ADOPTION AND MAINTENANCE OF ENVIRONMENTAL MANAGEMENT SYSTEM IN THE TOURISM SECTOR

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ABSTRACT

Though at the start of the decade, environmental management was not of prime concern for the hospitality sector, however with efforts of organizations such as International Hotel and Restaurant Association and World Tourism and Travel Council and as environmental concerns are of paramount importance nowadays, the concept of going green is no longer fashionable or glamorous but it is a fact of life in the existing cutthroat competition. The launching of major environmental initiatives have been of recent nature and the purpose of this paper is to identify the need, benefits, barriers and steps required for the adoption and maintenance of Environmental Management System (EMS) and also to assess the ability of combating the degradation of the environment using the certification method. The case study of the Tourism Sector was used for the purpose of this paper as being a major consumer of energy and water and as it generates a huge amount of solid wastes and wastewater, this particular sector has many environmental repercussions. Hotel ABC which is not certified to ISO 14000, was used for exploring the adoption phase of the EMS Whilstan already ISO 14001:2004 certified Hotel XYZ was used for the maintenance part. An initial environment review was carried out at Hotel ABC to know the strengths and weakness of the hotel aiming at identifying the gaps against the requirements of ISO 14001:2004 and ultimately devising ways so as to fill the existing identified loopholes of the system. Maintenance of an EMS which is a very important phase of certification was explored at Hotel XYZ. Results conclude that environmental consciousness in the hospitality sector through the integration of an EMS is very crucial as it will lead to minimize and avoid environmental damage whilst maintaining and increasing profitability.

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INTRODUCTION

Despite the fact that, Mauritius has gained a worldwide recognition as a tourist destination of choice, the tourism industry has been in troubled waters recently. This can be proved by the decline of 7.9% in the number of tourists, be it 767,626, who visited Mauritius from January to November 2009 compared to the same period in 2008. The factors which contributed to all the difficulties faced by the tourism industry were the slowing down of the economy of several of the developed countries, specially our main tourists market, the increasing cost of air tickets due to instability in the oil world, reduction in the frequency of airlines and pandemic diseases such as swine flu. The tourism sector should have vested interest in environmental management because of the need to preserve attractive and safe surrounding which is an essential feature of its core business. Thus, any program developed for the hospitality industry should have the fundamental objective of promoting the positive impacts and mitigating the negative impacts on the social, economic and physical environment. Hereby keeping this aspect in mind, the target of the Tourism Development Plan of Mauritius is to achieve certification as a “green destination” status by 2020, to increase tourist arrivals and strengthen its foothold in the highly competitive luxury tourism market but with increased inclination towards eco-tourism.

Though there exists a number of environmental laws and regulations like Tourist Act 2004, Environmental Protection Act 2005, Beach Authority Regulations 2004, hoteliers must see voluntary certification such as ISO 14001 as a way to help in evaluating their practices in relation to established standards and in developing targets so as to meet with the growing demands of protecting the environment in this sector as well as gain market distinction with consumer recognition and increase profitability in business. Thus the tourism sector can be an excellent force for change towards sustainable development for which one of the methods is to adopt EMS- ISO 14001 which is systematic approach dealing with environmental aspects of any organization by enabling it to control the impact of its activities, products or services on the natural environment.

Adoption of EMS which is based on the Deming’s PDCA cycle aiming at continuous improvement of environmental performance will bring operational, marketing, financial, environmental and certification benefits to hotels. The major barriers and challenges faced for implementation of ISO 14001:2004 are high implementation cost, manpower constraints and lack of management commitment.

METHODOLOGY

As two aspects, that is adoption and maintenance have to be considered and analyzed here, the title was broken into two parts. For the adoption part a non ISO 14001 Hotel was selected so as to explore all the steps that a hotel must go through if it decides to opt for an EMS. The five star hotel in question will be referred to as ABC. Similarly to scrutinize the steps required to maintain an EMS within an organization an already certified ISO 14001 hotel was selected and this particular five star hotel will be referred to as Hotel XYZ. The methodology for the Initial Environmental Review (IER) was broken into three steps as follows.
Step 1: Initial environmental review (IER) was performed at Hotel ABC so as to know its strengths and weaknesses. The IER mainly involved these main steps:

- Inspection of existing environmental practices and procedures to determine the actual environmental status of the hotel.
- Identification of legal and regulatory requirements to determine level of compliance within the hotel.
- Identification of significant environmental impacts with regard to its products, services or activities that will interact with the environment and their rating which will allow the hotel to devise its environmental policy and set its goals and targets accordingly.
- Gap analysis against all the clauses of the standard to see the extent to which the requirements of ISO 14001:2004 standards are being adhered to at Hotel ABC, thus leading to identification of loopholes that must be filled so as to achieve full compliance.

Step 2: The methodology used for assessing existing environmental practices and procedures are: energy, water and waste audit and the audits were performing according to how it has been explained in the Fig. 1 below.

1. **Screening and surveying.**
   
   A walk through audit was done so as to identify places where energy and water are used, the different types of energy used and the sources of solid wastes generation.

2. **Analysis of data available.**
   
   The energy and water bills were analyzed so as to know the total monthly requirements of the hotel.
   Graphs of consumption was plotted so as to get the energy trend.
   The garbage rooms were monitored so as to get an estimation of the total amount of wastes generated and the nature of the wastes generated.

3. **Benchmarking**
   
   The values obtained for total energy, water and solid wastes during the auditing year were compared with existing values of similar hotels so as to get estimation as to where the hotel is situated based on its overall consumption.

4. **Rating**
   
   The rating of energy consumption and solid wastes generation obtained during the benchmarking step will be considered while setting targets and objectives of the hotel.

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**Fig. 1**: Methodology for assessing existing environmental practices
Step 3: Identification of significant environmental impacts at ABC Hotel was evaluated by performing an aspect analysis. The input and output of each department together with the environmental impact was used to determine the most significant impacts. It was done on a departmental wise basis so as to identify the department with the highest environmental impacts which will require immediate attention and action.

Both business criteria (e.g. difficulty and cost of changing the impacts) and environmental criteria (e.g. scale of impact, severity of impact, probability of the occurrences and duration of the impact) must be taken into consideration while determining the significance of the environmental impact. However, in this case, the business concerns were ignored and only the environmental concerns were taken into consideration while evaluating the significant impacts.

Environmental impact was evaluated by using the following equation:

\[ \text{Environmental Impact} = \text{frequency of occurrence} \times \text{severity} \]

The most significant aspects (the one with the highest scores) from the list were then used to build the objectives and targets – so as to tackle the most important environmental problems that were identified. Thus, directly leading to the creation of Environmental Management Programs (EMP) of Hotel ABC. Secondly to write the environmental policy in order to set goals for the hotel based on information generated from the IER.

Maintenance part
For the maintenance of certification, three methods of data collection were adopted at the certified Hotel XYZ and are as follows: documentation, interviews and visual inspection.

RESULTS AND DISCUSSION
Hotel ABC
Energy audit
The three main types of energy used by the Hotel are namely electricity 53%, LPG 23% and Diesel 24% as in Fig. 2. Energy is mainly used for lighting, heating, cooling, ventilation, powering appliances and waste water treatment. The trend of energy consumption varies mainly with the occupancy of the hotel and season of the year as energy usage considerations differ in hot and cold climates, with consumption being higher in summer.

Total electrical consumption of Hotel ABC was estimated to be 244 kWh/m² and in order to analyze the energy efficiency of Hotel ABC, the rating given in Table 1 below was used:

![Fig. 2: Energy Consumption at ABC](image_url)
Table 1: Benchmarking Values for energy consumption

<table>
<thead>
<tr>
<th>Benchmark values for Energy Consumption (KWh/m²) in typical Hotels: (Tropical)</th>
<th>Excellent</th>
<th>Satisfactory</th>
<th>High</th>
<th>Excessive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Luxury Serviced Hotel</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electricity</td>
<td>&lt;190</td>
<td>190-220</td>
<td>220-250</td>
<td>&gt;250</td>
</tr>
<tr>
<td>Other Energy</td>
<td>&lt;80</td>
<td>80-100</td>
<td>100-120</td>
<td>&gt;120</td>
</tr>
<tr>
<td>Total</td>
<td>&lt;270</td>
<td>270-320</td>
<td>320-370</td>
<td>&gt;370</td>
</tr>
</tbody>
</table>

More efforts need to be done so as to reduce electrical consumption as it amounts to 244 KWh/m² and it lies in the range of high electricity consumption. Provision for energy consumption reduction can be made via the environmental management programs which will be devised for the hotel. Reduction in energy consumption can be an appropriate target that the hotel can set for as energy consumption is a vital factor to be considered as energy accounts for the largest share of operating costs, after salaries of the hotel and also because of the increasing cost of energy. Energy management can make the difference between profit and loss and can establish competitive enhancements.

Water audit

The major water consumption areas in decreasing order are the hotel rooms and staff changing rooms, swimming pool, laundry, kitchen and restaurants followed by others. Over 50% of water is used in guestrooms, kitchens and laundries. The trend of water consumed varies with the number of tourists present in the hotel and also the season of the year.

Water consumption per guest = Total water consumed / Number of guests nights

Water consumption per guest of hotel ABC = 1.03

In order to analyze the water efficiency of the Hotel, the rating given in Table 2 below is use

Table 2: Benchmark values for water consumption

<table>
<thead>
<tr>
<th>Benchmark values for Energy Consumption (KWh/m²) in typical Hotels: (Tropical)</th>
<th>Excellent</th>
<th>Satisfactory</th>
<th>High</th>
<th>Excessive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Luxury Serviced Hotel</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temperate</td>
<td>&lt;0/50</td>
<td>0.50-0.56</td>
<td>0.56-0.90</td>
<td>&gt;0.90</td>
</tr>
<tr>
<td>Mediterranean</td>
<td>&lt;0.60</td>
<td>0.60-0.75</td>
<td>0.75-1.10</td>
<td>&gt;1.10</td>
</tr>
<tr>
<td>Tropical</td>
<td>&lt;0.90</td>
<td>0.90 &lt; 1.00</td>
<td>1.00-1.40</td>
<td>&gt;1.40</td>
</tr>
</tbody>
</table>

Using water efficiency benchmarks of Table 2, it can be found that as the water consumption lies between 1.0-1.40, the total water consumption of the hotel is thus high. As Mauritius is in a water stress situation and the proper usage of water counts a lot, hotel ABC has already taken several steps such as loading the dish washer to its maximum, detection of leaks in the piping system etc so as to reduce wastage of water. A little more effort in water conservation and the hotel can easily reduce its water consumption index shifting its rating from high to excellent and this effort can be rendered possible through the EMP and proposed target for the hotel. Ninety percent of the water consumed is captured and treated in the treatment plant of the hotel and used for irrigation purposes and sometimes backhouse cleaning purposes.

**Solid waste audit**

Average solid waste results for Hotel ABC is around one to two tons of different types of solid wastes (non hazardous) per day. Paper and cardboard (stationary products, packaging materials), aluminum and tin products (aluminum foil, beverage and preserved food cans and tins), plastic materials (containers, bags, packaging and disposal items), organic wastes (food wastes, garden trimmings, dried leaves.), glass materials (champagne bottles, jars, flasks) textile materials (used linen, rags, napkins). Hazardous wastes that are generated by the hotel are paints and solvents, cleaning chemicals, ink cartridges, batteries and fertilizers and chemicals (insecticides, herbicides). The lion share of wastes generated by the hotel is mainly organic in nature, followed by paper, plastics wastes and others (glass and textile). The nature of the waste itself will help to determine the final fate of the waste other than land filling.

Waste Production per guest night = 3.62

In order to analyze the waste generation index of the Hotel, the rating given in Table 3 below was used:

**Table 3 : Waste Production Benchmark values**

<table>
<thead>
<tr>
<th>Waste Production (kg per guest night)</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Luxury Fully serviced Hotels</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Excellent</td>
<td>Satisfactory</td>
<td>High</td>
</tr>
<tr>
<td>All Climate Zones</td>
<td>&lt;0.60</td>
<td>0.60-1.20</td>
<td>1.20-2.00</td>
</tr>
</tbody>
</table>


From the Table 3, it can be observed that the waste production of the Hotel lies in the excessive category as it is higher than 2.0. This point will be considered while preparing the EMP of the Hotel so as to reduce the waste generation and reduction in waste production which can be attained by setting appropriate goals and targets pertaining waste reduction.

**Aspect/Impact analysis**

As already mentioned that the aspect/impact analysis was performed on a departmental
and input output basis, the example of the kitchen department has been taken here so as to show the method used and the findings obtained.

The rating which will be used in determining the environmental impact is as given in the Table 4 below.

### Table 4: Environmental impact Factors used for aspect weightage

<table>
<thead>
<tr>
<th>Description</th>
<th>Factor</th>
<th>Description</th>
<th>Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unlikely (less than once a year)</td>
<td>1</td>
<td>Minimal environmental impact</td>
<td>1</td>
</tr>
<tr>
<td>Common (monthly/several times a year)</td>
<td>2</td>
<td>Low environmental impact</td>
<td>2</td>
</tr>
<tr>
<td>Frequent (daily/weekly)</td>
<td>3</td>
<td>Moderate environmental impact</td>
<td>3'</td>
</tr>
<tr>
<td></td>
<td></td>
<td>High Environmental impact</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Severe environmental impact</td>
<td>10</td>
</tr>
</tbody>
</table>

Environmental impact = Frequency of occurrence × Severity

From the scoring evaluation used, it could be concluded that kitchen, recreational and laundry have the greatest environment impacts followed by administration and housekeeping, thus they will demand more attention. Once the significant impacts identified, environmental objectives and targets are set and continuously monitored against existing legislations and norms.

### Setting of objectives and targets for Hotel ABC

Objectives are goals set by the hotel itself and related targets are performance goals and milestones for measurement. Examples set were as follows:
- Objective set: Reduction in the amount of water and energy used
- Target set: Reduction in the amount of energy used by 20% by the end of 2013.

The devised goals directly give rise to the Environmental Management Programme (EMP) that the hotel has to set so as to achieve its targets. Example of EMPS set for a particular department of the hotel is as shown in Table 5.
Table 5: Target setting for an environmental programme (EMP)

<table>
<thead>
<tr>
<th>Target</th>
<th>Responsibility</th>
<th>Activities</th>
</tr>
</thead>
</table>
| Reduction in the amount of energy used by 20% by the end of 2013 | Administration | - Avoid leaving computers switched on when taking breaks longer than 30 minutes as on standby, a computer consumes 95 W.  
- Switch off equipment when not in use (like for example, a copying machine on standby can consume up to 80% of the energy it uses in working mode)  
- Avoid leaving doors and windows open to minimize energy consumption for heating or air conditioning  
- Rearrangement of workplace so as to make optimal use of natural light. |

**Hotel XYZ – certified hotel**

Continuous maintenance and improvement of the EMS requires nonstop focus and vision and at Hotel XYZ this is done by carrying out internal audits on a regular basis together with the Annual ISO 14001 Surveillance Audits to ensure that the system is functioning appropriately. Some ways used by Hotel XYZ, which were found out during the interviews conducted, to maintain its EMS apart from audits were

- To track of all new legislations proposed are or announced are kept so as to identify those concerning hotels.
- To train new recruits, detailed training feedback are accessed seriously
- Complaints were addressed within a reasonable time frame without delaying too much and it is ensured that communication has reached all levels and all departments of the hotel.

- Emergency procedures are amended based on test findings and reports carried out.
- Repeated non-conformances are discussed in meetings so as to find probable solutions to counteract them.

**CONCLUSION**

The survival of the tourism industry is highly dependent on the physical environment and hence hotels must be at the fore-front of actions directed towards the protection and preservation of environment so as to ensure its survival. The aspects of adopting EMS-ISO 14001 were analyzed in detail in this project and it can be concluded that if Hotel ABC wants to remain profitable and competitive, one of the most efficient way is through the integration of environmental management into the daily practices of the hotel. Gaps identified during the IER must be filled by resources allocated by the hotel so
as to meet with all the clauses of ISO 14000:2004 standard before going for third party registration. The efficient running of the EMS of Hotel XYZ has proved the theory of the myth of environmental management being nothing but paperwork to be wrong. Its efficient EMS is due to the ongoing maintenance of the system and constant checking of the environmental performance of the hotel on a continual basis as attaining certification is not the last phase.

**RECOMMENDATIONS**

**Hotel ABC**

The first thing that hotel ABC can do is concentrate on the formation of a selected environment team by providing appropriate training and education so as to enhance their knowledge and capabilities. The team formed will then have the responsibility to provide in house training to all staff dealing with environmental issues, new recruits and to instill awareness to personnel of each level on their roles and responsibilities in attaining the set environmental goals, EMPs and to assure stability of the EMS. The EMS documentation of the Hotel must include a description of the main elements of the EMS and their interaction, records required by ISO 14000 standards, description of the scope of the EMS, environmental policy, targets and objectives and documents, including records, determined by the hotel itself.

The emergency program of the hotel can be prepared with the help of the health and safety unit of the hotel. ISO 14001 requires establishment and maintenance of procedures for identify potential and response plans to accidents and emergency situations, and for preventing and mitigating the environmental impacts that may be related with them and also requires that the emergency procedures must be tested frequently, reviewed and revised periodically.

The effective emergency preparedness and response program of the hotel must assess the potential for the occurrence of accidents and emergencies, prevent the occurrence of incidents and their associated environmental impacts. The hotel must have plans/procedures for responding to incidents (e.g.: emergency service numbers, how to contact them). It must carry periodic testing of emergency plans/procedures (e.g. fire drills) and find solutions to mitigate impacts associated with these incidents

All equipment used for measuring must be calibrated periodically. Parameters that can be monitored by the hotel are: Water effluent (COD, BOD, PH, TSS…) and Consumption of power, water, fuels and chemicals.

Records which are data stored of all phases of the EMS of the hotel must be legible, identifiable, traceable, properly stored, retrievable, and protected against damage. ABC hotel must establish procedures so as to identify environmental records (e.g. numbering, traceability of activities, products and services), for disposition of environmental records (e.g. legibility, retention time, storage) and for maintenance of environmental records (e.g. how records are kept up to date and whose responsibility is it).

The hotel should have trained internal auditors (if possible with environmental background) to undertake EMS audits. The EMS auditor will have to verify and access various analytical, environmental inspection
and test operations conducted at the hotel. During the struggling phase of the EMS, auditors must audit the system almost every month (pre-registration audit) until registration has been obtained, and then audits can be performed twice per year. Auditing methodology must be selected by the auditors and they will also determine how the audit findings will be classified, communicated and addressed within the EMS. Audit instruments that can be used by the internal auditors would be examination of documents, interviewing staff and physical site verification.

**Hotel XYZ**

Hotel XYZ must continue to maintain and improve its EMS in such a way that it remains an active tool, resulting in environmental improvement and supporting in its general development as it is very simple to find cost neutral environmental improvements initially but it gets more and more difficult with time. As ISO 14001 is based on the continual improvement of environmental performance, the next step that the hotel can take in the direction of enhancing its “green” image is composting as an alternative to organic waste dumping. Backyard composting of its organic degradable wastes (yard wastes and kitchen wastes-partly) can be an additional source of revenue for the hotel as it will help to reduce cost of fertilizers used by the gardening department, reduce load on our already saturated landfill and help the hotel in its environmental sustainability quest.

**REFERENCES**


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