Mechelle N. Best and Brijesh Thapa

Environmental management in the Caribbean accommodations sector

Abstract

This study focused on the implementation of environmental management (EM) in the Caribbean accommodations sector based on diffusion of innovations theory. More specifically, it examined the status of EM and the differences between adopters and non-adopters in terms of hotel characteristics, attitudes to the natural environment, familiarity, and the constraints to implementation. This study was conducted among general managers and owners of various types of accommodations within the 19 English-speaking countries of the Caribbean. Data were collected via an online user-administered questionnaire due to the wide geographic range. There were 197 completed questionnaires with at least one respondent from each country. Based on the results, four different levels of EM have been implemented and have diffused to two thirds of the sector throughout the region, though some countries exhibited a higher proportion of adopters. Generally, adopters were small properties 75 rooms or less. Adopters and non-adopters were compared to determine differences and there were very few variations between adopters and non-adopters. However, given that adoption of EM is still in the growth segment of the diffusion curve, the number of non-adopters may decrease over time as some of the non-adopters have indicated that they were relatively new properties and/or intended to implement EM in the future. Overall, the results have implications for hoteliers, local and regional hotel associations, and policy makers.

Key words:
environmental management; environmental attitudes; accommodations; sustainability; diffusion of innovations; Caribbean

Introduction

The Caribbean has become the one of the most tourism intensive region in the world in terms of the economic dependence which has remained unchanged in recent years (World Travel & Tourism Council [WTTC], 2007). However, tourism relies heavily on the region's natural resources and despite its reliance, land-based tourism development has historically occurred with minimal regard to environmental resources (Patullo, 2005). Such impacts include beach erosion, deforestation, loss of vegetation, soil erosion, pollution of coastal waters, and coral reef loss (McElroy & de Albuquerque, 1998; Wilkinson, 1989). Reforms to reduce these impacts have been legislated in some destinations, while the industry has made various initiatives to decrease its impact on the natural environment (Mycoo, 2006).

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The Caribbean tourism industry has been developing and implementing environmental initiatives which seek to improve their impact on the biophysical environment and host communities. Such initiatives have been, to a great extent, implemented by the accommodations sector and the phenomenon has become known as the 'greening' of the industry. In 1997, the Caribbean Hotel (now & Tourism) Association (CHA) created the Caribbean Action (now Alliance) for Sustainable Tourism (CAST) to improve its membership's capacity in order to manage their impacts on the natural environment. CAST's mission is to enhance industry practices by providing training and education on sustainable tourism (CAST, 2010). The formation of CAST represents a landmark decision by the Caribbean hotel industry, whereby members of CHTA agreed that the environmental concerns in the industry warranted a more concentrated region-wide effort.

Since the establishment of CAST, different levels of environmental management[1] (EM) have emerged in the accommodations sector. These range from the implementation of a few basic initiatives such as the replacement of inefficient lighting in key areas, to a full scale environmental management system (EMS) that has been benchmarked and certified against an international standard such as Green Globe (GG) or the International Organization for Standardization (ISO) (Best, 2002, 2004; Blanchard & Lorde, 2004; Brown-Thompson & Cresser, 2004). Quite notably, the Caribbean is home to the first four hotels in the world certified against the GG standard for travel and tourism companies (Meade & Pringle, 2001). It is also the region with the highest number of certified properties and the first country to be benchmarked against the GG Community Standard (Geis, 2009; PA Government Services, Inc., 2004). One hotel in Aruba has also been certified against the ISO 14001 standard for EMS (Biemans, 2009). Additionally, various hotels within the region have won international awards in recognition of their environmental stewardship (CAST, 2005; Responsible Travel, 2010; WTTC, 2010).

EM has been promoted to have a range of benefits to hotels that include improved impacts on the natural environment, increased efficiencies, reduced operating costs, improved relationships with the wider community, and improved staff morale, amongst others (Bohdanowicz, 2005; Goodman, 2000; Vernon, Essex, Pinder & Curry, 2003). It is the attainment of these benefits which encourage hotels to embark on greening programs. Meade and del Monaco (1999) noted that "the Caribbean hotel industry is positioned to reinvent itself in a way that improves profitability, enhances guest relations, builds bridges into the local communities, and preserves the Caribbean's natural beauty" (p. 1). Yet, in spite of these prospects and aforementioned achievements, it remains to be seen whether EM has been the "quiet revolution" in the industry as described (Meade & del Monaco, 1999). In essence, if 'greening' is a major innovation for the accommodations sector, then to what extent has it impacted the Caribbean region?

Literature review

ENVIRONMENTAL MANAGEMENT

Broadly defined environmental management (EM) encompasses measures taken to protect the environment from harmful anthropogenic impact so as to sustain resources over time. Some aspects of EM or 'greening' in business as it is commonly known have become mainstream because of governmental regulations, especially in developed countries (Meyer, 2000). These efforts related largely to compliance with regulations rather than to the potential for overall management through an environmental strategy (Hoffman, 2000). However, though compliance was completely voluntary, the underlying threat of additional and stringent legislation made voluntary measures more attractive (Sarkis & Rasheed, 1995).

Although EM has been a significant part of business management for a few decades, it has now become an international phenomenon. The implementation of EM is increasingly part of the core business philosophy and operations management of diverse companies (Greeno & Robinson, 1992; Lovins, 2008; Meyer, 2000). Companies that utilize environmental management as a business strategy enjoy a number of benefits. These benefits include greater levels of innovation, fewer pollutants generated and resources consumed, enhanced employee morale, improved public image, financial performance, and competitive advantage (Lovins, 2008; Meyer, 2000; Shrivastava, 1995). EM in the business sectors has a longer history in manufacturing than in the service industry (e.g., transportation, banking, hospitality, health care, entertainment, travel and tourism,) (Kassinis & Soteriou, 2003). This appears to be disproportionate given the increasing size of the service industry and the fact that it, too, can cause detrimental impacts on the natural environment (Burke & Maidens, 2004; Grove, Fisk, Piekett & Kangun, 1996). The very aspects of services which distinguish them from manufactured products (intangibility, heterogeneity, perishability, and simultaneous production and consumption) may be a major reason why the industry tends to be overlooked (Grove et al., 1996). However, the service industry still uses a range of tangible products on a daily basis. Given the reliance on manufactured goods, the service industry still wastes resources and generates copious amounts of solid waste (Grove et al., 1996). For example, consumption of resources such as water and energy is often much higher for tourists than for residents of the surrounding communities (Burke, 2007; Gössling, 2002). This is exemplified in Barbados and St. Lucia where the average daily consumption of water by hotel guests was estimated as three times that of residents (Pantin, 1998 cited in Burke, 2007).

The transition of EM to the service industry and particularly the tourism industry is relatively recent. The lack of research on EM implementation in the service industry has improved in recent years but despite the acclaim given to sustainable tourism (with industry emphasis on the natural environment) empirical research remains a bit limited. To establish a context for EM in the accommodations sector, it is necessary to consider a few critical issues. First, most enterprises which provide accommodations are profit-oriented businesses with managers who make fiscally responsible decisions (Knowles, Macmillan, Palmer, Grabowski & Hashimoto, 1999; Stabler & Goodall, 1997). Second, these enterprises offer a service to customers and managerial decisions

are influenced by the need to optimize customer satisfaction (Gustin & Weaver, 1996). Third, construction and operation of accommodation units have impacts on the natural environment.

An evaluation of various studies indicates that a range of EM (from basic initiatives to environmental management system certification) has been implemented. Also, there are various motives, facilitators, and constraints which determine whether or not a company does or does not implements EM (Ayuso, 2007; Bohdanowicz, 2005; Bramwell & Alletorp, 2001; Leslie, 2007; Tzschentke, Kirk & Lynch, 2008; Vernon et al., 2003). While EM has increased incrementally, researchers have also shown a certain amount of skepticism with regards to the sincerity of greening efforts, both within the hospitality/tourism industry and the wider business sector (Brown, 1996; Saha & Darnton, 2005). Some researchers have even suggested that much 'greenwashing' exists and there may be a bandwagon effect where lodging providers adopt the terms but often not the practices, and that "sophisticated marketing techniques often allow the travel industry to appear "green" without making fundamental or costly reforms" (Honey, 1999, p. 47). However, it has also been posited that changing circumstances, both, in the global tourism industry and all industries as a whole, will ultimately force more sincere greening efforts to emerge (Pizam, 2009).

EM in the hotel industry is often characterized as a relatively recent phenomenon, yet there are individual lodging facilities that were built and/or operated with consideration for the natural environment over the years. This is evidenced through design for proper solid waste management, water and energy conservation, and conservation of the natural landscape in the 1950s (Stipanuk, 1996). Additionally, surveys conducted by the American Hotel & Motel Association from the mid-1970s to the mid-1980s sought to define and address environmental issues relevant to the tourism industry (Stipanuk, 1996; Zurburg, Ruff & Ninemeier, 1995).

DIFFUSION OF INNOVATIONS THEORY

An innovation is any idea, product, process, system, management style, service style, or combination thereof, which is new to the individual, organization, industry, or other unit and is usually held to be potentially beneficial to the user (Bigoness & Perreault, Jr., 1981; Rogers, 2003). Diffusion of innovations (DOI) has been explained by Strang and Soule (1998, p. 266) as "the spread of something [an innovation] within a social system." Rogers (2003) also describes diffusion as social change or the process through which the function and structure of a social system are changed. The process begins with the innovation which is communicated through various means to members of a social system. These members choose to adopt, modify and adopt, or reject the innovation. If the innovation is adopted then there are consequences to the social system (Rogers, 2003).

Since its origins in rural sociology in the 1940s, DOI has been used in a range of applications across many disciplines. In more recent decades, this has also been applied in recreation and tourism studies to understand the implications of information

technology and other innovations in international tourism for the Caribbean tourism industry (Poon, 1987); transportation systems in US national parks (Dilworth, 2003); the use of technologies such as website development as a means of marketing (Sahadev & Islam, 2005); and the likelihood of adopting environmentally friendly management practices in Vietnamese hotels (Le, Hollenhorst, Harris, McLaughlin, & Shook, 2006). Diffusion of innovations theory has been consistently applied to research in developing countries. Additionally, it has been used to investigate innovations in the hotel sector as well as the wider tourism industry in the Caribbean and other destinations. For example, Poon (1987) examined the influence of hotel structure, organization, ownership and management in adopting new technologies that would improve their competitiveness, finding that hotels' innovativeness was most influenced by the caliber of managers and their willingness to embrace changes and innovations. Le et al. (2006) used DOI to investigate the influence of perceived innovation characteristics, environmental characteristics, and organizational characteristics on the likelihood of hotels to adopt environmentally friendly practices. They found that innovation characteristics, especially complexity and observability, had the strongest influence on hotels' likelihood to adopt environmentally friendly practices. Other influential factors were relative advantage, perceived competition and the organizational characteristics of size, location, and level of risk-taking (Le et al., 2006).

In the context of the Caribbean, tourism has long been proposed as a tool for economic development and the accommodations sector has played a key role. This sector comprises a major element of the tourism industry in terms of employment, consumption of goods, services and natural resources, and also generation of wastes. From this perspective and with the regional dependence on tourism, EM can be seen as an important innovation. The use of DOI to examine the adoption and impact of EM was appropriate and thus used as the underpinning theory for this study.

PURPOSE OF STUDY

The constructs analyzed and reported are taken from a broader study which sought to examine the implementation of EM in the accommodation sector of the Caribbean tourism industry. This segment of the study is focused on one of the four primary objectives: specifically to determine the extent of adoption of EM in the accommodation sector. The research questions formulated to address this objective were:

- To what extent has EM been adopted in the accommodations sector? (Research Question 1)
- Is there a difference between adopters and non adopters of EM in terms of (a) characteristics, (b) organization membership, (c) importance of natural resources to the accommodations sector, and (d) knowledge of environmental management? (Research Question 2)
- Is there a difference between adopters and non adopters of EM with regards to constraints? (Research Question 3)
- Do hotel characteristics influence the level of EM implementation? (Research Question 4)

Methods

POPULATION AND SAMPLING

Accommodation in the Caribbean covers a wide range of properties, from less than five rooms to mega-resorts with over 1,000 rooms, and largely includes hotels and resorts, guest houses, villas, apartments, and eco-lodges. There is also a variety of types of accommodations that range from locally owned and operated, to foreign owned and/or part of an international hotel chain (CHA, 2010; Spittle, 2005). Most are the members of the CHTA and/or national hotel association. Since it was possible to obtain the membership list of all the association, the population of this study was made of all accommodation facilities operating in the nineteen English speaking countries of the Caribbean that are members of the CHTA or national hotel associations, with the membership list used as the population frame. CHTA is an alliance of NHAs throughout the English, Spanish, Dutch, and French sub-regions of the Caribbean. At the commencement of this study, there were 19 member associations from the Anglophone Caribbean (CHA, 2007). In addition to its NHA members, individual hotels or other types of accommodation units are members of the CHTA. There were 849 hotels with membership which accounted for approximately 125,476 rooms. The CHTA categorizes accommodations as small (75 rooms and less), medium (76-500 rooms) and large (over 500 rooms). Two thirds of the membership of the CHTA is within the small hotel category (CHA, 2010).

Table 1
ACCOMMODATIONS IN THE ANGLOPHONE CARIBBEAN

Country	Number of accommodation units (2007)[a]		Number of rooms (2005)[b]
	Sample (%)	Total	
Anguilla	2.5	25	746
Antigua and Barbuda	5.1	39	ND
Bahamas	7.1	59	14,800
Barbados	10.7	76	6,353
Belize	11.7	41	5,593
Bermuda	2.5	33	3,067
British Virgin Islands	1.0	32	2,722
Cayman Islands	2.0	44	2,954
Dominica	10.2	29	787
Grenada	5.1	29	1,470
Guyana	0.5	35	ND
Jamaica	8.1	124	22,528
Montserrat	0.5	9	ND
St. Kitts & Nevis	3.6	19	ND
St. Lucia	5.1	67	4,511
St. Vincent & the Grenadines	6.6	47	1,692
Trinidad & Tobago	9.1	64	5,929
Turks & Caicos Islands	2.5	31	ND
U.S. Virgin Islands	5.1	41	4,762
Total	99.0	844	

ND: Data not available

[a] From CHA and National Hotel Associations' databases

[b] From Compendium of Statistics (WTO, 2007)

A database of hotels in the English speaking countries was compiled using CHTA's membership list in combination with membership lists from the 19 NHA. In total there were 920 hotels identified, although it has to be acknowledged that not all hotels were members of either the national or regional association. All hotels in the database for which email addresses of general managers/owners could be obtained were emailed invitations to participate in the survey. However, despite telephone calls to each property to confirm an appropriate email address, a number of emails did not reach the intended recipient - 840 emails were confirmed received (Table 1). The respondents were general managers or owners of properties. Since these individuals are normally responsible for strategic decision making, they were deemed the most suitable group to be surveyed.

DATA COLLECTION

Data for this study were collected from December 2007 until March 2008 via an online user-administered questionnaire created and accessed through Zoomerang™. This method was chosen for several reasons. Firstly, the study sites covered a wide geographic range and it was not feasible to travel to each country to administer surveys or to recruit local researchers to do so. Secondly, using an online survey significantly reduced the cost of paper, postage, and recruiting, hiring, and training research assistants to administer the questionnaire. Thirdly, the database indicated that the majority of hotels had email addresses and a website. Fourthly, online surveys have been found to have a quicker return rate and in some instances, the same or significantly higher response rate than mail surveys, particularly for groups that frequently use the email or the Internet (Kaplowitz, Hadlock, & Levine, 2004).

Since previous studies have shown better response rates when advance notification was made, a pre-notice was first emailed to alert the hotelier to expect an invitation (Kaplowitz et al., 2004). This pre-notice also served to test the validity of the email addresses and those that were found to be invalid were removed from the database. Following the pre-notice, an email with the uniform resource locator (URL) link was sent to the hotels. Subsequently, four email reminders were sent and each contained the URL link to the questionnaire.

INSTRUMENTATION

The construct "property characteristics" was operationalized through questions pertaining to property type (budget, mid-range, luxury), size (small 1-75 rooms, medium 76-500 rooms, large 500+ rooms), ownership (local, foreign, chain, group), and guest origin. These characteristics were selected primarily because similar characteristics have been used to examine the adoption of innovations and specifically the propensity to adopt EM (Alvarez Gil, Burgos Jimenez & Cespedes Lorente, 2001; Le et al., 2006; Sahadev & Islam, 2005). Additionally, regional organizations such as the CHTA and the Caribbean Tourism Organization traditionally use them to categorize accommodations.

In DOI, change agents such as membership organizations are seen to play key roles in the adoption or rejection of an innovation, as well as in determining the rate at which an innovation is diffused (Rogers, 2003). Also, it has been found that organizational membership influences participation in voluntary certification programs (Rivera, 2002). Therefore, organizational membership was used to help understand the adoption of EM in the Caribbean, and whether adopters or non-adopters differed in terms of organizational membership. National association, the CHTA, CAST, and generic green organization category (with examples Caribbean Conservation Association, Green Hotels Association, International Hotels Environment Initiative) were regarded as the most relevant items for this question.

A single question was used to determine the importance of natural resources to the accommodation unit. Respondents were asked to indicate their level of agreement with five statements: (1) this property is dependent on the natural environment; (2) the accommodations sector has a positive impact on the natural environment; (3) the accommodations sector has an important role to play in protecting the natural environment; (4) a pristine natural environment is very important to our guests and (5) the natural environment in very important to this property. The agreement scale ranged from 1 to 5 where 1=strongly disagree to 5=strongly agree.

Level of environmental management was operationalized as a single question which asked respondents to select the most appropriate descriptor of environmental management at their property from: (1) some environmental best practices in place, (2) an environmental policy and planned actions throughout the property, (3) an environmental policy and a comprehensive program to reduce consumption of resources and generation of waste, and (4) certification against a recognized standard (e.g. Green Globe, ISO14000). A pilot study was conducted to test for content and face validity, and user-friendliness of the online survey. No problems were reported by the respondents.

Results

PROFILE OF PARTICIPANTS AND HOTELS

There were 197 usable questionnaires completed with at least one respondent from each country that yielded a 27% response rate. Forty two percent of the participants represented hotels in Barbados, Belize, Jamaica, and Trinidad & Tobago. Most participants were general managers (41%), followed by owner/general managers (27%) and owners (9%). Approximately 19% were managers or supervisors in other departments such as sales and marketing, front office, and human resources, while 4% were environmental officers or managers. In terms of their familiarity with EM in the accommodations sector, 41% of the respondents indicated that they were somewhat familiar, while 40% indicated that they were very familiar. Only 6% were not at all familiar. Small hotels (1-75 rooms) comprised 73% of the sample, while medium hotels (76-500 rooms) and large hotels (501+) were 25% and 3%, respectively.

Table 2
PROFILE OF HOTELS

Hotel characteristics	% of respondents
Hotel size	
Small (1-75 rooms)	72.9
Medium (76-500 rooms)	24.5
Large (500+ rooms)	2.6
Hotel opening year	
Prior to 1900	0.5
1940s	1.1
1950s	3.7
1960s	9.6
1970s	13.4
1980s	18.2
1990s	27.8
2000+	25.7
Average annual occupancy	
Under 25%	4.6
26 – 50%	27.7
51 – 75%	44.5
Over 75%	23.1
Hotel categories	
Budget	19.1
Mid-range	47.4
Luxury	33.5
Hotel ownership	
Locally owned and operated	60.6
Locally owned and foreign operated	2.6
Foreign owned and operated	10.4
Foreign owned and locally operated	13.5
Part of international chain or group	8.8
Part of locally operated chain or group	4.1
Guest origins	
USA	60.6
UK	18.7
Caribbean	11.4
Canada	2.1
Germany	2.1
Other	5.1
Organization membership	
National Hotel Association	82.9
Caribbean Hotel Association	76.6
Caribbean Alliance for Sustainable Tourism	43.7
Other Green Organizations	42.4

The number of employees ranged from 1 at a 4-room property in Tobago, to 800 at a property in the Bahamas. Roughly half of the hotels represented were established between 1940 and 1989; there was one hotel in Bermuda which was over 100 years old.

Average annual occupancy ranged from 10% to 95%, while 50% or less were reported by 32%, and 23% experienced over 75% occupancy rate. The majority was categorized as either mid-range (47%) or luxury properties (34%); others were budget hotels. Most hotels were, both, locally owned and operated (63%), while 24% were either foreign owned and operated or foreign owned and locally operated. Hotels that were associated with local and international chains comprised only 13%. Majority of guests originated in the U.S. (61%), 19% originated in the UK and 11% from the Caribbean (Table 2).

Responses were mixed with respect to current or previous membership in national and regional hotel associations and other environmental organizations. About 83% of the hotels were members of their national hotel association, while 77% were members of CHA. Membership in CAST was 44%, while other environmental organizations such as the Green Hotels Association and the International Hotels Environment Initiative were 42%.

IMPORTANCE OF THE NATURAL ENVIRONMENT

Respondents were also asked to assess their understanding of the relationship between the accommodations sector and the natural environment. Seventy-eight percent of respondents agreed that their property depended on the natural environment. A similar pattern of agreement emerged with respect to the importance of the sector's role in environmental protection (85%), the importance of a pristine natural environment to guests (91%) and the overall importance of the natural environment to the individual property (91%). Interestingly, 25% suggested that the accommodations sector did not have a positive impact on the natural environment, while 51% felt that its impact was positive.

ENVIRONMENTAL MANAGEMENT

Sixty eight percent had implemented some form of EM in their respective hotels and were classified as *adopters*. Hotels that had not implemented any form of EM were categorized as *non-adopters*. Most adopters were small with 75 rooms or less (69%), mid-range (45%) or luxury (39%) properties that were locally owned and operated (52%). Additionally, guests at these hotels originated mainly from the U.S. (64%). Thirty-two percent (32%) of the properties initiated their EM efforts prior to 2000, while 68% commenced in 2000 or later.

Adopters were asked to select one of four levels to describe their current efforts. Forty four percent were in the basic category of properties that had implemented environmental best practices (e.g., energy saving bulbs, water saving devices, linen and/or towel reuse program, solid waste separation for reuse or recycling) on an ad hoc basis. Twenty-five percent had an environmental program, i.e. an environmental policy and planned actions throughout the property (involving all or most departments) to reduce consumption of resources and generation of waste. Fourteen percent had implemented an environmental management system (EMS) - a comprehensive program guided by an environmental policy with objectives, targets, and action plan, performance moni-

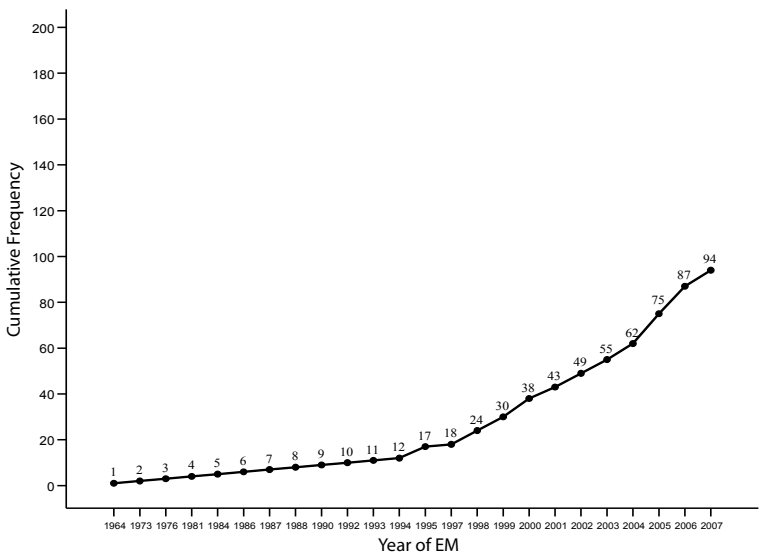
toring and feedback, participation at all staff levels, and documentation of all environmental and social initiatives. Finally, about 17% noted their property's Environmental Management System (EMS) was certified against a recognized standard (e.g., local Authority or Environmental Agency, Green Globe, ISO 14001).

Respondents were asked whether their respective properties had a written environmental policy; 47% answered in the affirmative. The average time to have had an environmental policy was 5.2 years. One respondent from the U.S. Virgin Islands indicated that their property had a policy for over 30 years. Additionally, 41% of adopters had an environmental officer or manager. Participants were also asked to denote the portion of their overall operations budget that was allocated for EM. The highest allocation reported was 60% of total operating budget, while the lowest was zero. Eighty-three percent of the 46 hotels that have a budget allocation for environmental management indicated that it was 15% or less of their total operating budget. Finally, respondents rated the overall benefit of EM to their properties based on a scale of 1 to 10, with 10 being extremely beneficial. The lowest rating was 2, with the highest at 10. The average rating was 6.7. Notably, participants also indicated that they anticipated an increase in the overall benefit over time.

RATE OF ADOPTION OF EM IN THE ACCOMMODATION SECTOR

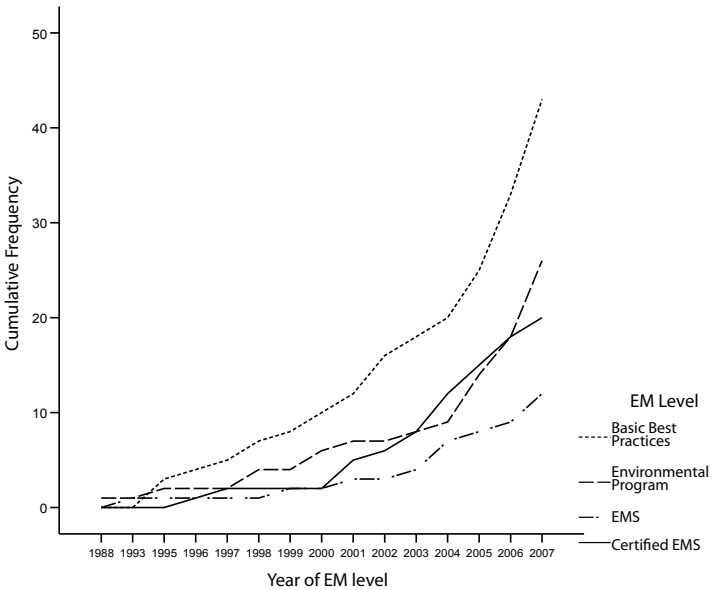
The diffusion of EM (Research Question 1) was determined by plotting the year of implementation (X axis) against the cumulative frequency (Y axis), thereby creating the diffusion curve. EM was in existence at 67% of the hotels (i.e., adopters). Forty-four percent of adopters had implemented basic environmental best practices, while 56% had more advanced levels of EM such as, a program of planned actions or a comprehensive EMS. EM or greening had diffused to approximately two thirds of the Caribbean's accommodations sector. Results suggest that the sector is still on the growth section of the s-shaped diffusion curve and is yet to plateau (Figure 1).

Figure 1
CUMULATIVE IMPLEMENTATION OF ENVIRONMENTAL MANAGEMENT IN CARIBBEAN HOTELS



The four levels of EM identified (environmental best practices, environmental program, EMS, certified EMS) were also graphed. These followed the initial stages of the s-shaped diffusion curve, but like the main curve were yet to reach the plateau stage (Figure 2).

Figure 2
CUMULATIVE IMPLEMENTATION OF LEVELS OF ENVIRONMENTAL MANAGEMENT IN CARIBBEAN HOTELS



DIFFERENCE BETWEEN ADOPTERS AND NON-ADOPTERS

The second research question dealt with the differences between the adopters and non-adopters of EM in terms of (a) characteristics, (b) organization membership, (c) importance of natural resources to the accommodations sector, and (d) knowledge of environmental management. Chi-square analysis was used to assess characteristics and organization membership, while independent sample t-tests were used to assess importance of natural resources and knowledge of EM. Contingency tables and Pearson χ^2 were calculated for each characteristic. EM was operationalized as a dichotomous categorical variable.

HOTEL CHARACTERISTICS

A 2 x 3 contingency table was created for EM in place (currently in use) and *property type*. Adopters (hotels with current EM) comprised of 16% budget properties, 45% mid-range, and 39% luxury, whereas non-adopters comprised of 23% budget properties, 54% mid-range, and 23% luxury properties (Table 3). There was no statistical significant association between EM in place and property type ($\chi^2_{(2)}$=4.95; p>0.05). Consequently, there was no difference between the adopters and non-adopters.

Table 3
ENVIRONMENTAL MANAGEMENT IN PLACE BY PROPERTY TYPE
(Chi square test)

EM in place	Property type (%)		
	Budget	Mid-range	Luxury
Adopters	16	45.0	38.9
Non-adopters	23	54.1	23.0
Chi-square	4.95		
df	2		
n	192		
P value	0.085		

A 2 x 2 contingency table was created for EM in place and *property size*. To meet the Chi-square requirement of at least 5 cases per cell, large hotels were removed from this analysis because with large hotels included, the 2 x 3 contingency table had 2 cells with less than 5 counts each (Table 4). Adopters comprised of 71% small properties and 29% medium, while non-adopters comprised 82% small and 18% medium properties. EM in place was not statistical significantly associated with property size ($\chi^2_{(1)}$=2.34; p>.05). Adopters and non-adopters were not different with regards to property size.

Table 4
ENVIRONMENTAL MANAGEMENT IN PLACE BY THE PROPERTY SIZE
(Chi square test)

EM in place	Property size (%)	
	Small	Medium
Adopters	71.2	28.8
Non-adopters	81.7	18.3
Chi-square	2.34	
df	1	
n	185	
P value	0.15	

A 2 x 3 contingency table was developed for EM in place and *property ownership*. To meet the Chi-square requirement of at least 5 cases per cell, the initial 6 categories for property ownership were reduced to 3 by grouping (a) locally owned and operated with locally owned and foreign operated; (b) foreign owned and operated with foreign owned and locally operated; and (c) international chain or group with locally operated chain or group (Table 5). Fifty-four percent of adopters were locally owned properties, 28% foreign owned and 18% chain or group. Of the non-adopters, 81% were locally owned properties, 16% foreign owned and 3% chain or group properties. There was a statistical significant association between EM in place and property ownership ($\chi^2_{(2)}$=13.87; p<.01). Compared with adopters, non-adopters were more likely to be locally owned and less likely to be foreign owned, or part of a chain or group.

Table 5
ENVIRONMENTAL MANAGEMENT IN PLACE BY THE PROPERTY OWNERSHIP
(Chi square test)

EM in place	Property ownership (%)		
	Locally owned	Foreign owned	Part of a chain or group
Adopters	54.3	27.9	17.8
Non-adopters	80.6	16.1	3.2
Chi-square	13.9*		
df	2		
n	191		
P value	0.001		

A 2 x 4 contingency table was created for EM in place and *guest origin*. To meet the Chi-square requirement of at least 5 cases per cell, the initial choices (US, UK, Caribbean, Canada, Germany and other) was recoded to the 4 categories: US, UK, Caribbean and Other (Canada, Germany and other countries). Sixty-four percent of adopters' guests originated in the US, 18% UK, 10% Caribbean, and 8% other locations, while 53% of non-adopters' guests originated in the US, 21% UK, 15% Caribbean, and 11% other locations (Table 6). There was no statistical significant association ($\chi^2_{(3)}$=2.02; p>.05) whereby adopters and non-adopters did not differ in the origins of their guests (Table 6).

Table 6
ENVIRONMENTAL MANAGEMENT IN PLACE BY GUEST ORIGIN
(Chi square test)

EM in place	Guest origin (%)			
	US	Caribbean	UK	Other
Adopters	63.6	10.1	17.8	8.5
Non-adopters	53.2	14.5	21.0	11.3
Chi-square	2.02			
df	3			
n	191			
P value	0.57			

ORGANIZATION MEMBERSHIP

To assess the difference in organization membership between adopters and non-adopters, 2 x 2 contingency tables were created and Chi-square calculated. Eighty-seven percent of adopters were members of their NHA, compared with 73% of non-adopters. There was a statistical significant relationship between EM in place and national association membership ($\chi^2_{(1)}$=4.75; p=0.03) in which adopters were more likely than non-adopters to be members of NHA. Seventy-seven percent of adopters were members of the CHTA, compared with 76% of non-adopters. There was no statistical significant relationship between EM in place and membership in CHTA ($\chi^2_{(1)}$=0.03; p>0.05). Therefore, there was no difference between adopters and non-adopters in CHTA membership.

Fifty percent of adopters were members of the CAST, compared with 28% of non-adopters. There was a significant relationship between EM in place and CAST membership ($\chi^2_{(1)}$=5.03; p=0.03). Adopters were more likely to be members in CAST than non-adopters. Fifty-one percent of adopters were members of other green organizations compared with 18% of non-adopters. There was also a statistical significant relationship between EM in place and other green organization membership ($\chi^2_{(1)}$=10.61; p<0.01) such that adopters were more likely to be members in other green organizations than non-adopters (Table 7).

Table 7
ENVIRONMENTAL MANAGEMENT IN PLACE BY ORGANIZATION MEMBERSHIP
(Chi square test)

EM in place	Organization membership (%)	
	Yes	No
	National Hotel Association (NHA)	
Adopters	87.2	12.8
Non-adopters	72.9	27.1
Chi-square	4.75*	
df	1	
n	157	
P value	0.03	
	Caribbean Hotel & Tourism Association (CHTA)	
Adopters	76.7	23.3
Non-adopters	75.5	24.5
Chi-square	0.03	
df	1	
n=	169	
P value	0.85	
	Caribbean Alliance for Sustainable Tourism	
Adopters	50	50
Non-adopters	27.8	72.2
Chi-square	5.03*	
df	1	
n	118	
P value	0.03	
	Other Green Organizations	
Adopters	51.2	48.8
Non-adopters	18.2	81.8
Chi-square	10.61**	
df	1	
n	117	
P value	0.002	

*Significant at 0.05 level.
**Significant at 0.01 level.

IMPORTANCE OF NATURAL ENVIRONMENT

Independent sample t-tests were performed to determine the differences between adopters and non-adopters with respect to the importance of the natural environment to the accommodations sector (Table 8). Of the five statements, respondents were significantly different on the statement 'the accommodations sector has a positive impact on the natural environment' ($t_{(154)}$=-2.34; p=0.02). Non-adopters were more likely to agree with this statement (M=3.58) than adopters (M=3.22).

Table 8
IMPORTANCE OF THE NATURAL ENVIRONMENT TO THE ACCOMMODATIONS SECTOR

Statement[1]	Mean		t	df
	Adopters	Non-adopters		
This property is dependent on the natural environment	4.14	3.82	1.77	189
The accommodations sector has a positive impact on the natural environment	3.22	3.58	-2.34 *	154
The accommodations sector has an important role to play in protecting the natural environment	4.35	4.13	1.28	189
A pristine natural environment is very important to our guests	4.42	4.37	0.3	188
The natural environment in very important to this property	4.44	4.36	0.45	190

[1] Strongly disagree=1; Disagree=2; Neither agree nor disagree=3; Agree=4; Strongly agree=5.
* Significant at 0.05 level.

KNOWLEDGE OF ENVIRONMENTAL MANAGEMENT

An independent sample t-test was conducted to determine whether familiarity with EM differed between adopters and non-adopters. The two groups were statistically significantly ($t_{(100)}$=5.44; p<0.001), with adopters being more familiar with EM (M=4.34) than non-adopters (M=3.41).

ADOPTERS AND NON-ADOPTERS OF EM WITH REGARDS TO CONSTRAINTS

Independent samples t-tests were conducted to determine whether adopters and non-adopters differed in their constraints to EM (Research Question 3). Of the twelve constraints, adopters and non-adopters differed significantly on 'EM is not necessary' ($t_{(133)}$=-2.07; p=0.04) and 'property unaware of any stage beyond current level of EM' ($t_{(100.03)}$=5.44; p<0.001). Adopters disagreed more with both 'EM is not necessary' (M=1.38) and 'property unaware of any stage beyond current level of EM' (M=2.18) than did non-adopters (M=2.07 and M=2.57, respectively). Therefore, these items were more of a constraint for non-adopters than for adopters (Table 9).

Table 9
CONSTRAINTS TO ENVIRONMENTAL MANAGEMENT

Statement[1]	Mean		t	df
	Adopters	Non-adopters		
More advanced level of environmental management too difficult or complicated	3.26	3.02	1.37	130
Making necessary organizational changes is too difficult	2.87	2.79	0.45	130
Implementation is costly	3.73	3.68	0.28	135
Lack of capital	3.60	3.40	0.99	133
Potential benefits not apparent	2.38	2.62	-1.45	135
No access to technology	2.79	2.70	0.51	121
Lack of know-how	2.74	2.90	-0.83	137
Employee resistance	2.67	2.54	0.71	112
Lack of time	3.05	3.00	0.22	132
Current level of Environmental Management is most appropriate for the property	2.93	3.02	-0.45	135
Environmental Management is not necessary	1.38	2.07	-5.1 *	131
Property unaware of any stage beyond current level of environmental management	2.18	2.57	-2.07 *	133

[1]Strongly disagree=1; Disagree=2; Neither agree nor disagree=3; Agree=4; Strongly agree=5.
*Significant at 0.05 level.

THE LEVEL OF EM IMPLEMENTATION IN TERMS OF HOTEL CHARACTERISTICS

To answer the fourth research question, the level of EM was regressed on hotel characteristics. Categorical predictor variables (hotel characteristics) were coded as dummy variables while the level of EM was recoded into two categories: 1) environmental best practices was kept intact as basic EM; and 2) environmental program, EMS, and certified EMS were combined to create advanced EM. A logistic regression was conducted with characteristics as the predictor variables (with each characteristic in a separate block) and level of EM as the outcome variable.

The regression model with all characteristics improved on the base model by correctly classifying 58% of the cases compared with the initial 53%. However, none of the characteristics variables were statistically significant, nor were the model changes (Block 1 $\chi^2_{(2)}$=1.73; p>0.05; Block 2 $\chi^2_{(4)}$=2.57; p>0.05; Block 3 $\chi^2_{(6)}$=5.42; p>0.05; Block 4 $\chi^2_{(9)}$=11.55; p>0.05). The non-significant Hosmer & Lemeshow test statistic at each stage of analysis indicated that the model fit the data relatively well in terms of actual and expected classifications. Hotel characteristics did not predict the level of EM implemented (Table 10).

Table 10
HOTEL CHARACTERISTICS AND LEVEL ENVIRONMENTAL MANAGEMENT

Characteristics	*B*	SE	*Exp (β)*
Type			
Mid-range	-0.16	0.55	0.85
Luxury	-0.39	0.60	0.68
Ownership			
Foreign owned	0.66	0.48	1.94
Part of chain or group	-0.03	0.61	0.97
Size			
Medium Hotel	-0.17	0.49	0.85
Large Hotel	-0.65	1.24	0.52
Guest origin			
UK	0.68	0.50	1.98
Caribbean	0.28	0.65	0.66
Other[1]	2.10	1.12	0.06
Model change χ^2	11.55		
-2Log likelihood	157.05		
Cox and Snell R^2	0.09		
Nagelkerke R^2	0.12		
Hosmer and Lemeshow χ^2	4.64		
Hit Ratio	58.20		
n=122			

[1] 'Other' includes Canada, Germany and other countries.

Discussion

Since the late 1990s, a 'greening' movement was promulgated which has focused primarily on the accommodations sector in the Caribbean. This study was conceptualized to assess the extent to which greening has spread in the Anglophone Caribbean. Additionally, this study also sought to determine whether there were differences between adopters and non-adopters in terms of characteristics, organizational membership, and attitudes to the natural environment. Findings denote that the accommodations sector has implemented four different levels of EM which has diffused to two thirds of the hotels. The geographic spread of adoption of variations of EM was witnessed throughout the study region, though some countries (Barbados and Jamaica) exhibited a higher proportion of adopters. This diffusion may be due in part from the fact that despite geographic boundaries, accommodation sub-sectors within the region have a number of factors in common such as small size, limited resources, and membership in the CHTA and CAST, which are prominent change agents (Rogers, 2003). Overall, such innovation (e.g., EM implementation) diffuses more readily when there is homogeneity within a system whereby members share information (Rogers, 2003; Smith, 2004).

However, given that adoption of EM within the industry is still in the growth stage of the diffusion curve, the number of non-adopters may decrease over time. This is supported by the fact that some of the non-adopters have indicated that they were relatively new properties and/or intended to implement EM in the future. Conversely,

it may be unlikely that complete adoption – 100% diffusion, particularly of the most advanced variation of EM will occur as the accommodations sector is a dynamic system. Annually, a number of new properties are added to the inventory that inevitably changes the number of potential adopters. Also challenges such as cost and knowledge may stymie the diffusion of this innovation, even at the most basic level as identified by Tzschentke, Kirk and Lynch (2008) with regards to small hotel companies in the UK. Also, new properties may be built with resource conservation measures (e.g., faucet aerators, energy saving bulbs) which eliminates the need to adopt such types of best practices.

Generally, adopters were primarily small properties 75 rooms or less. This is not a surprising finding as two-thirds of CHTA's membership comprises of small hotels. The small properties tend to be locally owned and operated; a pattern which was also reflected in the results of this study. Similar to other studies conducted in the Caribbean, adopters run the gamut in terms of size, ownership, and guest origin (Best, 2004; Blanchard, 2004; Brown-Thompson & Cresser, 2004).

Adopters and non-adopters were compared to determine differences on the importance of the natural environment to the accommodations sector, membership in organizations, familiarity with EM in the accommodations sector, and hotel characteristics. With respect to the natural environment, adopters and non-adopters generally agreed on the importance and dependence of their properties on the pristine natural environment. This is understandable because the Caribbean tourism industry has traditionally emphasized the use of coastal and marine resources and also other types of natural resources in the last two decades. Therefore, hoteliers recognize the importance of natural resources to their properties.

However, adopters and non-adopters had divergent views on the impact that the accommodations sector had on the natural environment. Non-adopters were more likely to agree with the item that, 'the accommodations sector has a positive impact on the natural environment'. Hotels that consider the sector's impact to be positive may not perceive the need to change their operations. A similar finding was reported by Stabler and Goodall (1997) where some respondents indicated that the tourism sector and more specifically, the hospitality sector did not contribute to environmental problems. These respondents were disinclined to make changes to their properties. Comparable attitudes were also exhibited by Caribbean hoteliers in the CHEMI project (Blanchard & Lorde, 2004), and by hoteliers in the popular tourist area of Plymouth, UK (Hobson & Essex, 2001).

In terms of hotel characteristics, adopters and non-adopters were similar in property type, size and guest origins, but differed in ownership. Adopters were more likely than non-adopters to be foreign owned or part of a chain or group. Foreign owners of adopters may originate in countries in which environmental awareness is high and this might have influenced business practices. Additionally, for some properties, EM

may require capital expense for retrofitting. Foreign property owners may have greater access to funding to make the needed changes. Also, hotels that are part of a chain or group may have opportunities to implement EM that are not available to independent properties. Álvarez Gil et al. (2001) suggested that being part of a chain gave individual properties greater access to information, and also allowed for sharing of various types of resources. Furthermore, the economies of scale within a chain or group of hotels allows for environmental initiatives that may be cost prohibitive for independent hotels. Additionally, chain or group hotels could provide internal pressure for continuous improvement, or could develop environmental management protocols centrally to be disseminated throughout the chain (Álvarez Gil et al., 2001). Such a strategy has been implemented by Sandals Resorts International (R. May, personal communication, August 6, 2003).

Adopters and non-adopters also differed in membership in trade organizations. Adopters were more likely to be members of their NHA, CAST, and other environmental organizations that are likely to share EM information with its members. Similar findings were made by Rivera (2002) regarding participation in the Costa Rican Certification for Sustainable Tourism. Additionally, these organizations offer periodic training, usually at reduced rates to their members. Thus, membership in these organizations may have exposed adopters to information which may have helped them to implement EM at their respective properties. The diffusion of an innovation (i.e. adoption by most of a group) is heavily influenced by the sharing of information among individuals or organizations (Rogers, 2003; Smith, 2004). As evidenced by the diffusion curve, the rate of EM adoption increased after 1997 following the establishment of CAST. This is noteworthy because CAST's mission centers on building awareness and capacity. To this end, particularly in its early years, workshops were hosted regularly, and many informational materials were developed. Hence, building awareness of environmental management seems to have played a key role in diffusing this innovation in the Caribbean, dovetailing with the concept that knowledge of an innovation facilitates its adoption.

Finally, hotel characteristics were not predictive of the level of EM implemented. In previous studies, findings on the relationship between characteristics and environmental management (whether policy, likelihood of adoption, or implementation) have been mixed. Kirk (1998) found that property characteristics such as size, ownership and classification (type) were not related to a property having a written policy (regarded as a key precursor to environmental action). Álvarez Gil et al (2001) found hotel size and chain affiliation to be significantly related to environmental management.

Conclusion

The survival of the Caribbean accommodations sector depends to a large extent on the quality of the natural environment. Therefore, the accommodations sector has an important role in protecting natural resources. One way to enhance protection is for properties to implement EM. Adopters in the Caribbean accommodations sector exhibited a range of characteristics. This should provide encouragement to those proper-

ties that may think their respective characteristics preclude them from EM implementation. Further, properties can choose the level of EM implementation - basic environmental best practices or more advanced environmental management from the onset. Benefits such as increased efficiencies, decreased resource consumption and corollary cost savings accrue to the environment and the property.

Hoteliers must to understand the connection between tourism and the environment, thus the NHAs and CAST need to continue their efforts to raise awareness about the environment and actions that can reduce those impacts. Implementation of EM, even at its most basic level is seldom an easy task. Hoteliers should be proactive and lobby their associations to organize appropriate training. While EM in its most advanced forms will involve most or all personnel within a property, the existence of a 'green champion' may help to take a property to the next level. EM may have a better chance of success if there is at least one person, a 'green champion' within a property who really drives the process.

From a methodological standpoint, the study was conducted in the Caribbean instead of a single destination. Bohdanowicz's (2005) research on attitudes to environmental management in the hotel sector proposed that research in a single destination represented a serious limitation. Hence, this study encompassed different countries and the geographical limitation was minimized, while literature on EM was expanded. This study has several benefits for the Caribbean tourism industry. First, it has provided comprehensive data on EM in the accommodations sector. Second, a better understanding of EM in terms of the number and types of hotels and the levels of EM was realized. Overall, the results of this study are valuable to hoteliers, local and regional hotel associations, and policy makers.

Notes

[1] In this study, environmental management is defined as management of the body of policies or actions which impact the biophysical environment. It is also noteworthy that in some instances environmental management also subsumes policies and actions within the broader socio-cultural context.

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