Covenant Journal of Research in the Built Environment (CJRBE) Vol. 11 No. 1,June 2023
***ISSN*: p. 2384-5724 e. 2384-5716 DOI: xxxxxxxxxxxxxxx**

Sustainable Facilities Management Practices in Selected Universities in Ado-Odo/Ota Local Government Area, Ogun State, Nigeria

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An Open Access Journal Available Online
Received: 18.07.2023 Accepted: 10.08.2023
Date of Publication: July, 2023

Abstract:

Sustainable development is being pursued at a global level and acknowledged across all sectors of the economy including universities. In order to apply sustainable measures, universities need to be vigilant in their management approaches. This study aimed at assessing the extent to which the selected universities in Ado-Oda/Ota Local Government Area of Ogun State have incorporated sustainability principles into their facility management practices. The study adopted a qualitative case study approach where interviews were conducted with experts from Covenant University (CU) and Bells University of Technology (BUT) who were purposefully sampled. The study population was comprised of facility managers from the physical planning and development units of the two universities who were chosen because of their expertise and responsibility. The interview guide contained questions about the types of buildings in the universities, sustainable facilities management (SFM) strategies being used by the universities, factors influencing the adoption of SFM strategies at the universities and challenges to the adoption of SFM practices. Data was analysed using conventional content approach. The study found that the universities have partially implemented SFM practices. The common practice adopted by the universities includes energy management. The universities have also done well in waste management. Legislation and cost savings were the drivers for the adoption of SFM practices. Despite such being the case, there are challenges to the adoption and implementation of SFM. These include resource constraints, design constraints, and lack of knowledge about SFM. Therefore, the study recommends development of a system that monitors and evaluates progress of sustainable facilities management practices in the Universities in Ado-Odo/Ota LGA, Ogun State.

***Keywords: F*acilities management, Universities, Practices, Sustainability,**

1.0 Introduction

As sustainability concept is increasingly gaining prominence so is awareness spreading across many fields (Razali, Yunus, Zainudin & Yim, 2017). Sustainability is "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (Brundtland Report, 1987). Buildings are regarded as one agent contributing to the deteriorating natural environment, posing higher standards yet to be attained for building engineers to create innovative strategies for minimising the use of natural resources. In retrospect necessitating Sustainable Facilities Management (SFM), which has been deemed essential during the majority of a building's life-cycle, where the greatest ecological impact transpires (Alnaser, Flanagan & Alnaser, 2008). Sustainability has become a global issue which the facilities management (FM) sector must address (Baaki, Ali & Baharum, 2016). Sustainability in FM is a novel way to managing facilities that may be impacted by organisational practitioners. Hasim, Abdullah, Rasam & Ismail (2020) argue that sustainability has the capability of impacting an organisation's year on year growth by boosting the company's balance sheet, decreasing costs, and improving safety and health.

FM development has been necessitated by organisations' need to focus on the bedrock activities for their business and the driving factors of the rising cost of occupying buildings, the provision of support services in business daily operations, and enhancing working environments so that productive activities are maintained (Alexander, 2003). Opoku and Lee (2022) point out that FM results into increased productivity as costs associated with building maintenance are reduced as it incorporates people, workplaces and resources hence boosting worker's morale whereas Okoro (2023) adds that FM aims at ensuring that a building provides an intended level of usability, comfort, safety, and productivity to the occupants.

The integration of FM responsibilities to sustainability has brought the concept of SFM which has gained prominence lately. This requirement is given to the FM profession from two angles. Firstly, as a result of the detrimental impact of the buildings domiciled in the current environment (Environ. Sustain. Build., 2003) and as a result of the growing demand for more detailed knowledge among facilities managers in order to comprehend the intricacies of smart buildings and their functionalities (Elmualim, Shockley & Valle, 2010). Reductions in energy usage, gains in productivity, reductions in waste, etc., were picked out as components capable of securing management support for sustainability initiatives. The facilities manager is frequently being poised to be in an opportune position and promoter of organisation's sustainability policy.

There is potential for sustainability to be adopted in the management of facilities at educational institutions. Facilities managers can greatly affect sustainability results in educational institutions

through a variety of operational tasks like environmental management and campus design, etc.(Radebe & Ozumba, 2021) . Nielsen, Sarasoja and Galamba (2016) argue that facilities managers have the ability to assist with and offer answers to problems like climate change and natural resource efficiency at both the organisational and social levels. FM is still a new phenomenon in most African nations including Nigeria and these countries are yet to benefit from the fruits of practicing it. The art of property management is a related activity that has been historically recognized and widely adopted (Oladokun, 2011). Natukunda, Pitt and Nabil (2013) examined the expansion of FM in Uganda and found that, although not being formally recognized, the industry has the potential to grow gradually in tandem with the economy. The relative infancy of FM in Nigeria and other African countries explains the dearth of literature in the area. Ikediashi, Ogunlana and Ujene (2014) Assessed the policy direction and driving forces for SFM in Nigeria. . Abigo, Madgwick, Gidado and Okonji (2012) and Adewunmi, Omirin and Koleoso (2012) evaluated the adoption of SFM in public sector property management in Nigeria sustainable approach to corporate FM in Nigeria respectively whereas Odediran, Opatunji and Eghenure (2012) studied the maintenance practices of residential building occupants in Nigeria. These studies revealed that majority of buildings lack maintenance guidelines which significantly influences maintenance practices. Ikediashi, Ogunlana, Bowles and Mbamali (2012) investigated the level of FM awareness and the factors that influence the practice by analysing outsourcing of FM services at public universities in Nigeria. Furthermore, Adewunmi, Ajayi and Ogunba (2009) evaluated factors influencing Nigerian estate surveyors' role in FM and concluded that training in FM and the type of organization supervised by the estate surveyor are key factors influencing estate surveyors' participation in the core competence areas of FM. Asiabaka (2008) investigated the need for good FM in Nigerian schools. The study discussed the methodology for FM and the correlation between educational facilities quality against quality of the institution's output. Adenuga, Odusami and Faremi (2007) evaluated factors influencing asset management of public hospitals in Lagos State, Nigeria. The study identified insufficient funding for maintenance programmes as one of the important factors. Universities in developing countries lag behind in adopting and implementing sustainability measures, and they perform poorly in terms of SFM (Elmualim et al., 2010). Despite the acknowledged significance of facilities managers' duties as sustainability drivers in educational institutions, there is a paucity in the literature examining the role SFM plays in institutions of higher learning particularly in developing countries. This is in spite of the fact that buildings are the primary physical assets which are meant to provide shelter thereby improving the quality of life for the populace (Thompson & Kent, 2017). Since 2002, 50% of all annual construction activity in the United Kingdom have been dedicated to building repair (Lam et al., 2010). This is not the situation in Nigeria, where maintenance culture and ideals are lacking. In the previous two decades, the focus has been on the creation of new properties, with little regard to the upkeep of existing properties and the anticipated maintenance requirements of prospective ones (Odediran, 2013).

Universities ought to take strides towards incorporating a sustainability mindset into every element of their operations (Awuzie & Isa, 2017). Most universities care about achieving

Sustainable University (SU) status by embodying the sustainable development (SD) ethos across all parts of operations including FM, which is crucial to the smooth running of a university (White, 2014). Universities in developing economies have been making efforts to include SD in their curricula and research. However, little is known about the practical implementation of the same. This is particularly true in Africa south of the Sahara. Because of this shortcoming, these schools are less likely to try to become SUs. For these universities to earn SU recognition, they must commit to a comprehensive implementation of the SD ethos across the board (Ferrer-Balas et al., 2010). FM is a typically neglected part of the education system in Nigeria, and when new structures are erected and handed over to the relevant authorities, almost no care is paid to their maintenance (Asiabaka, 2008). Notwithstanding the changes in the curricular requirements, a number of educational facilities constructed during the past five years have never been renovated or modernised. Educational leaders and administrators have long lamented that their institutions' physical spaces are woefully inadequate and, in many cases, architecturally antiquated, making it impossible for them to support students' development in relevant skills and knowledge (Asiabaka, 2008). In order to satisfy the ever-changing demands for updated curricular materials in Nigeria, educational buildings, particularly in universities, require immediate attention in terms of providing functional facilities (Odediran et al., 2015).

However, little is known on the concept of sustainable FM practice in Nigeria, making it difficult to validate the assertions (Ikediashi et al., 2014). Therefore, this study sought to examine the integration of sustainable FM practices in the universities in Ado-Odo/ Ota LGA, Ogun State in Nigeria to enhance the development and preservation of sustainable buildings with appropriate environmental initiatives and practices. The study focused on universities since they are the principal institutions for both the impartation of knowledge via instruction and production of new knowledge through research. Therefore, universities are crucial to the accomplishment of the Sustainable Development Goals, as they have a part to play in the quest for sustainability. Primarily, the study sought to answer the following questions: what factors influence the adoption of sustainable facility management strategies being used in the study area; what challenges do facility managers in the study area face in implementing sustainable facility management?

The study focused on the following potential areas of sustainable facilities management; energy management: waste management: water management: green building practices and sustainable transportation. Despite the universities having individual distinct types of buildings, the study only examined the busiest categories of buildings in the selected universities e.g. lecture halls, libraries, and hostels, which are primarily occupied by students. This was the case as students are the primary end users of these buildings; therefore, the concentration must be on the buildings that are predominantly occupied by these primary users. The study's main objective was achieved by using a qualitative case study approach to address the following research questions;

what types of buildings exist in the study area? What are the types of SFM strategies being used in the study area? What factors influence the adoption of SFM strategies being used in the study area? And what challenges do facility managers in the study area face while implementing SFM practices?

2.0 LITERATURE REVIEW

2.1 Pillars of Sustainability

Sustainability is an all-encompassing thing that includes environmental social and economic factors (Zeegers & Clark, 2014). Environmental, economic, and societal sustainability are often referred to as the "triple bottom line" (TBL) of sustainability because they all play a role in ensuring the long-term viability of an organization (Slaper & Hall, 2011). Using this metric, businesses can assess how well they are doing in terms of sustainability (Zulu, Zulu & Chabala, 2022).

2.2 Facilities Management and sustainable facilities management

Human resources, people (employees and employers), work activities and resources (productivity and expenses), and the built environment (architecture and engineering) are the three pillars on which facilities management rests (Potkany, Vetrakova & Babiakova, 2015). Energy management, utility performance, environmental and waste management, and recycling procedures are all under the purview of this department (Elmualim et al., 2012). As FM continues to evolve, facilities managers are taking a more active role in shaping their organizations' sustainability policies and advancing the sustainability agenda.

FM is responsible for both hard (structure, equipment, furniture) and soft (people, process, safety environment) aspects of an organization (Enoma, 2005). The hard FM responsibilities might be regarded as conventional property management job (Hasim et al., 2020). For this reason, FM can be seen as a broad field that includes how a building is run in connection to the people who work there and the comfort and safety they experience there on a daily basis (Ogungbile & Oke, 2015).

Most of the SDGs benefit from the work of facilities management for example SDG 6, 7, 9, 12 among others (Opoku & Lee, 2022). Consequently, these foster effective action and advancement in areas that have a lasting impact to the generations to come. To meet the difficulties, needs, and opportunities of sustainable development, FM professionals have chosen sustainability as one of the major areas in which to build their skills (Talib et al., 2019). Management of assets and facilities during the operations and maintenance phase is the primary emphasis of the increasing FM profession. This includes the regulation and compliance of the management of energy, water, and waste (Lee & Kang, 2013). Global economic growth is a primary responsibility of FM.

Research indicates that FM services contribute significantly to overall economic development (Wiggins, 2010) (Fmedge, 2012)

2.3. Sustainable Facilities Management (SFM)

FM is crowned as the leader in promoting sustainability in the built environment as it is responsible for the majority of operations and has the greatest say in how many resources are used and discarded. With the overarching effects they have on creating environmental performance measures and the data needed for green management, FM services are critical to lowering an organisation's environmental footprint (Asmone & Chew, 2016; Grover, 2020). The purpose of SFM is to maximise building efficiency while decreasing carbon emissions from building operations. Taking into account sustainable practices throughout the entire life cycle, Green Facilities Management (Green FM) seeks to lessen the impact on the climate while providing a pleasant and productive place of business for its employees. Maintenance-friendly, resource-efficient sustainable structures are impossible to achieve without FM's input. As a result, FMs need in-depth expertise in the maintainability of building systems to provide for sustainable asset management across the physical environment's entire life cycle (Grover, 2020).

SFM integrates FM with sustainable development through the use of cutting-edge technology and forward-thinking corporate practices that consider the whole range of consequences of their actions on society, the economy and the environment. The desire for the FM sector to create solutions that lessen buildings' environmental impact is being affected by the worldwide difficulties of climate change and the need for energy efficiency (Opoku & Lee, 2022). FM professionals' primary duty is to translate strategies into action and introduce sustainable policies within their companies Shah (2008). Ibid considers sustainable development to be an ongoing cycle of progress. In order to improve an organization's competitiveness, it is crucial to adopt SFM practice, as stated in Baharum and Pitt (2009). It includes waste management, energy efficiency, thermal comfort, indoor air quality, water reuse, use of environmentally friendly materials, and a circular economy through recycling techniques throughout construction, demolition, renovation, and occupation as well as a wide range of other factors (Lee & Kang, 2013). Meng (2014) outlined several key roles that facilities managers could play in sustainable FM practice, including integrating all sustainability considerations, linking strategic level with operational level, incorporating FM knowledge and experience into design, disseminating sustainable knowledge and educating people, and encouraging sustainability through innovation. Incorporating sustainability techniques into the operations and implementation of facilities management functions is the overarching goal of sustainable facilities management. FM and sustainability are brought together in a holistic approach in sustainable facility management (Meng, 2014).

2.4. Sustainable FM Strategies

Sustainable FM strategies aim to improve the health and wellbeing of building inhabitants while reducing the property's negative impact on the environment at the same time. Sustainable FM advocates the incorporation of environmental, economic, and social sustainability into already established FM duties with the following tools; energy management; sustainable transportation; waste management etc. (Appleby, 2018). Universities can design new buildings or renovate existing ones to meet green building standards, such as LEED certification. Green buildings use energy and water efficiently, promote indoor air quality, and reduce the environmental impact of construction materials (Grover, 2020; Elmualim et al., 2012).

2.5. Drivers for Sustainable Facilities Management

Despite less being known about the drivers of SFM (Baaki et al., 2016). However, from the developed world's perspective; legislation, corporate image, and organisational culture are believed to be the primary drivers to SFM. Elmualim et al. (2012), Meng (2014) and Ikediashi et al. (2014) found that employment creation for local populations, waste reduction, and building connections with stakeholders were the primary drivers to SFM in a developing country context, although corporate image was still the major key driver to SFM. Some of the least influential forces on SFM were found to be pressure from higher-ups, client demands, halting deforestation, and government control (SANZ, 2009; Baaki et al., 2016). Grover (2020) put sustainable FM drivers into 3 categories namely: environmental, social and economic drivers. Love, Niedzweicki, Bullen and Edwards (2012) pointed out that the first six-star Green Star energy-rated commercial office building in Western Australia used innovative green technologies for six main reasons; improving health and happiness of the building's occupants, lessening building's environmental impact, cutting the building's total cost of ownership, creating landmark, and attracting premium tenants and high rental returns. Gou, Lau and Prasad (2013), pointed out that developers are willing to use GB to enhance low operating energy cost; ecologically friendly; decreased greenhouse gases; opportunity to differentiate in the market; lower vacancy rates; ease of resale; higher rentals and/or sales prices; increased comfort; and enhanced health and productivity. In their study, Aktas and Ozorhon (2015) revealed that some of the important factors leading to adoption of SFM were increased commitment to environmental sustainability; recycling of materials; reduced consumption of electricity, energy, and water; and enhanced occupant happiness and comfort. Windapo and Goulding (2015) identified positive public perception, competitive advantage, cost savings, and increased productivity as motivators for adopting GB. Energy and resource saving as well as trash reduction were found to be the most important drivers of change by Manoliadis, Tsolas and Nakou (2007) whereas Ahn, Pearce, Wang and Wang (2013) found top five drivers for sustainable design and construction being energy conservation, enhanced indoor environmental quality, environmental/resource conservation, waste reduction, and water conservation. In addition to that, Chan, Qian and Lam (2009) fewer operating expenses, higher building value, cheaper lifespan cost, improved marketability, and a higher

return on investment as the most important business reasons pushing the GB market. Chan et al. (2009) state that there are various economic opportunities realized through investing in GB and these prospects benefit not only customers or buyers but nearly every participant in the sector. Mondor, Hockley and Deal (2013) pointed out that GB projects can accelerate broader organisational sustainability efforts by creating major benefits for a region, including additional commerce thereby affecting the industry standards for future design and construction as well as by facilitating a cultural shift toward sustainability.

2.6. Challenges to Adoption of Sustainable Facilities Management Practice

Støre-Valen and Buser (2019) identified organisations, technology, users, and policies as the four major areas posing as central challenges to the adoption of SFM.

2.6.1. Organisations

While it is agreeable that sustainability measures help the environment, the higher price tag and murky financial advantage of such rollouts are still seen as bottlenecks (Andelin, Sarasoja, Ventovuori & Junnila, 2015). Elmualim et al. (2010) found that the primary obstacles to implementing consistent and comprehensive SFM practice were time limitations, lack of knowledge and lack of commitment from top management. Lack of steering mechanisms, financial skills, client understanding, process knowledge and underpinning knowledge as well as the lack of available methods, tools, and competencies related to the innovation process, are identified by Häkkinen and Belloni (2011) as the main barriers to SFM. Sarpin, Yang and Xia (2016) offer a concise literature review on the deficiencies and barriers that sustainable development confronts in FM practices. They put the problems into four categories, thus capability, knowledge, organization, and authority.

2.6.2 Technology

Despite its reputation as a facilitator, technology can be a hindrance to the integration of sustainable practices into FM operations (Støre-Valen & Buser, 2019). Energy efficiency gains from retrofitting existing structures have been highlighted by a number of researchers (Risholt, Time & Hestness, 2013); (Weiss et al., 2012). Energy consumption in Europe's current residential buildings could be reduced by as much as 80% (Lechtenböhmer and Schüring, 2011). Building energy usage is affected by many factors that can be improved upon such as the building's envelope, substructure, construction year, climate, size, building type, equipment efficiency, heating system, hot water use, and so on (Carlsson, 2017). However, FM professionals face challenges when trying to describe and select all-encompassing solutions due to the complexity of these various systems and the rapid development of ICT like Building Information Models

(BIM) and smart house technology (Liu & Thoresson, 2013); (Risholt & Berker, 2013). Knowledge, comprehension, and appropriation of these technologies are essential to their implementation, and these factors need to be continuously updated (Thomsen et al., 2013); (Støre-Valen, Larssen & Bjorberg, 2014); (Moum, Hauge & Thomsen, 2017). The existence of these competencies at all levels of the company including the operative one, appears to be crucial for their effectiveness. It is important to educate caretakers and similar workers, like concierges on the rationale and details of the technological solutions they must manage (Johansson, 2017). Another factor that could threaten the success of these solutions is if the building's occupants do not use it as intended (Gram-Hanssen & Georg, 2018). As a result, there is a pressing need for advancements in the field of SFM, particularly in the areas of service provision, communication, and the presentation of user-relevant metrics (like per-worker energy usage and social indicators of well-being).

2.6.3 End-users

Risholt et al. (2013), Moum et al. (2017), Shah (2008), and Then (2013) highlighted the difficulty of FM practitioners engaging with users. FM professionals typically prioritize technological fixes and assume that occupants will follow rules by default (Johansson, 2017). By ignoring questions about users' everyday interactions with the facilities and the compatibility of their routines with the technical solutions, professionals miss opportunities to improve them (Sezer, 2012); (Gram-Hanssen & Georg, 2018).

2.6.4 Policies

Regulations play a role in encouraging decreased carbon emissions. Hardie, Allen and Newell, (2013) argue that one of the most important variables triggering environmental innovations is the regulatory environment and as a result, the impact of clients and end-users will diminish. Even though practitioners are encouraged to adopt sustainable practices by professional guidelines, standards, and regulations (Sarpin et al., 2016). These are not always suitable for defining and implementing concrete solutions adapted to the local sustainability challenges (Elmualim et al., 2012); (Buser & Koch, 2014). Thus far, literature analysed suggest that main obstacles to adopting and implementing sustainable facilities management include lack of information, lack of senior management commitment, lack of time and financial resources, and a lack of skill (Radebe & Ozumba, 2021).

3.0 METHODOLOGY

This study used a qualitative case study approach to explore sustainable facility management practices in selected universities in Ado-Odo/Ota Local government area, Ogun State, Nigeria. The study population included people from the Physical Planning and Development Unit (PPD), who are responsible for managing university buildings. The PPD's expertise, decision-making

influence, and data collection and validation allowed researchers to understand their decision-making processes, policies, and practices related to sustainable facilities management. The sample design included employees in FM-related departments and units of Covenant University and Bells University of Technology. The primary data collection came from semi-structured interviews with facility managers from the PPD units. The study used a two-part instrument (an interview guide) to gather data, including questions on respondents' basic profile data and unstructured questions corresponding to the study's unique objectives. The study used conventional content analysis, which focuses on the meaning of facts rather than numbers or statistics, to analyse the data

4.0 RESULTS AND DISCUSSION

4.1 Demographic Information

The study used two universities, namely Bells University of Technology and Covenant University as case studies for the research. Respondents came from the physical planning and development units (PPD) of these two universities. These two respondents formed the sample size for the study and in-depth interviews were conducted to solicit their views on SFM for their respective universities. Table 4.1 summarises the demographic information of the respondents.

Table 1: Demographic Information of Respondents

Information	Covenant University	Bells University
Gender	Male	Female
Position	Head of Department (HoD) for civil works	Deputy Director of PPD
Years of experience	12	8
Profession	Civil Engineering	Architecture

Source: Field data

4.2. Types of Buildings at a University

At every institution of higher learning, there are different types of buildings that serve different purposes. Generally, there are lecture halls, libraries, workshops, residence halls, research centres, assembly halls, and staff offices among others (Robins, 2022). The study showed significant similarities with respect to the types of buildings that exist at the two campuses. In both universities, there are administrative buildings that are used as offices by academic and administrative members of staff. There are also academic buildings, these include libraries and lecture theatres in which lectures and examinations are administered. Research and workshop

buildings were also indicated to be part of housing structures at the two universities. Both universities have residential halls used to house students and recreation facilities for sports and entertainment. The respondent from BUT pointed out that the strategic combination of these different specialized structures is to provide a healthy and acoustically pleasant environment for the education, productivity of students and staff, and success of the university as a whole. Table 4.2 summarises the responses from the two universities.

Table 2: Types of Buildings found in the study area

Type of Building	Covenant University	Bells University
Residential	Available	Available
Academic	Available	Available
Recreational	Available	Available
Health care	Available	Available
Research/Workshop	Available	Available
Administrative	Available	Available

Source: Field data

4.3 SFM Strategies Adopted by the Universities

SFM strategies are crucial when it comes to minimising the negative effects that buildings have on the environment. Organisational success can be greatly aided by adopting such practices which can have a positive impact on costs, productivity, safety, health, and return on investment (Hasim, 2014). Respondents were asked to outline and explain the SFM that they have adopted on their various campuses. The study revealed that the universities are driven towards achieving SFM.

Operation and maintenance

The study revealed that there are certain operational and maintenance management activities that the institutions perform to operate, maintain, and manage buildings effectively, and it covers the activities, processes, and workflows that were strategically put in place to keep the core business operations running. Responses from the in-depth interview conducted included maintenance of building structures with environmentally friendly materials. The respondent from CU indicated that they used screeding and the application of anti-fungi and weather-shield paints to paint the buildings. Literature supports that these are indeed long-lasting and in turn, sustainable. The respondents also mentioned that they undertake regular inspections of building systems such as electrical, plumbing and HVAC so that preventative maintenance is done on time and prevents any inconveniences that may be caused to the users of the spaces (students and staff). Respondent from BUT gave the example that they usually have to check water levels in their reservoir tanks. *''It would be very catastrophic if suddenly the institution experienced a shortage of water without plans for short-term supply''*. The respondent also mentioned providing good security for the institution's facilities as one of the SFM strategies they adopted coupled with the use of environmentally friendly procedures for grounds keeping and landscaping, like lawn mowers, instead of harmful herbicides.

Financial and Sustainability Management

The study also revealed elements of financial and sustainability management. These consist of the organisational practices that ultimately lead to sustainable development. It involves economic production and consumption that alleviate environmental impact and facilitate the conservation of resources. An element of sustainability was showcased by both universities. The respondents showcased that they use POP walls and ceiling designs because of their light weight, durability, and low thermal conductivity. The study also revealed that the buildings were designed to use day and night roller blinds to control light intensity and sun rays. The respondent from CU further highlighted that "*…they are perfect for allowing in daylight without overexposing the window or inviting too much glare…*" The buildings were also designed such that sensor lights are installed in CUCRID and CU chapel restrooms and that LED lights save energy costs for all the buildings. The respondents also indicated the use of HVAC units in some buildings, like CUCRID and Chapel, for energy cost savings. They further indicated the use of gas power plants to generate electricity. This was being done with the intention of reducing the use of diesel generators while ensuring the availability of electricity at all times. The universities also built a central sewerage treatment plant where the entire network of sewer lines discharged sewerage into the plant for treatment. The respondent from BUT indicated that they apply sustainable management in the design stage at their institution. For instance, the structures on the campus are designed to have a brick-face finish which lasts longer in comparison to finishes with paints.

In the long run, they are able to cut costs for yearly painting work. It was further revealed that they incorporated sustainable development by making provision for water supply from the highest point so that distribution of water to various locations is by gravity in comparison to using pumps. Furthermore, they try as much as possible to use simple design techniques that are easy to maintain. The research has revealed the significance and extreme caution to be considered in the design stage of projects. This is because the design of a building may have a lot of implications with regards to maintenance and operational costs in the long run. Table 4.3 summarises the SFM strategies adopted by the two universities.

Table 3: SFM Strategies Adopted in the Study Area

SFM Strategy	Covenant University	Bells University
Brick face finish	No	Yes
Central water distribution point	No	Yes
Screeding & application of anti-fungi & weather shield paints	Yes	No
Use of POP wall and ceiling design	Yes	No
Sensor lights and LED bulbs	Yes	Yes
Use of gas-powered plant to generate electricity	Yes	No
Use of Lawn mowers for cutting grass	Yes	Yes
Availability of central sewerage treatment plant	Yes	No

Source: Field data

4.4 Eligibility of Existing Buildings in Universities for SFM

Respondents from both universities pointed out that existing buildings are not entirely eligible for SFM. The respondent from BUT indicated that the main reason is that the university comprises both very old and relatively new structures. This entails that some of the buildings are built with modern construction methods and materials tailored to achieve SFM while others are constructed with old construction methods that have a lot of gaps as far as SFM is concerned, and there is little that can be done to improve their status due to design constraints.

A tour around the university revealed the facts raised by the respondent. It was observed that the use of generators as backup power supplies, which emit fumes and defeat the achievement of SFM by emitting fumes to the environment and having high maintenance costs. Additionally, the respondent indicated how the environment of the university has changed from the 2000s to date, indicating that new construction projects have come in and as a result, a lot of vegetation that used to surround the campus is gone. New construction that has come in at the expense of natural vegetation can be considered a move against SFM. One of the respondents also indicated the occurrence of unresolved maintenance issues that remain outstanding for a lengthy period of time, which makes their building not qualify for SFM.

4.5 Factors Driving SFM in Universities

On the question of factors that drive SFM practices, the study revealed that facilities managers are striving to achieve SFM practices. Both respondents indicated that over time, it has been realised that SFM practices are beneficial for any organisation, unlike old FM practices as in the long run they are cost-effective. For instance, the two universities are using energy-saving light fittings and materials that do not need regular maintenance, the avoidance of using so much fuel saves a lot of costs for an organisation. This, in turn supports the business continuity of any entity. Businesses and organisations are able to thrive in the prevailing unstable economies because of these cost reduction strategies. This agrees with Grover (2020), Darko et al. (2017), Windapo and Goulding (2015), and Andelin et al. (2015) who support cost reductions as a motivator for SFM adoption. The respondent from CU also indicated the need to have a durable, lightweight, and good heat insulation material for ceiling and wall finishes as another driver to SFM. Furthermore, the respondent pointed out that control and reduction in the use of electricity, waste management and treatment and running of generators causing noise and air pollution as other drivers to the adoption of SFM practices at CU. This agrees with Grover's (2020) categorization of SFM techniques which include social and economic approaches. Other drivers to SFM adoption at BUT were aesthetics and creating a conducive environment for learning. Furthermore, the respondents indicated that they are pursuing SFM as there legislations tailored to achieving SFM, therefore, no institution, organisation, or corporate entity would want to be in a legal mess because they have failed to adhere to certain laws. This is in agreement with what Grover's (2020) Elmualim et al. (2012), and Meng (2014), found as some of the drivers to SFM adoption.

The study further revealed that universities are also driven towards SFM adoption so that they maintain a good institutional image. BUT respondent pointed out that the university is a learning environment where the country as a whole gets first-hand information with regards to the environment as a very important resource. *"…our university, for example, offers courses in architecture, biomedical engineering, and others. We have to be practical and exemplary with the*

outlook of our campus and even how we do certain things; otherwise, we cannot be marketable out there if we claim we train minds in something that we are failing to showcase ourselves...." Previous studies by Grover (2020), Windapo and Goulding (2015), Andelin et al. (2015), Meng (2014), Serpell et al. (2013) and Elmualim et al. (2012) also found corporate image as a factor to SFM adoption.

Table 4: Factors Influencing the Adoption of SFM in the Study Area

SFM Drivers	Covenant University	Bells University
Save costs	Yes	Yes
Aesthetics	No	Yes
Creation of conducive environment for learning	No	Yes
Legislation	Yes	Yes
Institutional Image	No	Yes
Electricity usage control & reduction	Yes	No

Source: Field data

4.6 Challenges to Implementation of SFM

In spite of the benefits of implementing SFM practices, organisations are encountering obstacles to adopt and integrate the same. The study revealed that both universities follow SFM practices to some extent although there are some barriers that are hindering the achievement of SFM. The challenges range from some buildings and structures being designed in ways that give little or no room for any improvements so that they suit new SFM strategies as *"…the damage was already done*," BUT respondent. The respondent further pointed out that in a case where a building was designed and constructed with strip footing, which is a shallow foundation design often used for medium-rise buildings. This would be impossible to optimise space by adding another storey to an existing multi-storey building, due to the original foundation which cannot support any additional load, unlike if it were designed and constructed with a pile foundation, which can support heavy loads. CU respondent said that *"SFM was not included in the buildings right from the design stage; this has been a challenge to incorporating some of the needed installations in order to achieve SFM."*

The study also revealed that there was a perception between the respondents that having sustainable buildings or management operations does not actually guarantee energy or

maintenance cost savings. "…*I gave an example that using herbicides causes a lot of pollution, and we opt to use grass mowers. We cannot use manual mowers because our campus is just as huge as you may have noticed. That means we have to use fuel-powered mowers. Petrol and diesel are very expensive nowadays, and that does not save any costs at all*…" CU respondent. This points to the perception that implementing some SFM actually raises more costs. This disagrees with other studies reviewed in the literature. Respondents also indicated a lack of capability by the institution to implement other SFM practices. For example, one of the recommended SFMs is waste management and recycling. The university itself is not capable of undertaking intensive waste management and recycling since its core business is teaching. As such, less effort and budget is allocated to support this SFM practice. As a result, they operate within minimum standards as far as some SFM practices are concerned.

CU respondent also highlighted little or no knowledge and awareness of SFM, unavailability of local materials for SFM, lack of skilled workers to carry out maintenance, and adoption of improper SFM practices as challenges to adoption of SFM practices whereas BUT respondent cited space constraints as another barrier to the successful implementation of SFM. This agrees with Radebe and Ozumba (2021) and Hasim (2014) who found lack of knowledge and competence as obstacles to successful implementation of SFM. Table 4.5 summarises major challenges that were highlighted by the respondents.

Table 5: Challenges to the Adoption of SFM in the Study Area

Challenges	Covenant University	Bells University
Design constraints	Yes	Yes
High long-term costs	Yes	Yes
Space constraints	No	Yes
Resource constraints	No	Yes
Little knowledge & awareness of SFM	Yes	No

Lack of capability	Yes	Yes
Lack of skilled workers	Yes	No
Unavailability of local materials for SFM	Yes	No

Source: Field data

5.0 Conclusion and Recommendations

The study assessed SFM practices in selected universities in Ado-Odo/Ota Local Government Area of Ogun State by examining current state of facility management practices, SFM strategies adopted in the universities, drivers to SFM adoption and barriers to SFM implementation. Facility managers in the selected universities handle the upkeep of university buildings in order to better equip them to incorporate sustainable FM practices into their daily operations. The study shows that Ado-Odo/Ota Local Government universities are increasingly aware of sustainable facilities management practices, but more commitment and action are needed to integrate them into daily operations. Current practices vary in effectiveness and efficiency, with some facing difficulties in waste management, energy, water conservation, sustainable procurement, and transportation. The study makes the following recommendations based on the data collected, analysed and presented herein.

5.1 Recommendations

1. Both universities should establish a well-defined sustainability policy that states the university's commitment to sustainable practices and put them into practice;
2. Both universities should put in place strategic plans outlining measurable objectives to enhance facility management and decreasing the institution's carbon footprint;
3. Both universities should prioritise waste reduction, recycling, and appropriate waste disposal practices to improve waste management by establishing recycling centres, promoting paperless initiatives, and adopting decomposition practices that can significantly contribute to reducing campus waste and promoting a circular economy;
4. Both universities should establish partnerships with local government authorities, NGOs and other universities in order to share best practices;
5. Both universities should develop training programmes to enhance sustainable practices, skills and knowledge of facility management for staff offer workshops, seminars, and certification courses that focus on the principles, techniques, and emerging trends of

sustainable facilities management.

6. Both universities should develop a system for monitoring and evaluating the progress of sustainable facilities management practices in universities and conduct regular evaluations to measure the efficacy of implemented initiatives and identify areas requiring further development.

Acknowledgement

We would like to thank Africa Sustainable Infrastructure Mobility Program (ASIM) for contributing towards the actualisation of this research.

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