

ICSECM 2015 - Facilities Management Approaches for Sustainability

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Abstract: In its most general sense sustainability is the capacity to endure. Sustainability has emerged as a result of significant concerns about the unintended social, environmental, and economic consequences of rapid population growth, economic growth and consumption of natural resources. Sustainability depends on three basic pillars; environmental, social and economical sustainability. In order to be sustainable, these three areas of sustainability must be achieved throughout the life cycle of a facility. The facility manager is in a unique position to view the entire process and is often the leader of the only group that has influence over the entire life cycle of a facility. Therefore, the facility manager often becomes the proponent of sustainable and green practices. Armed with the proper approaches, the Facility Manager can create long-lasting value to the organisation by developing, implementing and maintaining sustainable facility practices. Therefore, this study attempts to pinpoint the Facilities Management approaches to achieve and maintain environmental, social and economical sustainability.

A comprehensive literature review was carried out on a broader perspective with the purpose of getting familiarize with the research phenomena. Interview guidelines were developed based on the findings of the literature review. In order to validate and further the literature findings five expert interviews were carried out with experienced industry practitioners.

Research findings revealed that in Sri Lankan context, a Facility Manager's involvement for maintaining sustainability is most crucial in the operational phase of a facility. FM should have a clear view of environmental, social and economical aspects of sustainability. He / She should equally value the three pillars and a balanced approach needs to be taken in order to maintain a facility that is sustainable.

Keywords: Facilities Management, Sustainability, Facilities

1. Introduction

Both sustainability and Facilities Management (FM) are substantial topics trending in the current business environment and have been researched in detail over the past few years. Due to the changing nature of the FM profession, facility managers are increasingly engaged with the evolving sustainability agenda and the development or uptake of sustainability policies within their organisations (Elmualim, 2012).

Increasingly, organisations are concerned with the impact of their business activities on environmental, social and economic sustainability, as well as the impact of sustainability issues on their business (Adams and Frost, 2008; Holton et al., 2010; Lindsey, 2011). Study by Elmualim (2012, pp.167-168) revealed that the perception of sustainability, as a matter of benevolence with no direct impact on an organisation's core business strategies, has changed over the years as organisations actively incorporate sustainability principles into their core business strategies. Therefore, sustainability goals of an organisation

become of vital importance to achieve success in core business.

The built environment's potential as a significant contributor to achieving sustainability goals is well documented and recognised within the FM profession (Wood, 2006). The role of facility manager has been taken up throughout the design, construction and operation of the built environment, with a function to provide the feedback of knowledge on effective management of the facility (Shah, 2007). Therefore, the facility manager often becomes the proponent of sustainable practices in business organisations. However, FM profession is still blooming in Sri Lankan context and therefore, facility managers' involvement is mainly seen in operational stage. This study thus examines how to adept sustainability approaches within the scope of FM in operational stage.

The paper is structured into four sections. The first section above gave a brief background to the research problem. The next section presents a review of related literature to put the study in a proper perspective. This is followed in Section 3

by methodology. Section 4 discusses the research findings that emanated from analysis while Section 5 presents conclusion, implications for research and practice, and recommendation emanating from research.

2. Literature Review

This section intends to describe the concepts of FM and sustainability both as individual subjects in their own right and how to deliver FM practises in a way that achieves sustainability in built environment.

2.1 Facilities Management

FM emerged over the past decade in response to turbulent change in the business environment (Alexander, 1994). The concept, scope and context of FM are still evolving. Over the years, researchers and practitioners have provided many definitions that help to clarify the objectives and scope of FM. Some definitions cited are tabulated in Table 1.

Table 1: FM definitions

Source	Definition
Becker (1990)	FM is responsible for co-ordinating all efforts related to planning, designing and managing buildings and their systems, equipment and furniture to enhance the organisation's ability to compete successfully in a rapidly changing world.
Barrett (1995)	FM is an integrated approach to operating, maintaining, improving and adapting the buildings and infrastructure of an organisation in order to create an environment that strongly supports the primary objectives of that organisation.
Alexander (1996)	The process by which an organisation delivers and sustains support services in a quality environment to meet strategic needs.
IFMA (2006)	Facilities Management is a practice of coordinating the physical workplace with the people and work of the organisation. It integrates the principles of business administration, architecture and the behavioural and engineering sciences.

As per Table 1, Becker (1990) suggests that FM is only concerned with the hard aspects such as buildings, furniture and equipments. Later definitions, however, include soft aspects such as people, process, environment, health and safety in

the responsibilities of FM (Alexander, 1996). Others have taken the definition further by expanding the scope of FM to cover the entire property life cycle of designing, building, financing and operating (Tay and Ooi, 2001). However, regardless their contradictions and limitations, most definitions imply that FM is about managing non-core activities of an organisation in such a way that they will optimally support the core-business objectives.

A research carried out by Global Job Task Analysis (GJTA) (2009) over 62 countries identified 11 core competencies of FM. It is the most comprehensive to date and the first truly global survey and analysis (IFMA, 2014). The core competencies identified are as follows.

- Communication
- Emergency Preparedness and Business Continuity
- **Environmental Stewardship and Sustainability**
- Finance and Business
- Human Factors
- Leadership and Strategy
- Operations and Maintenance
- Project Management
- Quality
- Real Estate and Property Management
- Technology

As per the clarifications made by GJTA (2009 cited IFMA, 2014), sustainability is one of the functions of FM. Further, as discussed in Section 1, sustainability poses a direct impact on an organisation's core business strategies. Thus, sustainability becomes a main concern of facility manager in order to support the core-business objectives of an organisation. This has been also emphasised by Wood (2006) mentioning that the contribution of FM to achieve sustainability is well recognised. Next section discusses the concept of sustainability.

2.2 Sustainability

Sustainability studies continue to attract global attention among researchers (Johannesburg Declaration on Sustainable Development, 2002). In most simple terms sustainability is defined as meeting the needs of the present without compromising the ability of future generations to meet their own needs (World Commission on Environment and Development, 1987)

Sustainability is also understood as one that is socially just and ethically acceptable. Sustainability has thus been acknowledged as a major normative regulation principle for contemporary society which includes a long-term ethical relationship of present generations with those of the future (Laws et al. 2004, Scholz 2011). Sustainability is an integrative concept which considers environmental, social, and economic aspects as three fundamental dimensions. These three dimensions have been denoted as pillars of sustainability, which reflect that responsible development requires consideration of natural, human, and economic capital or colloquially speaking the planet, people, and profits (Elkington 1997, Kajikawa 2008, Schoolman et al. 2012).

Environmental sustainability is the ability of the environment to support a defined level of environmental quality and natural resource extraction rates indefinitely (Think.org, 2015). Mainly it focuses on an organization's impact on living and non-living natural systems, including ecosystems, land, air and water. Environmental responsibility involves more than compliance with all applicable government regulations or even initiatives such as recycling or energy efficiency (Jamali, 2006). The researcher further stated that it involves a comprehensive approach to a company's operations, products, and facilities that includes assessing business products, processes and services; eliminating waste and emissions; maximizing the efficiency and productivity of all assets and resources; and minimizing practices that might adversely affect the enjoyment of the planet's resources by future generations.

The social aspect of sustainability focuses on balancing the needs of the individual with the needs of the group.

The social dimension centers around the impact of the organisation on the social systems within which it operates. The expectations of diverse groups of internal and external stakeholders as well as interest groups comprising civil society are genuinely considered and skilfully balanced (Jamali, 2006).

It has also been defined as the continuing ability of an organisation to function as a long-term, viable setting for human interaction, communication and cultural development (Yiftachel and Hedgcock, 1993). The social bottom line incorporates issues of public health, community issues, public

controversies, skills and education, social justice, workplace safety, working conditions, human rights, equal opportunity, and labor rights (Jamali, 2006).

Economic sustainability is used to define strategies that promote the utilization of socio-economic resources to their best advantage. The idea is to promote the use of those resources in an efficient and responsible way that provides long-term benefits and establishes profitability (frontstream, 2015). According to ICC (2002), the economic dimension refers to financial viability. It encompasses issues of competitiveness, job and market creation and long-term profitability. Economic sustainability is increasingly understood to refer to generating added value in a wider sense, rather than conventional financial accounting. Simply it is about making sure the business makes a profit, but also that business operations do not create social or environmental issues that would harm the long-term success of the company.

Table 2 summarises the basic idea of the three pillars of sustainability

Table 2: Pillars of sustainability

Sources: Knoepfel (2001) and GRI (2003)

Environmental sustainability	<i>Studying the implications of resource consumption, energy use and the effects of the firm on ecological integrity</i>
Social sustainability	Maximizing the positive impacts of a firm's operations on broader society
Economical Sustainability	Moving beyond conventional financial accounting by according attention to new measures of wealth such as the human/intellectual capital that firms develop

2.3 Linking Facilities Management into Sustainability

Sustainability has been increasingly quoted over recent years as more organisations jump on the 'triple-bottom-line' bandwagon. With this trend the organisations has moved towards implementing sustainable approaches into their day-to-day operations (Shah, 2007).

As it was mentioned in Section 1, FM is a profession that involves in the four phases of a building life cycle; site and project planning, design and construction, operation and maintenance, refurbishment and demolition. According to Tertiary Education on Facilities

Management Association (TEFMA) (2004), a facility manager could adept sustainability practices in all the four phases (refer Figure 1).

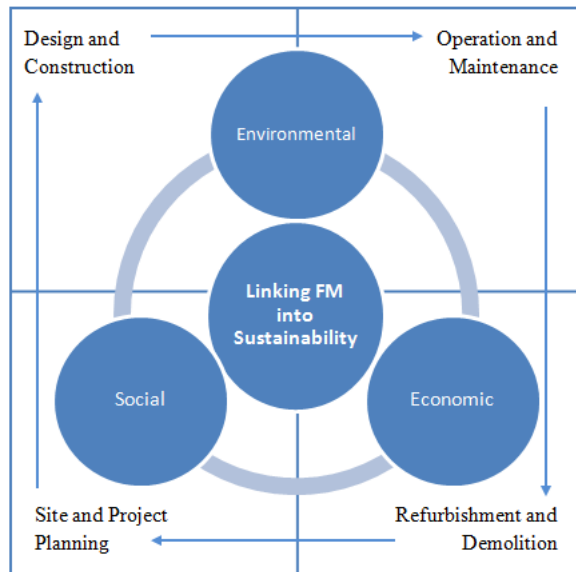


Figure 1: Linking FM into sustainability
(Adapted from TEFMA, 2004)

Built environment is the final product of construction process. The main role of a facility manager thereafter is the conversion of this physical product into a suitable and habitable built environment (Atkin and Brooks, 2002, Kelly et al., 2005, Ventovuori et al., 2007). Built environment has a significant impact on the sustainability agenda as it accounts for nearly 40% of limited natural resources consumed, and 40% of waste and greenhouse gases generated (Chartered Institute of Building, 2004). Further, according to Hodge (2005), cost of maintaining and operating the facility is only topped by the cost of labour of an organization.

FM is a novel profession Sri Lankan context and therefore, still the facility managers' involvement is limited mainly to operational stage. Therefore, sustainable practices that a facility manager can adept in Sri Lanka are found largely in operational phase of a facility.

The approaches those can be adapted to incorporate sustainability into FM practices in Sri Lankan context are discussed in Section 4.

3. Methodology

A comprehensive literature review was carried out on a broader perspective to gain an understanding

of how facility managers are adopting sustainability approaches. Interview guidelines were developed based on the findings of the literature review. In order to validate and further the literature findings five expert interviews were carried out with experienced industry practitioners.

Table 3 briefs the profile of the experts interviewed for the data collection.

Table 3: Interviewees' profile

<i>Interviewee</i>	<i>Designation</i>	<i>Experience</i>
A	Facilities Manager	10 Years
B	Deputy General Manager -Projects	20 Years
C	Facilities Manager	15 Years
D	Facilities Engineer	08 Years
E	Deputy General Manager - Operation	25 Years

Finally, collected data were analysed using content analysis.

4. Research Findings and Analysis

The FM as an industry is complex in its nature. The industry is rapidly expanding with a huge economic as well as environmental impact. Thus, experts viewed that this has created a trend to align FM with sustainability along its three strands, economic, environmental and social.

All the experts are currently involved in sustainable practices in their organisations. According to them, lifecycle cost reduction, legislation requirements, corporate image, pressure from stakeholders, leadership initiative, quality assurance etc. are the driving factors for implementing sustainable practices in their organisations.

All the experts agreed that sustainability must be maintained or practices throughout the project life cycle of a building, while interviewee C pointed out that the most crucial of involvements of a facility manager to sustainability is in the operational stage of the facility. This finding was consistent with the literature findings as well (refer Section 2.3)

In this stage, facility manager has a role in strategic, tactical and operational levels. According to the findings, strategic role involves; getting commitment at all levels of the organisation - this

involves evaluating and enhancing the organisation's attitude towards the social, economic, and environmental attitudes of sustainability; developing the sustainability mission, vision and values - this can be achieved by performing the SWOT analysis (strengths, weaknesses, opportunities, threats); and developing goals and objectives to support the sustainability strategy and communicate the strategic plan to all the stakeholders. Experts further reviewed that having a policy documented for sustainability will direct the facility managers towards effective implementation of FM approaches sustainable practices. Experts clarified that such a policy should cover areas like Building disposal, Ethical purchasing, Carbon footprint, Flexible working, Sustainable travel, Specification of sustainable products & services, Targets, measurement and reporting Biodiversity, Health & safety, Energy Management, Waste management & recycling, Biodiversity, Community engagement, Training, Staff productivity etc.

In the tactical level, the processes and procedure those are required in achieving the strategic plan is developed and documented. All the strategic and tactical decisions by organisations to advance the sustainability agenda have to be translated into measurable operational targets which are executed in the operational level.

By reviewing the research findings, it was apparent that the typical FM functions involved in the operational phase are energy management, water efficiency, indoor environment quality, waste management, and space and assets management.

In the vast scope of energy management, to maintain sustainability, a facility manager should pay attention right from choosing the appropriate energy sources, because environmental performance of a building can be significantly improved by choosing the most appropriate energy sources. According to most of the experts, the FM approaches for energy management include frequent monitoring and analysing the amount of energy used by the facilities; adopting energy efficiency measures – e.i. install high-efficacy lamps and fixtures, maximize daylight to reduce the need for electric lighting, rearranging the facility in to lighting zones based on the demands and control lighting accordingly, provide individual controls for lighting where feasible, minimize glare and visual discomfort from electric lighting sources etc.

According to the Expert B and E, careful thought given in the early stages of planning can greatly reduce water consumption and contamination. This will make it easy to ensure water efficiency in the operational stage. Techniques that should be employed for water efficiency are reducing water demand, rainwater harvesting, stormwater management, on-site water reuse, recycling of gray water, water sub metering, waterless or low flow pans and urinals, outdoor water use or appropriate landscape design etc. Further, Expert C stated that in a Facility Manager's plan for water efficiency should include, Initial plan including *purpose and scope, policy and principles, goals and objectives*; Baseline data and performance targets, Water saving measures, Management performance, Performance reporting. Experts further emphasised that water audits should be conducted in regular intervals to identify patterns of consumption. This will help them to identify areas of further improvement of water efficiency.

Indoor Environment Quality (IEQ) is affected by the choices made in the materials selection process. In refurbishments and renovations, the facility manager can go for materials with less volatile organic compounds. Design elements such as daylighting and natural ventilation can also be appropriately used wherever possible to enhance the IEQ. A well maintained indoor environment can affect people of the organisation in a positive manner by creating a healthy, safe and productive environment for the employees of the facility.

According to the experts, a facility manager can apply four main waste management techniques in the operational phase. They are; *Reduce* waste generation, *Reuse* components and materials, and *Recycle* materials to earn additional income, *Recover* energy from suitable materials. In addition, as the last resort, disposal also plays an important role in waste management. To achieve this, a facility manager needs to maintain a safe and environmentally responsible landfill. This can be done by minimising organic waste to landfill. A facility manager might also need to manage hazardous waste wherever necessary, depending on the types of waste the facility associates with. Further, awareness among the staff is vital to successfully manage waste generated in an organisation. Litter and dumping can be reduced through raising awareness.

Space and asset management also has an indirect impact on the pillars of sustainability. According to the experts, in Sri Lankan context, the majority of

FM professionals are yet identify the approaches to manage the space and assets in an organisation in a manner which is sustainable. Experts further suggested that rationalising existing space – minimise space wastage; saving resources in having to provide less new space; reorganising existing space for improved efficiency; rethinking public spaces within the facility; remodelling the usage of spaces (i.e. - sharing parking facilities by the organisations which are located in the same area).

Since FM is still a developing profession in Sri Lanka, it is limited to the few functions discussed above. These functions, when managed properly, can contribute more or less to the three pillars of sustainability.

5. Conclusions

The FM profession has been growing and maturing. Sustainability is an emerging focus of FM today. It addresses sustainable issues during the operation and maintenance of building facilities and the management of support services. A facility manager is a well-rounded and fully educated practitioner in the holistic management of the built environment. The role of the facility manager is to provide the resources and environment in which employees and organisations can be most productive.

Sustainability requires a systems approach to managing a business. FM is a system that supports all other systems. The optimal impacts of sustainability are long term and belong in a strategic plan, and the best facility managers are already linking FM strategy and sustainability tenets to those of the overall entity.

They must develop a holistic view, and knowledge of how an organization works, and how departments interface and interact.

FM been a developing profession in Sri Lanka, it is still restricted to the few functions that are clearly distinguishable among a facility's operational phase. FM approaches for sustainability are considerably limited within the Sri Lankan context. Throughout this study, a number of FM functions that can be practiced in the operational phase with approaches for sustainability have been identified, namely; energy management, water efficiency, indoor environment quality, waste management, and space and assets management.

Integrating FM and sustainability approaches will result in social progress which recognises the needs of everyone, effective protection of the environment, prudent use of natural resources, and maintenance of high and stable levels of economic growth and employment, achieving the three pillars of sustainability.

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