

# ENVIRONMENTAL MANAGEMENT ACCOUNTING PRACTICES: MAJOR CONTROL ISSUES

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## Abstract

The use of environmental management accounting (EMA) remains debated in South Africa and the literature reveals that EMA is still at an infancy stage in the emerging economies, including South Africa. Currently, there is limited existing research on environmental management accounting practices available for use by the hotel sector in South Africa. The overall aim of this study was to investigate and describe the use of the environmental management accounting tools by the hotel sector in the 3-5 star categories in KwaZulu-Natal. The research was an exploratory study and qualitative in nature using a single case study with embedded units approach. It is envisaged that study will bridge the gap that exists in South Africa as far as environmental management accounting is concerned and it will also make the provision of meaningful results for policy decision making by the relevant stakeholders in the hotel industry. Moreover, it established factors that drive and/or hinder the implementation of EMA tools that would control and manage environmental costs and their root causes.

**Keywords:** Environmental Management Accounting Tools, Major Environmental Costs, Environmental Reporting, Drivers And Barriers, 3-5 Star Hotels

## 1. INTRODUCTION

Many studies indicate that environmental issues and concerns are world-wide phenomena (Seetharaman, Mohamed & Saravanan, 2007); Mõhr-Swart, Coetzee & Blignaut, 2008); and Jones, 2010). At the current moment, various eminent environmental issues are threatening the future of humankind. These include the over-consumption of non-renewable resources and global air pollution (Chan, 2008). In the hotel industry, the environmental concerns include among other things, 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 (Mensah, 2006). According to Chan & Hawkins (2012) there is a wide interest globally centred on these environmental problems and the moral, ethical, social, and political arguments for taking action on these issues are becoming more intense and an increasing number of stakeholders are interested to participate in order to address this phenomena. Research establishes that environmental management systems are important means for businesses to manage their environmental impacts but 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 & Hawkins, 2012). The South African hotel sector with specific reference to KZN also needs more investigation. Therefore, this study

intended to investigate more on this problem and recommend the solutions.

## 1.2. Problem statement

The use of environmental management accounting (EMA) remains debated in South Africa (Mõhr-Swart, Coetzee, & Blignaut, 2008). Farouk, Cherain, & Jacob (2012) support this premise by stating that it might be because EMA is still at an infancy stage in the emerging economies, including South Africa. It appears that there is limited existing research on environmental management applications available for use by the South African hotel sector (Rogerson & Sims, 2012). Literature indicates that traditional management accounting systems and attempts normally fall short in providing adequate or appropriate data to be used in the administration of environment, also for management of costs related to the management of that environment (Vasile & Man, 2012). Companies considerably misjudge both the costs and benefits of comprehensive environmental management (Christ & Burrit, 2013).

## 1.3. Aim and objectives

### Aim

This research's main aim is to examine and describe the practice of the environmental management accounting tools by the hotel sector in the 3-5 star categories in KwaZulu-Natal (KZN)

## Objectives

- To identify the environmental management accounting tools used for the reporting of environmental costs by the hotel sector in the 3-5 star category in KZN.
- To determine to what extent the tools of environmental management accounting are used to report environmental costs by the hotel sector in the 3-5 star category in KZN.
- To examine the awareness, knowledge, and experience with regards to environmental management accounting tools by KZN's hotel sector in the 3-5 star category.
- To identify critical factors enabling and limiting the use of environmental management accounting by the hotel sector in the 3-5 star category in KZN.

## 2. LITERATURE REVIEW

### 2.1. An Overview Of The Tourism Sector In South Africa

The accommodation sector of South Africa's tourism industry has seen tremendous growth since the country's re-entry into the global tourism economy (Hoogendoorn, Grant, Fitchett, 2015 and Rogerson, 2013). According to the Annual Report 2013/2014 by the National Department of Tourism (NDT, 2015) the World Travel and Tourism Council estimated that South Africa's travel and tourism sector contributed approximately R102 billion (\$10.4

billion) to the country's economy, directly supporting an estimated 620,000 jobs in 2012. An upward trajectory in tourism numbers is evident for the period 1990 - 2010. As a consequence of pressures for boycotts of South Africa and the subsequent formal imposition of international sanctions, the country's tourism economy stagnated throughout the 1980s. During this phase of 'stagnation' in international tourism, investment in new product development was low and driven by an industry focus upon the white South African domestic tourist. Under late apartheid, the years of political turmoil witnessed a national State of Emergency which further undermined possibilities for developing international tourism. In an expanding international tourism economy, South Africa was avoided by European and North American travellers (Rogerson & Visser, as quoted by Rogerson, 2013). Figure 1 shows famous places that are visited in South Africa.

According to South African Tourism (STA, 2015) the country is endowed with a well-established tourism industry with an exciting sector of emerging entrepreneurs. The country is strong on adventure, sport, nature and wildlife, and is a pioneer and global leader in responsible tourism. The country's top 10 cities where most of the country's tourism space is dispersed are: 1) Cape Town; Western Cape; 2) Johannesburg, Gauteng; 3) Durban, KwaZulu-Natal; 4) Pretoria, Gauteng; 5) Port Elizabeth, Eastern Cape; 6) Bloemfontein, Free State; 7) Nelspruit, Mpumalanga; 8) Kimberly, Northern Cape; 9) Polokwane, Limpopo; and 10) Pietermaritzburg, KwaZulu-Natal (STA, 2015).

Figure 1. South Africa tourist map



Source: Safari Co., 2015.

PricewaterhouseCoopers (PWC, 2015) expects the number of available rooms in hotels to increase by 0.7% in 2015 and to average 0.9% compounded annually to 63 600 in 2019 from 60 800 in 2014. Growth, however, will be limited by the imposition in May 2014 of two new requirements needed to obtain a visa. One requirement mandates that foreign visitors must appear in person at a South African consulate to apply for visas to have biometrics taken. A second policy requires that parents and guardians travelling with minors must have an unabridged birth certificate that shows the names of both parents. If a minor is travelling with one parent, an affidavit from the other parent is required granting consent for the trip. The purpose of the latter policy is to stop child trafficking. Tourism industry commentators in South Africa say this has already adversely affected travel from China and India, as potential visitors from these countries may have to travel long distances to a large city to obtain the necessary documentation before travelling to South Africa (PWC, 2015).

## 2.2. Environmental challenges facing the South African hotel sector

According to Erdogan & 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. This study investigated the environmental management accounting practices used by the hotel sector and according to Janković & 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 there 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.

## 2.3. Water challenges in South Africa

According to Erdogan & Baris (2007) the hotel's water consumption depends on the type, standards, and size of the facility, on the services and facilities offered, on the climate and irrigation needs, and on existing water conservation practices. Water and energy management is normally organized in a similar manner in hotels. Most water consumption occurs in hotel rooms, the laundry units, and the kitchen facilities (Erdogan & Baris, 2007). As quoted by Wyngaard & de Lange (2013), Alexander asserts that up to 1499 litres of water may currently be used daily in a single luxury hotel room and hotels may produce food waste of up to 46% of a hotel's total waste, which is clear evidence of the impact on the

environment caused by the hospitality industry in this regard". Wyngaard & de Lange (2013) further assert that "South Africa is considered a drought prone country with an arid climate over 69% of its total surface area, which makes it one of the 20 driest countries in the world. Literature reveals that South Africa is facing physical water scarcity with demanded estimated to outstrip supply at the current consumption rates (Gulati, Jacobs, Jooste, Naidoo, & Fakir, 2013). Some parts of the country have witnessed water shedding to address the scourge of water shortages. Water and electricity resources are under the greatest demand in South Africa, and current availability cannot sustain the consumption levels of tourist accommodation (Hoogendoorn et al, 2015).

## 2.4. Energy crises in South Africa

The country is currently experiencing energy crises. Towards the end 2007, the country experienced the widespread rolling blackouts as supply could not meet the demand. Even though rolling black outs or load shedding, as it is referred to, were suspended in May 2008, it has been re-introduced since November 2014. Blackouts are understood to implicate the wider sub-Saharan region, which depends on Eskom, South African's main energy utility company, for more than 60% of its electricity (Rafey & Sovacool, 2011). The government of South Africa asserts that the energy constraints are not a permanent crises for the country (National Department of Energy, (NDE), 2015).

## 2.5. Waste management challenges

Janković & Krivačić (2014) reveal that the consumption of energy from non-renewable resources, the consumption of drinking water, as well as the amount of solid waste and waste waters are the biggest generators of environmental costs in hotels. The main environmental waste related issues emanate from food processing activities include high water consumption, the discharge of high strength effluent and the consumption of energy (Massoud, Fayad, El-Fadel, and Kamle, 2010). It has been stated above that approximately 1499 litres of water may currently be used daily in a single luxury hotel room and hotels may produce food waste of up to 46% of a hotel's total waste. This is a serious concern for the environment.

## 3. ENVIRONMENTAL REPORTING IN THE HOTEL SECTOR

Various studies have been conducted in environmental management issues related to hotel operations in the areas of corporate business practice and policy, hospitality issues, and hotel operations. Literature reveals that many hotels have adopted a formal environmental management system (EMS) for the sake of the environment, for economic reasons, and/or to achieve a positive image (Chan & Hawkins, 2010). According to Chan (2008) many hotels are still undecided about adopting EMS. Erdogan & Baris (2007) add that in as much as there has been numerous studies of the environmental protection practices of hotels, the

majority has focused on large hotels catering to the demands of mass tourism on seashores and in popular resort areas.

### 3.1. Environmental management systems (EMS)

An environmental management system can be described as a methodology through which organizations operate in a structured manner in order to ensure protection of the environment (de Oliveira, Serra & Salgado, 2010). In other words, organisations define the impacts of their activities and then propose actions to reduce them. The ISO 14001 process standard is one of several structures within which a facility may develop an EMS (Massoud et al., 2010). Chan & Hawkins (2012) reveal that ISO EMS has become the preferred approach to managing the environmental aspects of a company's operations, as it depends less on government regulations and more on voluntary, proactive efforts within the organisation.

### 3.2. Environmental Management Accounting

Burritt & Saka (2006) define Environmental Management Accounting (EMA) as the identification, collection, analysis and use of two types of information for internal decision making: i) physical information on the use, flows and destinies of energy, water and materials (including wastes) and ii) monetary information on environment-related costs, earnings and savings. According to De Beer & Friend (2006) environmental management accounting is an innovative sustainability initiative. Coupled to the various standardised procedures and practices for effective environmental management, for example, ISO 14000 and Integrated Environmental Management Systems (IEMS), it defines the environmental management frameworks that exist at present that can assist companies in managing, measuring and improving the environmental aspects of their operations (Jones, 2010).

Conventional management accounting systems and practices often do not provide sufficient, sufficiently accurate, information for environmental management and environment-related cost management (Vasile & Man, 2012). As a result, many organisations significantly underestimate both the costs and benefits of sound environmental management (Jasch, 2003). To fill in this gap, recently the emerging field of Environmental Management Accounting has been receiving increasing attention. EMA provides a pragmatic response to criticism that conventional management accounting has failed in its ability to provide explicit consideration of environmental issues with environmental costs frequently 'hidden' in general overhead accounts and potential environmental benefits often downplayed or ignored (Jasch, 2003 and Christ & Burritt, 2013). This term is taken to mean managing environmental and financial performance through the development and implementation of appropriate accounting systems and practices. EMA incorporates a number of techniques and tools designed to assist organisations in recognising and managing their environmental impacts. These tools include, but are not limited to: environmental cost accounting; full

cost accounting; life-cycle costing; environmental life-cycle budgeting; environmental capital investment appraisal; total quality environmental management; and material and energy flow accounting (Christ & Burritt, 2013).

## 4. RESEARCH METHODOLOGY

Qualitative case study research method was chosen in this study. According to Burritt and Saka (2006) a case study can provide rich descriptions, explorations and explanations of the phenomena being studied, and are of particular use where little prior study has been undertaken. The selected case is that of a hotel management company (for confidentiality purposes will be referred to as ABC Hotel Management Group), managing about 11 hotels and lodges in KwaZulu-Natal. The environmental management challenges faced by these establishments are universal. Therefore a single case study with embedded units is much suitable for this study as generalisations would be possible (Baxter & Jack (2008). A single case study with embedded units was also chosen because this is a critical, unique and revelatory case and the researcher had access to the case previously inaccessible to empirical research (Chan & Hawkins, 2012).

In-depth interviews were used as the primary source of data collection, using semi-structured questions. Furthermore, additional documents were analysed. These included the hotels' Group Energy Profile Analysis programme (GEPA), Building Management System (BMS), financial statements, policies and the group websites together with their individual hotel websites. Judgement sampling was used as the researcher selected sample members to conform to some criterion. Only 3 hotels within ABC Hotel Management Group met the selection criterion. The hotel had to have an already developed environmental management system. Therefore, it had to have a Green Leaf Eco Standard certification and/or Fair Trade Tourism certification. The sample consisted of hotel employees who occupy certain positions of responsibility within the hotels. Data collection took form of semi structured/in-depth interviews and these participants provided relevant information because they are hands on in the area that was investigated, that is they either report on the environmental impacts caused by the hotel sector or perform activities that contribute to the environmental costs made by the hotel sector. As both management accounting and environmental management are of special interest and concern to this study, participants from the finance department, resources/general management division, cleaning department and maintenance department of the targeted hotel were required to participate. The group engineer and three senior staff members from the targeted hotels participated. Senior staff members consisted of the general manager, financial manager, and maintenance manager. Thematic coding was used to categorise findings from the hotel being investigated.

The interview questions were structured such that they address the research objectives and questions for this study and were categorised into themes as depicted in Table 1:

**Table 1.** Themes and interview questions

<i>Themes</i>	<i>Objectives</i>	<i>Interview questions</i>
1. EMA practices within the hotel sector and the extent to which they are used.	<ul style="list-style-type: none"> <li>To identify the environmental management accounting tools used for the reporting of environmental costs by the hotel sector in the 3-5 star category in KwaZulu-Natal.</li> <li>To determine to what extent the tools of environmental management accounting are used to report environmental costs by the hotel sector in the 3-5 star category in KZN.</li> </ul>	<ul style="list-style-type: none"> <li>What are the hotel's main environmental challenges?</li> <li>What has the hotel already done about the challenges? (Please mention recent projects.)</li> <li>Does the hotel have any form of environmental reporting? If yes, what is reported? Is it including the major environmental costs? At what level are the major environmental costs reported (if any)?</li> </ul>
2. Awareness, knowledge and experience with regards to EMA tools	<ul style="list-style-type: none"> <li>To examine the awareness, knowledge, and experience with regards to environmental management accounting tools by KZN's hotel sector in the 3-5 star category.</li> </ul>	<ul style="list-style-type: none"> <li>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?</li> <li>Have you ever requested any environmental cost information from accounting, or environmental management related administrative divisions? If yes, what is the purpose of requesting such information? If not, why not?</li> </ul>
3. Internal and external factors affecting the use of EMA tools.	<ul style="list-style-type: none"> <li>To identify critical factors enabling and limiting the use of environmental management accounting by the hotel sector in the 3-5 star category in KZN.</li> </ul>	<ul style="list-style-type: none"> <li>Do you think the hotel has provided enough incentives to motivate general managers or administrative divisions to control, or reduce environmental costs?</li> <li>Are any external pressures forcing the hotel to account for any of its impacts on the environment? Who imposes the pressure? How does the hotel react to the pressure and what are the actions taken?</li> </ul>

## 5. RESEARCH FINDINGS

### Theme 1: EMA practices within the hotel sector and the extent to which they are used.

This section provides findings for the selected case with its embedded units. A comparison was made amongst these hotels and presented as follows:

**Table 2.** Environmental management challenges

<i>Question</i>	<i>ABC Hotel Group</i>	<i>Hotel A</i>	<i>Hotel B</i>	<i>Hotel C</i>
1. What are the hotel's main environmental challenges?	Regulation, Data accuracy, Capital budget, Understanding data.	Energy consumption, Lighting infrastructure (Some lights are shut down).	Energy efficiency	Energy consumption (Lights are constantly switched on, Water consumption and waste management (separation of wet and dry waste).

Table 2 shows that all the hotels agree that energy consumption is the main environmental challenge, whilst the group engineer disputes data accuracy. Hotel C points out that their environmental challenges were not only energy consumption and efficiency, they are also concerned about water consumption and waste management, which involves the separation of water into wet and

dry waste. This is 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 budget and the ability to understand data as challenges faced by the hotel group.

**Table 3.** What has been done to address challenges?

<i>Question</i>	<i>ABC Hotel Group</i>	<i>Hotel A</i>	<i>Hotel B</i>	<i>Hotel C</i>
2. What has the hotel already done about the challenges? (Please mention recent projects.)	Engage in energy efficiency projects and water management. Installing Group Energy Profile Analysis (GEP). (GEP).	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.

In table 3, 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 have engaged in energy efficiency projects and thus 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.

**Table 4.** Environmental reporting and major environmental costs

<i>Question</i>	<i>Group Engineer</i>	<i>Hotel A</i>	<i>Hotel B</i>	<i>Hotel C</i>
3. Does the hotel have any form of environmental reporting? If yes, what is reported? Is it including the major environmental costs? At what level are the major environmental costs reported (if any)?	Yes. Water, energy and occupancy including conferencing, bed nights and room nights sold.	Yes. Water and energy consumption reported monthly through Group Energy Profile Analysis (GEPA). Major costs included (Yes) Reported across all departments	Yes. Water, energy and waste are reporting in line to the Green Leaf (GL) standard and subject to GL audit All major costs included and reported monthly across all departments.	Yes. Energy, water and waste. All major costs are included and reported monthly across all departments within the hotel.

Participants were asked in table 4 if the hotel has any form of environmental reporting and all of them responded positively. The major environmental costs that are reported by the hotels are water, energy, and waste. These costs are reported monthly and are in line with those that

were mentioned by the group engineer. Hotel A, however, does not seem to report its waste management costs.

**Theme 2: Awareness, knowledge and experience with regards to EMA tools.**

**Table 5.** The control of environmental costs

<i>Question</i>	<i>Group Engineer</i>	<i>Hotel A</i>	<i>Hotel B</i>	<i>Hotel C</i>
1. 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?	Yes.  Yes.	Yes.  Yes.	Yes.  Yes.	Yes.  Yes.

All informants were in absolute agreement to the question asked in table 5. The hotels find it important that they control their major environmental costs. The interventions in place as

per the discussion above are indicative of the fact that the control of the hotel's major environmental costs is an important issue even currently.

**Table 6.** The request of environmental cost information

<i>Question</i>	<i>Group Engineer</i>	<i>Hotel A</i>	<i>Hotel B</i>	<i>Hotel C</i>
2. Have you ever requested any environmental cost information from accounting, or environmental management related administrative divisions? If yes, what is the purpose of requesting such information? If not, why not?	Yes. Benchmarking and monitoring.	Yes. Monthly, for comparison analysis and benchmarking	Yes. Budgetary reasons, monitoring and control.	Yes. Monthly, for monitoring and reporting. The maintenance manager has never requested any of the environmental information as he finds it not relevant for him.

There is a general positive response from all the informants on the questions asked in Table 6. The participants in their respective positions responded that they have requested environmental cost information mainly for monitoring, control and

benchmarking. The maintenance manager finds environmental cost information not relevant for him to use and as such he has never requested it.

Internal and external factors affecting the use of EMA tools.

**Table 7.** Environmental cost reduction incentives

<i>Question</i>	<i>Group Engineer</i>	<i>Hotel A</i>	<i>Hotel B</i>	<i>Hotel C</i>
1. Do you think the hotel has provided enough incentives to motivate general managers or administrative divisions to control, or reduce environmental costs?	No incentives but directives.	No	Not necessarily expected but part of the culture to manage and reduce environmental costs	Yes. Part of the culture adopted from Green Leaf.

Table 7 provides mixed responses as not participants were positive about the question which related to the incentives provided to reduce environmental costs. Hotel A was in total

disagreement to the question while Hotel B and the group engineer were not much sure about it. Hotel A was totally positive to the question.

**Table 8.** External factors forcing the hotel to account for its environmental impacts

<b>Question</b>	<b>Group Engineer</b>	<b>Hotel A</b>	<b>Hotel B</b>	<b>Hotel C</b>
9. Are any external pressures forcing the hotel to account for any of its impacts on the environment? Who imposes the pressure? How does the hotel react to the pressure and what are the actions taken?	Yes.  "Foreign markets" (Tourists). The hotel assures its foreign markets about their commitments to reducing the hotels' impact on the environment.	No.  N/A  N/A	Yes.  International visitors. The hotel's commitment to sustainable operations is disclosed in its website.	Yes. Occasionally from government but not enforced. The MM responded that there are no external pressures. Information about the hotel's commitment to minimising environmental impact is disclosed in guest cards but still needs to be updated on the website.

Table 8 illustrates that the hotel management was partly divided about the external pressures forcing the hotels to account for any of their impacts on the environment. The group engineer together with the management of hotel B agreed that there are pressures. Hotel A's management was in complete disagreement to the question together with the maintenance manager of hotel C, whilst the rest of hotel C's management was not quite sure. Mainly international visitors are said to be the ones contributing to the external forces.

incurred by the hotels and establish the activities performed that results in these costs being incurred. The group is encouraged to conduct workshops for its hotel management and all the decision makers to create awareness about systems that are used in reducing and managing environmental costs. Uniformity and consistency is also recommended in the application of the EMA tools across all hotels in order to maintain order and facilitate the comparability of data and to improve monitoring and controlling.

## 6. LIMITATIONS

This study was limited to hotels within the province of KwaZulu-Natal 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 South Africa. It may add value to use multiple case studies in order to increase rigour of the analysis and to compliment this study.

## 7. IMPLICATIONS

EMA tools used by the hotel industry remain arguably unknown in South African. This is due to the fact that limited investigation has been done in this area. This study contributes to the identification and critical evaluation of the EMA tools used by hotels based on the experiences applied by ABC Hotel Management Group. Furthermore, internal and external factors impeding the implementation of EMA tools are identified.

## 8. RECOMMENDATIONS

### 8.1. Recommendations for ABC Hotel Management Group

It is evident from the findings that the group has implemented the environmental management systems to reduce its environmental costs. The study investigated only 3 of 11 hotels managed by the group, which is indicative of the fact that the hotel is at an infancy stage in terms of implementing these systems. It is recommended that the group appoints a group environmental officer who will assist in tracing and tracking environmental costs

### 8.2. Recommendations for future research

A longitudinal case study approach can be used to identify and evaluate EMA tools used by the hotel sector. This type of study would provider a much richer and more detailed evaluation of the EMA tools used by the hotel sector. This approach can assist in determining the extent at which these tools are used and how effective are they in reducing and controlling environmental costs and how are they reported. This study used a qualitative approach and therefore a quantitative method is recommended to test the relationship between various variables.

## 9. CONCLUSION

The study found that the hotel group is aware of the environmental challenges and these include energy and water consumption and waste management. As such, the group developed a GEPA system to track, trace, allocate and monitor its major environmental costs. The system is linked with all the hotels managed by the group. Some of the hotels have implemented BMS to monitor and control energy and water consumption. This is linked to the GEPA system. Among the three studied hotels, it was discovered that the implementation of EMA tools is not consistent across the board and not all hotels have installed systems that facilitate the reduction of major environmental costs.

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