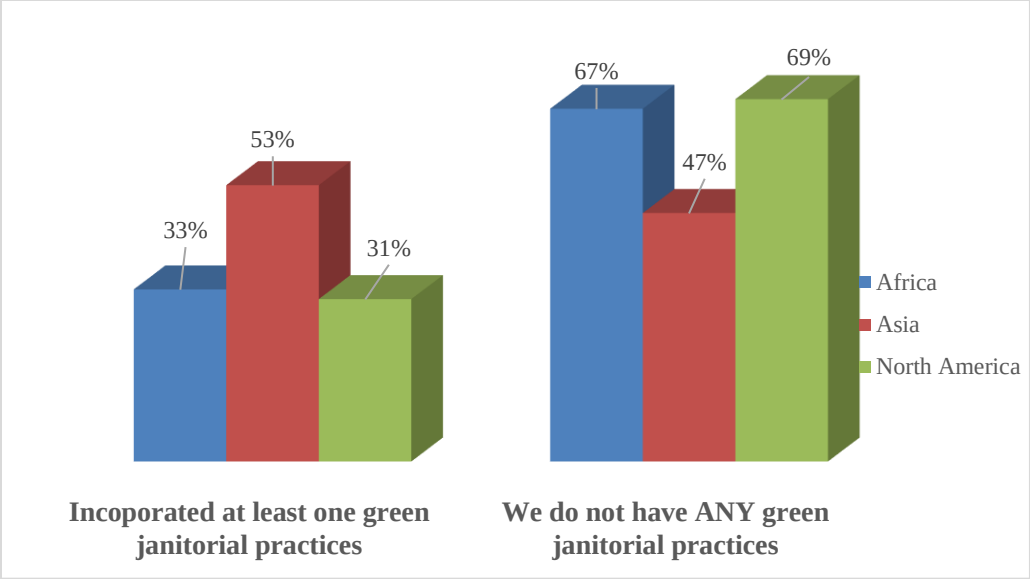

Figure 4.4.2 - Integration of Green Janitorial Practices

Table 4.4.11 - Green Janitorial Practices (N = 854)

Green Janitorial Practices	Africa	Asia	North America
Green cleaning certified staff or contract service	20%	33%	27%
Implemented a green cleaning training program for janitorial staff	27%	45%	37%
Green cleaning training is regularly provided and documented	14%	52%	22%
Janitorial procedures are audited on a periodic basis	67%	73%	66%
Green cleaning procedures are documented	25%	50%	43%
Other	7%	0%	4%
No green janitorial practices	28%	33%	39%

4.4.3 Green Certification Status

As part of the growing emphasis on social responsibility and environmental impact, respondents were asked about the green certification status of their buildings. Regarding buildings with certification, Africa ranked the least with 18%, Asia - 40% and North America – 42%. Tables

4.4.12 and Tables 4.4.13 provide a regional and industry sector breakdown of green certification status, reflecting the current state of green building initiatives.

Table 4.4.12 - Building Green Certification Status by Region (N = 378)

Green Status	Africa	Asia	North America
No Green Elements	46%	34%	20%
Green Elements, No Certification	30%	34%	36%
One or More Buildings Certified	18%	40%	42%
Plans for Green Certification	46%	39%	15%

Table 4.4.13 - Building Green Certification Status by Industry Sector (N = 354)

Industry Sector	No Green Elements	Green Elements, No Certification	One or More Buildings Certified	Plans for Certification
Services	**23%**	**33%**	**30%**	**14%**
Africa	28%	35%	16%	21%
Asia	22%	31%	36%	10%
North America	10%	33%	50%	7%
Manufacturing	**21%**	**42%**	**24%**	**13%**
Africa	30%	60%	10%	0%
Asia	19%	38%	31%	13%
North America	17%	33%	25%	25%
Institutional	**18%**	**41%**	**31%**	**10%**
Africa	32%	29%	25%	14%
Asia	11%	40%	29%	20%
North America	14%	48%	36%	2%

4.4.5 Recycling Programs

The survey also explored the prevalence of recycling programs across the regions. 99% of respondents from each region affirmed the presence of recycling programs in their facilities. Paper was identified as the most recycled item across all three regions, as shown in Table 4.4.14. This

high rate of recycling adoption indicates a widespread commitment to environmental sustainability practices in facility management.

Table 4.4.14 - Recycled Items

Industry Sector	Africa (N = 86)	Asia (N = 122)	North America (N = 122)
Paper	17%	14%	11%
Aluminum Cans	10%	6%	11%
Computer Parts	6%	10%	10%
Light Bulbs	9%	8%	10%
Carpet	2%	4%	2%
Batteries	7%	11%	10%
Plastic	18%	11%	10%
Ink Cartridges	5%	9%	9%
Cardboard	9%	8%	11%
Kitchen Oil	4%	4%	4%
Construction Debris	6%	6%	4%
Chemical Waste Disposal	6%	7%	6%

4.4.6 Water Conservation Practices

Regarding water conservation, respondents were asked about the specific practices they employed. In Africa, rain harvesting (the collection and storage of rainwater, rather than allowing it to run off) emerged as the most popular method, with a 68% adoption rate, while in North America, computerized irrigation controllers were the leading practice, used by 77% of respondents. This variation in water conservation methods reflects the different environmental conditions and resource management techniques in these regions in Figure 4.4.3

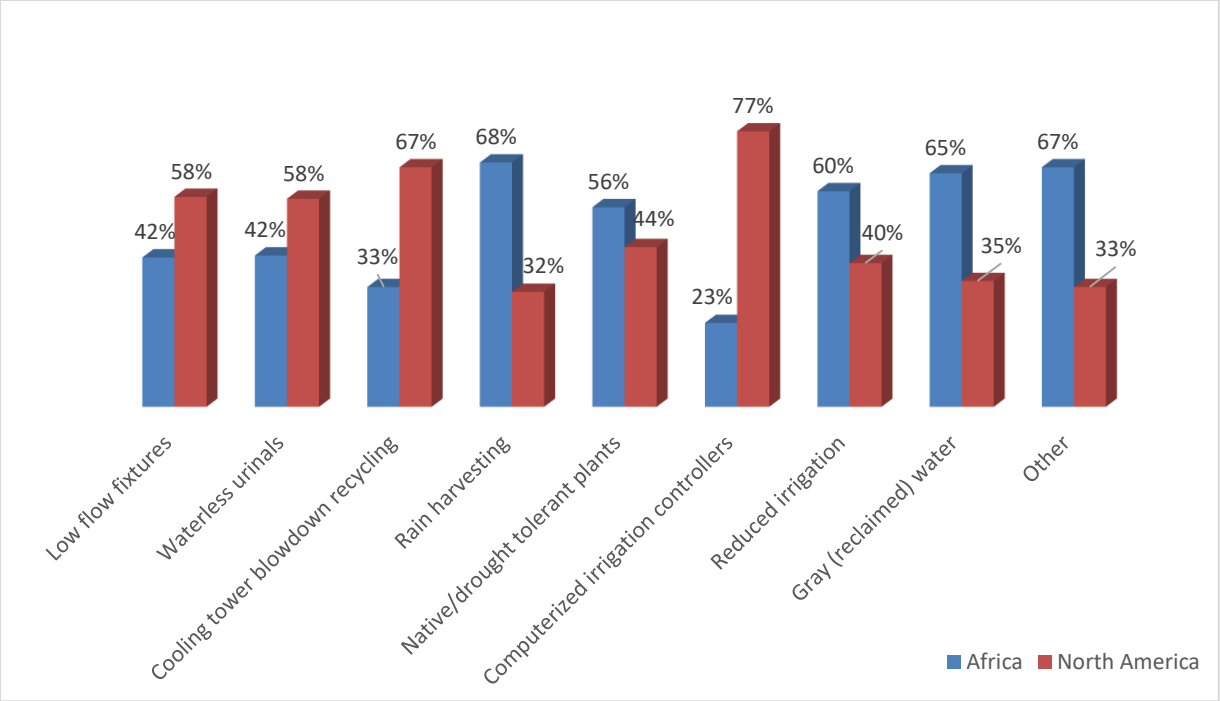

Table 4.4.3 - Water Conservation Practices by Region

4.5 Regional Salary and Compensation Structures

This section provides insight into the various factors influencing Facility Manager salaries and benefits across different regions, highlighting the diversity of the FM compensation landscape globally.

4.5.1 Demographic Data

The demographic data, shown in Table 4.5.1, offers an overview of the different regions covered in this study - Africa, Asia, Europe, and North America. It outlines the distribution of responses received from Facility Managers across these regions, providing a geographical context to the study.

Table 4.5.1 – Demographic Data

Region	N	Percentage
Africa	140	16%
Asia	209	24%

Europe	257	29%
North America	270	31%
Total	**876**	**100%**

4.5.2 Salaries by Region

As shown in Table 4.5.2, there is a notable regional difference in salaries. Facility Managers in Africa have an average salary of $43,380 significantly lower than their North American counterparts, whose average is $120,751. The Annual Minimum Wage (AMW) of each country served as the chosen economic metric (a starting point) for comparing facility manager compensations – this is because it is the baseline wage for ensuring fair compensation for labor across most countries and it is also globally available. Data on AMW were sourced from official central/reserve banks and Statista as of January 2024. All AMW figures in local currency were converted to U.S. dollars using currency exchange rates as of January 2024.

Table 4.5.2 – Facility Manager's Salary by Country and Region

Region	N	Average Salary	Annual Minimum Wage ($)	%age by which Average Salary is Greater Than Minimum Wage
Africa	**111**	**$43,380**	-	-
Egypt	17	$59,541	$1,358.95	97.72%
Ghana	23	$39,955	$382.57	99.04%
Nigeria	61	$43,592	$378.00	99.13%
South Africa	10	$84,104	$2,832.12	96.63%
Asia	**176**	$91,576		
China	24	$96,430	$3,268.28	96.61%
Hong Kong	67	$114,990	$10,637.54	90.75%
India	47	$49,853	$4,453.62	91.07%
Singapore	38	$98,832	**	**
Europe	**181**	$57,592	-	-

Hungary	20	$44,011	$9,012.50	79.52%
Netherlands	43	$91,218	$29,816.99	67.31%
Poland	103	$30,374	$12,698.51	58.19%
Switzerland*	15	$166,203	$58,656.73	64.71%
North America	**250**	$120,751	-	-
Canada	82	$110,799	$25,775.21	76.74%
United States	168	$125,609	$15,600.00	87.58%

*** No Statutory Minimum Wage*
**Minimum wage is for the canton of Geneva. Weekly work hours are 42hrs.*

When comparing facility manager salaries with the annual minimum wage, significant disparities emerge, offering insights into economic conditions and wage structures. In regions like Africa, where average salaries are relatively lower, facility manager salaries notably surpass the minimum wage by nearly 97% to 99% in countries such as Egypt, Ghana, Nigeria, and South Africa. Conversely, in North America, where average facility manager salaries are highest, the percentage difference from the minimum wage is slightly lower, at 75% for Canada and 88% for the United States. These provide valuable context for discussions on wage equity, labor standards, and the economic standing of facility management professionals within each country.

4.5.3 Salaries by Age

Table 4.5.3 shows a correlation between age and salary, with older Facility Managers generally earning more across all regions. This trend likely reflects the accumulation of experience and expertise over the years.

Table 4.5.3 – Facility Manager's Salary by Age

Birth Year	Africa	Asia	Europe	North America
1998 or later	$41,929	$35,090	$62,970	$50,850
1979 - 1997	$43,361	$69,353	$42,072	$96,998
1965 - 1978	$59,411	$101,940	$80,341	$130,492

1946 - 1964	$83,069	$133,999	$123,152	$136,529
N	**112**	**164**	**71**	**263**

4.5.4 Salaries by Gender

The study, as outlined in Table 4.5.4, indicates an insignificant gender pay gap in FM, with male Facility Managers earning an average of $89,199 slightly more than female Facility Managers at $87,855. However, this varies across different regions.

Table 4.5.4 – Facility Manager's Salary by Gender

Gender	N	Average Salary
Male	**494**	**$89,199**
Africa	88	$48,258
Asia & Pacific	128	$89,937
Europe	112	$66,770
North America	166	$125,467
Female	**165**	**$87,855**
Africa	16	$63,418
Asia & Pacific	29	$97,289
Europe	46	$53,394
North America	74	$110,862

4.5.5 Salaries by Level of Education

Facility Managers with higher educational qualifications tend to earn more, a trend consistent across all regions as seen in Table 4.5.5. This bolsters the value placed on educational achievement in the FM industry.

Table 4.5.5 – Facility Manager's Salary by Education Level

Education	N	Average Salary
High school graduate or equivalent	**20**	$69,833
Asia & Pacific	3	$67,405
Europe	10	$42,373

North America	7	$98,701
Vocational certificate, no degree	**38**	$89,008
Africa	4	$94,232
Asia & Pacific	6	$101,404
Europe	5	$17,823
North America	23	$100,340
Some colleges, no degree	**56**	**$96,847**
Africa	3	$42,965
Asia & Pacific	5	$68,515
Europe	9	$34,417
North America	39	$119,031
Bachelor's degree	270	$90,426
Africa	48	$41,685
Asia & Pacific	65	$91,607
Europe	56	$65,989
North America	101	$126,380
Master's degree	248	$87,767
Africa	43	$52,814
Asia & Pacific	77	$96,509
Europe	75	$66,808
North America	53	$133,086

4.5.6 Salaries by Management Levels

Table 4.5.6 shows that salaries in FM increase with advancing career levels across all the regions. As Facility Managers climb the management ladder, their compensation correspondingly rises.

Table 4.5.6 – Facility Manager's Salary by Management Levels

Bonus Eligibility	Africa	Asia	Europe	North America
Level 1	$44,829	$114,404	$40,460	$98,433
Level 2	$37,442	$69,919	$42,372	$99,251
Level 3	$38,943	$84,575	$75,633	$119,769
Level 4	$52,016	$82,949	$72,202	$140,063

Level 5	$76,295	$119,913	$96,815	$181,969
N	**96**	**159**	**143**	**219**

4.5.7 Bonus Eligibility by Region

A significant proportion of Facility Managers are eligible for bonuses, with the highest eligibility in Asia (85%) and the lowest in Africa (63%), as highlighted in Table 4.5.7.

Table 4.5.7 – FM Bonus Eligibility by Region

Bonus Eligibility	Africa	Asia	Europe	North America
Yes	63%	85%	73%	64%
No	37%	15%	27%	36%
N	**114**	**181**	**68**	**260**

4.5.8 Insurance Benefits by Region

Insurance benefits are a common part of the compensation package for Facility Managers. Table 4.4.8 shows that 100% of respondents in North America reported having insurance benefits, followed by 92% in Asia, with Europe having the lowest at 54%.

Table 4.5.8 – FM Insurance Benefits by Region

Insurance Benefits Included	Africa	Asia	Europe	North America
Yes	80%	92%	54%	100%
No	20%	8%	46%	0%
N	**111**	**174**	**65**	**260**

Chapter 5: Discussion and Conclusion

This chapter concludes the study by testing the hypothesis and discussing the results presented in the previous chapter. It presents the key findings on how O & M practices, their associated costs, and salaries of professionals compare across selected countries in Africa, Asia, and North America. It also discusses the prevailing energy management and sustainability practices in selected countries across Africa, Asia, and North America. Conclusions were drawn based on the results and the thesis contribution to the body of knowledge and industry practitioners were also described in this chapter. The chapter ends with highlighting the limitations of the study and offers recommendations for future research.

5.1 Hypothesis Testing Using ANOVA

This report was guided by three research questions aimed at exploring operations and maintenance (O & M) practices, energy management and sustainability practices, and salary and compensation structures across the study area. These questions were complemented by two hypotheses (H1 and H2) tested using One-way ANOVA, with descriptive statistics aiding in the analysis of O & M practices and energy management/sustainability programs.

5.1.1 Hypothesis One:

Are there statistically significant differences in operations and maintenance costs in FM across Africa, Asia, and North America? (*O & M costs will be limited to janitorial and maintenance costs only due to the limited available data*)

5.1.1.1 Statistical Differences in Janitorial Cost

Table 5.1.1 shows a comparison of janitorial costs in Africa, Asia, and North America, including the lower and upper bounds. The cost, which is the dependent variable, was found to not

have a normal distribution. Also, the Levene's Test for Equality of Variance indicated that there was a violation of homogeneity of variance (p = 0.042). Because of this difference in variances, the Welch test ANOVA and Games-Howell Post Hoc Multiple Comparisons were used.

The Welch test showed a statistically significant difference in costs across regions with a p-value of 0.034. Results from the Games-Howell Post Hoc test revealed the statistically significant difference lies only between Africa and North America (p = 0.026) at 95% Confidence Interval. As a result, the H_0, indicating no significant regional differences in janitorial costs, was rejected, while H_1 was retained.

Table 5.1.1 – Janitorial Cost Differences Between Africa, Asia, and North America

Region		Mean Difference	*p*-Value
Africa	Asia	-$0.35	0.338
	North America	-$0.43349*	0.026
Asia	Africa	$0.35	0.338
	North America	-$0.08	0.938
North America	Africa	$0.43349*	0.026
	Asia	$0.08	0.938

*. The mean difference is significant at the 0.05 level.

5.1.1.2 Statistical Differences in Maintenance Cost

Table 5.1.2 compares maintenance costs in Africa, Asia, and North America, showing both the lowest and highest costs. The cost, which is what we are studying, didn't follow a normal pattern. Also, a Levene's Test for Equality of Variance showed that there were differences in variance (p = <0.001) between the regions. Because of these differences, the Welch test ANOVA and Games-Howell Post Hoc Multiple Comparisons were used.

The Welch test showed that there were indeed significant differences in costs across the regions, with a *p*-value of <0.001. Further analysis with the Games-Howell Post Hoc test revealed that a significant difference only existed between Africa and North America (p = <0.001) with a 95% Confidence Interval. Hence, the H_1, indicating significant regional differences in janitorial costs, was retained.

Table 5.1.2 – Maintenance Cost Differences Between Africa, Asia, and North America

Region		Mean Difference	Sig.
Africa	Asia	-$1.17	0.144
	North America	-$1.19704*	<.001
Asia	Africa	$1.17	0.144
	North America	-$0.03	0.999
North America	Africa	$1.19704*	<.001
	Asia	$0.03	0.999

*. The mean difference is significant at the 0.05 level.

5.1.2 Hypothesis Two:

Are there statistically significant differences in compensation structures for FM professionals across Africa, Asia, Europe, and North America?

Table 5.1.3 shows a comparison of salaries in Africa, Asia, Europe, and North America, including the lower and upper bounds. The salary, which is the dependent variable, was found to not have a normal distribution. Also, Levene's Test for Equality of Variance indicated that there was a violation of homogeneity of variance (p = <0.001). Because of this difference in variances, the Welch test ANOVA and Games-Howell Post Hoc Multiple Comparisons were used.

The Welch test showed a statistically significant difference in salaries across regions with a *p*-value of <0.001. Specifically, the Games-Howell Post Hoc test found significant differences between Africa and Asia (p = <0.001), Africa and Europe (p = <0.001) and Africa and North America (p = <0.001) at 95% Confidence Interval. Therefore, the H_0, indicating no significant regional differences in salaries, was rejected, while H_1 was retained.

Table 5.1.3 – Salary Differences Between Africa, Asia, Europe, and North America

	Region	Mean Difference	Sig.
Africa	Asia	-37285.71240*	<.001
	Europe	-22874.89861*	<.001
	North America	-62794.19744*	<.001
Asia	Africa	37285.71240*	<.001
	Europe	$14,410.81	0.106
	North America	-25508.48504*	<.001
Europe	Africa	22874.89861*	<.001
	Asia	-$14,410.81	0.106
	North America	-39919.29883*	<.001
North America	Africa	62794.19744*	<.001
	Asia	25508.48504*	<.001
	Europe	39919.29883*	<.001

*. The mean difference is significant at the 0.05 level.

5.2 Discussion of Results

The primary goal of this research was to conduct a ***comparative analysis of FM performance indicators in selected countries across North America, Europe, Africa, and Asia***. By examining these diverse geographical areas, the study uncovered regional differences and similarities in FM practices, thereby contributing to a better understanding of the global FM

landscape. This comparative approach is crucial for identifying the best practices and areas for improvement in FM across different cultural and economic contexts.

5.2.1 Regional Operation and Maintenance Practices:

In examining ***heating and cooling practices***, the survey revealed a significant regional disparity in the adoption of central plants. Asia exhibited the highest preference for centralized systems, followed by North America, while Africa had the lowest adoption rate. This variation aligns with Alexander's (1992) observation of distinct regional needs and preferences in facilities management. Regional climatic conditions likely play a role in shaping these preferences, with facilities in colder climates, such as North America, requiring more extensive heating and cooling systems compared to regions with milder climates.

The prevalent trend of outsourcing ***janitorial duties*** across all regions with Asia showing the highest rate of outsourcing, reflects a strategic choice made by facility managers, driven by factors such as cost efficiency, flexibility, and access to specialized expertise. This aligns with the findings of Belcourt (2006), who emphasized the importance of outsourcing non-core functions to focus on core business activities and enhance overall operational efficiency. However, it's essential to recognize the potential challenges associated with outsourcing, such as quality control issues and dependency on external service providers, which may vary in significance across different regions.

The widespread adoption of the ***team cleaning method*** across regions underscores a shared preference for specialized and efficient cleaning practices tailored to the unique requirements of diverse facility areas. This finding resonates with Alexander's (1994) recognition of the importance of user satisfaction in facilities management, emphasizing the need for tailored cleaning solutions to meet the diverse needs of different facility areas. ***Contract durations*** for

janitorial services varied across regions, with African facilities predominantly opting for shorter contract durations compared to North America. These findings reflect regional preferences and practices in contract management, highlighting the importance of flexibility and adaptability in addressing evolving facility needs.

Regarding ***software utilization for maintenance tracking***, the predominance of Microsoft Excel in Africa and Asia, and CMMS in North America, reflects varying levels of technological adoption across regions. This finding resonates with Baaki et al.'s (2016) observation of a lack of awareness within the FM industry about the importance of implementing standard practices, including the use of specialized software for maintenance management.

Additionally, the higher utilization rates of ***Building Automation Systems (BAS) and Building Management Systems (BMS)*** in Asia and North America compared to Africa underscore the influence of technological maturity and regulatory frameworks on utility management practices within FM. These findings highlight the need for targeted interventions to bridge the technological divide and promote sustainable practices across regions, aligning with the objectives of the United Nations Sustainable Development Goals (UNSDGs) and global initiatives for energy efficiency and environmental conservation (United Nations, 2020)

5.2.2 Regional Operation and Maintenance Costs *(janitorial and maintenance costs only)*:

Janitorial costs, encompassing a range of expenses from wages and benefits to supplies and equipment, exhibit notable variations across Africa, Asia, and North America. Considering janitorial costs per percentile (RSF), the data demonstrates distinctive patterns among the regions. Africa emerges with the lowest janitorial costs across the percentiles, followed by Asia and North America. However, a statistical analysis reveals a significant difference between Africa and North America, suggesting that despite the overall lower costs in Africa, North America incurs higher

janitorial expenses per RSF. The classification of nations into advanced and less developed categories (United Nations, n.d.) provides a framework for understanding the socio-economic context in which these costs are incurred. Developed nations, characterized by higher economic prosperity and technological advancement, often exhibit higher operational costs in facility management due to factors such as stricter regulatory standards and labor market conditions (United Nations, n.d.).

Similarly, when examining janitorial costs by region, Africa reports the lowest average janitorial cost per square foot, followed by Asia and North America possibly owing to FM being at nascent stages of development (Syed Mustapa & Jusoff, 2009), hence devoid of advanced practices that cost more. The difference between Africa and North America is statistically significant, indicating substantial variations in operational expenditures for janitorial services. Factors such as labor costs, regulatory requirements, market conditions and socio-economic realities of each region (Alexander, 1994; Sari, 2018) are likely to contribute to these differences.

Moving to maintenance costs, which include external, interior, and utility system maintenance, etc., the data reveals a similar trend. While Africa maintains the lowest average maintenance costs per square foot, Asia and North America exhibit higher expenditures, with North America reporting the highest average maintenance costs. Statistical analysis confirms significant differences in maintenance costs between Africa and North America, highlighting distinct regional spending patterns, resource allocation strategies, and interplay of factors such as infrastructure development, regulatory frameworks, and market conditions as highlighted by Baaki et al. (2016). North America, with its advanced infrastructure and stringent regulatory standards, likely incurs higher maintenance costs (Sari, 2018), compared to Africa. Similarly, Asia's intermediate position in terms of maintenance costs may be attributed to its diverse economic

landscape and varying levels of infrastructural development across different countries within the region.

Overall, these amplify the importance of contextualizing operation and maintenance costs within the broader socio-economic and regulatory frameworks of each region as corroborated by the findings of Adewunmi et al., (2017), which highlight the need for benchmarking and comparative analysis to understand variations in facility management practices. While cost differentials exist, they do not necessarily imply inefficiencies but rather reflect the unique challenges and priorities faced by facility managers in different parts of the world.

5.2.3 Regional Energy Management and Sustainability Practices:

The survey findings point out both the progress made and the areas for improvement across different geographical regions, as outlined in Tables 4.4.1 to 4.4.14 and Figures 4.4.1 to 4.4.3. Comparing the adoption rates of ***energy management practices*** and sustainability programs between Africa and North America reveals a notable difference, with North America demonstrating higher levels of integration. This finding echoes the observations of Smithwick (2017), indicating a potential growth area for energy management practices in Africa. However, it is important to note that the western regions experience more extreme weather conditions, which may contribute to the higher adoption rates of more energy efficient building envelopes, equipment, and controls, etc., as a means of mitigating high energy consumption rather than solely an indication of advancement.

The incorporation of ***sustainability programs*** into facility management practices further highlights the commitment to social responsibility and environmental impact mitigation (Baaki et al., 2016). Despite the lower adoption rates in Africa, the presence of such programs signifies a growing recognition of the importance of sustainability initiatives across regions. This aligns with

the global trend towards corporate sustainability and the integration of Environmental, Social, and Governance (ESG) criteria into business practices. As organizations strive to align sustainability goals and stakeholder expectations, there is an opportunity for enhanced collaboration and knowledge sharing to accelerate the adoption of sustainability programs in lagging regions.

The assessment of ***green certification status*** for buildings offers insights into the current state of green building initiatives and environmental sustainability practices. This gap may reflect varying levels of awareness, market incentives, regulatory frameworks, and industry maturity and standards across regions, consistent with the observations made by researchers on the drivers for sustainable FM (Elmualim et al., 2010; Baaki et al., 2016; I. Ikediashi et al., 2014). Green building certification not only signifies environmental performance but also enhances property value, occupant satisfaction, operational efficiency and numerous incentives (Olubunmi et al., 2016). Therefore, promoting green building initiatives in Africa presents an opportunity to unlock multiple benefits, including energy savings, carbon emissions reduction, and overall positive contribution to global warming.

The widespread adoption of ***recycling programs*** across all regions underscores a shared commitment to waste reduction and resource conservation within facility management. The emphasis on paper recycling highlights a common sustainability practice aimed at minimizing landfill waste and promoting circular economy principles. However, there remains room for expanding recycling initiatives to encompass other materials and foster a culture of waste minimization, resource recovery and environmental sustainability (Elmualim et al., 2010); IFMA, 2011).

For ***water conservation***, the regional variations in adopted practices reflect the diverse environmental contexts and resource management priorities. From rain harvesting in Africa to computerized irrigation controllers in North America, facility managers are leveraging innovative

solutions to optimize water use and mitigate the impact of water scarcity. This highlights the importance of context-specific approaches and adaptive strategies in addressing regional water management challenges.

5.2.4 Regional Salary and Compensation Structure of FM Professionals:

The regional salary and compensation structures of Facility Managers (FMs) reflect an interplay of factors influenced by economic development, education levels, gender, age, and management hierarchy. Findings from the study reveal significant variations in FM salaries across different regions, shedding light on the diverse landscape of FM compensation globally.

When examining salaries by region, stark differences emerge, with North America leading in average FM salaries at $120,751, followed by Asia at $91,576, Europe at $57,592, and Africa at $43,380. The IFMA Global Salary and Compensation Report (Smithwick & Call, 2021) also corroborates this trend, where developed nations typically offer higher FM salaries compared to developing countries. This discrepancy can be attributed to the advanced state of the FM industry, the complexity of tasks involved, and the higher cost of living in developed regions.

Moreover, the correlation between age and salary highlights the importance of experience and expertise in FM. Older Facility Managers tend to command higher salaries across all regions, reflecting the accumulation of skills and knowledge over the years. This finding resonates with Klaas (2002) observation that compensation often correlates with the individual value brought by the person performing the role.

Statistical analysis confirms significant differences in salaries across regions, with Africa consistently lagging behind other regions. Specifically, significant differences were found between Africa and each of the other regions: Asia, Europe, and North America. This implies that the

average salaries of FM professionals in Africa differ significantly from those in the other regions studied. Conversely, the analysis also highlighted variations in salaries between Asia, Europe, and North America, albeit to a lesser extent. While significant differences were observed between Asia and North America, as well as between Europe and North America, no statistically significant differences were found between Asia and Europe.

The statistical analysis corroborates the qualitative observations regarding the regional disparities in FM salaries, providing empirical support for the contention that economic and developmental factors play a pivotal role in shaping compensation structures within the FM profession.

5.3 Research Impact

This study makes several key contributions to the existing body of knowledge in FM practices for AEC/FM firms. It also offers practical takeaways for industry practitioners, offering guidance for informed decision-making in benchmarking processes.

One of the pivotal contributions of this study lies in its examination of FM practices on a global scale. By transcending geographic boundaries and encompassing regions spanning Africa, Asia, and North America, the study has provided a one-stop resource for operation and maintenance practices and costs. This broad perspective not only enhances scholarly discourse but also informs strategic decision-making within organizations operating on an international scale.

The study's examination of janitorial costs, maintenance costs, and compensation structures relative to economic metrics like the minimum wage provides valuable insights for facility managers. Going beyond nominal costs, this analysis offers wider perspectives that can inform benchmarking processes and enhance cost management strategies.

Furthermore, this study has sparked conversations about the pivotal role of facility management (FM) in advancing sustainability and environmental stewardship. Backed by empirical evidence, it highlights how FM practices can effectively curb environmental impact, minimize carbon footprint, and cultivate a sense of corporate social responsibility. These findings resonate not only with academic audiences but also with policymakers, industry stakeholders, and sustainability advocates, driving momentum toward the creation of more sustainable built environments.

Overall, this thesis serves as a seminal contribution to the field of facility management, offering insights on practices on a global scale. By bridging the gap between theory and practice, my research not only advances scholarly discourse but also empowers practitioners and organizations to thrive in an increasingly dynamic and interconnected world.

5.4 Research Limitation & Recommendations for future study

While this research aims to offer a comprehensive global perspective on facility management (FM) practices, costs, and salaries, it faced some limitations.

Firstly, the challenge of data availability impacted on the study, particularly concerning European countries, where data was not collected for O & M practices & costs. Additionally, not all nations from the regions of Africa, Asia, and North America were adequately represented, potentially limiting the generalizability of the findings.

Moreso, the study's focus on specific aspects of FM, such as operation and maintenance practices, energy management, and sustainability initiatives, may inadvertently overlook other crucial dimensions of FM operations, such as space utilization, technology integration, and workplace strategies.

Another notable consideration is the decision to standardize cost data using the United States Dollar (USD) as the reference currency. While this approach facilitates comparability and streamline analysis, it's essential to acknowledge the potential introduction of bias. This is particularly relevant given the diverse economic landscapes of the countries included in the study, each with their own currency fluctuations and purchasing power disparities.

These limitations serve as valuable insights for future research endeavors in the field of FM - addressing the gaps and providing more inclusive data of global FM practices, costs, and compensation structures.

5.5 Conclusion

This multi-region study highlights the dynamism of the FM profession across different geographical contexts and the interplay of economic, technological, and organizational factors in shaping industry norms and practices. The observed regional disparities in FM practices and salaries reflect not only the diverse stages of economic and infrastructural development but also the varying degrees of professional recognition across countries. The study highlights the evolving nature of FM from an operational focus to a strategic role, emphasizing the importance of sustainability, energy management, and alignment with organizational objectives.

Despite the challenges, the FM profession emerges as a critical contributor to organizational efficiency, sustainability, and strategic goals. The study calls for a global dialogue on standardizing FM practices and educational curricula to further professionalize and advance the field. The assessment of regional energy management and sustainability practices within facility management unveils both challenges and opportunities for advancing environmental stewardship and resource efficiency. By bridging gaps in adoption rates, promoting knowledge exchange, and leveraging innovative solutions, stakeholders can collectively accelerate progress towards a more

sustainably built environment, fostering resilience, and enhancing quality of life for present and future generations. By understanding and leveraging these regional nuances, stakeholders can develop tailored strategies to optimize facility management outcomes, enhance operational resilience, and promote sustainable development in a rapidly evolving global landscape.

Overall, the findings offer a snapshot of the current FM landscape, providing a roadmap for future advancements and reinforcing the strategic significance of FM in the modern organizational context.

The tables below provide a summary of the hypothesis (Table 5.5.1) and findings (Table 5.5.2) of this research.

Table 5.5.1 – Hypotheses Summary

Hypothesis 1	• We reject H_0 due to the presence of significant differences in operations and maintenance costs between Africa & North America • We reject H_1 due to the absence of significant differences in operations and maintenance costs between Asia & North America; Asia & Africa
Hypothesis 2	• We reject H_0 due to the presence of significant differences in operations and maintenance costs between Africa & Asia; Africa & Europe, Africa & North America; Asia & North America; Europe & North America • We reject H_1 due to the absence of significant differences in operations and maintenance costs between Europe & Asia

Table 5.5.2 – Summary of findings

S/NO	Remarks
1.	**Operation and Maintenance Practices** • Outsourcing janitorial duties were a prevalent trend across regions, possibly driven by cost efficiency and specialized expertise. • The Team cleaning method was widely adopted across regions, indicating a preference for specialized cleaning practices. Also, primary cleaning mostly occurs before or after work hours across all regions. • Differences in software usage for maintenance tracking and utility management systems were noted among regions (North America ranked highest), reflecting technological advancement and adoption rates

2	**Operation & Maintenance Costs *(Janitorial & Maintenance Costs only)*** • North America and Asia reported higher nominal average maintenance and janitorial cost per SF per annum. • There were statistical differences in janitorial and maintenance costs. Also, nominal costs were compared using economic metric like the minimum wage to provide better insights into the economic peculiarities of each region. • Although North America and Asia reported higher nominal O&M costs, the proportion of the minimum wage allocated to cover these expenses is notably lower compared to other regions.
3.	**Energy Management and Sustainability Practices** • Lower adoption rates of energy management and sustainability programs were observed in Africa compared to North America, indicating growth opportunities in Africa. The higher adoption of energy-efficient practices in western regions may also be attributed to more adverse weather conditions, with these practices serving more as mitigants. Overall, recycling programs showed widespread adoption across all regions, reflecting a commitment to environmental sustainability. • Variations in water conservation methods across regions highlighted differing resource management strategies - Africa mostly conserved water via rain harvesting while North America utilized computerized irrigation controls. • Asia ranked the highest with respect to incorporating green janitorial practices. Generally, the study noted the importance of FM professionals in driving sustainability initiatives and promoting environmentally responsible practices
4.	**Salary and Compensation Structures** • North America and Asia reported higher average nominal salaries per annum. • There were statistical differences in salaries across all regions. Also, nominal salaries were compared using economic metric like the minimum wage to provide better insights into the economic peculiarities of each region. • In Africa, FM salaries significantly exceed the minimum wage by up to 97% despite lower average salaries while in North America, where salaries are highest, the difference from the minimum wage is slightly lower. • These findings contribute to discussions surrounding wage equity, labor standards, and the economic well-being of facility management professionals

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Appendix: Economic Data Summary

Table 1.0: Currency Conversion Rates (O&M Data)

This conversion utilized the official exchange rates from the central, or reserve banks as of the data collection dates: Africa in May 2023, Asia in May 2021, and North America in May 2020

Country	Dollar Equivalent
AFRICA	
Botswana	$0.076511
Egypt	$0.032456
Ghana	$0.086132
Nigeria	$0.001408
South Africa	$0.055772
ASIA	
China	$0.16
Hong Kong	$0.13
India	$0.014
NORTH AMERICA	
Canada	$0.70109
United States	$1.00

Table 2.0: Currency Conversion Rates (Salary Data)

Most compensation data were primarily provided in the US Dollar. Compensation data provided in local currency was converted to U.S. dollars based on currency exchange rates per the Federal Reserve of April 11, 2021. To interpret the table, 1 Egyptian Pound (EGP) = $0.032456, similarly, 1 Chinese Yuan (CN¥) = $0.154457.

Country	2021 Dollar Equivalent	2024 Dollar Equivalent
AFRICA		
Egypt	$0.032456	$0.032356
Ghana	$0.086132	$0.081070
Nigeria	$0.001408	$0.001050
South Africa	$0.055772	$0.053564
ASIA		
China	$0.154457	$0.140753
Hong Kong	$0.128747	$0.127855
India	$0.013497	$0.012029
Singapore	$0.751371	$0.746
EUROPE		
Hungary	$0.003339	$0.002815
Netherlands	$1.202067	$1.080263
Poland	$0.263630	$0.249460
Switzerland	$1.090275	$1.159554
NORTH AMERICA		
Canada	$0.81360	$0.744260
United States	$1.00	$1

Table 3.0: Inflation Rate Adjustment

Considering the time difference in data collection, the United States Consumer Price Index (CPI) for January 2024 was applied to adjust the dollar-cost data for inflation across all currencies – this adjustment for inflation was done using the United States BLS CPI Inflation Calculator. While interpreting this data, users are encouraged to consider country-specific inflationary trends.

Region	Duration calculated (using last month of data collection till date)	Inflation (%)
Africa (O & M)	May 2023 to January 2024	1.40%
Asia (O & M)	August 2021 to January 2024	13.58%
North America (O & M)	May 2020 to January 2024	18.42%
Global (Salary)	August 2021 to January 2024	14.37%

Table 4.0: Minimum Wage by Country

These rates were adopted from official central/reserve banks and Statista as of January 2024. All Minimum Wage data provided in local currency were converted to U.S. dollars based on currency exchange rates as of January 2024.

Country	Annual Minimum Wage ($)
AFRICA	
Botswana	$1,124.23
Egypt	$1,358.95
Ghana	$382.57
Nigeria	$378.00
South Africa	$2,832.12
ASIA	
China	$3,268.28
Hong Kong	$10,637.54
India	$4,453.62
Singapore	**
EUROPE	
Hungary	$9,012.50
Netherlands	$29,816.99
Poland	$12,698.51
*Switzerland	$58,656.73
NORTH AMERICA	
Canada	$25,775.21
United States	$15,600.00

**No statutory minimum wage

*Minimum wage is for the canton of Geneva. Weekly work hours are 42hrs.