

MATERIAL FLOW COST ACCOUNTING AS A TOOL FOR IMPROVED RESOURCE EFFICIENCY IN THE HOTEL SECTOR: A CASE OF EMERGING MARKET

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Abstract

Material Flow Cost Accounting (MFCA) is one of the Environmental Management Accounting (EMA) tools that has been developed to enable environmentally and economically efficient material usage and thus improve resource efficiency. However, the use of this tool to improve resource efficiency in the South African hotel sector remains unknown. An exploratory study, qualitative in nature, was conducted using a single case study with embedded units approach. A Hotel Management Group that met the selection criteria formed part of this study. In-depth interviews were conducted with 10 participants and additional documents were analysed. The investigated hotels have developed technologies that provide an environmental account in both physical and monetary units which constitute the use of MFCA to improve resource efficiencies. However, the study established a number of factors that affect the implementation of MFCA by the hotel sector in a South African context.

Keywords: Environmental Management Accounting, Environmental Performance, Hotel Sector, Material Flow Cost Accounting, Resource Efficiency

1. INTRODUCTION

The hotel sector in South Africa contributes significantly to the economy and this sector is still expected to grow in the near future. Inevitably, this future growth will be strenuous on the limited non-renewable resources and, hence, cause environmental threats. It is clear from the literature review that the hotel sector has established the fact that there is a relationship between the environmental performance and scarce resources and thus it recognises the need to address its impact on the environment by introducing strategies that improve its environmental performance (Pirani and Arafat, 2014). These strategies include the use of Environmental Management Accounting (EMA) tools. The hotel sector uses EMA tools to focus mainly on energy efficiency, water use efficiency and waste management (Nyide and Lekhanya, 2016). These environmental management practices go a long way in motivating hoteliers in reducing, controlling and managing their environmental costs. However, South Africa, as a drought prone country, is experiencing water shortages, and the country's energy demand surpasses the available supply. Research reveals that MFCA is one of the EMA tools that has been developed to enable environmentally and economically efficient material usage and thus improve resource efficiency (Nyide and Lekhanya, 2016). Literature also maintains that environmental cost accounting methods (including MFCA) are capable of evaluating direct and indirect inputs of energy, water and waste as well as emissions and related ecological impacts that results from organisational operations (Buonocore, Häyhä, Paletto

and Franzese, 2014: 11). Pavlatos and Paggios (2009: 263) add that the particular features of an appropriate environmental cost accounting system will depend upon the specific circumstances within an organization. The effectiveness of design of an environmental cost system depends on its ability to adapt to changes in external circumstances and internal factors.

Pavlatos and Paggios (2009: 269) concede that hotels that put their emphasis on cost control or that are cost oriented need to have a functional Environmental Cost Accounting (ECA) system to enable managers to access even qualitative cost accounting information for monitoring cost. According to Jasch (2003: 670), ECA is not an independent system that only assigns costs to environmental activities of an organisation; it is an integral part of other EMA tools such as MFCA. These systems coordinate data of environmental accounting in order to provide managers with information to better understand the impacts on their decisions. Information on environmental costs can influence on the improvement of environmental performance (Buonocore et al., 2014: 11).

Research establishes that environmental management practices are important means for businesses to manage their environment. However, most previous studies were conducted in industries such as manufacturing, electronics, chemicals, construction and farming; only a few environmental management system investigations have been conducted in the hospitality and tourism industries (Chan and Hawkins 2012). The South African hotel sector needs more investigation. Therefore, this study intended to investigate more on the use of

MFCA as a tool for improved resource efficiency and thus contribute to the body of knowledge.

2. PROBLEM STATEMENT

There are several environmental initiatives used by the South African hotel sector to improve efficiency in energy consumption, water use and waste management (Rogerson and Sims, 2012). These initiatives include the use of EMA tools. However, the application of EMA tools in the South African hotel sector is at an elementary stage and there is generally limited awareness of these tools in this sector (Nyide and Lekhanya, 2016). MFCA is one of the EMA tools that organisations use to enable environmentally and economically efficient material usage (Schaltegger and Zvezdov, 2014). The extent at which MFCA is used by the South African hotel sector to improve resource efficiency remains unknown, hence, this study is conducted.

3. AIM AND OBJECTIVES

3.1. Aim

The main aim of this study is to examine the use of MFCA by the hotel sector in South Africa, to improve resource efficiency.

3.2. Objectives

- To examine the awareness, knowledge, and experience with regards to the use of MFCA by the hotel sector.
- To determine to what extent is MFCA used by the hotel sector to improve resource efficiency.

4. LITERATURE REVIEW

4.1. Environmental challenges facing the South African hotel sector

Hotels have been built, and continue to be built as a symbol of attractions, with the design requiring a substantial amount of energy, water and other resources used by the various mechanical systems to make them habitable (Bohdanowicz, 2006). The services offered by the hotel and the operational mechanisms applied, if not efficiently managed, can lead to a significant amount of energy and water used by this industry being wasted. According to Erdogan and Baris (2007), the hotel industry, because of the nature of its functions, characteristics, and services, consumes substantial quantities of energy, water, and non-durable products. It has been estimated that most environmental impacts created by the hotel industry can be attributed to site planning and facility management; excessive consumption of local and imported non-durable goods, energy, and water; and emissions into the air, water, and soil. Mensah (2014) also maintains that, within the hotel sector, the areas of concern for the environment include recycling of waste, waste management, clean air, energy and water conservation, environmental health, maintenance of permits such as building permits and compliance with legislation, purchasing policy and environmental education.

Hotels are facing increasing pressure to pay appropriate attention to environmental issues, as they consume substantial quantities of energy, water, and non-durable products (Chan and Hawkins, 2012). Moreover, the hotel industry has an additional stake in protecting the environment, because its business success depends on providing attractive and safe surroundings (Chan and Hawkins, 2012). According to Janković and Krivačić (2014), the hotel inputs and outputs concerning the environment cost lies in the use of energy which causes lower atmospheric pollution, lower water consumption that causes less wastewater and less distortion of the hydrological cycle, better use of other productive factors which cause less contamination of soil and less land used for rubbish tips. The major environmental issues and costs that were under investigation were, therefore, limited to energy, water and waste management as it is indicated above that hotels consume substantial amounts of these factors of production. Sustainability in hotels' operations and existence is important and equally so the preservation of the environment.

Rogerson and Sims (2012) assert that South Africa is ranked as a competitive destination internationally for nature tourism. However, the country has a poor track record for reducing carbon dioxide emissions. According to Tsai, Lin, Hwang, and Huang (2014), carbon dioxide is emitted generally by the direct use of fossil fuels and indirectly by electricity consumption in the tourism sector. Therefore, it is argued that innovative local solutions are required to provide support for low carbon destinations, enhanced travel and accommodation efficiencies and accessible carbon offsets as part of wider efforts to grow the ecotourism and experiential tourism market in South Africa (Rogerson and Sims, 2012). However, the lack of appropriate policies is affecting the possible growth rate of the depreciation of possible harmful emissions, and overuse of energy and water consumption (Leonard and Dlamini, 2014).

4.2. The use of EMA for improved resource efficiency

According to Jasch (2003), the publication by the EWG tabled out the terminology and techniques that were agreed upon by the group members. This was intended to establish a common understanding of the basic concepts of EMA and provide a set of principles and procedures to guide those interested in its application. The publication was intended to minimize the cost of introducing EMA systems by offering a set of principles and procedures for EMA (Jasch, 2003). A comprehensive EMA was developed by Burritt, Hahn, and Schaltegger (2002) which takes into consideration a broad set of tools of environmental information management which support different decision situations. The variety of EMA tools, as classified by the EMA framework, systematically integrates two major components of EMA: monetary environmental management accounting (MEMA) addressing environmental aspects of corporate activities expressed in monetary units, and physical environmental management accounting (PEMA) measuring and analysing a company's impact on the natural

environment, expressed in physical units (Schaltegger, Viere, and Zvezdov, 2012). The EMA set of tools will be discussed comprehensively in the next section. The EMA framework, as it was proposed by Burritt et al. (2002), is presented in Table 1 and it consists of 16 different types of decision situations.

EMA concept includes internal monetary and internal physical accounting to stress the importance of integrating environmental and financial issues. This implies that EMA can thus be described as a generic term that integrates MEMA and PEMA, as illustrated in Table 1. MEMA is an accounting system for the monetary impacts of environmentally-related activities. It supports strategic and operational planning, provides the main basis for decisions about how to achieve desired goals or targets, and acts as a control and accountability device (Schaltegger, Hahn, and Burritt, 2000). PEMA, as well, functions as an internal decision tool for the management (Gunarathne and Lee, 2015). "PEMA focuses on the organisation's environmental impact expressed in terms of physical units such as kilograms and litres" (Schaltegger et al., 2000). The aforementioned authors also suggest that these tools can be used as follows:

- As an analytical tool designed to detect

- environmental strengths and weaknesses;
- As a decision-support technique concerned with highlighting relative environmental quality;
- As a measurement tool that is an integral part of other environmental measures such as eco-efficiency;
- As a tool for direct and indirect control of environmental consequences;
- As an accountability tool providing an unbiased and transparent base for internal and external communication; and
- As a tool with a complementary fit to the set of other tools being developed to help promote environmental sustainability.

Schaltegger et al. (2012) maintain that the EMA framework serves for conceptual classification purposes but also provides a practical structure for the identification of the appropriate EMA tool for any given corporate decision setting. It can, therefore, serve as a basis for managers and staff to ascertain whether an EMA tool already in use is the most appropriate one for the intended decision-making purposes.

Table 1. The existing comprehensive EMA framework

Environmental Management Accounting (EMA)					
Monetary Environmental Management Accounting (MEMA)				Physical Environmental Management Accounting (PEMA)	
		Short-term Focus	Long-term Focus	Short-term Focus	Long-term Focus
Past/Present Oriented	Routinely generated information	1. Environmental cost accounting (e.g., activity based costing)	2. Trend analysis of environmentally driven costs, revenue, etc.	9. Material and energy flow accounting.	10. Environmental (natural) capital impact accounting.
	Ad hoc information	3. Ex-post assessment of relevant environmental costing decisions	4. Post-investment assessment of individual projects (Life cycle costing and target costing)	11. Ex-post assessment of short term environmental impacts	12. Post-investment assessment of physical environmental investment appraisal (Life cycle inventories)
Future Oriented	Routinely generated information	5. Monetary environmental operational and capital budgeting.	6. Environmental long-term financial planning	13. Physical environmental budgeting	14. Long-term physical environmental planning
	Ad hoc information	7. Relevant environmental costing	8. Monetary environmental project investment appraisal	15. Relevant environmental impacts	16. Physical environmental appraisal

Source: Burritt et al. (2002) and Schaltegger et al (2012)

According to Burritt et al. (2002) and Schaltegger et al. (2012), the framework identifies different EMA tools for various decision situations, according to:

- the type of information - monetary or non-monetary (physical) information;
- the time frame - past or future (looking at whether the focus of the decision is oriented towards measuring past performance or making decisions for the future);
- the length of time frame - short-term or long term: whether the decision setting involves strategic information concerning several years

or whether it is more operational, thus covering a shorter period such as months, weeks or days;

- the routineness of information provision - regular or ad hoc: whether the required information is gathered regularly for a recurring purpose or only when required, e.g., to support a specific and non-recurring need.

Literature reveals that there is limited research pertaining to the application of EMA tools, particularly in the hotel sector. As a result, the implementation and application process of EMA remains unclear. Schaltegger et al. (2012) point out

that the aforementioned framework, like the multitude of proposed environmental accounting tools, does not explain the processes as to how corporate decision makers design their environmental information management and use processes. Gunaratne and Lee (2015) support this argument by stating that the development stages of EMA have not been empirically investigated well enough. Thus, there is a need to identify and demonstrate how companies have continuously developed and systematically adopted environmental strategies with the support of EMA practices over the years, especially in the tourism sector.

4.3. MFCA as an EMA tool for improved resource efficiency

MFCA is one of the EMA tools that has been developed to enable environmentally and economically efficient material usage (Schaltegger and Zvezdov, 2014). MFCA is a tool that physically traces material flows into the process through to the final output of its positive and negative products. It involves detailed quantification of material and energy mass and the costs attached to them and it can be flexibly applied according to the company's own capabilities (Sulong, Sulaiman and Norhayati, 2014). Schmidt, Götze and Sygulla (2014) echo that MFCA is a specialized accounting method aiming at the identification and monetary valuation of inefficiencies in material and energy use. Fakoya and Van der Poll (2013) add that MFCA can be used to capture and draw decision-makers' attention to the full costs of waste because, as an EMA tool, MFCA provides detailed and in-depth waste cost information by analysing flow of materials and energy in a production process. Schaltegger and Zvezdov (2014) assert that that information gained from MFCA can act as a motivator for organisations and managers seeking opportunities to simultaneously generate financial benefits by improving material efficiency through simultaneously reducing material costs and adverse environmental impacts.

Schmidt, Hache, Herold and Götze (2013) point out that the objective of MFCA is to motivate and support the efforts of organisations to enhance both environmental and financial performance through improved material and energy use by means of:

- improving the transparency of material flows and energy consumptions as well as related costs and environmental aspects;
- support of decisions within organisations in fields of process technology, production planning, quality management and supply chain management; and
- improving the coordination and communication regarding material as well as energy consumptions within the organisation.

According to Schmidt et al. (2013), the application of MFCA comes in three steps:

- flow structure modelling. For the modelling of material and energy flows system, boundaries have to be specified. Basically, the boundaries can span a single or several processes, the whole organisation or even entire supply chains. Furthermore, the specification of a time period is necessary (Schmidt et al., 2013).

- quantification of flows. Based on the flow structure, material flows have to be quantified in physical units such as mass, length, volume or number of pieces (Schmidt et al., 2013).
- evaluation (cost appraisals of the quantified flows). The last step is the quantification of material flows in terms of monetary units in order to evaluate them (Schmidt et al., 2013). In the context of the hotel sector, major items that would be identified and quantified for cost appraisal motivations would be energy, water and waste.

5. RESEARCH METHODOLOGY

The research consisted of literature review and empirical study. The historical review laid a foundation that guided empirical study and provided an insight and understanding into the research problem.

Qualitative exploratory case study research method has been adopted in this study. This type of case study is used to explore those situations in which the intervention being evaluated has no clear, single set of outcomes (Yin, 2012). The use of case study as a research methodology to collect data is appropriate for this study because it is a means to provide rich drawings, descriptions, considerations and clarifications of the events being investigated. The primary data collection for this study came in the form of in-depth interviews using semi-structured questions. Furthermore, additional documents were analysed. These included the hotels' Group Energy Profile Analysis programme (GEP), Building Management System (BMS), financial statements, policies and the group websites together with their individual hotel websites.

Purposive sampling was used in this study because, with purposive sampling, one needs to use one's judgement to select cases that will best enable the researcher to answer research questions and to meet objectives (Saunders, Lewis, and Thornhill, 2012). The hotels had to have an already developed EMS. Therefore, it had to have either a Green Leaf Eco Standard certification, Heritage Environmental certification or Fair Trade Tourism certification. The selected case is that of a hotel management company (for confidentiality purposes will be referred to as ABC Hotel Management Group) with its 3 hotels which met the selection criteria. The environmental management challenges faced by these establishments are universal. A total of 10 individuals participated in this study, which consisted of 3 general managers, 3 financial managers, 3 maintenance managers, and the Group engineer. Creswell (2015) recommends a sample size of between 3 to 10 participants for phenomenology studies like this one. The interviews were conducted between May and June 2015 based on the availability of the informants.

6. RESEARCH FINDINGS

To ensure triangulation, field notes from direct observation, documentation and hotel websites were also incorporated into the analysis of data to complement in-depth interviews. This exercise was performed to ensure reliability and validity of the findings and thus address bias. Cross-case synthesis

was used and the results were analysed in accordance to the theme and objectives. Table 2 shows the themes, objectives and interview questions that were used in this study. For each hotel, group interviews

were held with the hotel management team (hence each table has only four columns which represent responses from the Group engineer and the management team from hotel A, B, and C).

Table 2. Themes, objectives and interview questions

Themes	Objectives	Interview questions
1. MFCA awareness, knowledge, and experience.	To examine the awareness, knowledge, and experience with regards to the use of MFCA by the hotel sector.	What are the hotel's main environmental challenges?
		What has the hotel already done about the challenges? (Please mention recent projects.)
		Do you think it should be an important issue for hotels to control their major environmental costs? Is it an important issue for the hotel now?
2. The Extent at which MFCA is used.	To determine to what extent is MFCA used by the hotel sector to improve resource efficiency	Please indicate if any of the major environmental costs are considered for inclusion in the financial analysis of a proposed capital project. If yes, how?
		Are the major environmental costs included in one single budget pool and allocated to responsibility centres as a lump sum? If not, please describe.
		What is your opinion on the separate identification and allocation of the major environmental costs? Is it possible for the hotel to do so? Why?
		Do you think the hotel should provide major environmental cost information as a means to increase environmental awareness and encourage behaviour change? If not, why not? If so, whom do you think should be provided with this information (consider in your answer both general managers and administrative divisions)? What do you think would be the major barriers (either technical or political) to the provision of such information to heads of departments or internal managers?

The results are discussed as follows:

Theme 1. MFCA awareness, knowledge, and experience.

Table 3. Main environmental challenges

Question: What are the hotel's main environmental challenges?			
Hotel A	Hotel B	Hotel C	Group Engineer
Energy consumption, Lighting Infrastructure	Energy efficiency	Energy consumption, water consumption and waste management	Regulation, Data accuracy, Understanding of data and Capital Budgeting

Table 3 shows that all the hotels agree that energy consumption is the main environmental challenge, whilst the group engineer challenges data accuracy and the understanding of data. Hotel C points out that their environmental challenges were not only energy consumption and efficiency. Hotel C is also concerned about water consumption and waste management, which involves the separation of water into wet and dry waste. This is in line with what the literature suggests that energy consumption, water consumption and waste management are the main environmental challenges for the hotel. However, the group engineer finds

regulation, capital budgeting and the ability to understand data as environmental challenges faced by the hotel group. Erdogan and Baris (2007) maintain that even though the hotel sector demonstrates interests in managing their impacts on the environment, there is, however, a lack of the necessary skills required to understand environmental management-related data and the management tends to be reluctant to invest in programmes that will minimise the hotel's impact on the environment.

Table 4. Initiatives already done

Question: What has the hotel already done about the challenges? (Please mention recent projects)			
Hotel A	Hotel B	Hotel C	Group Engineer
Installation of Building Management System (BMS) to monitor and control energy usage. Shut down some of the lights.	Installation of LED lights. Building of a boiler room with 8 pumps. Analysis of tariffs to evaluate energy consumption in units and convert it into monetary value. Installation of BMS.	Reduction of geyser temperatures. Adjustment of water flow in the toilets and showers. Installation of LED lights. No BMS installed.	Engage in energy efficiency projects and water management. Installing Group Energy Profile Analysis (GEPA).

In Table 4, the informants from the group and its embedded units, were positive about what has been done already to address their environmental challenges even though different interventions have been implemented to cater for their environmental

challenges. The group engineer asserted that the group has engaged in energy efficiency projects by installing a Group Energy Profile Analysis in all 3 hotels. Hotel A and B installed a Building Management System to monitor and control energy

consumption. This intervention is yet to be implemented by hotel C. The aforementioned initiatives relate mainly to the reduction of energy consumption. Rogerson and Sims (2012) allude that the introduction of new technologies is the most common initiative by hotels because they result in apparent financial gains

Table 5. The importance of controlling major environmental costs

Question: Do you think it should be an important issue for hotels to control their major environmental costs? Is it an important issue for the hotel now?			
Hotel A	Hotel B	Hotel C	Group Engineer
Yes.	Yes.	Yes.	Yes.
Yes.	Yes.	Yes.	Yes.

Table 5 shows that informants agreed, collectively, that it should be an important issue for the hotels to control their major environmental costs and it is an important issue even currently. Papaspyropoulos, Blioumis, and Christodoulou (2012) maintain that, by controlling the major environmental costs, the organisation is provided with more cost savings and, subsequently, with more available economic resources since, usually, these resources are very scarce.

Theme 2. The Extent at which MFCA is used.

Table 6. Major environmental costs and capital projects

Question: Please indicate if any of the major environmental costs are considered for inclusion in the financial analysis of a proposed capital project. If yes, how?			
Hotel A	Hotel B	Hotel C	Group Engineer
Machinery and equipment are acquired in line with the Green Leaf Eco Standards.	Yes. The hotel buys and installs energy and water efficiency machines.	Yes. The hotel applies cost vs. benefit analysis in proposed capital projects.	In every project, relevant costs for that project are considered in line with Green Leaf Eco Standards.

According to the data in Table 6, the hotel management collectively assert that investing in capital projects is in accordance with the Green Leaf Eco Standard and the major environmental costs generally considered are energy and water efficiency-related costs and a cost verses benefit analysis is performed before committing financial resources to any capital items. Kasim (2009) asserts

Table 9. Environmental cost information and awareness

Question: Do you think the hotel should provide major environmental cost information as a means to increase environmental awareness and encourage behaviour change? If not, why not? If so, whom do you think should be provided with this information (consider in your answer both general managers and administrative divisions)? What do you think would be the major barriers (either technical or political) to the provision of such information to heads of departments or internal managers?			
Hotel A	Hotel B	Hotel C	Group Engineer
Yes. On the webpage and broader booking platforms. No barriers.	Yes. To everyone and improve the Green Leaf Eco Standard scoring which currently stands at 75%. No barriers.	Yes (internally). Staff and guests. No barriers.	Yes. Everyone Technically it would be a challenge. Confidentiality and completion.

Informants were in agreement towards the question. However, confidentiality was the main

concern for the provision of information relating to major environmental costs for the hotel. Therefore,

Table 7. Single budget pool

Question: Are the major environmental costs included in one single budget pool and allocated to responsibility centres as a lump sum? If not, please describe.			
Hotel A	Hotel B	Hotel C	Group Engineer
Water and energy are included in a single budget pool. Waste is recorded separately.	They are separated.	They are separated.	Water and wastage is recorded in a single budget pool. Energy is recorded separately.

The general response by informants to the question asked in Table 7 is that there is a separate budget pool for each of the major environmental costs. However, there is no consistency in the manner that these costs are allocated. For example, hotels B and C have a separate budget pool for each of the major environmental costs whilst hotel A adds together water and energy in a single budget pool contrary to the group engineer's response that water and waste are grouped in a single budget pool.

Table 8. The separate identification and allocation of the major environmental costs

Question: What is your opinion on the separate identification and allocation of the major environmental costs? Is it possible for the hotel to do so? Why?			
Hotel A	Hotel B	Hotel C	Group Engineer
It is important. Compare like for like. Yes, it is currently used.	Important. It is used currently. To monitor each cost objects.	Important. Yes. For monitoring and tracking purposes.	It is critical but very difficult to implement and very costly. It is possible if the budget allows.

Table 8 shows that the informants find the separate identification and allocation of the main environmental costs important because it facilitates the monitoring and comparisons of each of these costs. This process is currently in use. However, it is difficult and costly to implement because it requires skilled and experienced people to implement it properly and that would contribute towards additional labour costs for the hotels.

Table 9 shows that even though the informants responded that the information should be provided to everyone, the emphasis was that it should be provided internally. The general managers along with the maintenance managers and financial managers responded that there are no barriers to the provision of such information, contrary to the view of the group engineer who cited technical barriers, competition and confidentiality.

6.1. Summary of key findings

- MFCA application for improved resource efficiency.

The study found MFCA is one of the main EMA tools utilised by the investigated hotels within the Group. The hotels under study focus on the allocation of environmental costs to activities with the aim of determining costs created and costs avoided by the hotels' operations and this is a description of. The hotels in this study also developed technologies such as BMS and GEPA, not only to allocate environmental costs to activities but also to trace and record flows of energy and water. These are the characteristics of MFCA.

- The extent at which MFCA is used.

The investigated hotels have limited experience and knowledge of MFCA. In as much as reductions in environmental costs have been reported in the area of energy and water consumption, less has been reported in the area of waste management. Therefore, it can be concluded that the practice of MFCA for improved resource efficiency is still very poor within the investigated hotels and the use of this tool is not up to the level that exploits its full potential.

7. LIMITATIONS

This study was limited to hotels within the province of KwaZulu-Natal, a province in South Africa, using a single case study with embedded units approach. Generalisation should be exercised with care in terms of the findings being applicable to all hotels in the developing economy. It may add value to use multiple case studies in order to increase rigour of the analysis and to compliment this study.

8. IMPLICATIONS

This study contributes to the identification and critical evaluation of the use of MFCA as an EMA tool used by the hotels based on the experiences applied by the ABC Hotel Management Group. The contribution of this research is to add new concepts and theories in MFCA practices for the hotel sector. Theories about the MFCA used by the hotel sector have not been published in the literature previously. The new concept and theories in MFCA should focus on the operational and management processes within the hotel sector so as to improve this craft within this sector. This implies that the hotel sector needs to implement MFCA.

9. RECOMMENDATIONS

9.1. Recommendations for ABC Hotel Management Group

- Sourcing of specialist staff

It is recommended that the group appoints a group specialist environmental manager who will work along with the group engineer. This team should endeavour to facilitate effective tracing and tracking environmental costs incurred by the hotels and establish the activities performed that results in these costs being incurred. It is envisaged that the appointment of the specialist staff member would add value in the use of the MFCA for the improved economic and environmental performance by the group.

- Partnership with relevant agencies

The collaboration with management accounting professional bodies and academic institutions is also recommended. Professional bodies may provide expert advice on the technical issues around the practice of MFCA. Academics may conduct empirical research that will facilitate the development of MFCA systems that better improve the Group's ecological and economic performance and thus increase the Group's competitive edge.

9.2. Recommendations for future research

- A longitudinal case study approach can be used to identify and evaluate MFCA implementation process by the hotel sector. This type of study would provide a much richer and more detailed evaluation of the use of MFCA the hotel sector. This approach can assist in determining how effective MFCA is in improving resource efficiencies.
- This study investigated the use of MFCA by 3-5 star hotels in KZN. A similar study could be undertaken in other star-rated hotels and it may incorporate other provinces.

10. CONCLUSIONS

The use of MFCA tools, as revealed by literature, is at an infancy stage in the hotel sector in emerging markets. However, given the commitment exhibited by the management of the ABC Hotel Management Group, it is possible that such an attitude elsewhere would encourage the successful application of these tools and eventually be widely implemented within this sector. With experience, the effective use of these tools is certain to yield the desired outcomes. The academic and industry partnership may also steer the ship in the right direction in as far as the application of MFCA with the aim of improving resource efficiencies.

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