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Managing Waste and Water with the Help of Environmental Management Accounting (EMA): A Sri Lankan Hotel Sector Case

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Abstract

Purpose –The study aims to examine how waste and water management practices along with EMA systems have been implemented by a Sri Lankan hotel.

Design/methodology/approach –Single case study method was adopted in the study. The main primary data collection method was unstructured interviews with open ended questions. Data were triangulated using other sources such as non-participative observation, informal conversations, perusing documents and inspecting physical artifacts. To improve the reliability, preparations were taken before the field visits and interviews. The collected data were analyzed thematically.

Findings – The hotel is in the forefront of implementing green practices among the Sri Lankan hotels. The approach is holistic and is at the center of management. The commitment of the founder and current chairman, increased regulation and voluntary certifications have driven the change for better management of waste and water over time. The key to successful green practices is stakeholder engagement while the key infrastructure needed for waste and water management is a good EMA System which is still at primary stage of development. The case demonstrates how the basic practices could result in better benefits if applied effectively.

Research limitations/implications –The findings of the research is based on a hotel context hence the recommendations best fit to the hotels with similar characteristics.

Originality/value –The study attempts to fill the gap of knowledge in the area of sustainability *and* waste and water management pertaining to the hotel industry, which is a key growth sector for many emerging economies including Sri Lanka. The results will be useful for better adoption of waste and water management and to develop a better EMA system for the hotel sector in emerging markets.

Keywords- Environmental management accounting; hotel industry; Sri Lanka; sustainability; waste and water management.

Paper type- Case Study

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1. Introduction

Tourism is a developing industry and a key growth sector in the post war Sri Lankan economy (Ministry of Economic Development, 2011; Central Bank of Sri Lanka, 2012). To harvest the maximum benefits, Sri Lanka's tourism industry inevitably needs to adopt sustainability into their businesses due to reasons such as increasing adoption of responsible tourism globally, increased public awareness and media coverage of issues concerning environmental impact and growing demand for sustainable tourism (Miththapala *et al*., 2013). Despite the importance of sustainability practices in the hotel sector, Gunarathne and Lee (2013) state that research addressing sustainability in tourism industry is scarce in emerging markets.

On the other hand, Chung and Parker (2006) identifies that there is a need and opportunity for field base case studies that focus on investigating both historical and contemporary environment strategy and management controls employed by hotels. Motivated by this gap of knowledge, the researchers undertook this study based on the field of sustainability management in the hotel sector in Sri Lanka. Within the vast field of sustainability, waste and water management can be identified as one of the most visible areas in the hotel industry that initially triggered the need for responsible tourism globally (United Nations Environment Programme, 2003). While some researches on sustainability in Sri Lanka appeared after 2012, researches that specifically address waste and water management area in the hotel industry are scarce. Hence, this study aims to fill this gap by examining waste and water management practices of a renowned Sri Lankan hotel along with its EMA practices.

The hotel selected in the study belongs to a prestigious hospitality group in Sri Lanka and is considered one of the initiators of sustainable tourism in the country. The group commenced operations 40 years back in Negombo, an area known to be a key tourist hot spot in Sri Lanka. The hotel under study is situated in the same area, Negombo that amasses to a 9 acre land of golden sand facing the Indian Ocean. The hotel which was incorporated in 1973 went through a renovation in 2011 after which it was re-launched with 112 luxurious rooms, banquet halls and all other modern amenities. This stylish hotel was awarded the 5-star certificate in 2012.

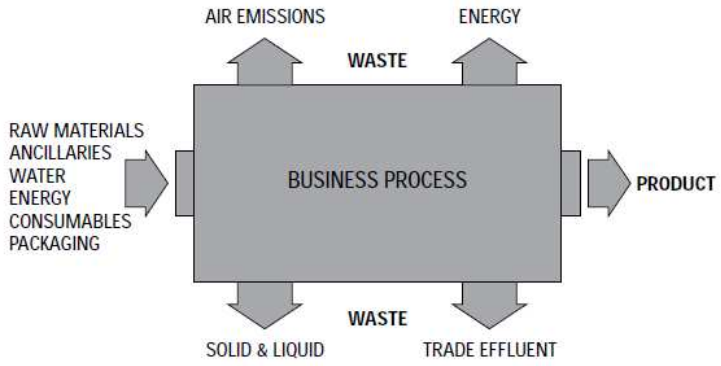
The rest of the paper is organized as follows: Section Two presents the literature review of the study which is then followed by the research methodology in Section Three. Section Four provides the findings and discussion while the last section presents the conclusions.

2. Literature Review

The main focus of this study lies on solid waste and wastewater management practices. The term waste is defined in many ways (Margaret, 1998; Michael, 2007; Sandberg and Bildsten, 2010). As per European Union's waste framework directive (1989), waste is defined as an object the holder discards, intends to discard or is required to discard. A more comprehensive definition is given by the UK Environmental Protection Act (1990) which defines waste as any substance which constitutes a scrap material or an effluent or other surplus substance arising from the application of any process; and any substance or article which requires to be disposed of as being broken, worn out, contaminated or otherwise spoiled, but does not include a substance which is explosive.

Figure 01 illustrates a typical waste generation process that could be applied to any kind of an organization whereusually organizations feed raw materials, ancillaries, water, energy, consumables and packaging to the production process and it generates outputs which can be classified as productive outputs and non-productive outputs. Productive outputs are the finished goods and by-products with packaging. Non-productive outputs are air emission, energy waste, solid waste, liquid waste and trade effluent (Environmental Protection Agency (EPA), 1998; Margaret, 1998; IFAC, 2005). This simple illustration could be utilized in identification, analysis and management of waste which are discussed in later parts of the study.

Figure 01: Productive and non-productive output of an organization



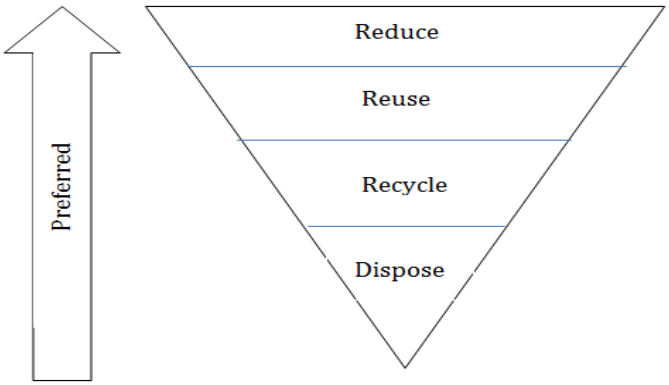
Source: EPA (1998)

Waste and water management in the hotel sector is of utmost important due to the high levels of wastage that could significantly impact the environment if not managed properly (United Nations Environment Program, 2003). Initially hotels used to dump solid waste to low-lying areas and release waste water to the sea,

rivers and other water steams through the drainage system. Reasons identified for these practices are financial constraints, lack of motivation in the corporation, absence of management and employee involvement in waste management. Even technologies such as composting which needs small capital investment were not initially practiced. However, improved environmental awareness, pressures from green customers and tightening of environmental regulations led hotels to be more environmentally friendly. As of now, green hotels have taken necessary actions to implement cleaner production and waste management systems more holistically (Jayawardana *et al.,* 2013).

An important tool that is being widely utilized in the area of waste and water management is the waste management hierarchy developed by the UK Governmentwhich is illustrated in Figure 02 (Her Majesty's Stationery Office (HMSO) as cited in Margaret, 1998). First version of the waste management hierarchy comprises of four main levels of waste management namely waste reduction, reuse, recycle, and disposal. Reduction is the first priority for more sustainable waste management, involving reduction or minimization of waste at source. Reuse involves putting objects back into use so they do not enter the waste stream. Recycle refers to the recovery of value or energy from waste materials. Further, this incorporates material recycling, composting and the recovery of energy from waste. Disposal is regarded the least attractive waste management option, usually involving landfill or incineration (Margaret, 1998).

Figure 02: **Waste management hierarchy**



Source: HMSO as cited in Margaret (1998)

With increased importance placed on the environment as discussed above, Environment Management Accounting (EMA) has emerged as an interface between management accounting and environment management (Bennett *et al.,* 2002).

International Federation of Accountants (IFAC) (2005) defines EMA as the management of environment and economic performance through the development and implementation of appropriate environment related accounting systems and practices. Bennett and James (1998) further state that it includes both financial and non-financial information.

When environmental considerations are getting ever important in accounting, conventional management accounting has been largely criticized due to its ignorance to separate identify, classify, measure and report of environmental information, especially environmental costs (Burritt, 2004). Furthermore, according to EPA (1995), EMA could classify environmental costs as *conventional*, *potentially hidden costs, contingent costs and image* and *relationship costs*. Conventional costs are costs of using raw materials, utilities, capital goods, and supplies and are usually addressed in cost accounting and capital budgeting. Potentially hidden costs can be upfront environmental costs (incurred prior to the operation of a process, system, or facility), regulatory environmental costs, voluntary environmental costs or back-end environmental costs (incurred at the end of the production cycle or facility). Contingent costs are those that may or may not be incurred at some point in the future such as the costs of remedying and compensating for future accidental releases of contaminants into the environment. Image and relationship costs are incurred to affect subjective perceptions of management, customers, employees, communities and regulators. Hence, as a branch of EMA, waste management also requires better a accounting and reporting system to back the efforts.

Inspired by the gap of literature of this important aspect of environmental management and the role of accounting, the study aims to examine how waste and water management practices have been implemented by the selected Sri Lankan hotel with the help of EMA. The next section explains the methodology followed in the study.

3. Methodology

This section discusses the data collection and analysis methods followed. Single case study method was adopted for the purpose of this research owing to the nature of the research question and the focus on the contemporary real life phenomenon in the study (Yin, 2009).

With the aim of collecting data, two site visits were made to the hotel. The first site visit was aimed at gaining a thorough insight into the current waste and water management practices. The Naturalist and the Chief Engineer at the hotel premises guided the visit with some insights from the General Manager as well. During the

first visit, physical evidence pertaining to the operation and maintenance of waste and water management practices were observed and examined. These included interviews with the Naturalist and the Engineer with further questions being asked for immediate clarification.

After some discussion and analysis on the practices observed from the first visit, a second visit, aimed at obtaining more information, was made after a lapse of a month. Another aim of this visit was to examine the EMA practices of the hotel, including details of the physical and monetary data being maintained. Also with this visit, details of the internal meetings held at the hotel and their effectiveness and specific management accounting techniques used for decision making in the area of waste and water management were obtained. The facts and knowledge gained from aforementioned parties allowed method and data triangulation.

Unstructured interviews consisting of open ended questions formed the main methodof primary data collection during these visits. This helped to gather a vast and novel array of information. Key consideration was paid to maintain the accuracy and reliability of the data through a triangulation process which has been emphasized by Yin (2009) when carrying out case studies. As a mean of triangulation, random employees from different levels were interviewed in addition to the interviews with the Naturalist and the Chief Engineer. Moreover, apart from the unstructured interviews, methods such as non-participative observation, physical inspection of artifacts were utilized as other means of triangulation. Secondary data sources such as daily and monthly material and energy records, official website, online information, Green Directory and various other documents were also analyzed.

Further, to maintain the validity of the data gathered, preparations were done before the second visit by way of listing down the required information rather than preparing specific questions. This is in-line with Yin's argument that construct, internal and external validity and reliability are prerequisites when carrying out case studies. This also helped to determine the length of the interviews where the conversation was maintained until the listed down expected information were gathered.

Thematic approach was used to analyze the collected data with regard to waste and water management practices, since theoretical propositions could be a good starting point for case study research as per Yin (2009). Hence, current practices of waste management were analyzed in the lines of waste management hierarchy of HMSO (1994). The next section presents the findings and discussion of the study along these themes.

4. Findings and Discussion

This section presents the findings and discussion of the study under drivers of change, current waste management practices, current water management practices, EMA system and challenges faced by the hotel.

Drivers of change

The hotel was built after considering some sustainability aspects when established in 1970's even during a period when sustainability was not popular among Sri Lankan hotels. Such practices were derived from the founder of the group who valued being environmentally friendly and promoted locality in providing employment opportunities and selecting suppliers. Later on, sophisticated green practices were adopted and other sustainability practices were gradually introduced as a result of a series of pressures and incidents the hotel underwent. Some water and waste treatment practices came into operation from external professionals and engineers who were hired by the hotel for some other technical projects. Their informal references to knowledge of such advanced practices gradually led the hotel to seek and adopt waste and water management practices. Another major trigger point was the appointment of the founder's son as the current chairman in 1987, who, armed with thorough knowledge on international hospitality practices, successfully implemented them within the hotel over time.

Later with increased regulation and voluntary certifications available, the hotel started implementing ad hoc standards such as HACCP. Today the hotel has integrated all such environmental practices into a coherent management system called the environmental management system and has successfully obtained certification as an ISO 14001 certified company in May 2013. Since then, the hotel's efforts towards sustainability are continuous and supported by professionals such as Naturalist and Engineers at the hotel premises.

The hotel first established the post "Naturalist" in 2010. Currently the post is handled by an expert who is reading for a Master's qualification with his first degree specializing in "wild life conservation and management", obtained from a local university. The main role of the Naturalist, who reports to the General Manager of the hotel, is to reduce or neutralize the carbon emissions. However, he is also involved with waste management, Corporate Social Responsibility aspects, nature/eco tours, and awareness programs and reporting. As identified by Moreno *et al*. (2004) and Gil *et al*. (2001) it is clear that the chain affiliation, accreditation and stakeholder environmental pressures have exerted a lasting influence on the implementation of environmental management practices by the hotel. These various pressures, accidental and intentional, have given rise to the current state of waste and water management practices which are discussed and analyzed henceforth.

Current waste management practices

In this section, all types of waste excluding water; air and energy are taken into account. The Naturalist at the hotel is responsible for the management of this area. The management practices are discussed and analyzed in terms of waste hierarchy (HMSO, 1994); i.e., waste reduction, waste reuse, waste recycle and waste disposal.

Waste reduction

The first step of the hierarchy is waste reduction which is an important step since this enables to avoid waste at source. The hotel's management has taken several steps to avoid waste at source.

Supply chain management of the hotel gives priority for the suppliers who follow sustainable practices, especially suppliers who avoid secondary covers and excess packaging of the goods. To highlight this preference the Naturalist says;

> *"When we select the suppliers, we look at their sustainable packaging practices… Always we give priority for those who offer environmentally friendly packaging."*

In addition, the hotel has displayed notices at receiving bay notifying a strict principle on usage of polythene when supplying raw materials. To support this, the staff has been given plastic crates to bring vegetables and other supplies from the market. Selecting vendors with easily recyclable packaging if the quality and other standards are met can also be considered as a mode of reducing waste.

There are other means of reducing the use of non-degradable materials. The hotel has set up a movable bottling plant at the hotel premises to clean and refill water. In this plant, plastic water bottles are 100% eliminated from the system and instead smart glass bottles are used. Moreover, the hotel has used wooden display boards and wooden cocktail stirs as well. In addition, organic paint has been used in most of the cases. As a green building practice, environmental friendly easily degradable clay tiles have been used instead of ceramic tiles. These practices highlight that the hotel has considered the life cycle impact in capital investment decisions, a requirement highlighted by Bennet and James (1998) and EPA (1995).

Waste reuse

Another important element in the waste hierarchy (HMSO, 1994) is the reuse of waste. In explaining their approach for waste reuse, the Naturalist during his explanation states;

> *"The first step of making use of any waste is to classify the types of waste and collect them separately."*

In-line with his statement, the hotel categorizes the waste as the first step to reuse. The hotel generates different types of waste, namely, solid waste, wet waste, hazardous waste and liquid and oil waste. Considering the above material types solid waste is further categorized and separately collected as glass, metal, paper and plastic in a small store room, adjoining the Sewerage Treatment Plant premises, named the "Resource Center".

50% of the wet waste is reused by a local piggery farmer for which, the hotel does not have any disposal cost. Oil waste is reused by selling to small vendors who manufacture detergent powder related products. Other solid waste such as metal and wood has been used to create ornaments and decorations for the hotel itself.

Waste recycle

As the next approach of the waste management hierarchy, the hotel recycles waste to a certain degree. For the recycling of the waste, a compost machine is used. This machine has been purchased irrespective of their financial feasibility and solely considering the sustainability aspect. This is because the plant that produces compost out of biodegradable waste has a pay-back period of more than 20 years and the financial benefits are negligible.

The machine is capable of producing compost mainly through the remaining 50% of the wet waste which is not being taken away by the piggery farmer. The compost generated by this machine is used for the hotel's organic and general gardening. Moreover, the compost is being distributed among schools and other charities as a CSR project.

Waste disposal

Another important aspect of the waste hierarchy is the waste disposal. The hotel chooses to dispose waste only if there is no other way to reuse or recycle. Hazardous and toxic substances are properly disposed taking health and environmental aspects into consideration. The housekeeping department of the hotel has to obtain the MSDS certificate (Material Data Safety Sheet) for chemical waste disposal. No chemical or chlorine is used in the swimming pool, and instead a salt related chemical process is followed. Monthly beach cleaning exercise that involves cleaning beach beyond the hotel plot is undertaken by the hotel with the help of neighbor hoteliers.

It is evident that the waste management of the hotel represents traditional end-of-pipe treatments as well as innovative approaches as suggested by (United Nations Environment Program and United Nations Industrial Development Organization, 1991). The next section presents the hotel's waste water management practices.

Current water management practices

The hotel uses water in areas such as guest bathrooms (for showers, wash basins, bath tubs and toilet cisterns), kitchens (for cooking, drinking water, food preparation, dish and pot washing), restaurants and staff canteens, common wash rooms (for wash basins, urinals and toilet cisterns), gardens (for gardening and landscaping), swimming pools and for make-up water, laundry, staff quarters and vehicle washing areas. An analysis of water consumption revealed that seventy five percent of the water is turned to be waste and very little portion is actually consumed. This situation requires better management of water and presents high potential for water saving. The hotel's water management practices have been analyzed based on the waste hierarchy (HMSO, 1994); waste reduction, waste reuse, waste recycle and waste disposal.

Water reduction

Water reduction practices can be identified as engineering and behavioral practices. The engineering practices represent the technical aspects used for reduction of water consumption. Practices such as replacement or installment of all toilets with low-flush fittings and bathrooms with low flush shower heads have enabled the hotel to reduce water consumption significantly. Conventional toilets use 3.5 to 5 gallons or more of water per flush, but low-flush toilets use only 1.6 gallons of water or less. Since low-flush toilets use less water, they also reduce the volume of wastewater produced. The hotel has installed paddling taps which has reduced the misuse of water drastically. Further, the installation of separate water meters enables the hotel to identify and account for the excess water use of each wing separately. This paves the way to investigate breakdowns in pipe lines and other damages immediately, enabling prompt recourse actions.

Showers account for about 20 percent of total indoor water use of a hotel. Replacement of standard 4.5-gallon-per-minute showerheads with 2.5-gallon-per-minute heads has reduced the hotel's indoor water consumption. The hotel has installed faucet aerators, which break the flowing water into fine droplets and entrain air while maintaining wetting effectiveness in sinks to reduce water. These are relatively inexpensive devices, yet effective in reducing water usage by as much as 60 percent while still maintaining a strong flow. The hotel has further focused on pressure reduction of fixtures and dip rinsing- cleaning dishes as a whole rather than cleaning them individually by hand. Above mentioned exercises are some of the engineering practices implemented to reduce the water consumption at source. As highlighted by Gunarathne and Lee (2013) these practices involve less investments but are applied with careful analysis with the help of guests and employees. The next section explains how the hotel receives the support of these stakeholders.

The behavioral practices involve changing water use habits so that water is used more efficiently, thus reducing the overall water consumption in the hotel. The hotel management has identified that these practices result in water conservation without zero investment through a change in behavior. Behavioral practices for water users can be applied both indoors in the kitchen, bathroom, and laundry room and outdoors. Therefore, the hotel has taken following measures to make an attitude change both among staff and guests.

The hotel conducts awareness programs for the staff that involve highlighting the importance of sustainable use of water through informing about the basics of water use efficiency; how water is delivered to them, the costs of water service, why water conservation is important, how they can participate in conservation efforts. The water savings from the employees are rewarded back to staff welfare fund. This involves rewarding the staff through directing savings yield from sustainable use of water directly to the staff welfare fund. To highlight how the fund operates the Engineer during an interview stated;

> *"All the proceeds of savings of waste water are credited to employee welfare fund... this gives them a sense of ownership."*

The hotel uses the Green Directory to increase awareness of the guests on its sustainability practices. All guests are provided with one such directory that summarizes hotel's green practices and includes requests to conserve water and reduce waste. Moreover, displays and quotes have been exhibited in different places such as tissue papers, bathrooms and rooms etc in considering the potential contribution that can be made through merely changing attitudes to reduce water without any investment.

Water reuse, recycle and dispose

Once the water is used, it is often considered as waste water. Hence, any relevant practice to reuse should be subject to treatment and discussed under water recycling. The recycled water is reused for gardening and for maintenances of land. The recycling of water is done at Sewerage Treatment Plants**.** Engineering division has identified and considered following factors when implementing the Sewerage Treatment Plants.

- Identification of water reuse opportunities
- Evaluation of the minimum water quality needed for a particular use
- Evaluation of water quality degradation resulting from use
- Determination of the treatment steps, if any, that might be required to prepare the water for recycling

The hotel has established two Sewerage Treatment Plants representing two techniques called Aerobic and Anaerobic. The difference lies in the biological digestion method where the treated water is used for gardening purposes. This not only reduces a larger water usage but it also prevents the environment and ground water system from having to absorb polluted water. The sludge, the by-product of the process, is used as organic fertilizer. Waste water is only disposed if it is hazardous and cannot be used after any treatment. The disposal of hazardous toxic waste water is carried out through the municipal council.

The next section describes how the hotel operates an EMA system for water and waste management.

EMA system

The EMA system of the hotel relating to waste and water management comprises of measuring water and waste data, calculating integrated performance measures and reporting of the data. It was identified that the level of sophistication of the accounting system is very low and basic. The Finance/Accounting team is little involved with the operation of the environmental information system. They are involved with only issuing and receiving receipts relating to environmental costs. The engineering division is responsible for major part of the environmental information system as information pertaining to energy and water is collected and managed by them. The Naturalist is responsible for waste related data.

According to Burritt *et al*. (2002) EMA systems collect data on physical and monetary aspects. Some of the physical data collected in the hotel pertaining to the water and waste management are: water units for each of the department, number of waste bins issued for piggery farmers, number of wet waste bins issued for compost machines, kilograms of e-waste, kilograms of waste paper sold, kilograms of glass waste, etc.

The monetary data pertaining to the waste and water management include the monthly water bill, chemicals costs for Agronova machine, operating costs of Agronova machine and sewerage treatment plants etc.

Waste and water management costs (environmental costs) are not separately identified or categorized from other non-environmental costs. All environmental costs are treated as general overheads. For example a major part of the engineer's time is spent on managing and overlooking waste treatment plants, water management etc. But it is not separately identified as an environmental cost. This observation is clearly in line with the argument of Burritt (2004) and IFAC (2005)

which states that non-identification of environmental costs act as a major barrier for the better implementation of environmental management accounting.

In the area of water, water consumption per guest is reported. In addition, water consumption is compared with occupancy. In the area of waste, no such integrative measure is calculated, rather the number of waste bins disposed is considered. Further, the hotel does not separately treat environmental costs but consider those as general overheads. No Activity Based Costing practice was noticed in the area of allocating these waste related costs (EPA, 1995; Soonawalla, 2006).

Environment related projects that involve considerable capital expenditure are evaluated based on pay-back period (EPA, 1995). Few examples were compost machine, sewerage treatment plants and solar panel systems. However, compost machine which gave a pay-back of more than 20 years was installed irrespective of the financial feasibility. Engineering team is predominantly involved in identifying costs and incomes relating to a project appraisal since such projects are technical savvy. The accountant takes part in attributing financial values together with the engineer. However, discounted pay-back is not utilized. Only direct financial income and expenses are considered for this appraisal. A larger societal benefits and costs are neglected in environmental project evaluation which makes most of the projects financially not feasible (EPA, 1995)

When considering the reporting system adopted by the hotel it was identified that it conducts three main meeting relating to sustainability. These meetings are daily morning meetings, monthly green directory meetings and engineers' meetings. These meetings provide and shape the reporting frequency and the structure of environmental information. The daily morning meetings are conducted by the General Manager where all department heads such as maintenance and engineering, housekeeping, administration and human resource, front office, laundry, accounting, spa and gym and kitchen participate along with the Naturalist. Previous day's data relating to water and energy are discussed and in case of any abnormal usages the respective department heads are questioned. Usage is often compared with the occupancy. In the monthly green directory meeting, waste and overall sustainability is discussed and analyzed critically. Monthly water consumption compared to occupancy, waste data and energy usage are important focus areas that are usually subject to the discussion in these meetings. Finally, in the engineers' meetings engineers report data relating to energy and water usage. Long term solutions are also discussed in these meetings. It is clear that the reporting framework of the hotel by means of meetings is due to chain affiliation as suggested by Gil *et al.* (2001).

Challenges faced by the hotel

The practices discussed in previous sections, actions are not without challenges. From management perspective, waste and water management and sustainability is at the center of hotel operations. However, the main challenge against holistic implementation is the engagement of all stakeholders to a greater extent (Gunarathne and Lee, 2013).

Stakeholders such as guests, employees and suppliers, who have a greater bearing on waste and water management, are aware of the hotel's sustainability movement to a greater extent. The hotel usually does not accept any polythene bags from suppliers when receiving vegetables and other supplies. Instead, staff has been provided with plastic crates to bring such supplies from market. Amidst such good practices being established, vegetables in polythene bags are seldom noticed at the receiving bay as all other vegetables are received in cartons. However, it is evident to different departments that stakeholders although aware, tend to forget the norms and values over time due to lack of continuous emphasis and control. The naturalist admitted by saying;

> *"This is the challenging part, no matter how we advise them, when we are not present they tend to neglect."*

Another source of waste generation hotel has identified is the level of education of employees which makes it harder to convince the benefits of the concept vis-à-vis the busy routine schedule they have to follow. Moreover, it was evident that the hotel does not have the control over a major part of waste as guests have a huge bearing in the area unlike employees who could be controlled to a greater extent. The Naturalist of the hotel commented;

> *"Some guests are not reacting to the whole sustainability movement and they have the mentality of consuming the maximum for the amount they pay, for an example every time you flush a cigarette butt, facial tissue or other trash, three to four gallons of water is wasted."*

This statement of the Naturalist highlights the challenge they face when managing guests which has also been observed by Gunarathne and Lee (2013).

Further, the hotel tries to eliminate secondary packaging in receiving goods and supplies to stores as much as possible. Nonetheless, due to the practical difficulties the hotel has to buy goods with the secondary packaging in certain situations such as when buying in bulk. According to the naturalist, another challenge faced by the hotel is eliminating polythene completely or recycling them. It is not feasible to put up a polythene recycling plant in account of lesser quantity and higher capital costs against financial benefits. Moreover, delivering the polythene waste to local

recyclers, the next best alternative also has higher implications on transportation cost and carbon emissions which in turn contradict with the hotel's motive to be a carbon neutral entity.

5. Conclusions

The case demonstrated that the waste and water management practices are holistically established in the hotel, at times, irrespective of their financial feasibility. The continuous application of these environmental practices is now certain owing to a series of events which took place after 2011 including the major renovation and receiving of ISO14001 certification. Further, the hotel is highly committed and equipped with greater top management support and posts such as naturalists and engineers at the hotel premises. The greatest challenge to the waste and water management is the engagement of guests and employees in the process who account for a massive portion of the usage. However, advanced and creative methods such as reward systems, to engage the stakeholders, guests and employees are yet to be adopted that would lead the hotel to perfection along with continuous effort. On the other hand, to support all of these good practices, the need of a sophisticated EMA system is increasingly felt. Yet, the hotel has been able to implement environmental strategies to a greater degree of success. Thus, the case again confirms the findings of Gunarathne and Lee (2013) that simple and less sophisticated systems could still be effective if applied with consistent commitment.

The hotel can further strengthen the waste and water management strategies by stakeholder engagement, continuous physical investment and effective establishment of an EMA system. For effective stakeholder engagement, especially guests, an Eco-Voucher system. This would be conducted to reward the guests who support the hotel's sustainability movement by way of free stay-over in any hotel in the group in recognition of the savings they make. On the other hand Eco-Circles could be implemented and strengthened for employee involvement and empowerment to support sustainable practices. In the area of further physical investments, the hotel can re-look at further green building, elimination of polythene use, polythene recycling and other investments. At the same time, it is crucial to establish a proper EMA system that can properly identify and would facilitate all other sustainability initiatives such as Eco-Vouchers and Eco-Circles.

Though the findings of this study are useful for hotel sector organizations to manage waste effectively, there are some limitations involved. Among them, the difficulty in generalizing, limited number of interviews involved and the context specificity are important. The researchers took various measures to mitigate these issues. Yet, in the future, more research is needed covering hotels of other

geographical locations, star categorizations and sizes to get a deeper understanding of waste management practices of the Sri Lankan hotel sector.

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