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Developing a sustainable approach to corporate FM in Nigeria

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Abstract

Purpose – This paper aims to examine common environmental practices and strategies for implementing sustainable FM among Nigerian FM practitioners.

Design/methodology/approach – A review of the literature on sustainability and environmental management was undertaken. Data collection was through self-administered questionnaires directed to a sample of 150 facilities managers who are members of the International Facility Management Association (Nigeria Group), Lagos, Nigeria. Structured interviews with five top facilities management professionals were also conducted. The data collected were analyzed using frequency counts, means, z-test, repeated measures analysis of variance (ANOVA) and relative importance index. The survey achieved a response rate of 30 percent.

Findings – The survey revealed that many of the practitioners put a premium on achieving energy efficiency as a very vital environmental practice within their organizations. A strategic management procedure is more important for the implementation of environmental management in the Nigerian FM industry.

Originality/value – There is a paucity of literature in sustainability within facilities management in Nigeria. An integration of sustainability considerations into FM practice is required to promote the development of suitable environmental initiatives and practices within Nigerian cities, as many facilities managers are employed by companies whose activities harm the environment.

Keywords Facility, Facilities management, Sustainability, Environmental management, Nigeria

Paper type Research paper

Introduction

The Brundtland Report (United Nations, 1987) defined sustainable development as development that meets the needs of the present without compromising the ability of future generations to meet their needs. Sustainable development is now in general described as the line between environmental, economic, and social sustainability. It is necessary for any true measurement of sustainability to deal with all three pillars. The benefits of sustainability and green building practices in facilities management include: reduction in energy consumption, productivity increases, and waste reduction. Equipped with requisite financial and strategic planning tools, such as life cycle cost the facilities manager can create long-term value to the organization through sustainable facilities practices (Hodges, 2005). Globally, organizations are increasingly being forced to engage in environmental initiatives through government regulations,

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community participation and market demand (Chen and Soyeze, 2003; Zhang *et al.*, 2008). Increasing public concern for the environment is influencing the way the business enterprise functions (Fergusson and Langford, 2006). Facilities management aids organizations to meet social, environmental and economic responsibilities through appropriate use of resources (IBC EUROFORUM GmbH, 2007). Many of today's environmental problems are closely tied to the daily activities of people within organizations (Melissen *et al.*, 2008). Therefore, facilities managers should be at the forefront of leading their organization in sustainability issues and communicating to employees' concepts such as energy savings, recycling and other green practices. They can easily expand these throughout their organizations. In developed countries big companies such as Nike, Google, BP, and Toyota deal with "environmentalism" as a marketing effort, as well as internal process improvement system, to effectively manage environmental, social and governance risks and opportunities. These companies are looking for ways to improve their impact on the environment, while also improving business performance (Roper, 2007).

Corporate FM in Nigeria is a relatively new field and was introduced as a result of the relocation and space management exercises of two foremost multinational oil companies namely Chevron and Mobil in the early eighties. FM is practiced in government agencies, corporations and non-profit institutions that have realised that management of corporate assets using traditional organizational structures is inadequate. Examples include: Muritala Muhammed Airport 2, Investment and Banking Trust Corporation building, Mobil, Chevron, MTN, Central Bank and Guaranty Trust Bank among others. There is also the presence of the International Facility Management Association (IFMA) which started in 1997 and offers guidance and opportunities to acquire expertise to its members in Nigeria. The activities of IFMA have driven improved practice among its members and increased awareness of FM to the general public.

The concepts of sustainability are the same with that of other countries in the world but awareness and attitudes differ. Awareness is low and attitude inadequate. Issues concerning sustainability are mainly directed towards the environment in developing countries (Kadiri, 2006). Nigeria, like other developing countries, is plagued with such environmental problems as insipient desertification, deterioration of urban physical quality, land degradation, deforestation, soil erosion, and flooding (Egunjobi, 1993). Most of the problems are usually found in cities which in most cases serve as bases for administrative and economic activities of individuals and institutions. Indeed a sizable number of facilities managers are employed by these institutions. Other problems that plague urban centres include poor waste management, pollution from toxic wastes, insecurity, poverty and unemployment. Facilities managers can contribute to achieving sustainable cities by encouraging institutions to use environmentally friendly technologies, reduce wastage through good waste management practices and encourage recycling (see Kadiri, 2006).

An examination of the literature on sustainability showed that not much work has been done in the field of FM in Nigeria. This paper is concerned with how sustainability concepts can be incorporated into Nigerian FM practice, based on the attitudes of facilities managers in Lagos, Nigeria to sustainability in facilities management. Although, sustainability covers three pillars: environmental, social and economic development, the emphasis of this paper is on environmental sustainability.

The research questions for the study are: What is the perception of Nigerian facilities managers towards best practice in environmental management? What are the environmental practices of Nigerian facilities managers and how is this different from the experience of their counterparts in developed countries? What is the performance of ecological sustainable development activities in Nigerian FM organizations? What is the relative importance of strategies deployed for managing environmental issues in Facilities management in Nigeria?

The paper is arranged as follows: The present section has introduced the paper and defined the research problem. Environmental management within the context of sustainability was discussed in the second section. In the third section respondents were asked to provide a rating of their views on best practice in environmental management and environmental practices. Environmental performance of ecologically sustainable development activities of FM organizations was also evaluated. In addition significant strategies needed for managing environmental issues using relative importance index were studied. The concluding section is directed towards conclusions and making suggestions for appropriate strategies for the Nigerian market.

Studies on environmental sustainability

This paper examines environmental sustainability because sustainability issues in less developed market are geared mainly towards the environment. There is also the need for facilities management to be at the forefront of environmental sustainability as many of the problems facing the environment are caused by people occupying buildings managed by facilities managers. Facilities management is a relatively new discipline in Nigeria, hence there is need to build a body of knowledge in vital aspects of the profession out of which sustainability is one. A critical look at previous and recent literature in facilities management shows that there is a dearth of literature on the subject of environmental sustainability in facilities management in Nigeria. Few exist in the developing countries. Papers that have focused on environmental sustainability are from the UK, the USA, Hong Kong and China among others.

In the UK, Alshuwaikhat and Abubakar (2008) affirmed that environmental sustainability is needed in universities and can be promoted through the integration of three strategies, namely: University Environmental Management System (EMS); public participation and social responsibility; and promoting sustainability in teaching and research. It can be embraced by other types of organizations.

Other studies are found in the construction industry (Brown and Pitt, 2001; Chartered Institute of Building, n.d; Majdalini *et al.*, 2006 and McLeod, 2008), Urban design (Boyko *et al.*, 2006) and professional bodies (Dixon *et al.*, 2008) examined the involvement of members of Royal Institution of Chartered Surveyors (RICS) with sustainability agenda using the survey method and concluded that stakeholders must work together for educating and guiding members in sustainability. Although the survey is global and targeted at RICS members, other professional bodies' involvement will also be useful. Also in aviation, for example Brown and Pitt (2001) investigated the role of the facilities management profession to airport expansion and designed a conceptual evaluation framework to measure the likely sphere of influence of the airport facilities manager. Another area is service sector (Junnila, 2004), corporate buildings. Sustainability has been known to improve corporate image in the UK, however facilities managers need to first be familiar with concepts associated with it.

In less developed markets such as Hong Kong and China, environmental sustainability has been assessed mainly through surveys of perception of practitioners' on key issues involved. Practitioners are rarely aware of environmental initiatives. Lai and Yik (2006) investigated the knowledge and perception of operation and maintenance (O&M) practitioners in Hong Kong about the key aspects of sustainable buildings, and contribution of current education and training to their knowledge level. Penny (2007) examined the extent at which environmental management has been used by Hotels in Macao, China. His findings showed that low customer demand, poor environmental knowledge and the lack of governmental regulations enforcing environmental practices are the reasons hindering hoteliers in Macao from practicing green. The wide-ranging impact of improving hotel environmental performance on staff, customers and the hotel's productivity and competitiveness was not examined.

In the US, the focus of recent writers has been on green buildings using case studies. Roper and Beard (2006) discussed how green operations within buildings can be implemented and how business needs can be met in a global environment. Roper (2007) addressed the Leadership in Energy and Environmental Design Existing Buildings (LEED EB) guidelines and their effective implementation into facilities management procedures so as to promote organizational understanding of green building initiatives and practices. The studies did not assess the advantages of sustainable buildings for facility return-on investment.

There is however need for other studies on environmental sustainability to target other professional bodies. There is also need for a wide-ranging study as identified by Penny (2007); Alshuwaikhat and Abubakar (2008); Melissen *et al.* (2008) covering all the stakeholders in the industry. These issues will be addressed by this research. Also, none of the studies was conducted in a developing economy, but in an entirely different environment and context. Therefore one should be cautious in generalization of the findings to an emerging market.

Environmental sustainability in Nigeria

With an area of 923,770 sq. km, Nigeria is the largest country in tropical West Africa. It extends between Latitudes 4°16' N and 13°52' N and between Longitude 2°49' E and 14°37' E and is bounded by Cameroon and Chad Republic to the East, Niger Republic to the North and Benin Republic to the West. The southern coastline is dominated by the delta of the River Niger. Although Nigeria is the twelfth largest country in Africa, it contains a quarter of the continent's people and a greater population than any other country in Africa. The country has a great diversity of ecosystems that range from the rainforest through dry savannah to dry lands and flat coastal zones to plateaus and highlands.

The current environmental issues in Nigeria like most developing countries covers: soil degradation; rapid deforestation; urban air and water pollution; desertification; oil pollution – water, air, and soil; has suffered serious damage from oil spills; loss of arable land and rapid urbanization.

Erosion is one of the identified ecological problems that have affected many cities. In Lagos State and other coastal areas – coastal erosion has destroyed properties. Urban flood problem especially in areas with no or inadequate drainage system is common during the raining seasons. Due to deforestation; the nation loses about 351,000 sq. km annually of its land mass; (the desert is advancing southward at the rate

of 0.6km per year. The intensification of the use of fragile and marginal ecosystems has led to progressive degradation and continued desertification of secondary agriculture.

The use of solid biomass, such as fuel wood, is common and a major energy source. During the 1990s, for instance, Nigeria lost nearly 500 square miles of forested land annually, in part due to fuel wood consumption. However, the production and consumption of commercial renewable energy in Nigeria remains quite limited (Lawanson, 2006).

Solid waste characteristics in Nigeria are similar to those of other developing countries and can be classified into residential, municipal and industrial waste (Ogbonna *et al.*, 2007). In many cities waste is disposed off informally at open dumps. In a city like Lagos, however, the collection and disposal of waste is now better organized and controlled by the Lagos State Waste Management Authority (LAWMA). Private Sector Participation (PSP) operators which are registered by LAWMA collect and dispose waste from residences and commercial premises at a fee.

The energy generated in Nigeria is grossly inadequate; hence the need to imbibe energy efficiency culture. Most of the energy we generate in Nigeria comes from the burning of fossil fuel (oil and gas) and for every kilowatt of electricity we consume; there is an equivalent emission of greenhouse gases. There are nine electricity generating stations in Nigeria. Three of these stations are hydro based while six are thermal based and they are all owned by the government under the Power Holding Company of Nigeria (PHCN). They have an installed capacity of 6,000MW. However, for reasons ranging from shortage of gas supply to lack of maintenance, the stations are performing far below the installed capacity (about 2,000MW of electricity is generated). Ironically, part of the electricity generated is exported to neighbouring Niger Republic. Meanwhile electricity demand in Nigeria remains high and about 60 per cent of the populace have no access to publicly generated electricity. Although many gas-powered stations have been commissioned to increase generation by 4,000MW, by the year 2015 the total electricity power generated will remain far below the required level (Community Research and Development Centre, 2009).

Nigeria is a party to International Conventions on Biodiversity, Climate Change, Desertification, Endangered Species, Hazardous Wastes, Law of the Sea, Marine Dumping, Marine Life Conservation, Nuclear Test Ban, Ozone Layer Protection and Whaling. However the nation is not a signatory to the Kyoto Protocol to the Framework Convention of Climate Change. Studies have shown that large ecological and economic losses will continue to be incurred if environmental sustainability problems continue to be neglected. Initial estimate indicates that the costs of unsustainable development for our country are around US \$5.1 billion per year. Hence, corrective measures as well as new investment programmes should be developed to reduce these damages (Nigeria's Agenda 21).

Nigeria's efforts towards sustainable development are marked by policy formulation. One of the local environmental laws which have been enacted is: the Land Use Decree of 1978. There is also the National Policy on Environment (1989) concerned with securing the quality of the environment, conserving and using the environment for the benefit of present and future generations; restoring, maintaining and enhancing the ecosystem and ecological processes essential for the functioning of the biosphere to preserve biological diversity and the principle of optimum sustainable

yield in the use of natural resources. Another major provision of this policy is promoting public awareness on the link between development and the environment; and international co-operation with countries and international organizations in the protection of the environment.

The 1999 constitution, the apex of all local laws in Nigeria which also provides for the environment, for example the section 20 of the law states that:

The State shall protect and improve the environment and safeguard the water, air and land, forest and wildlife of Nigeria.

Other recognized environmental protection provisions are; the Harmful Wastes (Special Criminal Provisions) Act Cap 165 that was the immediate reaction to the dumping of toxic waste product in Nigeria in 1988, otherwise known as the Koko incident, and Environmental Impact Assessment Decree 86 of 1992 which is the core legislation that governs environmental impact assessment in respect of proposed projects in Nigeria and flows directly from the provisions of principle 17 of Rio declaration (Anago, 2002).

Integrating sustainability into facilities management

Incorporating sustainability into facilities management according to Australia's Department of Environment will require Facilities Managers to:

- gain commitment from senior management in an organization;
- find a champion at senior level to support the required changes;
- identify risks and priorities;
- set policies, objectives and targets (long and short-term) in conjunction with stakeholders;
- develop a plan to implement the process;
- allocate resources to action the plan; and
- effectively communicate those details to all internal and external stakeholders.

Integration of sustainability into FM has also been examined by other institutions and writers such as Tertiary Education Facilities Management Association (2004), www.ecosteps.com.au, Penny (2007), Lai and Yik (2006) and Alshuwaikhat and Abubakar (2008). In www.ecosteps.com.au relevant questions were highlighted such as: WHY DO shows that to implement sustainability you need to think how it specifically impacts your organization. UNDERSTANDING shows the need for further education and training to appreciate and prioritise sustainability issues. WHERE AT NOW shows the current position of the organization with regard to sustainability issues. WHERE TO, refers to development of a sustainability strategy which must be integrated into the organization's business strategy. HOW TO GET THERE shows how the sustainability strategy can be executed practically. MEASURING PROGRESS refers to measuring and reporting sustainability progress to an organization's stakeholders (for further details see www.ecosteps.com.au/content.asp?id=4). Also, TEFMA guidelines (Tertiary Education Facilities Management Association, 2004) provide various tasks that help integrate sustainability into FM.

Alshuwaikhat and Abubakar (2008), in relation to a university campus proposed a framework of a more suitable approach to achieving campus sustainability that could

remedy the limitations of the current environmental management practices in universities through the integration of three strategies, namely: Environmental Management System (EMS); public participation and social responsibility; and promoting sustainability in teaching and research.

There is however a dearth of literature of how sustainability can be integrated in facilities management in developing countries, inclusive of Nigeria. Environmental sustainability is usually borne out of the need to respond to pressure from government legislation (Zhang *et al.*, 2008), for example in Nigeria it is required under the Environmental Impact Assessment Decree 86 of 1992 that environmental impact assessment be conducted for building projects with more than four floors. Sustainable building technologies that make use of existing resources more efficiently and can function in challenging environments such as fluctuating power sources are operable in developing countries. In developed countries such as the UK and the USA on the other hand, sustainability in FM focuses now on developing policies to improve work outcomes. Concepts of building effect on the environment over its life span and green leasing are now developed. Also, the Global Reporting Initiative is used as a guideline for reporting sustainability of building projects. According to IFMA outlook (2007), the Leadership in Energy and Environmental Design (LEED) is used to provide specific market driven environmental certifications (the British label is 'BREEAM- Building Research Establishment Environmental Assessment Method). Buildings with good sustainability performance now command higher rents.

There are some themes that appear after a close look at practices that promote sustainable FM for Nigerian practitioners and this study is structured based on them. They include:

- environmental awareness;
- performance of ecologically sustainable development activities; and
- strategic management.

Environmental awareness

Environmental management aids in achieving organizational effectiveness (Penny, 2007). www.ecosteps.com.au identified that there is need to ascertain how sustainability impacts your organization. To achieve these managers need to be aware of the importance of various environmental initiatives to their organizations. Without environmental awareness buildings are unlikely to be managed sustainably (Lai and Yik, 2006).

Performance of ecologically sustainable development activities

The Australian National Strategy for Ecologically Sustainable Development defines ecologically sustainable development (ESD) as:

Using, conserving and enhancing the community's resources so that ecological processes on which life depends, are maintained, and the total quality of life, now and in the future, can be increased.

Environmental performance under ESD covers aspects such as: indoor environmental quality, outdoor air quality, energy, waste, water, land use and ecology (Tertiary Education Facilities Management Association, 2004). These aspects were identified by

Lai and Yik (2006) as most critical aspects of a building that impact on sustainable development.

Strategic management

In general environmental sustainability can be promoted within any organization through corporate strategy. Wagner (2005) discussed the relationship between environmental and economic performance and the influence of corporate strategies with regard to sustainability and the environment from the empirical analysis of the European paper on the manufacturing industry. He found that for firms with pollution prevention-oriented corporate environmental strategies, the relationship between environmental and economic performance is more positive, thus making improvements in corporate sustainability more likely.

In the practice of FM in Nigeria, strategic management is not emphasized. This implies limited capacity to bring about a change and assist an organization's competitive position (Adejumo *et al.*, 2009). Environmental management when integrated strategically enhances organizational effectiveness and competitiveness (Penny, 2007). A strategic Environmental management program according to Penny (2007) includes:

- having a clear environmental policy;
- designating a staff or team to be in charge of environmental management;
- creating an implementation plan to reduce the excessive consumption of goods, energy and water, and emissions;
- having a plan to raise the environmental awareness among staff and customers;
- seeking business partners' support by providing environmentally-friendly materials;
- participating in activities of local communities such as donating outdated products to the community;
- becoming a member of some environmental organizations and conducting research;
- seeking published information on environmental matters; and
- having a plan to audit environmental performances.

Sustainability strategy can be achieved through an organization's strategic plan, workshops, publications, benchmark survey and general awareness (Tertiary Education Facilities Management Association, 2004).

Challenges of implementing sustainable development can be from lack of understanding, gaining managerial leadership, ineffective funding models, reluctance to adopt new ideas, long-term benefits ignored because of intense competition from immediate priorities. Benefits can come from growing cultural shift to sustainable practices, cost savings, increasing executive support for sustainability, healthier facilities, increase in number of ESD projects and improved environmental performance. Solution will be to ensure continuous awareness programs, life cycle funding basis – not just capital cost, implement user-pays systems, develop links between FM and academic programs and ensure ESD projects work and measure benefits (Tertiary Education Facilities Management Association, 2004)

Research method

Findings from a literature review were used for the design, pre-test and administration of self administered questionnaires that contained closed and open-ended questions. These were sent in September 2009 to a sample of 150 members of the International Facility Management Association in Lagos, Nigeria (IFMA) who are mainly in the management cadre. This was supplemented with the use of scheduled interviews with five top facilities management professionals to further explore contextual conditions for the practice of environmental management in facilities management in Nigeria. Preceding the main survey, the questionnaire was pre-tested and necessary modifications were made. The sample frame of facilities managers in Lagos, Nigeria is 700 as found in the list of IFMA members (2008). A purposive sampling method was used based on the experience of the respondents in FM.

The seven-page questionnaire was structured into four sections; the first section which identified some aspects of the background of the respondents' organizations. The second section required the ranking of environmental practices. The third section examined ranking of strategies for managing environmental issues in FM. The fourth section identified the respondents' personal characteristics.

Of the total of 150 served, 50 questionnaires (30.0 percent) were received which was considered to be representative. The respondents were mainly employees of corporate organizations (61 percent) while only 39 percent are facilities management company employees. Most of them are managers (43.5 percent), followed by supervisors (34.8 percent). The remaining 22 percent were relatively more senior within their organizations. Most of the respondents (36 percent) work with large organizations with size of more than 500 employees. Of the managers' 20 percent work with companies having between 100 and 500 employees, while a total of 44 respondents work in smaller companies with less than 100 employees. Out of the 50 respondents, 60 percent belonged to companies that are indigenously owned, 12 percent are foreign owned, while 28 percent are owned by both indigenous and foreign companies. Most of the buildings under the respondents' management occupy a space less than 100,000 square metres (40 percent), 20 percent occupy a space of 1,000,000 sq. m and above, only 5 percent occupy a total space of between 500,001 to 750,000 square metres within their building portfolios. Most of the buildings under the management of the managers were between 1 and 5. Of the managers 28 percent had up to ten buildings within their portfolio. 24 percent had more than 51 buildings in their portfolio, while only 8 percent had between 11-50 buildings in their portfolio of properties.

Due to time constraints and huge financial costs, the study could not be extended beyond Lagos at this time. Nevertheless, Lagos metropolis is an ideal study area because it is the business nerve centre of Nigeria, which houses several of Nigeria's large corporations that require facilities management services. Data collected was analyzed using descriptive statistics (frequency counts, Mean and Standard deviation) and inferential statistics (z test and repeated measures analysis of variance).

Findings

Respondents' understanding of best practice in environmental management

Respondents were asked to rate words that represent "best practice" in environmental management on a five-point likert scale. The words used were identified from Penny (2007) and are used to assess how managers' feel sustainability impacts their

organizations (a step highlighted by www.ecosteps.com.au for the implementation of sustainable practices within an organization). The results shown in Figure 1 indicate that most managers (62.5 percent) “strongly agreed” and 37.5 percent “agreed” that facilities have an influence on the natural environment. Also, that taking action on environmental issues contributes to a company’s brand image competitiveness. 37.5 percent “strongly agreed” and 62.5 percent “agreed”. This is followed by “there are economic benefits to taking action on environmental issues” to which 95.8 percent “strongly agreed” and “agreed”, while 4.2 percent “fairly agreed” with this statement.

In terms of level of agreement, the view that “increased involvement in environmental issues improves customer satisfaction” was followed by “there are economic benefits to taking action on environmental issues” in respondents level of agreement. 41.7 percent “strongly agreed” and 45.8 “agreed”, while 12.5 percent “fairly agreed” with this statement. Lastly, we have agreement as regards employment satisfaction. In total, 37.5 percent “strongly agreed” and 54.2 percent “agreed”, while 8 percent “fairly agreed” to this statement.

Environmental practices

As cited by Obabori *et al.* (2009) the provisions of Section 20 of the 1999 Constitution of the Federal Republic of Nigeria says the term “environment” means the following:

- water, air and land;
- forest and wild life;

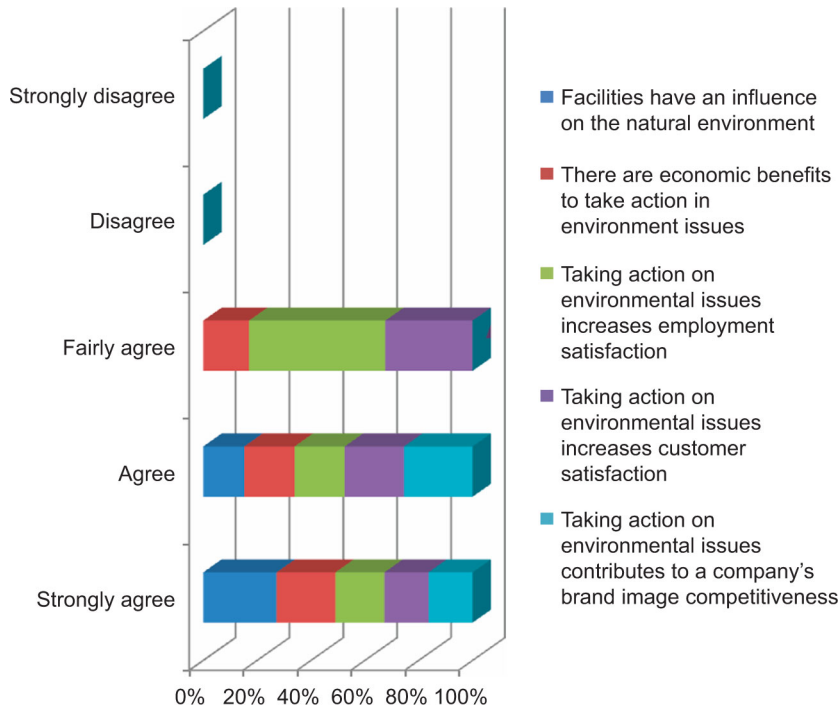


Figure 1.
Respondents’
understanding of best
practice in environmental
management

- all layers of the atmosphere;
- all organic and in-organic matter and living organisms; and
- the interacting natural systems that include components referred to in paragraph (1) to (4).

It is not clear the extent to which the FM practitioners embrace or appreciate this broad definition. Nevertheless the study sought to establish their attitudes based on broad FM related aspects.

In evaluating the attitudes of managers to environmental issues in FM practice, mean scores of respondents were used to rank their views on a 5 point ordinal scale in descending order as shown in Table I.

The broad aspects as shown include Energy efficiency, Environmental concerns and other concerns with procurement, reuse and recycling and the ecosystem.

According to United Nations Environment Programme (UNEP), energy efficiency is defined as the ability to provide the same (or higher) level of energy services, such as thermal comfort and high quality lighting at lower energy consumption and cost (UNEP, 2007). Energy efficiency is increased by investing in improvements in the design and the technology used in the building. In many instances, an energy efficient building costs more to construct but it always costs less to operate (Momodu, n.d). In this study, energy efficiency ranked highest (mean score of 4.21 and 0.97 SD). For example a study by Akinbami *et al.* (2002) showed that excessive energy is being expended in buildings daily in Nigeria and advocated therefore that use of energy conservation measures in design strategy will achieve about 40 percent energy savings per cubic metre of the built environment.

Environmental concerns ranked second (mean score of 4.09 and 1.19 SD). Major environmental concerns in Nigerian cities include: gully erosion and flooding, environmental pollution, loss of biodiversity, urban environmental decay and slum formation, deforestation and degradation. These environmental issues arise as a result of population growth which exerts pressure on available infrastructure (Obabori *et al.*, 2009), indiscriminate discharge of pollutants and topographical effects among others.

Waste recycling is an interesting approach to achieving an efficient, integrated manner of managing municipal solid waste. Reuse and recycling concern was rated as less important by the managers having ranked 5th out of the six highlighted broad environmental practices (mean score of 3.68 and 1.20 SD). This is to be expected since recycling is restricted to well segregated and clean high value materials. It has not

Broad environmental FM practices	<i>n</i>	Min	Max	Sum	Mean	SD	Rank
Energy efficiency	48	2.00	5.00	202.00	4.2083	0.9664	2st
Environmental concerns	46	1.00	5.00	188.00	4.0870	1.18932	2nd
Procurement concerns	48	1.00	5.00	194.00	4.0417	1.14777	3rd
General concerns	50	1.00	5.00	198.00	3.9600	1.19455	4th
Reuse and recycling concerns	50	1.00	5.00	184.00	3.6800	1.20272	5th
Ecosystem	46	1.00	5.00	164.00	3.5652	1.10860	6th
Valid N (listwise)	44						

Table I.
Broad environmental FM practices

received the attention of the government and the waste management authorities so far. Also, there is no officially known material recovery facility (MRF) in the state. Currently, only paper, plastics, glass and metals, have high recycled values in Lagos. These are separated from wastes either at the source or at landfill sites by scavengers and sold to the market. The materials collected are then subjected to some level of intermediate processing, such as washing and drying after which they are sold to dealers, either at the disposal site or at junk shop.

Environmental performance

Ecologically sustainable development activities that should be implemented in FM are identified in Table II. These activities were ranked on a three-point ordinal scale

Environmental performance	<i>n</i>	Mean	Std deviation	Rank
Is energy-efficiency and power-saving equipment acquired and used	44	1.2727	0.62370	1st
Are there controls to minimise the generation of indoor air quality pollutants	42	1.2381	0.61721	2nd
Are natural and built systems used to control and/or direct water run-off to prevent erosion	46	1.1304	0.74859	3rd
Are high efficiency lamps and ballasts matched to task lighting requirements	44	1.0909	0.67577	4th
Has a waste reduction program been developed and implemented	44	1.0909	0.74141	4th
Are contractors with demonstrated environmental systems sought as the principals for projects	44	1.0000	0.74709	5th
Is an environmental impact study conducted on the development before the design stage	42	0.9524	0.58236	6th
Does your facilities management section have a risk-based system	44	0.8636	0.63212	7th
Has hot water been eliminated from restrooms, where possible	42	0.8571	0.78310	8th
Has a strategic plan been developed	46	0.8261	0.56977	9th
Is light spillage minimised by use of directional lighting	44	0.8182	0.65673	10th
Are water saving devices fitted to fixtures	44	0.8182	0.78571	10th
Are high performance water heating systems used	42	0.8095	0.67130	11th
Are building materials selected such that they are used efficiently	44	0.7727	0.74283	12th
Identification of all emissions from the development	46	0.7391	0.80097	13th
Is there an indoor environmental quality management plan	44	0.7273	0.69428	14th
Is high quality process water reuse	44	0.7273	0.81736	14th
As rainfall infiltration maximised in exposed/landscaped area	44	0.6818	0.63878	15th
Is there a green purchasing policy	44	0.5455	0.66313	16th
Are all sources of waste water reused before discharge to waste	44	0.5455	0.66313	16th
Are waterless urinals used	42	0.4762	0.67130	17th
Do you use renewable energy sources	44	0.4545	0.58883	18th

Table II.
Ecologically sustainable
development activities of
FM organizations

(0 = not implemented, 1 = partially implemented, 2 = fully implemented) and had previously been identified by TEFMA guideline (Tertiary Education Facilities Management Association, 2004 and Alshuwaikhat and Abubakar (2008) as practices needed to achieve sustainability. Though there is a slightly higher, SD of sustainable development activity, the most sustainable activities of FM organizations include: use of energy-efficiency and power-saving equipment (mean score is 1.27, 0.62 SD) controls for indoor air quality, natural and built system to control erosion (mean of 1.13, 0.75 SD), use of high efficiency lamps (mean of 1.09, 0.68 SD), use of environmental contractors (mean of 1.00, 0.75 SD), use of environmental impact studies (mean of 0.95, 0.58 SD), use of risk-based system (mean of 0.86, 0.63 SD) and elimination of hot water systems from restrooms (mean of 0.86, 0.78 SD).

Preference for energy-efficient equipment and high efficiency lamps can be attributed to the high cost of providing alternative sources of energy for electricity due to the inefficiency of the power sector which has resulted into frequent cut in power supply. Also it is mandatory for environmental studies to be conducted on major projects as provided by the Environmental Impact Assessment Act of 1992. This is the central legislation that governs environmental impact assessment in respect of proposed projects in Nigeria and was enacted as a result of the provisions of principle 17 of the 1987 Rio declaration:

Environmental Impact assessment as or national instrument shall be undertaken for proposed activities that are likely to have a significant adverse impact on the environment and are subject to a decision of a competent national authority.

The Act therefore makes it compulsory that when approval is being sought for any activity likely to significantly affect the environment, the effect of such activity shall first be taken into account.

The less prominent activities identified in Table II include: use of renewable energy sources (mean of 0.45, 0.59 SD) ranked eighteenth, use of waterless urinals (mean of 0.48, 0.67 SD), reuse of waste water (mean of 0.55, 0.66 SD), presence of green purchasing policy (mean of 0.55, 0.66 SD), indoor environmental quality management plan (mean of 0.73, 0.81 SD), identifying emissions (mean of 0.74, 0.80 SD), use of efficient building materials (mean of 0.77, 0.74 SD), use of high performance water heating systems (mean of 0.80, 0.67 SD) and use of water saving devices (mean of 0.81, 0.79 SD). The inability of managers to fully implement the activities above can be linked to the need for there to be knowledge and use of technology for these devices to be in place.

Table III summarizes the results of overall average score of environmental performance of the ecologically sustainable development activities highlighted in Table II. Further analysis of the mean scores of the activities was conducted using the Z test to investigate if sustainable environmental performance exists in Nigerian FM organizations. Z score according to Calandro (2007) is a performance management tool and a discriminate and prediction model.

Table III.
Overall average score for environmental performance

	<i>n</i>	Mean	Std deviation	Std error mean
Environmental performance scores	32	19.1250	9.50297	1.67990

The hypothesis for the average score of environmental performance is:

- H0.* The score for sustainable development is higher than 22 for sustainable development
- H1.* The score for sustainable development is lower than 22 for sustainable development

The overall average score for the environmental performance is 19.12 (out of 44) with standard error mean of 1.68. A score of 22 is expected to be achieved before any conclusion can be made for the existence of sustainable development activities of FM organization.

Z test is conducted to examine if the 19.12 obtained is significantly lower than 22 expected for sustainable development. The calculation is as follows:

$$H0 = 22$$

$$H1 < 22$$

$$z = (x - \mu)/SE$$

where $x = 19.12$ and $\mu = 22$

$$SE = \sigma/\text{SQRT}(n) = 1.68$$

$$Z = (19.12 - 22.00)/1.68 = 1.709$$

$$Z_{cal} = 1.71$$

$$Z_{tab} = 1.65 \text{ (one-tailed test and Alpha} = 0.05)$$

$$Z_{cal} > Z_{tab}.$$

Since Z_{cal} is greater than Z_{tab} , the null hypothesis is rejected and the alternative hypothesis is accepted that the score is significantly lower than 22 expected for sustainable development. Thus it may be concluded that there is no sustainable environmental performance of FM organizations in the studied sample.

Interviews for environmental practices of Nigerian FM practitioners

Five experts in Facilities management field were interviewed on July 2011. Two were head of facilities departments of multinational companies (FD1 and FD2); FD2 was formerly a top executive of the International Facility Management Association (Nigerian Chapter). One is a facilities manager working in the Oil and Gas sector (FO), another one is a managing director of a leading facilities management service provision firm (MD) and the fifth is an academic (A). The excerpt of the interviews including the questions asked the respondents (14 questions in number) and their responses is found in Table IV.

The interview with the facilities managers revealed the following:

Facilities management practice in Nigeria only minimally addresses environmental issues. Many facilities managers operate at operational level, although they are conscious of environmental sustainability now because of recent environmental disasters that occur globally and locally. This was also confirmed in the result of the survey where the z-test

Questions asked and responses to the questions during the interviews

1. Does facilities management in Nigeria address environmental issues? Also if your answer is yes how does it do so?

- FD1: This is minimal. Focus now is still on operations management and the development of strategy is looking up which should help build focus on environmental matters
- FD2: Not in all cases in Nigeria, It is only in the limelight in recent times when environment disasters are occurring. It is presently an enlightenment issue as it is not full addressed
- FO: Yes, by ensuring all Facilities Management activities are planned and executed within environmental regulations, and also having minimal environmental effects on personnel, structures and surroundings
- MD: Yes, depending on the organization
- A: FM is still groping with issues in the operational levels in Nigeria so mainly it does not address this issue directly. However it sometimes addresses it indirectly in a bid to reduce the cost of alternative electric power supply (other than public mains) when there are cuts in supply. This they do by trying to procure electricity generators that consume less fuel (diesel)

2. How often in Nigeria do facilities managers raise environmental awareness among staff and customers of their organizations?

- FD1: Not often. Still developing
- FD2: Very rare, Not very often
- FO: Not so often, it is not considered to be at the core of operations
- MD: Rarely
- A: Not often, they usually take intra department actions to address it rather than address staff and customers

3. If they do raise environmental awareness what measures do they adopt?

- FD1: Don't know
- FD2: Office Memos and Lectures
- FO: Discourse, work review (with focus on environment), environmental assurance (including waste management)
- MD: Don't know
- A: They could put notices imploring people to conserve resources and switch off lights at particular times of the day when not in use leaving only essential ones

4. When facilities managers in Nigeria try to conserve energy, water and emissions, what measures do they adopt?

- FD1: Energy usually comes in the form of capacity and demand reduction, Water conservation initiatives are not common, emission reduction are not common but we are seeing it in the form of more energy efficient generators FD2: Mostly, few ones paste posters on electrical installations like A/C's, power sockets with the inscription like "put off when not in use" "Switch of all electrical appliances when leaving office". Some switch off the whole building power and water supply leaving only the designated essential services at the close of work and weekends
- FO: Water – flow switches are installed, energy (power) – installation of automatic voltage switchers and emissions – smoke collection chamber
- MD: Several depending on the facilities being managed
- A: They could do load shedding and only switch on generators at a particular time same with the supply of water at particular times during the day. They could also put notices imploring people to conserve resources and switch off lights at particular times of the day leaving only essential ones

Table IV.

Questions asked and responses given during facilities managers' interviews

5. What is the main motive for facilities managers to want to conserve energy, water and emissions?

- FD1: Cost savings
- FD2: To reduce cost and for safety

(continued)

Questions asked and responses to the questions during the interviews

- FO: To save costs and avoid environmental sanctions
MD: Cost, sustainable environment, compliance to environmental laws, etc.
A: Mainly to reduce cost
6. *What resource do facilities managers in Nigeria conserve the most? Give reasons to your answer*
FD1: Power generation fuel
FD2: Energy – power and diesel, in view of the high cost
FO: Energy
MD: I don't know because I don't have any proof but I suspect energy
A: Power consumption followed to some extent by water
7. *Do many organizations have a clear environmental policy in Nigeria?*
FD1: A policy is usually not available in most companies
FD2: No, Only few organizations do. Mostly organizations with international links like – oil and gas industries, and production
FO: Although many organizations have environmental policy on paper, the clarity in really understanding and execution of what is stated and expected is missing from a larger percentage of organizations having these “policies”
MD: How will I know? I can guess that a lot of oil and gas, multinational companies do
A: Very few, maybe those in global industries such as Oil and Gas where there are international enforcements
8. *If there are organizations that have environmental policies please state them and their sector*
FD1: The Oil and Gas, manufacturing and telecoms usually have stated policies
FD2: Oil and Gas and production
FO: Oil and Gas, cement and manufacturing/consumer goods
MD: I don't know
A: Possibly Oil and Gas and to some extent energy
9. *Do organizations that have environmental policies have designated staff or team to be in charge of environmental management?*
FD1: Not all. The development of a policy statement is usually not followed up with ongoing measurement, review and update. The companies that do this are usually driven by a regulatory need to have minimum compliance
FD2: Yes, they do
FO: Yes, be it solely confined to environmental issues or together with safety, health and at times quality
MD: Most companies who have environmental policies have HSE (Health Safety & Environment) Officer
A: In the area of emission of toxic gas in the exploitation of crude yes, but in the aspects of management of facilities and use of building materials no
10. *Do facilities managers in Nigeria often create an implementation plan to reduce the excessive consumption of goods, energy and water, and emissions?*
FD1: Yes however it might have a cost or budget undertone. Our sensitization efforts are geared at moving people to think more on driving long term benefits and efficiency which should yield savings
FD2: Yes, they do, but the enlightenment is not enough
FO: All facilities managers cannot be spoken for, but it is expected that all facilities managers have plans to address based on facilities management competencies areas and best practices
MD: Yes for energy, waste, water, emissions but not goods
A: Not often. It may just be taking off gradually in a few places and only with energy consumption and water

(continued)

Table IV.

Questions asked and responses to the questions during the interviews

11. *What type of building facilities in Nigeria are provided with environmentally-friendly materials?*

FD1: Don't know

FD2: Mostly international organizations – embassies, some oil and gas companies

FO: None that I know of

MD: Don't know

A: Few modern offices owned by international organizations who often import into Nigeria their national policies regarding environmental sustainability

12. *Are you aware of environmental organizations that facilities managers are members of in Nigeria?*

FD1: Not aware

FD2: Oil and Gas are likely members of environmental organizations

FO: ISO/SON (International Standards Organization, Standards Organization of Nigeria)

MD: No

A: I am not aware of any

13. *How often are environmental performances of facilities management organizations audited in Nigeria? If there are, you can state the sector and name of the organization that does so*

FD1: Not sure

FD2: It very often in oil and gas

FO: To the best of my knowledge, not at all

MD: Never

A: I am not aware of such audits for FM organizations. However I believe the activities of oil producing and exploration companies are audited to ensure compliance with minimum internationally acceptable standards

14. *In your own view how can environmental practices be implemented by facilities managers in Nigeria and what will be the challenges of doing so?*

FD1: The initial step would be to clearly define where we are and the impact that we want to have. Immediate focus might go to actions that degrade the physical environment and prevention of this. Once this move along with a measure of success, then a move to developing robust environmental management plans can evolve

FD2: Personally, the best way is through a Govt. policy and this can be easily achieved when facility managers obtain the Charter

FO: Environmental practices can be implemented by designing and executing a Facilities Management Solution from an environment management standpoint, meaning in clearer terms involvement of environmental assurance, conservation of water and power, reduction of all emissions and management of waste, reduction of environmental interferences through FM activities, and environmental based FM audit

MD: What environmental practices are we talking about? By definition of the role and function of FM, environmental management is part of the responsibility of FM; challenges can only be based on: Company policy; and Regulatory framework which in Nigeria is very clear, there are environmental laws that every FM should be aware of and adhere to

A: The areas to be addressed have to identified and treated as national policy issues with that will be backed up by enabling and enforcement regulations that will adopt reward and punitive initiatives at the same time. For example if you get rewarded further with lower unit rates payment for electricity for using low consumption electricity fittings or you get higher refund per unit rate for plastic bottles recycled beyond a certain number. However professional institutions in the construction industry and their members can contribute largely by making government come to this realization through well developed business case agitations

Table IV.

result showed no environmental performance among the facilities managers. The Nigerian FM practice sometimes addresses environmental management when in the quest to reduce cost (some facilities managers procure electricity generators that consume less fuel or diesel). Few companies such as the Oil and Gas are compelled to incorporate environmental management by environmental regulations (see response to question 1 in Table IV).

Environmental awareness. Environmental awareness is still very low and usually not central to the daily running of organizations. Agreement was strong among all the five managers with respect to this assertion. But concerning the measures used to raise awareness each facility manager had a different view. The head of facilities management department of company 1 (FD1) and the managing director of the FM service company (MD) are not aware of any methods used to raise environmental awareness. The others indicate that the methods used to raise awareness especially in multinational companies include office memos and workshops as well as notices. In the Oil and gas sector discussions with employees, their work reviews with focus on the environment and environmental assurance are used to disseminate environmental knowledge.

Resource conservation. The most conserved resource is energy. This is usually done through energy initiatives such as the use of notices to get the attention of employees to switch off lightings when not in use and load shedding of generators which was mentioned by the second head of facilities management department interviewed and the academic. In the oil and gas sector other resources conserved are water, in which float switches are installed. The use of devices such as automatic voltage switchers is used to conserve electricity while emissions are controlled using smoke collection chamber.

Strategic environmental programs. These involve availability of clear environmental policies, designating a staff or team to be in charge of environmental management; creating an implementation plan to reduce the excessive consumption of goods, energy and water, and emissions; having a plan to raise the environmental awareness among staff and customers, use of environmentally-friendly materials, becoming a member of some environmental organizations and conducting research and conduct of environmental audits (Penny, 2007).

Environmental policies. The interview responses showed an agreement among all the facilities managers that many organizations have not gotten an environmental policy except for companies in Oil and gas and Production sectors. The facilities manager from the oil and gas sector affirmed that even when there is a policy it is not clear and implementation can be an uphill task.

Implementation plan to reduce the excessive consumption of goods, energy and water, and emissions. There were different views about the regularity of creating an implementation plan for resource consumption by facilities managers. Most of them believe the development of such plans is drafted frequently.

Use of environmentally friendly materials. Most of the facilities managers are not aware of buildings with environmentally-friendly materials. Only one said it is available in buildings used by international organizations.

Membership of environmental organizations. Many facilities managers are not members of environmental organizations except for those in the oil and gas sector, this is shown by the consensus reached among the facilities managers interviewed. The facilities manager from that sector confirmed that they are affiliated with ISO

(International Standard Organization and SON (Standards Organization of Nigeria). This again is as a result of international protocols for sustainability in the Oil and Gas sector.

Environmental audits. Environmental audits are hardly conducted by FM departments in Nigeria; this was also reflected in the responses of the facilities managers interviewed.

The findings from both the survey and interviews contrast the practice in developed countries. In the UK for example a study conducted by BDO Stoy Howard on members of the British Institute of Facilities management (BIFM) in 2007 found that majority of the respondents identified an increased focus on sustainable environments and processes. Also most said that lifecycle sustainability was a required element of the business case for the procurement of plant, equipment and property. Respondents also indicated that their departments now manage a wide range of environmental issues mostly with regards to energy, waste, the workplace environment and use of hazardous materials. Although there were mixed views on the frequency of environmental auditing. In the USA as well as in Asia, sustainability has continued to grow in importance in many industries. In Asia, environmental depletion of resources is a growing concern. There is growing emphasis on energy conservation, high-performance buildings and indoor air quality. Although conformance to ratings systems is certainly not required to maintain high-performance facilities, facilities management professionals find that compliance to sustainability programs brings public recognition and easier marketing thus simplifying the facilities management professionals' role (IFMA outlook, 2007).

Strategies for managing environmental issues

Respondents were asked to rate themes shown in Table V and identified by Fergusson & Langford (2006) using a five-point ordinal scale where 1 represents not important, 5 represents very important. This was analyzed using relative importance index in Table V. The themes are important to the strategic management of environmental issues.

Table V shows that the first five strategies were:

- (1) objectives;
- (2) style of management;
- (3) strategic management procedures and time-scale;
- (4) values held; and
- (5) size of company.

These findings are similar to those of Fergusson and Langford (2006) who found that Style of Management scored highest. Other variables with required scores were: Strategic Management Procedures and Time-Scale, Environmental Impact, Size of Company and Environmental Reputation. Although Fergusson and Langford (2006) adopted a case study approach, while this study adopted the survey approach using relative importance index(RII) to identify important factors. An organization that has a style of management, which is open to ideas and proposals from its staff and which is willing to promote its environmental and social agenda, will likely have ambitious environmental strategies. Where employees are able to influence the management of

Strategies	<i>n</i>	Std deviation	Relative index	Ranking
Style of management	36	0.72155	0.162	2nd
Strategic management procedures and time-scale	36	0.91026	0.160	3rd
Environmental impact	36	0.88730	0.150	7th
Size of company	36	0.62994	0.156	5th
Environmental reputation	36	0.82808	0.154	6th
Environmental strategy	36	0.98400	0.156	5th
Values held	36	0.88730	0.158	4th
Objectives	36	0.82808	0.167	1st
Legislation	36	1.12122	0.154	6th
Increase market strategy	36	1.06904	0.141	11th
Complexity of operations	36	0.69693	0.147	8th
Industry leader	36	0.79682	0.145	9th
Capabilities	36	1.04502	0.145	9th
Rate of change of business environment	36	0.94449	0.143	10th
To be good employer	36	1.00791	0.150	7th
To make profit	36	1.18322	0.147	8th
Government incentives	36	1.19390	0.118	15th
Time span of decision making	36	1.12122	0.141	11th
Public interest in corporate objectives	36	0.98883	0.145	9th
Public attitudes to the environment	36	0.90326	0.139	12th
Climate change	36	1.02198	0.139	12th
Client requirement	36	1.20975	0.143	10th
Insurance cost	36	1.07644	0.130	14th
Increase production	36	1.07644	0.139	12th
Increase turnover	36	1.18322	0.147	8th
Corporate ethnological targets	36	1.18187	0.132	13th

Table V.
Relative Index of
Strategies for managing
environmental issues in
FM

their duties, they are more likely to have a sense of ownership, of the environmental impact and reputation of their company. The strategic management procedures and timescale will affect the way in which environmental strategies are formulated and the speed at which they are developed and integrated, within management procedures. The size of an organization will influence decisions on the approach it takes to environmental management. Large organizations are more likely to be in a position to set up, resource and effectively run, environmental protection programmes. However, such large organizations will require sophisticated systems, which are capable of ensuring that each part of the business is able to contribute, to the strategic environmental objectives. Flexibility in the systems provided to achieve the environmental objectives, will be required.

Table V gave the relative importance index for Strategies for Managing Environmental Issues in FM according to level of importance. Repeated Measures Analysis of Variance is conducted to further test the RII values in Table V to determine if there is significant difference between the strategies listed. Repeated measures analysis of variance (ANOVA) procedures was used to test for linear trends in strategies studied (Hackett and Parmanto, 2005). The result of the analysis is given in Table VI.

Table VI showed that Wilks' Lambda Value = 0.091, $F_{(17,19)} = 11.107, p < 0.001$. This result reveals that there is a significant difference in the importance of the strategies.

Strategic management

Since the strategic aspect of FM is a vital strategy for implementing environmental management within organizations, there is need for this to be emphasized. This was observed in a previous study by Adejumo *et al.* (2009). The study also showed that a significant proportion of facilities managers do not have a seat at board level, which raises questions about their position as professional facilities managers with required core competencies.

Conclusion and suggestions

Sustainable facilities management according to IFMA allows an organization to build and operate facilities that meet organizational goals, provide a productive office and work in harmony with the environment. The results of the study also showed that there is need to focus environmental needs on customers and employees as well. There is also emphasis on use of energy-efficient equipment because of the need to save costs. Alternative sources of energy can spell relief from frequent power failure. The z test showed that there is no sustainable environmental performance among the sampled Nigerian FM organizations. The interview results also showed that FM minimally addresses sustainability in Nigeria.

To promote sustainable practices among Nigerian practitioners there will be need for the following:

- *Training and research.* focused on introduction of use of alternative energy sources, new sustainable technologies and materials in the maintenance of buildings. IFMA Nigeria, with other institutions, should explore policies to promote use of energy efficient solutions.
- *Strategic management.* Also for integration of environmental management, facilities managers must develop their practices to the strategic level. Adejumo *et al.* (2009) observed that a significant proportion of facilities managers do not have a seat at board level. This questions the position of professional facilities managers with respect to core competencies required. It also suggests limited capacity to bring about a change in FM practice especially in implementing sustainable environmental practices to help their organizations' competitive position.
- *Sustainability policies.* For environmental practices to be implemented by facilities managers in Nigeria there is need for a government policy and this can be easily achieved when facilities managers obtain the Charter and thus improve their chances of getting recognized at the national level. There needs to be an enabling environment and enforcement regulations that will adopt reward and

Effect		Value	F	Hypothesis df	Error df	Sig.
Factor1	Pillai's Trace	0.909	11.107 ^a	17.000	19.000	0.000
	Wilks' Lambda	0.091	11.107 ^a	17.000	19.000	0.000
	Hotelling's Trace	9.938	11.107 ^a	17.000	19.000	0.000
	Roy's Largest Root	9.938	11.107 ^a	17.000	19.000	0.000

Notes: ^aExact statistic, Design: Intercept. Within Subjects Design: factor1

Table VI.
Analysis of variance for significant difference in the strategies for managing environmental issues in FM

punitive initiatives at the same time. For example if you get rewarded further with lower unit rates payment for electricity for using low consumption electricity fittings or you get higher refund per unit rate for plastic bottles recycled beyond a certain number. However professional institutions in the construction industry and their members can contribute largely by making government come to this realization through well developed business case agitations.

- *Facilities management solutions.* Environmental practices can also be implemented by designing and executing a facilities management solution that entails conservation of water and power, reduction of all emissions and management of waste, reduction of environmental interferences through FM activities, and environmental based FM audit.

The study targeted the environmental sustainability practices of facilities managers in Lagos, Nigeria. There is also need for a wide-ranging study as identified by Penny (2007); Alshuwaikhat and Abubakar (2008); Melissen *et al.* (2008) covering all the stakeholders in the industry. The studies did not assess the advantages of sustainable buildings for facility return-on investment (Roper, 2007). These other areas will be referred to as areas of further research.

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