



Establishing attributes of an environmental management system for green hotel evaluation



Teng-Yuan Hsiao^a, Chung-Ming Chuang^{b,*}, Nae-Wen Kuo^c, Sally Ming-Fong Yu^d

^a National Kaohsiung University of Hospitality and Tourism, Department of Leisure and Recreation Management, Taiwan, ROC

^b National Kaohsiung University of Hospitality and Tourism, The Graduate Institute of Travel & Tourism Management, Taiwan, ROC

^c National Taiwan Normal University, Department of Geography, Taiwan, ROC

^d National Kaohsiung University of Hospitality and Tourism, Department of Hotel Management, Taiwan, ROC

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ABSTRACT

This study establishes attributes of an environmental management system (EMS) for the hotel industry in Taiwan to create an instrument to help address green hotel auditing. Hotel EMS indicators were initially selected from ISO14000 and nine representative foreign green hotel assessment systems. The Delphi method conducted on twenty five experts with government officials, scholars and hotel managers for item modification to identify the preliminary EMS evaluation framework. An indicator selection process was employed to determine the dimensional indicators of the system. The data analysis reveals that a total of 64 indicators into ten dimensions were identified and prioritized in terms of their relative importance and feasibility. Moreover, 38 indicators are suitable for use and 18 of them should be implemented firstly in Taiwan hotel industry. The results also reveal the comparison with Taiwan government's environmental standards. Finally the EMS approach of this study provides managerial implications for government, hoteliers and consumers to improve their environmental management.

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1. Introduction

Environmental factors have gained major importance in the tourism industry (Erdogan and Baris, 2007). Environmental or sustainability policies were left to managers to resolve, and they must carry out those policies (Bohdanowicz et al., 2005). This creates significant pressure on resource and means that environmental friendliness is central to the notion of sustainable tourism. A focus on environmental factors in the tourism sector has given rise to green hotels. Environmental friendliness is critical to hotels if they are to sustain increases in tourism (Webster, 2000; Kasim, 2007). Studies suggest that the sustainable management and development of the hotel industry requires effective energy and environmental management policies (Erdogan and Baris, 2007). In Taiwan the Government's intends to double the number of tourists in a 6-year plan from 2008. An increase in hotel numbers means these, already large consumers of water and energy, are destined to make the

tourism sector even less environmental friendly. Architecture and Building Research Institute, Ministry of the Interior in 2000 report argues that average hotel energy consumption is 152.34 kWh/m³ y in Taichung area, which is higher than the regulation standard value 130 kWh/m³ y. Environmental management is therefore an issue that is ripe for attention in the Taiwan hotel industry.

Taiwan's Water Resources Agency indicates that individuals' home consumption is 300 liters per day. Since individuals' consumption is 902 liters per day, by contrast, in the hotel industry this suggests significant opportunities for savings (2001). An expanding tourism sector associates with an increase in hotel construction and a significant rise water consumption (Alexander and Kennedy, 2002; Erdogan and Baris, 2007; Tortella and Tirado, 2011). Hotel managers, therefore need to make water conservation measures integral to their plans. Electric consumption is also very significant; particularly in tourist hotels that account for 70.8% of all energy usage in the hotel sector (Hsiao et al., 2002). The CTCI Foundation,¹ a center dedicated to developing energy saving techniques, finds that the electric expenses of only 84 tourist hotels account for .32% of the total electric expenses in Taiwan (2003). By being more efficient in their use of electricity managers can readily contribute to savings that drive profitability. Lin et al. (2008) indicate that hotels

* Corresponding author at: National Kaohsiung University of Hospitality and Tourism, The Graduate Institute of Travel & Tourism Management, 81271 No.1, Songhe Rd., Xiaogang Dist., Kaohsiung City, Taiwan, ROC. Tel.: +886 953527586; fax: +886 7 8053249.

E-mail addresses: tyhsiao@mail.nkuht.edu.tw (T.-Y. Hsiao), cjoming@hotmail.com (C.-M. Chuang), niven@ntnu.edu.tw (N.-W. Kuo), sallyyu@mail.nkuht.edu.tw (S.M.-F. Yu).

¹ Formally known as China Technical Consultants, Inc. (<http://www.ctci.org.tw/ct.asp?xItem=2434&CtNode=526>).

can benefit by saving water and electricity. Their report suggests green hotels have the potential to reduce water consumption by 32 percent. The statistics, above, show that water and electric consumption in Taiwan's hotel industry are serious and means a focus on hotel environmental management is a critical issue.

Many tourists prefer destinations that practice environmental protection (Alexander and Kennedy, 2002; Lee et al., 2010). This preference translates into tourists' purchasing and booking lodgings at locations that practice environmental protection and support related local charities are practiced (Kang et al., 2012; Miller and Baloglu, 2011; Penny, 2007). This is driven by a rise in consumers' environmental awareness. Studies in Taiwan find a high public acceptance for the measures hotels take to protect the environment (Kung et al., 2001). Managers, too, are broadly supportive of implementing measures to be green, or environmentally considerate, in their hotels (Shen and Wan, 2001).

The trend in the hotel industry is to identify negative environmental impacts and to mitigate these effects by saving resources (Bohdanowicz et al., 2005; Zhang et al., 2012). Environmental management systems (EMS) are important to evaluate hotels' practices regarding environmental protection. The idea of an evaluation system for assessing green hotels is to protect the environment by minimizing the negative impact of resource consumption (Chan and Lam, 2001; Chan, 2011; Dief and Font, 2012). Hotel managers would like to target their plans and activities by implementing an EMS that meets the Government's green hotel regulatory standards (Butler, 2008). Currently, they however lack clarity about the components and operation of such a system (Kung and Lee, 2002). Moreover, choosing green hotel is not only an irreversible trend but is also perhaps an excellent way of balancing between consumption and environmental protection. In light of this, to establish a complete environmental evaluation system is a pressing matter for the hotel industry.

Accordingly, the purpose of this study is twofold. First, to propose hotel specific environmental performance standards. While some international standards are available to assess a firm's environmental performance, such as ISO 14000 and 14001, these are general formulations and so lack specificity to an industry sector, such as tourism. Second, to evaluate the appropriateness and benefits of the Taiwanese government's Regulatory Standards for Accrediting Green Hotels (RSAGH). While these standards were issued in November 2008, it was not until August 2011 that the third green hotel was built. There must be some drawbacks on applicability in this government system. In addition, while many hotels are willing to apply for RSAGH green hotel accreditation they could be deterred by the high cost of the equipment required. Installing green technology typically needs cost a lot. Studies show that one of greatest barriers to hoteliers in promoting green establishments is that environmental measures are prohibitively expensive (Bohdanowicz et al., 2005). It is important to understand the impact of standards on investments so as not to hinder the rate of green hotels' development.

Few studies consider how both hotels' physical facilities and their systems impact on the environment. In this study, ISO14000 is referred as a base from which to construct EMS indicators that are specific to the hotel sector. The study indicators are refined in consultation with 25 scholars and industry experts before determining priority for their implementation through the analysis of their importance and feasibility. So far there is a lack of systematic and scientific evaluation of RSAGH (2008 & revised in 2012). This study helps create a standard EMS for the hotel industry in Taiwan, so that hoteliers to become more efficient in implementing environmental management. Customers also can therefore be educated to have correct green concept, which is helpful to avoid the conflict with hotels toward the requirement of environmental management. The study does this by providing the government

with the means to audit the implementation of environmental protection policies at all levels of hotels' operations. And has four objectives:

- To understand the application of EMS in the hotel industry.
- To construct EMS framework indicators for green hotels.
- To identify which EMS framework indicators are suitable for use in the hotel industry in Taiwan.
- To compare with Taiwan government's 2008 RSAGH, providing managerial implications for future green hotel development.

2. ISO14000 environmental management standards (EMS)

Resource management guidelines have emerged as the means to combat the over consumption of energy and environmental degradation during the planning and execution of projects. The notion of EMS sets out to combine environmental awareness with sustainable industry development (Mori and Welch, 2008). The U.S. Environmental Protection Agency (2013) defines environmental auditing as, "a systematic, documented, periodic, and objective review of facility operations and practices related to meeting environmental requirements". EMS covers an organization in terms of its' internal division of responsibilities, policies, implementation, processes and resources. It is intended to protect the environment and to cope with the endless stream of environmental protests (Salmi, 2008). The idea of voluntary environmental auditing is at the center of the whole EMS concept, that intends to identify environmental issues and to measure the implementation status of EMS.

ISO14000, part of the European family of environmental management standards, was formulated to audit environmental protection and pollution prevention in a way that accounts for sustainable economic growth (Tseng, 1999). The implementation of ISO14000, a pollution control system, in a firm focuses on increasing the environmental awareness of its employees rather than on specifying the nature of equipment and facilities. For example, for product packaging, companies should pay attention to environmental issues in all aspects of their business from raw materials, product packaging design, production line processes, product sales, consumers' safety and post-consumption waste disposal. This voluntary approach differs from the current approach to environmental protection that relies on government regulation to carry out business management. Overall, ISO14000 exists to help organizations: first, minimize the negative affect of their operations on the environment (i.e. cause adverse changes to air, water, or land); second, comply with applicable laws, regulations and other environmentally oriented requirements and third, continuously improve their green management strategies.

3. The development of environmental auditing in the tourism industry

Holden (2000) states environmental auditing and EMS in the tourism industry should account for the impact of environmental management on the natural environment. In the tourism industry EMS is currently largely limited to environmental auditing. Environmental auditing evaluates environmental performance to identify any negative conflicts between the organization and its environment and to reveal opportunities for improvement (Goodall, 1995). Goodall (1995) argues that the benefits of environmental auditing to the tourism industry include: (1) cost savings by increasing resource efficiencies and reducing waste; (2) avoiding exposure to legal liabilities than can occur with increasing law cost by not identify environmental issues; (3) establishing a strong benchmark in environmental achievement; (4) positively

promoting the company image; (5) distinguishing market advantage (highlight the brand image); and (6) gaining the trust of investors by responding to customers' needs and attracting high-quality staff.

Different environmental audits used in the tourism industry need to respond to variations in individual sightseeing needs, policies and culture. And also need to consider the business impact on environment. For the tourism industry it is important to consider such as air emissions, land and water resources and legal constraints that affect the ecological diversity. Current audits, mostly voluntary, may become enforceable by law in the future (Goodall, 1995). Hospitality, central to tourism, has a high environmental impact and so should be considered as a first step to auditing this sector.

4. Green hotel environmental auditing systems

Green hotels devote themselves to save energy and water and decrease solid waste, in order to minimize the impact on environment (Ayala, 1995; Ecomall, 2000; Green Hotels Association, 2002). With the green concept, green hotels provide consumers green production and service by using eco-friendly facilities (Tourism Council Australia Jointly with Commonwealth of Australia, 1998). In addition, green hotels based on safety and health actively advocate green management and consumption, ecology protection, and resource conservation (The State Economic and Trade Commission, 2003). Green hotels are, therefore, emphasize energy conservation, environmental protection and sustainable management by practicing recycling, reusing and resource saving. This study defines a green hotel as one that is successfully, "providing tourists with a comfortable, natural, healthy and safe lodging service infrastructure on the basis of environmental protection, focusing on sustainable development and minimizing the negative impact on the environment."

There are various evaluation criteria for green hotels. To establish the evaluation system, the study critically selected the dimensions based on some organizations that use green hotel assessment systems. First of all, the Green Hotels Association (2002) divides green hotels into five main levels; signified through the use of leaf icons where the number of leaves to represent the score criteria. The State Economic and Trade Commission (2003) classifies green hotels into five grades (i.e., from A to AAAAA) and uses ginkgo leaves to represent the result. In addition, the organizations included are the Caribbean Hotel Association (1997), GrecoTels (1992), Coalition for Environmental Responsible Economies (CERES) (2001), South Pacific Tourism Organization (SPTO) (1996) and the State Economic Commission (2003). Those organizations cited have in common that are aware of the fact that tourism has an impact on the society and environmental protection, and mainly undertake hotel and tourism environmental cooperation programs and activities. They were committed to promote the effective management of natural resource and to achieve sustainable tourism. Basic guidelines are provided to help guide hotel companies draw up and implement green plans and measures. The organizations also provide advice and information to the tourism industry, generally and hotels, specifically on how to develop environmental awareness and management.

This study also cited dimensions from some programs. For instance, the National Wildlife Federation, the International Hotels Environment Initiative and the United Kingdom's Biffa Waste Disposal Company jointly established the www.benchmarkhotel.com website in 2001. This award recognizes the design of green hotel management tools; particularly in effective use of energy. Global Stewards (2002), though not an organization, encourages individuals increase their environmental awareness by following their

environmental management guidelines to conduct system assessments.

Many organizations in the world promote EMS implementation processes to support effective management of green hotels. These implementation guidelines specify a range of issues including water conservation, solid waste disposal and staff training of customers and community communication. For example, Scandic Swedish Hotels have proactively invested in their environmental management over the last decade (Bohdanowicz et al., 2005). They developed environmental training program which including four components (i.e., environmental guide, environmental meetings, environmental program and environmental barometer). These components provide insight into environmental policy making, employees' training, implementation planning, and efficiency auditing, to hotel suppliers in environmental appropriate approaches. To date, hotels that follow their own their environmental construction standards and measures produce very encouraging environmental performance (Bohdanowicz et al., 2005). It is consistent with Ann et al.'s (2006) finding: EMS standard (e.g., ISO 14001) has a strong impact on both economic and environmental aspects and perceives customer satisfaction. Assessed this way, many hotels have an excellent performance in implementing their own EMS standards (Chan and Lam, 2001; Chan, 2011; Dief and Font, 2012).

In Taiwan the government formulated a set of environmental management audit system guidelines specifically for hotels (i.e., RSAGH, 2008 & 2012). The approach is broadly consistent with standards found in other countries and seeks to use EMS to regulate the use of resources by the industry. The guidelines can be used by the industry for self-assessment environmental auditing. Some hoteliers, following the release of RASGH, started to take environmental protection measures to meet the Governments' requirements. But the environmental benefits of this auditing system have yet to be assessed due to the blurred measure effect. Therefore, it is unclear if the environmental audit system, established for hotels in Taiwan, still requires modifications. To help evaluate the appropriateness of the RSAGH standard the study formulates an EMS framework to assess green hotel environmental performance. Further, the study compares it with the implemented RSAGH, and the findings lead to recommendations to the Government in Taiwan about future assessment of green hotels.

5. Green hotels in Taiwan

The Government in Taiwan has been paying increasing attention to issues related to environmental protection and green hotels, particularly after the two-day weekend policy implemented. This has led a search for guidelines on environmentally friendly practices for the hotel industry. Hoteliers are encouraged to develop green products given market demand. This reflects the fact that consumers' need to have green hospitality products to choose from if they are to cultivate environmentally appropriate consumption habits. The Hotel Association of Canada's rates hotels based on their environmental performance by assigning numbers of green leaves to hotels (i.e., Green Leaf Eco-Rating Program). The European Union (EU) certifies hotels primarily based on their energy-saving performance. The Government in Taiwan intends to formulate standards for green hotels to avoid subjective performance evaluations. The Government started rating hotels' environmental performance in 2008 (by Hotel Green Mark) and the factors they considered included: energy conservation, water saving, sewage discharge control, methods of waste disposal, use of disposable toiletries and extent of green product procurement. Those hotels who take the initiative to apply for certification and pass are awarded the Government's Green Hotel status.

Although green concept in Taiwan's hotel industry is still nascent, many hotels in Taiwan have, of their own accord, been implementing energy saving measures. These measures include strategies to save water and electricity, reduction and recycling of waste and avoiding consumables such as disposable toothbrushes, toothpaste and tableware. These measures align with the availability of green travel packages and implementation of various carbon reduction measures (e.g., installing energy consumption monitoring system to strengthen energy management in rush hour) in the industry as a whole. This shows that the hotel industry has gradually been able to accept and cope with environmental requirements set by the Government while also developing their own approaches to contribute to environmental protection, and willing to use a variety of environmental assessment methods (Teng et al., 2012).

Hotel management strategies need to take into account internal and external environments as a whole while coordinating with relevant government agency programs (Lam et al., 2011). To construct an EMS that fits green hotels in Taiwan, this study analyzes internationally known green hotel assessment systems (e.g., ISO14000). Ten dimensions initially proposed are environmental policy, water management, energy management, waste management, indoor environment, green procurement, corporate governance, staff training, public and community relations, and consumer education.

6. Methodology

This study employed the Delphi method to construct EMS indicators for Taiwan green hotel evaluation, because it has been shown to be useful for information gathering and model building. This aligns with the purposes of this study. The Delphi method has been used extensively in a number of different forms in tourism contexts.

It works to facilitate group input for ideas and problem-solving (Green et al., 1990), such as identifying the environmental impacts of tourism and developing sustainable tourism indicators (Miller, 2001).

The Delphi method is a systematic interactive forecasting method for obtaining forecasts from a panel of independent experts (Rowe and Wright, 2001). Participants are encouraged to revise their prior answers in light of the replies of other anonymous members of the group, with answering questionnaires in two or more rounds. During the revised-process, the answers will gradually coalesce toward a consensus of opinion and the group will converge toward the "correct" answer. Thus the Delphi method is a structured process which sets out to obtain 'the most reliable consensus of opinion of a group of experts by a series of intensive questionnaire interspersed with the controlled opinion feedback' (Helmer, 1983: 135). This method is particularly suitable to develop factors to be included in a new system such as environmental management system (Miller, 2001).

6.1. Panel composition

To draw on experts' knowledge about that the needs of Taiwan hotel industry now and into the future of green hotel implementation, experts were defined as those with both "green" and "hotel" management expertise. Following Lee and King's (2009) suggestion, three panel groupings and 25 experts were constructed to increase the validity in acknowledgment of the need for both applied and theoretical inputs and expertise. The respondents profile is as follows: green hotel promotions officials from the Environmental Protection Administration (5), scholars in the field of green hospitality (5 in hotel management 5 in environmental management and 4 in architecture) and hotel managers (6). The questionnaires were sent three times to each respondent. In the

first round we distributed 25 questionnaires and received 20 in return for a response rate of 80%. In the second round all of 20 questionnaires we distributed were returned. In the third round we had a 95% return rate (i.e., 19 of the 20 questionnaires returned).

6.2. Questionnaire design

6.2.1. Selection of indicators

The indicators of hotel EMS were selected from ISO14000 and nine representative foreign green hotel assessment systems. For the purposes of this study, those systems were of: the Green Hotels Association, The State Economic and Trade Commission, Caribbean Hotel Association, GrecoTels, Coalition for Environmental Responsible Economies (CERES), South Pacific Tourism Organization (SPTO), The State Economic Commission, Global Stewards and the Benchmarkhotel.com website. These systems commonly undertake hotel and tourism environmental cooperation programs and activities. They were committed to promote the effective management of natural resource and to achieve sustainable tourism. In the selection of indicators, the researchers broadly considered the impact on the environment of both internal management (services, operations, personnel, administration, marketing, and finance) and to the external environment (economics, technology, social trends, ecological environment, customers, competitors, and suppliers). In addition, the primary management issues of hotels (Webster, 2000) were also given while auditing the environment. Overall, the study chose specific indicators from these different systems based on their nature, feasibility, operability and systematization as principles of indicator selection. The result initially arrived at 67 indicators in 10 dimensions, as listed in Table 1.

6.2.2. Questionnaire procedure

The design of the first expert questionnaire was in two parts. The first part invited experts to offer any revisions they felt necessary to the initial list of indicators (see Table 1) of EMS. According to their comments, the researchers then decided if the initial indicators need to revise or not. The second part requested experts to analyzing the importance and feasibility of using each indicator for hotels in Taiwan. Experts were invited to prioritize hotels' attention to the EMS indicators. Experts were asked, particularly, to consider how the industry was likely to develop in the future. The purpose of such an open questionnaire was mainly to imply the future development of hotel EMS in Taiwan. Through that, the expert consensus was obtained on indicators.

6.3. Data analysis

Each indicator was assessed on both its importance and feasibility of implementation on a five point Likert-type scale with anchors that ranged from 1 (not very important) to 5 (very important). Statistically, most studies use mean value and standard deviation to revise the results of Delphi method (Scheibe et al., 1975). Mean value can clearly reflect the expert views on each indicator. Standard deviation score means the divergent degree between expert opinions. After the first-round questionnaire was returned, the researchers appropriately revised the indicator content based on the expert opinions. Subsequently the researchers calculated the mean score and standard deviation for each indicator in terms of their importance and feasibility. The second round questionnaire included the first-round mean value for the experts' reference. If an indicator's first round standard deviation score was particularly large then this showed experts had very divergent views. To converge the still divergent views, the researchers conducted the same process after the second-round questionnaire was returned.

Table 1
Dimensional indicators initially selected from ISO 14000 and nine representative green hotel assessment systems.

Dimensions	67 indicators
1. Environmental policy	<ul style="list-style-type: none"> * 1.1 Publicly declare the hotel's specific environmental policy * 1.2 Widely promote the hotel's environmental policy to all employees, customers, and suppliers * 1.3 Environmental policy possesses clear goals (short, medium, and long terms)
2. Water resource	<ul style="list-style-type: none"> 2.1 Install low-flow showerheads and faucet Use water-saving toilet 2.3 Install water consumption monitoring system to record the tracking * 2.4 In areas where water usage is higher, install metering equipments to track and management * 2.5 Install leak detection system, and provide for quick leak repair
3. Energy	<ul style="list-style-type: none"> * 3.1 Install energy consumption monitoring system to track * 3.2 In areas where power usage is higher, install metering equipment to track and manage * 3.3 Install energy management system in carrying capacity of electricity (e.g., lighting and air conditioning) of departments 3.4 For intermittently used areas (e.g., lighting equipment), use timers or sensors * 3.5 Try to use natural lighting
4. Solid wastes	<ul style="list-style-type: none"> * 4.1 Avoid using disposable items (e.g., disposable tableware. . .) * 4.2 Minimize food wasting through appropriate distribution, storage, and management systems * 4.3 Convert kitchen or organic wastes into compost Use refillable containers such as shower bottles
5. Indoor environment (health and safety)	<ul style="list-style-type: none"> * 5.1 Install air filter cleaning equipment in air conditioning system * 5.2 Use low-vitality organic materials on building and decoration * 5.3 Avoid using toxic and dangerous chemicals Various places inside the hotel (lobby, rooms, corridors, etc.) have moderate lighting
6. Green purchasing	<ul style="list-style-type: none"> * 6.1 Procure durable goods that can be reused and recycled * 6.2 Avoid purchasing overly packaged products 6.3 Only work with suppliers who have a clearly declared environmental policy
7. Corporate management	<ul style="list-style-type: none"> * 7.1 Environmental policy can be successfully implemented under corporate management systems * 7.2 Appoint professional environmental managers, and regularly check progress and record system implementation * 7.3 All employees are aware of the appointed objectives and are assigned environmental responsibilities 7.4 Under the principle of introducing minimum impact to the environment, reduce operating costs
8. Staff education	<ul style="list-style-type: none"> * 8.1 Provide training courses and environmental education workshop * 8.2 Employees fully understand the extent of corporate environmental policy * 8.3 Employees develop habits for effective use of resources (e.g., turning off the lights, exhaust fans, and air conditioning when vacating areas)
9. Public and community relationship	<ul style="list-style-type: none"> * 9.1 Promote the green hotel concept * 9.2 Actively involved in green and environmental protection-related activities
10. Consumer education	<ul style="list-style-type: none"> 10.1 Provide green messages in public areas, rooms, and websites * 10.2 Provide signs to remind customers whenever to save resources

Two of final 64 indicators that are not included in the initial (first-round) questionnaire: Products and services provided by the hotels are consistent with the concept of green consumption; and Encourage employees to adopt a green lifestyle (turning off lights, water conservation, and waste separation).

* (36) Indicators that are suitable for green hotels in Taiwan.

** (7) Indicators that are not appeared in a final total of 64 indicators.

The second- and third-round questionnaire achieved convergence as assessed by the stability of the final ratings (Scheibe et al., 1975). This study followed Scheibe et al.'s (1975) approach to compare with prior-round questionnaire if the changing percentage of indicator importance scores is less than 15%. If yes, it means

that expert views achieve convergence. Finally, the principle of selecting indicators is that had a strong central tendency to construction of the presented hotel EMS. The mean value of an indicator's importance had to be above the total mean value and the number of experts who selected the item had to be above 50%

(Scheibe et al., 1975). The result represents the consistent opinions for the criteria of establishing an EMS model for Taiwanese green hotels.

7. Results and discussion

7.1. Analysis of questionnaire results

The expert comments from a three-round Delphi questionnaire were used to revise the indicators initially selected. The principle of indicator revision was easy to understand and flexible to operate for users. In the initial questionnaire there were ten dimensions for a total of 67 items. An additional two indicators emerged from the first round of expert interviews. The researchers progress to the second round of questionnaire with 10 dimensions and 69 indicators.

After the second round we revised eight items. To establish the extent of answer convergence, the researchers ran a stability test on prior two-round indicator importance scores. The results showed that 23 (more than 15% on change) out of the 69 items did not meet recommend levels of stability. The researchers, thus, proceeded to a third-round questionnaire. The stability-test results, after the third round, show that more than 90% of the items reached stability (less than 15% on change). Five items that did not reach stability were deleted and left with a final total of 64 indicators.

7.2. The framework indicators of EMS in green hotel

The results show that ten dimensions and 64 indicators are appropriate to assess green hotel EMS framework. Since all these items have mean values above 4.6 this demonstrates that various experts believe they are either important or very important. The average standard deviation across the indicators is 0.46. This demonstrates a strong convergence in the experts' opinions about the importance of these indicators (see Table 2). The top five indicators with the highest level of importance are: "avoid using toxic and dangerous chemicals (5.0)", "employees develop habits for effective use of resources (5.0)", "environmental policy can be successfully implemented under corporate management systems (4.9)", "provide training courses (4.9)" and "promote the green hotel concept (4.9)". The five least importance indicators were: "provide customers the choice not to change towels daily (3.8)", "provide customers the choice not to change bed linens daily (3.8)", "customer satisfaction with hotels' implementation of environmental policies is more than 80% (3.9)", "purchase local goods (e.g., food and materials) (4.1)" and "encourage employees to use public transportation (4.1)". Due to serious pollution problems, experts unanimously agree that avoiding the use of toxic chemicals and developing employee's saving habits are particularly important objectives of enterprises to carry out environmental management. Experts, furthermore agreed, some indicators were important even if these were to the detriment of customers' comfort.

For the feasibility of green hotel EMS framework indicators the mean value was above 4.1. This reveals the experts assess the implementation of these factors to range from ordinary to easy. Experts, though, have diverse opinions about feasibility of implementation (average standard deviation is 0.67). The top five most feasible indicators are: "establish two-side photocopy systems in the office, and reuse scraps, envelopes, and papers (4.9)"; "use electronic versions to transfer and save data in order to decrease paper consumption and waste (4.8)", "places inside the hotel (lobby, rooms, corridors, etc.) have moderate lighting (4.7)", "install low-flow showerheads and faucets (4.6)" and "use water-saving toilet (4.6)". The first two indicators follow the principle of re-use, recycle and reduce. For saving papers used in daily life, experts generally

believe that implementing environmentally sound approaches to managing solid wastes is relatively easy. Particularly, making office green was thought to be easy to achieve. Moreover, solid wastes are obvious so that the waste classification and re-use are very important. The five least feasible indicators for implementation are: "actively adopt new energy-saving technologies (e.g., solar heating devices or wind power, etc.) (2.9)", "hotel has already established action plan for potential environmental problems (3.0)", "customer satisfaction with hotels' implementation of environmental policies is more than 80% (3.0)", "guest rooms set up with independent air-conditioning systems to reduce the chances of pathogens spreading (3.4)" and "install energy consumption monitoring system (3.4)". Hotels in Taiwan are constrained by climate and terrain. If they want to take advantage of solar and wind power to achieve energy saving then government policies, energy-saving technologies and even their environmental conditions are important and need to be revised (Hsiao et al., 2002).

Each indicator's mean value shows that although some are very important feasibility of their implementation is low, and vice versa. The researchers classify the indicators into four groups based on importance and feasibility of implementation: low importance and high implementation; high importance and high implementation; low importance and low implementation; and high importance and low implementation. The top 18 indicators in terms of high importance and high implementation are shown in Table 2.

7.3. EMS evaluation indicators suitable for Taiwanese hotels

Through the Delphi method the researchers find 10 dimensions and 38 indicators (mean values above 4.6) to assess green hotel EMS for use in Taiwan. As Table 3 shows, 4 indicators are selected in each of four dimensions: environmental policy, water resource, indoor environment, and staff education; 5 indicators are selected in each of three dimensions: energy, solid wastes, and corporate management; 2 indicators are selected in each of two dimensions: green purchasing and consumer education; 3 indicators are selected in public and community relationship. Notably, 18 indicators classify as highly important and highly feasible. These are the first priority for hotel managers to implement. A further 20 indicators relate to highly import but low feasibility aspects that managers can target in a second phase of environmentally oriented improvements wave of implementation in hotel (see Table 2).

Table 4 shows the mean values of importance and feasibility of environmental management. Experts agree that the importance of the indicators range from important ($\bar{x} = 4.4$; $sd = 0.33$) to very important ($\bar{x} = 4.7$; $sd = 0.60$). Feasibility results that range from ordinary ($\bar{x} = 3.7$; $sd = 0.63$) to easy ($\bar{x} = 3.9$; $sd = 0.74$) are dimensions of environmental policy, energy, and corporate management. Dimensions considered highly feasible to implement are water resource, indoor environment, green purchasing, staff education, public and community relationship, and staff education ($\bar{x} = 4.0$ – 4.2 ; $sd = 0.55$ – 0.73). Only solid wastes is considered very easy to implement ($\bar{x} = 4.4$; $sd = 0.60$).

7.4. Comparison with the Government's hotel assessment standards

Table 5 compares the findings and the dimensions used in the Governments (2008) Regulatory Standards for Accrediting Green Hotels. The Government standard includes items on hazardous substance management that we did not find in this study. Moreover, the Government standards on corporate environmental management broadly include environmental policy, indoor environment, corporate management and staff education dimensions. Consumer education dimension in this study shares some similarities to specification of waste sorting and recycling in the Government's

Table 2
Importance and feasibility of 64-indicator content distribution status.

<i>High achievability</i>	<i>Implementation priority</i>
<ol style="list-style-type: none"> 1. Install low-flow showerheads and faucet 2. Use water-saving toilet 3. Install water consumption monitoring system to record the tracking 4. Provide customers the choice not to change towels daily 5. Provide customers the choice not to change bed linens daily 6. For intermittently used areas (e.g., lighting equipment), use timers or sensors 7. Check at any time to make sure that all the freezers and windows are closed tightly 8. Use refillable containers such as shower bottles 9. Places inside the hotel (lobby, rooms, corridors, etc.) have moderate lighting 10. Donate surplus materials to local non-profit organizations 11. Provide green messages in public areas, rooms, and websites 12. Provide customers with public transportation information (MRT, bus, shuttle, etc.) 	<ol style="list-style-type: none"> 1. Publicly declare the hotel's specific environmental policy 2. Widely promote the hotel's environmental policy to all employees, customers, and suppliers 3. In areas where water usage is higher, install metering equipments to track and manage 4. Use electrical equipment that meets power-saving standards 5. Regularly maintain and clean ventilation, air conditioning, heating, and ice making equipments 6. Avoid using disposable items (such as disposable tableware. . .) 7. Minimize food wasting through appropriate distribution, storage, and management systems 8. Establish two-side photocopy systems in the office, and reuse scraps, envelopes, and paper 9. Use electronic versions to transfer and save data in order to decrease paper consumption and waste 10. Install air filter cleaning equipment in air conditioning system 11. Avoid using toxic and dangerous chemicals 12. Procure durable goods that can be reused and recycled 13. Avoid purchasing overly packaged products 14. Company has related insurance (accidental insurance, environmental damage insurance) 15. Provide training courses 16. Provide environmental education workshops 17. Promote the green hotel concept 18. Provide signs to remind customers whenever to save resources
<ol style="list-style-type: none"> 1. Hotel has already established action plan for potential environmental problems 2. Install water recycling system (e.g., reclaimed water or rain water collection and reuse) 3. Use natural ventilation as much as possible 4. Actively adopt new energy-saving technologies (e.g., solar heating devices or wind power, etc.). 5. Should regularly monitor noise levels generated by air-conditioning, bathroom, water supply, and drainage 6. Guest rooms set up with independent air-conditioning systems to reduce the chances of pathogens spreading 7. Only work with suppliers who have a clearly declared environmental policy 8. Purchase local goods (e.g., food and materials) 9. Use minimum amounts of chemicals (e.g., cleaning agents, disinfectants, etc.) 10. Under the principle of introducing minimum impact to the environment, reduce operating costs 11. Products and services provided by the hotels are consistent with the concept of green consumption 12. Customer satisfaction with hotels' implementation of environmental policies is more than 80% 13. Encourage employees to use public transportation 14. Encourage employees to adopt a green lifestyle (turning off lights, water conservation, and waste separation) 	<ol style="list-style-type: none"> 1. Environmental policy possesses clear goals (short, medium, and long terms) 2. Environmental policy meets current environmental regulations (wastewater discharge, etc.) 3. Install leak detection system, and provide for quick leak repair 4. Install sewage disposal system 5. Install sewage emission monitoring system 6. Install energy consumption monitoring system 7. In areas where power usage is higher, install metering equipment to track and manage 8. Try to use natural lighting 9. Convert kitchen or organic wastes into compost 10. Healthy and comfortable indoor environment (temperature, humidity, wind speed) with regular monitoring 11. Noise volume controls within the statutory standards 12. Environmental policy can be successfully implemented under corporate management systems 13. Appoint professional environmental managers, and regularly check progress and record system implementation 14. All employees are aware of the appointed objectives and are assigned environmental responsibilities 15. Service quality of the hotel has obtained relevant certification mark 16. Employees fully understand the extent of corporate environmental policy 17. Employees develop habits for effective use of resources (e.g., turning off the lights, exhaust fans, and air conditioning when vacating areas) 18. Actively involved in green and environmental protection-related activities 19. Actively participate in public affairs of local communities 20. Provide customers with ways to participate in recycling and re-utilizing
Low importance	High importance

standard. But the former focuses on hotel facilities while the latter is mainly on consumer behavior. The researchers also find that the public and community relationships dimension is important. However The Government's standard does not currently include this dimension. Generally hotels that value social responsibility should particularly concern issues of environment protection. Actively participating in environmental protection activities with local communities is integral to hotels' green management strategy (Rodriguez and Cruz, 2007; McGehee et al., 2009). Thus revisions of the Government's standard should include the assessment of public and community relationships to improve interactions between hotels and their local communities.

38 Government green standards happen coincide with this study. But some of the indicators the researchers find to be

important are not included in the RSAGH's item list. Drawing on these results this study suggests the following revisions to the RSAGH standard:

- (a) Environmental policy dimension: In addition to employees, RSAGH should promote the importance of environmental policy to customers and suppliers.
- (b) Water resources dimension: The RSAGH should require hotels to install metering equipment to facilitate tracking management (for larger volume use).
- (c) Energy dimension: RSAGH should require hotels to set up metering equipment to track and energy consumption monitoring systems for hardware with high electricity consumption and encourage hotels to make use of natural lighting.

Table 3
The framework of EMS indicators suitable for green hotel auditing in Taiwan.

Dimensions	38 Indicators	Priority	Second wave
1. Environmental policy	1.1 Publicly declare the hotel's specific environmental policy	v	
	1.2 Widely promote the hotel's environmental policy to all employees, customers, and suppliers	v	
	1.3 Environmental policy possesses clear goals (short, medium, and long terms)		v
	1.4 Environmental policy meets current environmental regulations (wastewater discharge, etc.)		v
2. Water resource	2.1 Install leak detection system, and provide for quick leak repair		v
	2.2 Install sewage disposal system		v
	2.3 Install sewage emission monitoring system		v
	2.4 In areas where water usage is higher, install metering equipments to track and management	v	
3. Energy	3.1 Use electric equipment that meets power-saving standards	v	
	3.2 Regularly maintain and clean ventilation, air conditioning, heating, and ice making equipments	v	
	3.3 In areas where power usage is higher, install metering equipment to track and manage		v
	3.4 Install energy consumption monitoring system		v
	3.5 Try to use natural lighting		v
4. Solid wastes	4.1 Minimize food wasting through appropriate distribution, storage, and management systems	v	
	4.2 Use electronic versions to transfer and save data in order to decrease paper consumption and waste	v	
	4.3 Avoid using disposable items (e.g., disposable tableware...)	v	
	4.4 Establish two-side photocopy systems in the office, and reuse scraps, envelopes, and paper	v	
	4.5 Convert kitchen or organic wastes into compost		v
5. Indoor environment (health and safety)	5.1 Avoid using toxic and dangerous chemicals	v	
	5.2 Noise volume controls within the statutory standards		v
	5.3 Install air filter cleaning equipment in air conditioning system	v	
	5.4 Healthy and comfortable indoor environment (temperature, humidity, wind speed) with regular monitoring		v
6. Green purchasing	6.1 Purchase durable goods that can be reused and recycled	v	
	6.2 Avoid purchasing overly packaged products	v	
7. Corporate management	7.1 Environmental policy can be successfully implemented under corporate management systems		v
	7.2 Appoint professional environmental managers, and regularly check progress and record system implementation		v
	7.3 All employees are aware of the appointed objectives and are assigned environmental responsibilities		v
	7.4 Service quality of the hotel has obtained relevant certification mark (e.g., ISO14000)		v
	7.5 Company has related insurance (accidental insurance, environmental damage insurance)	v	
8. Staff education	8.1 Employees develop habits for effective use of resources (such as turning off the lights, exhaust fans, and air conditioning when vacating areas)		v
	8.2 Provide training courses	v	
	8.3 Provide environmental education workshops	v	
	8.4 Employees fully understand the extent of corporate environmental policy		v
9. Public and community relationship	9.1 Promote the green hotel concept	v	
	9.2 Actively involved in green and environmental protection-related activities		v
	9.3 Actively participate in public affairs of local community		v
10. Consumer education	10.1 Provide signs to remind customers whenever to save resources	v	
	10.2 Provide customers with ways to participate in recycling and re-utilizing		v

(d) Solid wastes dimension: EVEN though RSAGH has provisions in place to avoid the use of disposable items (e.g., disposable eating utensils and bath spares), it does not include other important aspects, including: reducing food waste through appropriate allocation and storage management, reducing paper waste through information delivery and electronic storage; establishing a double-sided photocopying systems, re-use of papers and envelopes and converting organic waste into compost.

(e) Indoor environment dimension: While RSAGH includes hotel air quality requirements, noise level control is not explicitly addressed. Other internal environmental factors about air condition, such as hotel temperature, humidity and wind speed should also be regularly monitored. It is worth noting that RSAGH classifies the indicator "avoid the use of toxic and dangerous chemicals" into hazardous substances management rather than here to implement.

Table 4
Descriptive statistics of dimensions.

Dimensions	Importance Mean ± SD	Feasibility Mean ± SD
1. Environmental policy	4.6 ± 0.49	3.7 ± 0.67
2. Water resources	4.4 ± 0.60	4.1 ± 0.73
3. Energy	4.6 ± 0.56	3.9 ± 0.74
4. Solid wastes	4.7 ± 0.53	4.4 ± 0.60
5. Indoor environment (safety and health)	4.6 ± 0.47	4.0 ± 0.66
6. Green purchasing	4.5 ± 0.57	4.0 ± 0.55
7. Corporate management	4.6 ± 0.47	3.7 ± 0.63
8. Staff education	4.7 ± 0.33	4.0 ± 0.63
9. Public and community relationships	4.6 ± 0.48	4.0 ± 0.60
10. Consumer education	4.5 ± 0.57	4.2 ± 0.71

Table 5
Comparison with The Government's RSAGH on hotel environmental management systems.

Dimensions	"2008 RSAGH"	Degree of consistency	Inconsistent indicators (set in/by this study)
1. Environmental policy	1. Corporate environmental management	H	<ul style="list-style-type: none"> Widely declare hotel's environmental policy to all customers and suppliers
2. Water resources	2. Water conservation measures	H	<ul style="list-style-type: none"> For areas where water usage is larger, install monitoring equipment to track and manage
3. Energy	3. Energy-saving measures	M	<ul style="list-style-type: none"> For areas where power usage is higher, install monitoring equipment to track and manage Install energy consumption monitoring system to record tracking Try to make use of natural lighting
4. Solid wastes	Reduction of disposable product and waste material use	L	<ul style="list-style-type: none"> Reduce food waste through the use of appropriate distribution and storage management systems Use information flow and electronic storage to reduce paper consumption and waste Establish two-side photocopy systems in the office, and reuse scraps, envelopes, and paper Convert kitchen or organic wastes to make compost
5. Indoor environment	Corporate environmental management	M	<ul style="list-style-type: none"> Noise volume control within the statutory standard Indoor environment is healthy and comfortable (temperature, humidity, and wind speed) and is being monitored regularly
6. Green purchasing	Green procurement	M	<ul style="list-style-type: none"> Procure durable products that can be reused and recycled
7. Corporate management	Corporate environmental management	L	<ul style="list-style-type: none"> Appoint professional environmental managers All employees are aware of the appointed targets and assigned environmental responsibility Hotel service quality receives relevant certification mark Company invest in relevant insurance (accident insurance and environmental damage insurance)
8. Staff education	Corporate environmental management	H	All items are consistent
9. Public and community relationships	–	X	<ul style="list-style-type: none"> Promote green hotel as a concept Actively participate in activities related to green and environmental protection. Actively participate in public affairs of local communities
10. Consumer education	Waste sorting, recycling	M	<ul style="list-style-type: none"> Avoid purchasing overly packaged products Provide signs to remind customers to save resources at all times
–	Hazardous substances management	X	<ul style="list-style-type: none"> Avoid using toxic and dangerous chemicals

H: high; M: medium; L: low; X: no correspondence.

- (f) Green purchasing dimension: RSAGH is supposed to encourage hotels to purchase durable products that can be reused and recycled. Addition of our indicator, "avoid purchasing overly packaged products" is classified by RSAGH into waste sorting and recycling to implement.
- (g) Corporate management dimension: The RSAGH should require hotels to appoint professional environmental managers to ensure that all employees understand and are assigned environmental responsibilities. And hotels should certify their service quality for such as green mark. The RSAGH also should require hotels to buy relevant insurance (e.g., accident insurance and environmental damage insurance).
- (h) Staff education dimension: It is positive to hold annual staff environmental protection education and training. Those courses can help staff to effectively use resource and completely understand hotel's environmental policy.
- (i) Consumer education dimension: While RSAGH mainly require on hotel facilities, our findings and that of the RSAGH standard relate to waste sorting and recycling. The RSAGH could be strengthened recommending on both aspects of hotel and consumer, such as the use of signage to remind hotel employees and consumers on the importance of energy savings, to carry out resource recycling programs.

8. Conclusions

After analyzing the Delphi results, this study identifies 64 indicators and 38 of them for Taiwan's green hotel environmental evaluation framework. Moreover, 18 indicators classify as highly important and highly feasible. The Delphi technique allowed the researchers to draw on experts' knowledge about that the needs of the hotel industry in Taiwan now and into the future of green hotel implementation. Consistent with Boiral and Henri's (2012) findings, experts argue that ten of the dimensions can lead to two distinct benefits for green hotels: enhancing corporate image and changing consumer habits. First, a positive image of green hotels can be established by effective implementation. Then significant promotion and enhanced employees' commitment will bring hotel economic benefits (Ann et al., 2006; Bohdanowicz et al., 2005). The indicators proposed can also serve an educational function to help raise consumer knowledge about green hotels. The high quality of life options that green hotels provide can attract consumers to participate in environmental protection (Chan, 2011). Consumers thus can understand the importance of environmental protection by receiving green product and service. Then they may consider green issues when choosing hotels in the future.

Experts also indicate that there are significant challenges for hotels who implement environmental measures. The first challenge is access to resources. Experts regarded resource constraints, whether they are financial, physical or organizational, as the major barrier to environmental management. Successful green hotels may pay critical attention to developing and applying the needed resources. Second, staff attitude, knowledge and commitment are also a challenge for managers of green hotels. Hotel managers are encouraged to change staffs' mindset by giving them a sense of ownership of the business to developing the green perceptions. Third, and finally, experts argue that hotels can only manage their green environment to the limits of market demand. Managers need to take account of the resistance to change from their target customers as well as from external barriers to environmental management. On the other hand, a firm's strategic decision to differentiate itself from competitors will affect its productive resources, the services it offers, and the management of the operations (Baum and Haveman, 1997). Consequently, green hotels need a competitive strategy that differentiates their service offerings from those closest competitors or in the provision process.

8.1. Managerial implications of amending green hotel environment management systems

Hotels in Taiwan can benefit in five specific ways from establishing a suitable EMS: (1) decrease resource consumption and save costs; (2) decrease their impact on environment and provide environmental education; (3) improve their image and competitiveness; (4) improve service quality and gain employees' recognition and (5) conform to the future green corporate standard. An EMS evaluation as well as providing economic and environmental benefits increases the level of resources available to government and local residents as well as fostering the spirit of sustainable development. However the discrepancy appears to our standards with that of the RSAGH.

Overall, the hotel in industry still has difficulties to comply with the RSAGH standard. A number of challenges exist for implementing EMS in green hotels. These include initial investment, the improvement of physical and software facilities, willingness to implement EMS, the cooperation of employees, customers, communities and suppliers, and so on. To improve the quality of the environment there needs to be a partnership between government, business (hotel) and the community (Ann et al., 2006). Government should first establish policy and provide related support and rewards measures. Second, hotel managers' support, particularly for staff training, is critical as well. They need developing themselves green perceptions to implement environmental management. Third, education of consumers and communities about environmental protection cannot be ignored. The researchers identify some implications for the Government's policy, industrial management, and consumer and community's environmental education in the area of green performance management for hotels.

(a) Government aspect. One can expect firms to assign more importance to environmental regulation when it revolves around a prevention logic in which they regard the voluntary norm (e.g., certifications, eco-labels, and cooperation agreements) as the basis for future resource allocations (Henriques and Sadosky, 1999). Firms that adopt a prevention logic create more sophisticated routines that include a learning component. Here, the dynamic evolution of legislation is the driving force behind the allocation of resources. The following suggestions on measures are provided for those voluntary norms to Taiwan government. Hotels can learn the creation of green competencies as a source of competitive advantage (Buysse and Verbeke, 2003).

- (1) *Enact relevant matching measures.* The Government should complement green hotel environmental management standards and certification with policies, technical support and incentive programs. These policies rely on a collaborative effort between the tourism and environmental protection agencies. For instance, The Tourism Bureau's "Evaluation benchmarks on star hotel construction equipment" requires hotels to use star initiative to offer a wide range of toilet spare parts. It generates contradiction with green hotel promotion. The Tourism Bureau should amend its benchmarks to align with green hotel standards. This will avoid conflicts between environmental protection and overall quality evaluation of the star hotel. In this way, the star rating of hotels will not only consider facilities and equipment but also environmental friendliness that can extend to green evaluation systems. This reduces the tendency to conflict between the star quality rating system and evaluation of environmental performance while looking toward sustainable development.
- (2) *Provide incentives for participating in the RSAGH implementation policy.* Only three hotels, since 2008, have achieved the Green Mark and this underscores a low degree of willingness in the industry to apply for this award. Regulation, in addition, is stringent. This suggests that the Tourism Bureau should meet hoteliers to increase, by precluding possible barriers, their cooperation willingness on developing green hotel. It needs to identify and offer incentives on factors that facilitate green hotel system implementation. Using tax breaks or incentive investments may provide a feasible approach for improving hotel industry environment.
- (b) Industry aspect. The commitment of decision makers to sustainable development remains the key to the success of long-term businesses and can equally become a source of competitive advantage (Enz and Siguaw, 1999; Mihalic, 2000). In the study, the green strategies adopted by hoteliers were also interpreted from the perspective of sustainable environmental development.
 - (1) *Re-training hoteliers.* Hoteliers should recognize the importance of environmental protection by understanding the impact hotel management has on the environment (Dief and Font, 2010). The extent to which hoteliers are aware of environmental protection will affect their environmental management decisions (Papagiannakis and Lioukas, 2012). By increasing hotel managers awareness of environmental issues, the researchers argue, that they will be more willing to apply for RSAGH and comply with environmental regulations.
 - (2) *Establish a sound staff training and education system.* Green hotels typically invest in the environmental education of their employees. Some environmental learning programs could be arranged. Housekeeping operations are a particular target since employees have significant opportunities to influence the economic use of resources and materials (e.g., electricity, paper and water). Many green hotels encourage employees to adopt green housekeeping practices. These include ensuring air conditioning or other equipment are turned off when not in use and sorting waste as part of their daily routine. Some hotels also educate employees to take public transportation in order to reduce environmental pollution caused by use of private vehicles.

Many hotels also offer incentive programs to reward those who set a good example in protecting the environment. They aim to go beyond raising individuals' eco-friendly behaviors to encourage everyone to invest effort in establishing a green environment. Staff training and education system encourage the re-use of energy and waste products,

such as water and towels. Re-use of resources help to reduce the negative effects of detergent and non-biodegradable waste on the environment.

- (3) *Green suppliers*. In the purchase decisions hotels should consider which suppliers care environmental conservation and sustainability. Also, hotels are suppliers to tourists and typically use service and product to communicate key brand characteristics. They should preclude green barriers in the production process in order to achieve green goal and increase competitiveness (Zhu et al., 2007).
- (c) Consumer and community aspect. Customers may choose to avoid a firm's offering if it is not produced and delivered services and products in a sustainable way (Foster et al., 2000). Firms that do not behave sustainably may find ecological organizations lobbying against them. Logically, the greater consumer pressure then the greater the interest of decision makers in protecting the environment. The environmental management system, reported in this study, helps environmental education of consumers and communities. This helps to avoid the conflict between customers and hotels as they implement green measures. Information delivery serves as means of encourage customers to actively participate in implementing environmental management.
- (1) *Environmental education of consumers*. Green management relies not on the Government and the industry but also consumers who play a critical role. Consumer education is, therefore, important to adjust consumption patterns in support of environmentally friendly approaches. People who have correct green concept can become green consumers and effectively use resources with the least waste. This study's approach educates people the green concept and encourages individuals to take ownership for the environmental impact of their actions. It therefore achieves the balance between the consumption and environmental protection. Tourist choosing green hotels in priority could be the most representative example of consumer environmental education.
- (2) *Environmental education of communities*. Community, an important role to manage environment, can coordinate with hotels to recycle and reuse to extend the range of environmental protection (Bohdanowicz et al., 2005). Environmental education of communities should take a holistic perspective while stressing environmentally aware solutions to problems. Thus developing communities' environmentally friendly behaviors and problem solving skills is the primary goal of environmental education. In this study, the established hotel environmental performance evaluation method aims to promote universal green living and consumption through actions that target the support of communities. It encourages consumers to choose green hotels that use local community based resources to create a clean and comfortable living environment.

8.2. Contributions and limitations

The main contribution of this study is to identify dimensional indicators of an environmental management system for evaluating green hotels in Taiwan. Bohdanowicz et al. (2005) found that investment in environmental management and training, over several years, significantly improved the environmental performance at Scandic hotels. They demonstrate, during the period under study, a significant improvement in energy saving, water consumption and waste generated, and ecological food served. The dimensions in this environmental management system presented can be used by Taiwan government to assess hotels' progress toward implementing environmental protection policies. This study's approach also

provides consumers with information that they can use to make informed choices about choosing green hotels. Hotel managers are therefore encouraged to actively audit their environmental performance according to the environmental management system established in this study. The improved performance will promise sustainable environmental development. The researchers identify 38 indicators in ten dimensions for Taiwan's hotels, and managers can first target the 18 indicators that relate to high importance and high feasibility in their journey toward environmentally sound management of their hotels.

Prior research on green hotels management attributes lack consistency. In response to this shortcoming this study constructs environmental evaluation dimensions and indicators to extract the implications and to fit the evaluation needs of green hotels in Taiwan. The participants of Delphi in-depth questionnaires were all well qualified green and hotel management experts (i.e., government officials, scholars, and hotel managers). There is no doubt on experts' professional information, practical experience, and representative. To ensure a robust set of indicators the researchers drew from multiple and well established assessment systems, including ISO14000 and foreign green hotel assessment systems, providing for Taiwanese experts to review. With the smallest influence of cultural difference, this study's approach could be more applicable than foreign indicators for Taiwan's hotels. Research in environmentalism (Schultz et al., 2000) suggests that culture is an important determinant of environmental attitudes and behaviors. Thus the dimensional indicators identified are useful as reference for the Government to formulate green hotel policies.

Limitations are unavoidable in all studies. There are few studies on green hotel in Taiwan. Due to the limited number of green hotels in Taiwan the number of experts as scholars was greater than that of owners. The results herein, consequently, should be regarded as exploratory. The study sample treated the hotel industry as homogenous. Future research could deepen the exploratory work by refining the indicators to meet the specific needs of different hotel types, such as general hotels, tourist hotels, boutique hotels, resort hotels, spa hotels, B&B hotels, and etc. (Walker, 2006). Finally, the study initially constructs a conceptual EMS framework for green hotel. Further research would usefully develop indicators in an operational system for being green hotel measurement scale. It expects to provide the Government assessing the performance of hotel environmental management. Hoteliers also can use for self-environmental evaluation to have a clear picture of the efforts on improvement.

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