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An environmental assessment of the accommodation sector in the Grenadine Islands

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ABSTRACT

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The tourism industry is one of the most important and rapidly growing industries in the Grenadine islands. This has severe implications for the natural environment of small islands with fragile ecosystems, limited resources and limited technical and human capacity. Many hotels operate in isolation from the environment. However, it is important for small hotels to act responsibly to mitigate any negative impacts that their operations may have on the environment through the conservation of water and energy, waste water and solid waste management, reductions in hazardous chemical usage, biodiversity conservation and community development. In many Caribbean islands and states tourism related activities are considered the primary contributor to coastal erosion and sedimentation from construction activities (Potter 1996). To date there has been no documentation on the environmental practices of the accommodation sector in the Grenadines. Hence, the following research was undertaken to identify which environmental practices are being promoted within the accommodation sector in the Grenadines, and their importance to the sector. The study presents the findings of two qualitative surveys conducted on the environmental practices of 63 accommodation facilities of various sizes in the Grenadines. The aim of the project was to assess current environmental practices and to make general recommendations for improvement. The information provides a basis for the development of “Greening Hotels” Project. The results of the study showed that many of the small hotels and guest houses studied do have environmentally friendly practices implemented. Additionally, those practices that impacted negatively on the environment were mainly due the fact that these facilities lacked the knowledge, human or financial capacity. These varied from energy saving programmes with guests and staff to community programme such as replanting of coastline vegetation. In most cases, the smaller facilities lacked the human and financial capacity to have a full environmental management system. However, many of them resorted to basic conservation techniques that made a significant difference in the environmental sensitivity of the operation.

Keywords: Sustainable tourism, Greening hotels, Grenadine Islands

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LIST OF ACRONYMS

BTA	Bequia Tourism Association
CAST	Caribbean Alliance for Sustainable Tourism
CC	Counterpart Caribbean
CEC	Carriacou Environmental Committee
CERMES	Centre for Resource Management and Environmental Studies
CHA	Caribbean Hotel Association
CPMTA	Carriacou and Petite Martinique Tourism Association
CR	Chaine des Rotisseurs
GEF-SGP	Global Environment Facility Small Grant Programme
GHTA	Grenada Hotel and Tourism Association
LHW	The Leading Hotels of the World
MPA	Marine Protected Area
NGO	Non-governmental organization
SGP	Sustainable Grenadines Project
SLHW	The Small Leading Hotels of the World
SPSS	Statistical Package for Social Sciences
SVG	St. Vincent and the Grenadines
SVGHTA	St. Vincent and the Grenadines Hotel and Tourism Association
UNEP	United Nations Environmental Programme
UWI	University of the West Indies
WTP	Water Taxi Project
XCD	Eastern Caribbean Dollar

1 INTRODUCTION

The Grenadine Islands extend between the islands of St. Vincent in the North and Grenada in the south. They lie on the Grenada Bank and belong to two countries, St. Vincent and the Grenadines and Grenada. St Vincent and the Grenadines (SVG) is an archipelago of 34 islands and islets located in the Eastern Caribbean at 13° 15' N, 61° 12' W. St. Vincent, the mainland, is 133 sq. miles, while the Grenadine islands which run for forty miles to its southwest are in total 17 sq. miles. The St Vincent and the Grenadines Grenadine Islands consist of a number of private and state-owned islands with Bequia, Mustique, Canouan, Mayreau, Union and Palm Islands and Petit St. Vincent being inhabited. Four other islands make up the Tobago Cays Marine Park (Culzac-Wilson 2003). The Grenadine islands of Grenada include Petit Martinique and Carriacou (Figure 1.1). The entire Grenadines are well known for their beautiful scenery, spectacular beaches and diverse marine habitats. All islands have a variety of surrounding fringing, patch and barrier reefs, and there are numerous offshore reef shoals on the bank. St. Vincent and the Grenadines is highly dependent on agriculture (mainly bananas) as a main source of income. However, growth in tourism has made that industry the current highest income generator in the country. In 2002, revenue from visitor expenditure amounted to approximately E.C. \$219.46 million, while that from banana export amount to EC \$38, 918,908.57 (Culzac-Wilson 2003).

At present there is no integrated plan within which development and conservation will be pursued in either country. In many instances, development is taking place haphazardly and often without the input of relevant stakeholders. Both governmental and non-governmental organizations lack the capacity to develop an integrated framework for development. Small hotels, villas and guest houses in the Grenadines are an important component of the tourism product.

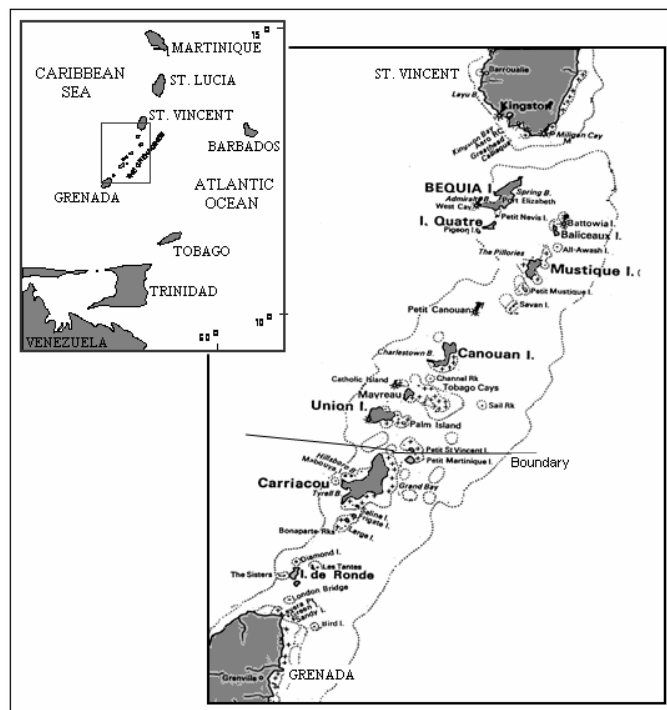


Figure 1.1: Location of the Grenadine Islands
(Adapted from Mahon et al, 2002)

1.1 Objectives

The objectives of this project are:

- To investigate the current status of environmental management practices in the accommodation sector in the Grenadine islands.
- To determine the aspects of hotel and guest house operations in the Grenadine islands that may be potentially harmful to the environment.
- To make general recommendations for sustainability within the accommodation sector in the Grenadines.

1.2 Sustainable Grenadines Project

The Sustainable Grenadines Project (SGP) is a project that focuses on the wise and sustainable use of the natural resources in the Grenadine islands. The project is currently funded by the Lighthouse Foundation and has been in existence since 2002. The goal of the project is to develop functioning participatory co-management for integrated sustainable development in the Grenadines (<http://cermes.cavehill.uwi.edu/susgrenadines>) and also to ensure that the people of the islands can gain maximum benefits, with minimal negative impacts on the natural environment. A number of stakeholders are involved in this project, including governments, NGOs and private sector organizations from Barbados, St. Vincent and Grenada. A number of mini projects and workshops have been undertaken by the Sustainable Grenadines Project and these include but are not limited to the Grenadines Water Taxi Project, the Grenadines Regatta Enhancement Project, Green Schools Programme and several training workshops in collaboration with local non-governmental organizations (NGOs) and private sector organizations. It is intended that the results of this study will be used by the SGP as the basis for a “Greening Hotels” workshop. In this workshop hotels and guest houses, local government organizations and NGOs will be brought together to develop an approach to improving the environmental practices in the accommodation sector in the Grenadines.

The natural resources in the Grenadines has allowed for the development of the more convention "sun, sand and sea" type of tourism. The Grenadines has also been able to attract investments in the high end market (Palm Island, Petit St. Vincent, Canouan, Mustique, and Bequia). However, the very fragile nature of the Grenadines islands calls for a clearly defined policy on development in the Grenadines, particularly as this relates to tourism development including development type, size of development and its long term sustainability (SVGHTA 2006). The mission of the Department of Tourism in St. Vincent and the Grenadines is *“to position SVG as a diverse, globally competitive tourism destination through effective planning, management and sustainable use of the natural resources of the country; while facilitating the preservation of cultural heritage as a vehicle for instilling national pride and foraging national identity”* (Culzac-Wilson 2003).

2 LITERATURE REVIEW

The concept of sustainable development has evolved since 1987 through the Agenda 21 Plan of Action that emerged from the UN Conference on Environment and Development (Rio 1992) and the Plan of Implementation from the World Summit on Sustainable Development (Johannesburg, 2002). Sustainable development has been defined by the World Commission on Environment and Development (1987) as “a process to meet the

needs of the present without compromising the ability of future generations to meet their own needs”. Sustainable tourism is envisaged as leading to management of all resources in such a way that economic, social, and aesthetic needs can be fulfilled while maintaining cultural integrity, essential ecological processes, biological diversity and life support systems” (World Tourism Organization 2002). There are three pillars of sustainability and 12 aims as outlined by UNEP and WTO in Figure 2.1. These three pillars are economic sustainability, environmental sustainability and social sustainability.

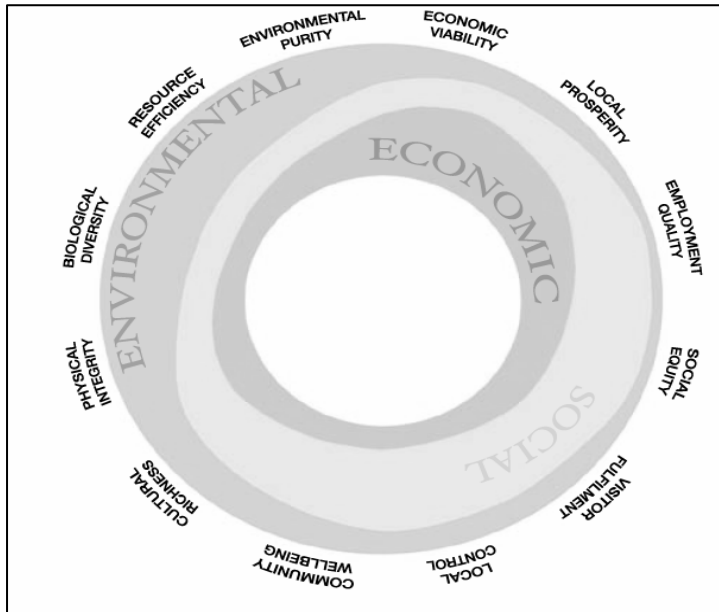


Figure 2.1: Relationship between the 12 aims and pillars of sustainability
(Source UNEP and WTO 2005)

The prominence of environmental degradation peaked at the 1992 United Nations Conference on Environment and Development (UNCED). This then resulted in Agenda 21 being formed, and being endorsed by nations, businesses and NGOs. Agenda 21 challenged governments, businesses and organizations to strive for sustainability in the environmental arena. There is now much emphasis for both governments and businesses to incorporate the principles of sustainable development into every day practices. There is a clear need for governments to take a leading role if significant progress is to be achieved in making tourism more sustainable. The tourism industry is fragmented and it is therefore difficult for any one individual to make a significant difference as a high level of co-ordination and collaborated effort is required for its success (Culzac-Wilson 2003). The tourism industry itself has the potential to be destructive in many ways including social alienation, destruction of the physical environment and destruction of wildlife, exploitation of natural resources such as water and oil and causing many types of pollution. Management of natural resources in daily hotel operations is one aspect of sustainable tourism that ought to be given greater attention. The accommodation sector is one of the most important sectors within the tourism industry, as it contributes substantially to the economic stability of the islands. However the accommodation sector if not properly managed can be a major source of environmental degradation particularly through negative effects on the coastal and marine resources (UNEP CAR/RCU undated). These can be summarized into three types of environmental impacts:

1. Excessive use of renewable and non-renewable resources including potable water, non-renewable energy, agricultural resources, pressures on wildlife.
2. Emissions of pollutants through inappropriate disposal of waste water, solid waste disposal, hazardous chemical usage and improper maintenance of boats.
3. Physical impact on the environment such as coastal erosion due to inappropriate building design, sand mining, filling of wetlands, removal of mangroves and dredging.

In order to minimize these negative effects a number of solutions may be derived from three main guiding principles:

- Eco-efficiency
- Cleaner production
- Eco-design

These principles may be achieved at the national level to address the problem of degradation of coastal resources. UNEP et al (1999) lists these efforts as:

- Development of integrated coastal zone management
- Improved land use planning and development control
- Development of environmental management tools
- Preparation of policies to deal with coastal resources use and coastal development
- Promotion of sustainable harvesting methods for some coastal resources
- Involvement of local groups and non-governmental organizations
- Rehabilitation of degraded areas

Action areas that should be addressed by the accommodation sector, according to the Caribbean Regional Training Manual on Integrated Coastal Area Management for the tourism industry include:

- Environmental policy
- Water
- Energy
- Solid waste
- Purchasing
- Wastewater
- Transport/ traffic
- Noise
- Air/emissions
- Landscape/surroundings
- Training of staff

➤ Guest communications

(UNEP *et al* 1999)

Internationally, there is a variety of agreements, policies and organizations have been developed to promote sustainable development and sustainable tourism in particular. These include the WTO Code of Ethics for Tourism 1999; The Convention on Biological Diversity, Guidelines on Biodiversity and Tourism Development, 2003; Quebec Declaration of Ecotourism, 2002 and the World Summit on Sustainable Development, Johannesburg, 2002. Within the Caribbean there have been several attempts to include sustainability in the accommodation sector of the tourism industry. These include projects such as the Small Tourism Enterprise Project (STEP) (STEP 2002) and the Environmental Audit for Sustainable Tourism (EAST) Project (USAID undated). Additionally Green Globe 21 is the global bench-marking, certification and improvement system for sustainable travel and tourism. It is based on Agenda 21 and its principles for sustainable development. Green Globe certification looks at a number of performance areas within the industry including freshwater management, waste management, hazardous chemical usage, conservation of biodiversity and community development. The Caribbean, as a region, leads the world in the number of Green Globe certified properties. Currently there are 57 certified properties in the region and 12 that are benchmarked and working towards certification (<http://www.cha-cast.com/GGproperties.html>).

2.1 The accommodation sector in St. Vincent & the Grenadines

There is no formal means by which the categories of facilities in the St. Vincent and the Grenadines accommodation sector are defined. Additionally, information regarding the accommodation categories was limited to St. Vincent and the Grenadines Hotel and Tourism Association (SVGHTA), as the Grenada Hotel and Tourism Association (GHTA) did not have any information at the time of the study in this regard. There are no set categories within St. Vincent and the Grenadine islands. Hence the SVGHTA have devised an informal means of categorizing them. The categories are based predominantly on how the owner chooses to name his facility and are as follows:

- Hotels/resorts
- Guest houses
- Apartments
- Villas

According to the SVGHTA, Bequia had a total of 20 facilities, Mustique (2), Canouan (6), Mayreau (2), Palm Island (1), PSV (1) and Union Island (9). However when the study was conducted it was found that there were many more in existence and these were as follows: Bequia (38), Mustique (2), Canouan (6), Mayreau (3), Palm Island (1), PSV (1) and Union Island (13). Of these, over half of the facilities were interviewed in each island (Appendix 1). The SVGHTA adds that a total of 8 establishments have undergone environmental walk

throughs ¹(Appendix 2) and that in the past a few training sessions have been held on the topic "*Hotel Energy & Plant Maintenance*".

3 METHODOLOGY

The study was conducted in two phases. The first stage of analysis was an initial telephone interview, which was done to test the level of interest in the greening programme as well as to investigate the level of awareness of hotel owners and managers on environmental issues (Appendix 3). Some managers and hotel owners were unavailable for telephone interviews, thus these interviews were conducted throughout the field visit in the Grenadine islands. This initial 10 question survey consisted of knowledge, attitude, perception and behavior based questions, some of which overlapped (Table 3.1).

Table 3.1: Questions for the initial survey

- **Four knowledge based questions:**
 - The present knowledge of the hotel owners/ managers on environmental practices for hotels
 - The effect of hotel operations on the environment
 - The importance of implementing these practices
 - The biggest environmental challenge facing the accommodation sector for that particular island

- **One attitude based question**
 - The willingness of the hotel owners/managers to participate in the “Greening” programme

- **Four behavior based questions**
 - The presence of an environmental policy
 - The membership of the organization
 - The attempts made to implement environmentally friendly practices
 - The presence of environmentally friendly practices

- **Four perception based questions**
 - The success rating of implementation of environmental practices
 - The extent to which hotels contribute to environmental damage
 - The perception of what the biggest environmental issue facing the accommodation sector on the island

¹ Environmental walk through is a simple rapid assessment of opportunities for improvement at small properties.

The second survey instrument (Appendix 4) was a qualitative analysis which was divided into six sections dealing with water management, energy management, waste management, hazardous chemical usage, biodiversity and community development. This survey examined predominantly the operational practices. However knowledge and perception based questions pertaining directly to performance areas were also included. This survey was administered in each of the Grenadine islands to the following numbers of establishments: Bequia (26), Mustique (2), Canouan (4), Mayreau (3), Union Island (11), Carriacou (14), Palm Island (1), Petit St. Vincent (1) and Petit Martinique (1).

There were several limitations to this study. Difficulties were encountered in determining the exact number of accommodation facilities existing in the Grenadines as there was no one document with all the information. The list of facilities was compiled from the various hotel and tourism associations, the Grenadines hotels websites, telephone directory listings, tourist magazines and local knowledge. Units were therefore added at various stages in the study. Another limitation was the time at which the study was done. July/August coincided with the period July to early November, which is usually regarded as the “off season” or the “slow season” for most accommodation facilities in the Grenadines and throughout the Caribbean. During these months many hoteliers took the opportunity to conduct personal business and to have renovations done on their properties. As a result of this, some owners and managers were not readily accessible for an interview. Environmental practices related to country laws and governance were not assessed in this report and no KAPB in depth study was carried out to investigate the environmental practices affecting the operations in the accommodation sector.

The data was sorted and entered in Microsoft Excel and the statistical analysis was performed in SPSS version 10.

4 RESULTS

A total of 85 accommodation facilities were found in the Grenadine islands (Figure 4.1). Of these, 71 accommodation facilities were available for the rapid telephone interview, while 63 facilities were available for the field interview. The analysis of the environmental practices is therefore based on these 63 facilities. It is important to note that many hoteliers and owners were not available as they were off island. Additionally, several facilities did not wish to participate in the project as they were skeptical of the purpose, despite the fact that it was explained to them. One Italian hotelier in Bequia was unavailable and the caretaker declined to participate on the owner’s behalf. It was also quite common to find one owner having several properties. So if that one owner unavailable it sometimes meant that more than one property could not be included.

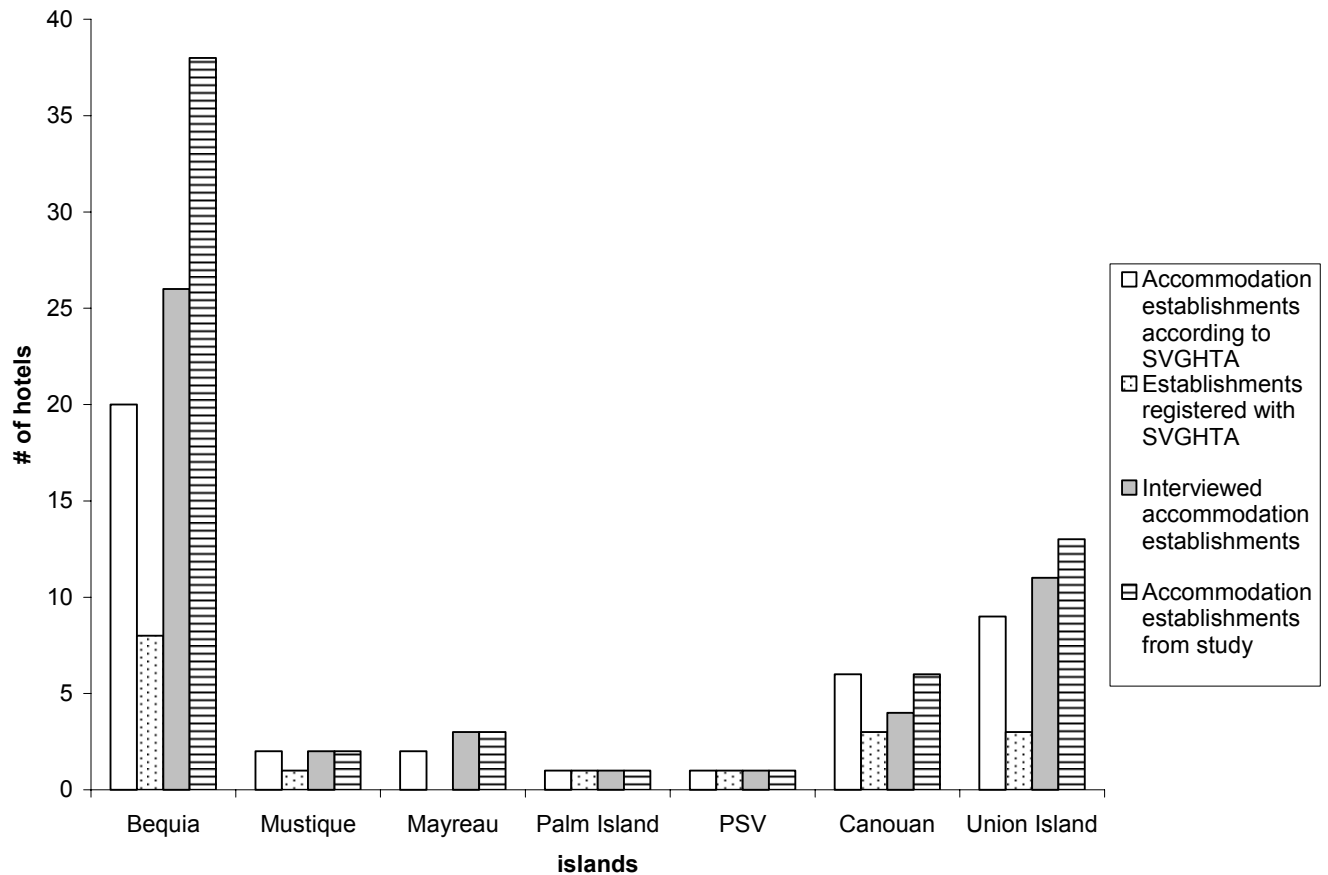


Figure 4.1: The number of accommodation facilities in the Grenadines

4.1 Initial survey

The initial survey sought to investigate the respondent's knowledge, attitude and behaviour towards environmental issues relating to the accommodation sector, the level of understanding of environmental "footprints" perceptions of the biggest environmental challenges facing the accommodation sector and interest in the "greening" process. The survey instrument was designed to also reveal areas of weak knowledge about issues relating to environmental best practices within the accommodation sector. If the findings reveal low levels of knowledge and awareness of the issue then this would indicate that current national and local strategies should be reviewed and new ones developed.

The survey results indicate that 70% of the accommodation facilities were members of various organizations while 30% did not belong to any organization. These organizations included the St. Vincent and the Grenadines Hotel and Tourism Association (SVGHTA), the Carriacou and Petit Martinique Tourism Association (CPMTA), The Leading Hotels of the World (LHW) and The Small Leading Hotels of the World (SLHW), the Bequia Tourism Association (BTA), Chaine de Rotisseurs and the Grenada Hotel and Tourism Association (GHTA). The average room number for hotels interviewed in the first and second phase surveys was 12, with the highest room number being 156 and the lowest 1. The majority of accommodation facilities (67%) fell in category A (10 rooms and under) (Figure 4.2).

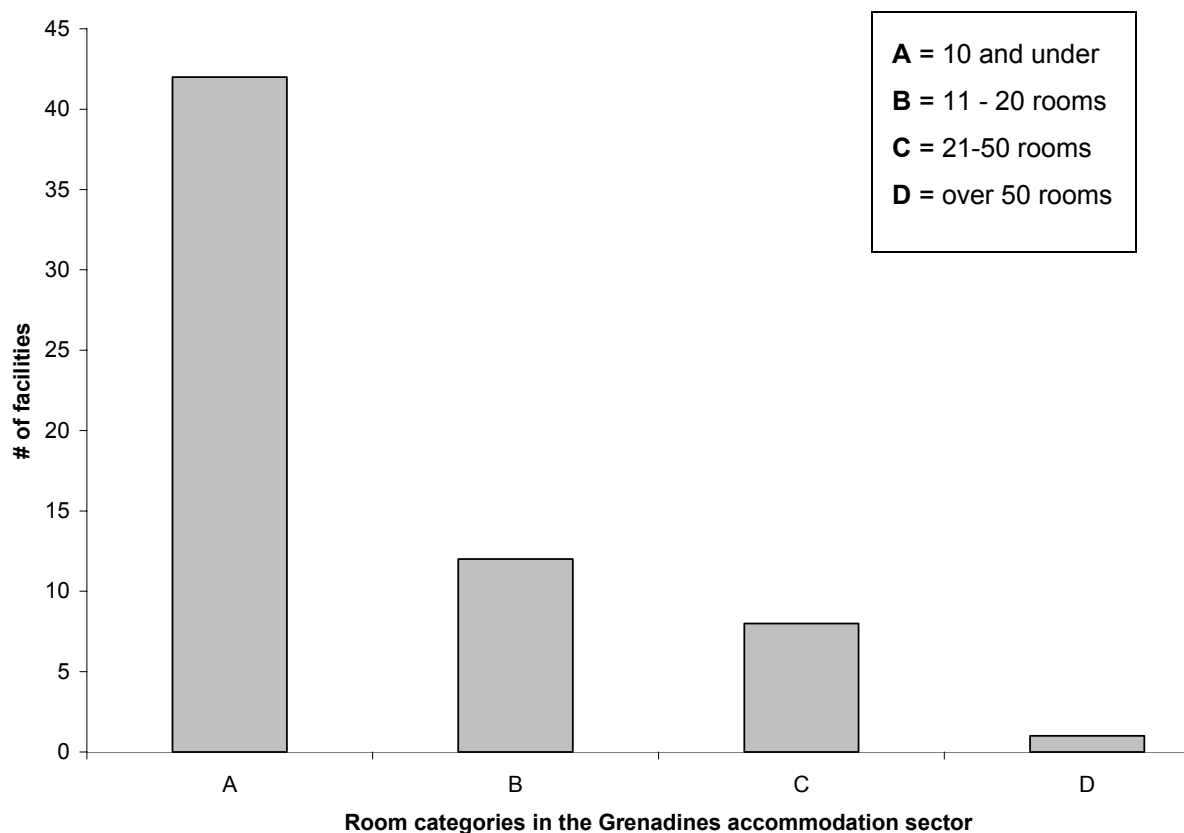


Figure 4.2: The frequency of room categories

The initial survey results revealed that 60% of the hotels claimed that they had at least heard of environmentally friendly practices for hotels, while 37% did not and 3% responded it was not applicable to them. 60.3% of the accommodation facilities had attempted at least once to implement environmental best practices. There was no significant relationship between hotel size and the implementation of environmental practices or hotel size and knowledge of environmental practices.

However when respondents were asked how they would rate the success of the implementation of these practices on a scale of 1 to 5, only 40% rated the success of their environmental practices in the higher ranges of 4 and 5. A mere 9.5% of the facilities claimed to have an environmental policy (written documentation of the facility's environmental goals and beliefs). However no copies of these policies were available, due in part to time constraints. One Carriacou hotelier claimed to have an environmental policy that was "verbal", but insisted nevertheless that it was a valid policy. There was a significant relationship between the hotel size and the presence of an environmental policy. Larger hotels were more inclined to have an environmental policy. Possible reasons for this may be that larger hotels may belong to more esteemed hotel associations that require an environmental policy.

Most facilities (81%) said that it was important or very important for hotels to implement environmentally friendly practices. The majority of the respondents selected a rating of 3 when asked to what extent they felt that hotels and accommodation facilities can contribute

to environmental degradation. The second and third most common answers were 5 and 4 with 21% and 19%. This is a strong indication that for the most part the accommodation facilities in the Grenadines are indeed aware that their actions can impact negatively on the environment. A total of 47 out of the 63 hotels interviewed (75%) expressed interest in participating in a “greening” workshop to be hosted by the Sustainable Grenadines Project. The lack of time and human resources were the main reasons that the other hotels were reluctant to participate. Most of these were also family run facilities. Despite the large percentage of respondents who claimed to know and implement best environmental practices for the accommodation sector, their latter response indicates that they may not particularly be concerned about their actions which can negatively impact on the environment. The details of their actions versus their responses will be further investigated in the study. The possible impacts of their actions on the environment will therefore also be explored.

4.2 In-depth survey

4.2.1 Fresh water management

The Grenadines are faced with several challenges. Because the islands are so small, they attract very little rainfall, have no permanent rivers or streams and due to their calciferous nature, do not support water retention (Caribbean Environmental Health Institute and UNEP 2006; Peters 2003). Approximate annual rainfall on the mainland island ranges from 1700 mm on the dry coast to 7000 mm in the wet central mountains. In contrast, the Grenadines may experience as little as 460mm per annum (Simmons and Associates, *Inc.*, 2000). Hence, there is very little surface water (Culzac-Wilson 2003). For this reason, it is vital for them to conserve their freshwater resources. All facilities interviewed obtained fresh water via harvesting rainwater year round and the majority had “stand alone systems”² (Figure 4.3).



Figure 4.3: Rainwater is harvested and stored in water tanks such as this one on Palm Island

² Stand alone systems are systems where rainwater only is harvested as the sole fresh water source

Tanks varied from overhead tanks to underground cisterns. However some of the facilities also obtained fresh water supplements from natural water wells (12.7%) and desalination plants (11.1%). One facility made use of storm water recovery on a large scale. This was a large Canouan resort. It was necessary to collect storm water in this case from an elaborate drainage system that filtered into three dams. The reason for this was to collect water for the 18-hole golf course.

Facilities that contained wells claimed emphatically that there was “more than enough water available to them all year round” and most of them did not have water saving devices installed. One hotel in Mayreau claimed that they usually donated water to those in need as their supply is so abundant. The desalination plants were found mainly on the private islands of Palm Island, Petit St. Vincent and Mustique. This may be due to the fact that desalination plants are costly to construct and maintain especially for small establishments.

One hotel in each of Union island, Canouan and Bequia was found to have a desalination plant on the property. The desalination plant in Bequia however was shared between two beach properties and was owned by the same person. One hotelier stated that the owner of this desalination plant had offered her to be a part of the desalination programme there, because of the proximity of their properties. However the desalination plant owner never followed up on this. Hence she is currently unable to share in the benefits of desalinated water. Desalination plant tanks are monitored via outer calibrations (Figure 4.4).

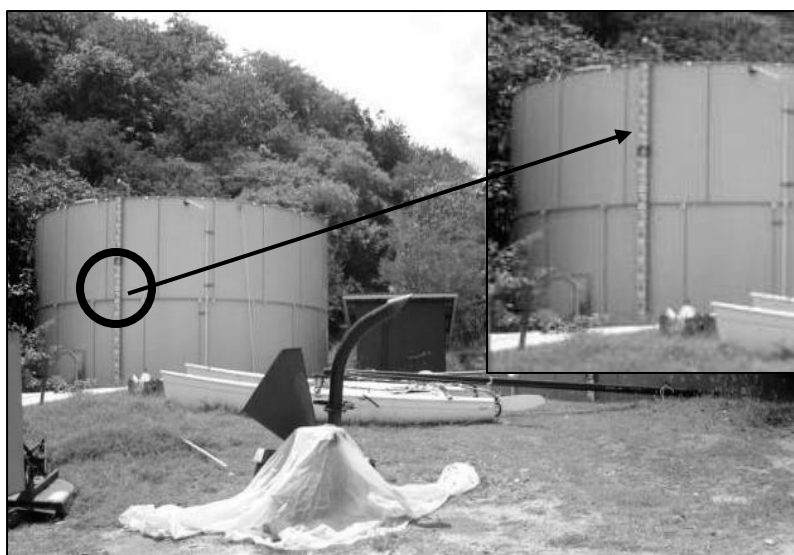


Figure 4.4: Metering of water for desalination plants

Of the 63 facilities interviewed, 52.4% had water saving devices installed on their properties. These water saving devices ranged from low flush toilets³ or low flush devices, low flow showers, low pressure valves, specialized nozzles, small holding tanks, drip irrigation systems and aerated taps. Low flush toilets (Figure 4.5) were however, by far the most common type of water saving device used for both small and large facilities,

³ Low flush toilets built after the 1990's tend to utilize less water per flush. Hence it is evident that low flush toilets, as the name suggests utilize far less water for flushing.

accounting for some 38% of the total of all the water saving devices used and utilizing about 1.6 gallons per flush (Table 4.1).



Figure 4.5: A low flush toilet with the low flush device at the top of the tank

Table 4.1: Water use for gravity style and flushometers in toilets (gpf – gallon per flush, N.C. Department of Environment and Natural Resources

Year made	Gravity Style (gpf)	Flushometer (gpf)
Pre-1977	5.0-7.0	4.5-5.0
1977-mid 90's	3.5	3.5
Mid 90's	1.6	1.6

There was no significant relationship between the use of water saving devices and hotel size. However there was a significant relationship between respondents who claimed to have implemented environmentally sound practices and those who had water saving devices. Although the majority of hotels had installed low flush devices, a few facilities utilized successfully homemade displacement devices blocks or bottles filled with sand in the tank to reduce the amount of water needed for flushing. No distinction was made between manufactured and home-made devices when analyzing the data, once the owners reported that they functioned efficiently in reducing the amount of water necessary per flush.

Various water saving programmes were utilized in the facilities, many of which overlapped. These water saving programmes were implemented in 73% of the total hotels interviewed. These included leak prevention (19.1%), water use monitoring (38.1%), linen reuse programmes (46.0%), grey water/treated black water reuse (35.0%) and metered faucets (4.8%). In addition to this many hotels opted to inform guests verbally about the need to conserve water as the islands are “water scarce”. Others chose to display signage informing the guests of the need to save water and indicating their environmental practices and programmes, such as linen reuse programmes. There was no significant relationship between hotel size and the implementation of water saving programmes. ($X^2 = 2.789$ $\alpha = .05$ $df = 3$ $P = .425$ Appendix 4). This therefore meant that small and large hotels were equally inclined to have implemented water saving programmes.

Leakage is one of the most common ways in which water can be lost. All respondents claimed that leaks and faults in the back of house, public areas, staff and outdoor facilities

were promptly reported and repaired. Hence in this way many of the properties were able to conserve water. The implementation of a preventative maintenance plan can assist greatly in preventing leakage. Only a few properties indicated that they indeed had a preventative maintenance plan in place. These were properties that had the financial and human capacity to support this type of programme. Drought resistant plants such as bougainvillea, oleander and palms were used on the majority of properties to reduce the amount of water necessary for their upkeep. In one Canouan resort, there was an 18-hole golf course which required an immense amount of water for the grounds. This therefore required that the water be obtained from storm water recovery that was collected in three dams.

4.2.2 Energy Management

For most of the respondents surveyed, air conditioning was reported to consume by far the most energy (Figure 4.6). Air conditioning guestrooms can account for up to 40% of a property's total energy consumption and costs (PA Consulting Group 2001). Guests often have the misconception that they need to keep the air conditioning units on while they are away from the room in order for it to remain cool. The majority of accommodation facilities had air condition units installed, whereas some had ceiling fans only. Others yet, had both ceiling fans and air conditioning units. Air conditioning in rooms can account for a lot of a hotel's energy consumption in hotels. Staff and management therefore need to inform guests that rooms may also be cooled via ceiling fans or natural ventilation. None of the hotels and accommodation facilities commented voluntarily on the promotion of natural ventilation in the rooms to their guests.

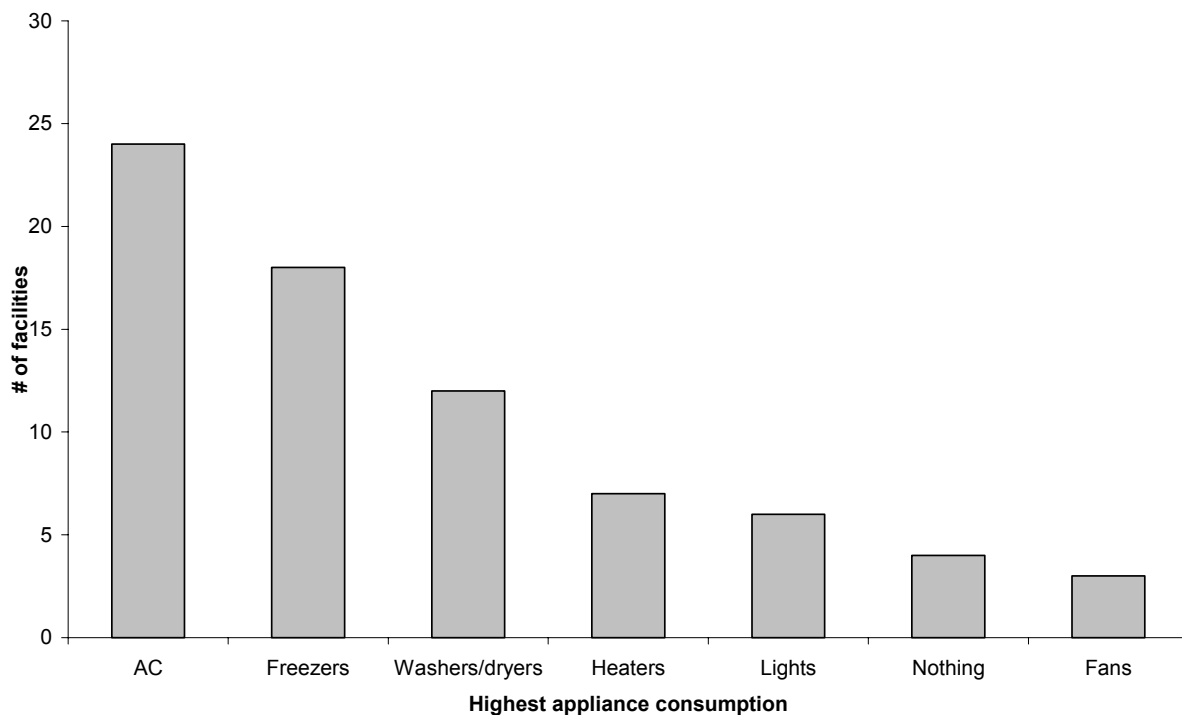


Figure 4.6: Energy consumption in the accommodation sector

57.1% of the facilities used split AC units which are generally more energy efficient than other types of air conditioning systems, while 10% used central air conditioning systems.

Some 33% did not use AC but had either ceiling or standing fans installed on the property. It is important to note that some facilities used both central and split, while others used portable AC units.

The second highest consumer of energy was the freezers and the third highest was the washers and dryers. Room appliances varied from facility to facility. The self-contained apartments contained kitchenettes while the majority of the regular guest suites did not. These kitchenettes were equipped with coffee makers, fridges, kettles, toasters and either electric or gas stove. However some regular guest suites did contain kitchen appliances, such as coffee makers and mini fridges. In addition, many of the guest rooms contained radio clocks, irons, ceiling or standing fans, hairdryers, electric shavers and televisions. The type and number of appliances has implications for the amount of energy consumed by the facility and the type of energy conservation measures that can be implemented. Signage has been placed on some properties to remind guests about the need to conserve energy by switching off appliances when the room is vacant.

Most respondents used electricity supplied by the local power company (96.8%), but a few were supplied from generators. Less than half of them (31.75%) monitor energy consumption on a regular basis or more frequently than once per month. This is an issue that needs to be addressed and can be addressed with little financial and human resources. Only 3.2 % of the respondents had sub-meters installed. Of the facilities that have generators a few depend on generator power only, whereas others have it simply as a backup power source. Those properties that utilized generators have the option of collecting and recovering the heat produced by the generators and using it to heat water for guest rooms. The majority of hotels (87%) also had areas of natural ventilation, reducing the need for artificial lighting and ventilation and therefore reducing energy consumption and energy cost. These naturally ventilated areas were mainly in the restaurants, bars and lobbies. They possessed large window and door openings which allow hot air to escape and give cross-ventilation. Some sitting areas, guest rooms and offices were also naturally ventilated. Three facilities obtained natural lighting via plastic/plexi glass roofing. This material was used for the roof as well as window panes. Various hues of green and blue were used to achieve energy efficiency as well as ambiance. The results show that 71.4% of the facilities have energy saving devices while 28.6% do not (Figure 4.7). These energy saving devices included energy saving bulbs, solar panels, motion and photo-sensors timers and fluorescent bulbs.

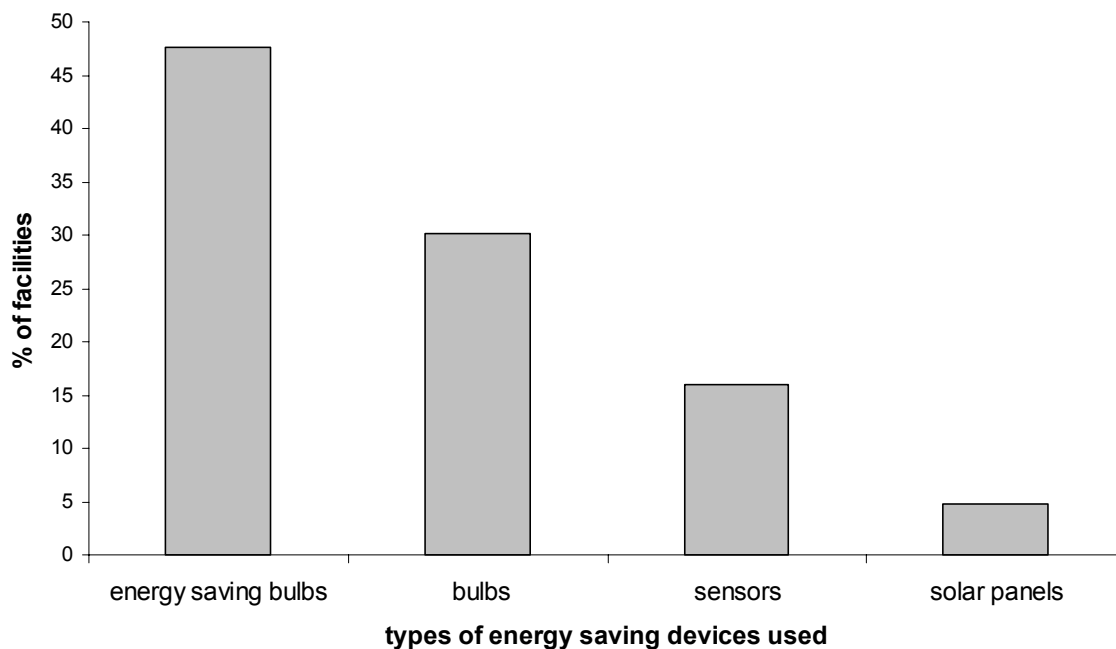


Figure 4.7: Types of energy saving devices used

Of those who reported using alternative energy or energy saving devices, 47.6% used energy saving bulbs, 30.2% used fluorescent bulbs, 4.8% used solar panels and 15.9% used sensors (Figure 4.8). These sensors ranged from motion sensors to pool pump timers. Some 27.1% used a combination of devices.

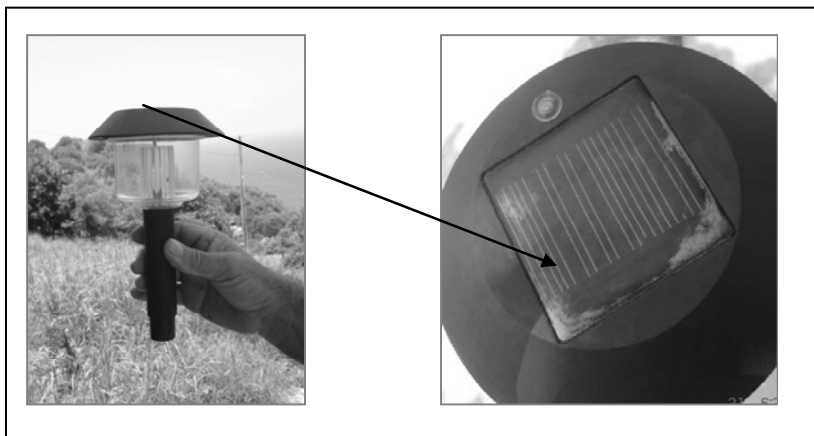


Figure 4.8: Solar lamps with solar sensor

Lighting controls accounted for 38% of the total energy saving devices utilized in these facilities. These lighting controls included photocell sensors, motion sensors, dimmers and lamps with solar sensors. Most of these were installed in the outdoor areas such as parking lots, driveways, garden and patio areas. Some hoteliers claimed to have “issues” with energy saving bulbs as they found that the color of the lighting was not particularly appealing. A total of 57 out of 63 of the respondents (90.5%) claimed that guests and staff were encouraged to switch off lights and appliances when rooms were vacated. Some facilities had notices in rooms as reminders for guests, while others preferred to give verbal

reminders. Yet still there were some who did not wish to “intrude” on the guests’ vacation by giving them verbal reminders on energy conservation. One hotel in Bequia reported that the air conditioning was sub metered and that guests who wished to utilize the air condition services were charged 75 cents US per hour. Some facilities resorted to penalties for excessive use of energy and irresponsibility on the part of the staff or the guests. In one hotel in Carriacou, the room attendants were charged when the lights and air condition units remained on in vacant rooms. In another hotel in Carriacou guests were penalized by being given fans and their air conditioning was switched off if they persisted in leaving air condition units on unnecessarily.

A few hotels expressed interest in installing solar water heaters while others did not want them as they claimed that they waste water, as the water has to be run for a long while before it is sufficiently hot at the faucet. One hotel in Carriacou was particularly interested in obtaining solar panels.

Most facilities possessed an on-site laundry (87.3%). Of these 92.1% of the laundry consisted of hotel laundry, 25.4% was guest laundry and 6.4% was any other type of laundry such as laundry from nearby yachts. This practice of doing yachters’ laundry varied from island to island. However if the majority of the laundry is hotel linen, then this means that rinse water may be utilized for washing, allowing for both energy and water conservation. Chi square tests were performed on the use of energy saving devices against facility size, environmental knowledge, environmental practice and use of water saving devices. None of these relationships was significant.

4.2.3 Waste Management

Solid waste management is provided in the Grenadine Islands of Bequia, Union Island and Canouan, Carriacou and Petit Martinique. These islands have landfills and collection systems. The other inhabited islands in St. Vincent and the Grenadines except Mayreau, are privately owned with their own system of waste disposal (Cambers undated). Solid waste management on Mayreau is expected to be linked soon with that of Union Island (Culzac-Wilson 2003). Approximately 47.6% of the facilities separate their waste while 52.4% do not. Respondents were asked to estimate total amount of waste produced daily. Larger facilities were unable to estimate amount of waste produced, so this variable was not included. It is therefore advised that hoteliers and owners seek to identify roughly at least how much waste is produced on a daily and monthly basis and also the type of waste that is produced. This can provide a basis for applying waste separation techniques, and may have applications for practices such as composting and recycling. The most common type of waste produced by the accommodation facilities were plastics and cans (54%) (Figure 4.9). In Petit St. Vincent, for example plastics (particularly water bottles) were reported as the main type of waste. The second most common type of waste was paper (30.2%), then glass and organics (28.6%) and finally yard waste and other (3.2% and 4.8% respectively). The “other” category included mainly seaweed which proved to be a major waste product specifically in the islands of Canouan and Bequia. One of the major comments from the hoteliers interviewed was that plastic water bottles are a significant contributor to the waste produced in the Grenadines. The fact that the local water supplier (Mountain Dew) did not recycle or have a return programme for small water bottles exacerbated this solid waste problem. One hotelier noted that this issue should be addressed as a mitigation strategy.

One surprising result was that only 17 respondents out of 63 claimed that organics were among the most common type of waste. This may be as a result of the fact that according to one hotelier, many guests “ate out”. A total of 40 facilities had restaurants, while 43 of them had kitchen facilities, which included anything from coffee makers and mini fridges to fully equipped kitchenettes.

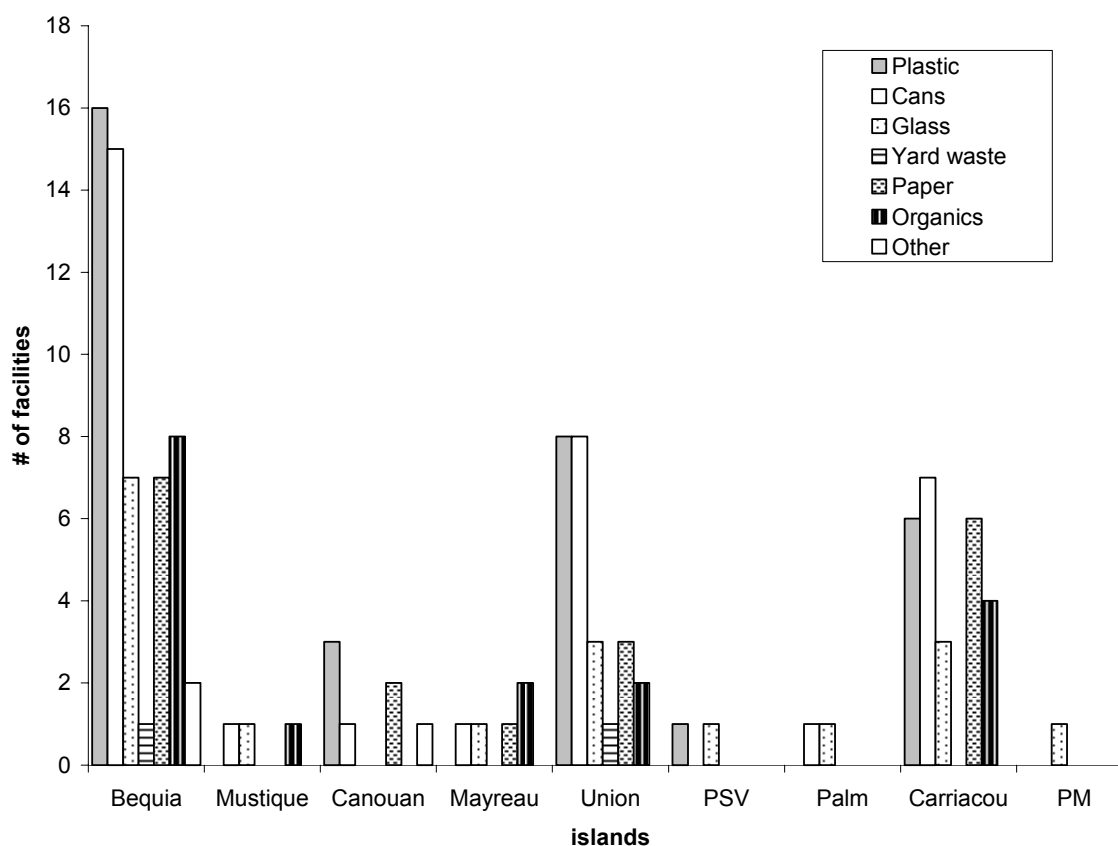


Figure 4.9: Bar chart showing most common waste types by island

There were significant differences in the type of waste produced from island to island (Figure 4.9). The private island hotels of Mustique, Palm Island and Petit St. Vincent all reported glass as a major waste type. However the two hotels in Mustique also reported organics and cans as major types of waste. In Palm Island cans were reported as a major waste type. It is important to note that waste separation takes place on Mustique (Cambers undated), as the island is run privately by the Mustique Island Company Limited and is governed by their regulations. Cans, bottles, organics and yard waste are all separated at the central garbage collection facility (Figures 4.10 and 4.11).



Figure 4.10: Cans being separated and crushed in Mustique



Figure 4.11: Coconut husk separation

Bulky and hazardous waste on all of the Grenadine Islands of St. Vincent and the Grenadines were stored separately and shipped off to St. Vincent for proper waste disposal. These items included old refrigerators, stoves, air-condition units (Figure 4.12). This process was recommended by several hoteliers to be a more environmentally sound choice as the mainland St. Vincent has facilities that are able to deal with bulky waste material.



Figure 4.12: Bulk solid waste to be shipped to St. Vincent

Respondents were questioned on the mode in which garbage was disposed of or dealt with and 73% of claimed that the regular authorities were used for garbage disposal. Others said that the garbage was sent directly to the landfill (25.4%). A smaller percentage still, claimed that they disposed of their waste by open burning (12.7%), via incineration (6.4%) or at sea (3.2%). The burning of solid waste (whether via an incinerator or open burning) is an environmental problem that should be addressed urgently on these islands. Some of the negative environmental impacts associated with the burning of garbage produced by the accommodation sector include but are not limited to the production of greenhouse gases such as sulphur dioxide, carbon dioxide and particulate matter. Other negative impacts may be experienced by animals and humans. Burning plastics produces highly toxic substances.

As a result of their high installation and maintenance costs, incinerators were less common than open burning. They were found only on the resort islands of Mustique, Palm Island and Petit St. Vincent. Hoteliers who burn their garbage do so mainly off of their properties. They were aware that smoke and other gases may affect the environment and human health and therefore took the necessary actions to reduce these negative impacts. Hoteliers were also fully aware that incinerators should be located away from the properties and also downwind. However more information on the effects of burning and alternatives to burning should be provided in the “greening” process for these establishments. Alternatives to burning include composting, reuse of items such as paper, bottles and plastics and recycling where possible.

One hotelier stated that her garbage was burnt on a private plot of land off of the hotel’s property, as she felt this was a more favorable option to burning on the property. Informal discussions with some of the respondents revealed many misconceptions regarding the impact of burning. These should be addressed during the “greening” workshop. Two facilities stated that they discarded mainly fish waste and seafood into the sea as they believed that these were biodegradable and therefore would have no negative impact on the near shore marine environment. A total of 28 facilities believed that their actions had an effect on the environment, either directly or indirectly. Hoteliers claimed that direct threats stemmed from poor practices such as disposal of garbage at sea and burning. Those who

claimed that the effects were indirect said that they stemmed from the fact that the landfills were adequately maintained.

In Bequia, many of the respondents gave reasons for the belief that they indirectly affected the environment. Some of the reasons stated were the attraction of pests to the landfill, the lack of top soil to cover the waste, no separation of harmful substances in the landfill and the burning of items such as plastics. In Mustique one hotel felt that there were no real negative impacts from their actions while the other felt that there were negative impacts. In Canouan two facilities admitted to regular burning and they saw this as having a negative effect on the environment and human health. In Mayreau, one facility said that burning of garbage may have a negative effect on the environment.

Many of the accommodation facilities claimed that they practiced recycling or reuse of materials (60.3%). Composting was practiced by 41.3%, while others reused materials (25.4%) such as glass and plastic bottles. A further 20.6% of facilities had materials recycled off property, while 6.4 % recycled on the property. Of those who composted some did so on a small scale as a backyard compost heap or in small bins while others did so on a large scale with huge composting bins (Figure 4.13). The practice of composting can be promoted within these establishments as it is possible for both small and large facilities.



Figure 4.13: Large composting bins on one of the resort island

The private islands of Petit St. Vincent, Palm Island and Mustique are prime examples of how compost is being used to nourish small-scale agricultural crops. Many properties owned and cared for small livestock such as goats, sheep, chickens and rabbits. Additionally the red footed land tortoises were common pets in many of the properties. Land tortoises are certainly an advantage to have as they are easy to care for and eat food waste from restaurants. In this way they assist in reducing the amount of waste being sent to the landfill. Properties such as Petit St. Vincent use the chicken eggs for the hotel guests and staff.

In Bequia for example, one hotelier who managed three properties stated that the glass bottles were sent to the schools for crushing and reuse. The students break the bottles and crush them to be mixed with cement and reinforced steel to make park benches. The glass

is also utilized to make patio tiles. This project that has gained popularity in Bequia and the schools have now become drop off points for unwanted bottles.

At the end of 2004 the Sandwatch group of the Bequia Community High School completed a new broken glass project. This project will take the park benches idea one step further. The Bequia Tourism Association asked them to develop the idea of using garbage to collect garbage, and they will be constructing garbage collection bins from crushed glass and cement. These bins will be located on some of the popular beaches, where the hoteliers and restaurant operators will undertake the responsibility of placing litter bags in them and having the trash taken to the landfill. This is another first for broken glass (<http://www.unesco.org/csi/smis/siv/Caribbean/svgact17-townhall4.htm>).

Materials that were reused included items such as bed and towel linen, tires, plastic and glass bottles and jars. Linen were reused as rags, tires were reused as planters, bottles and jars for were reused for the distribution and storage of food items and rum bottles were utilized for beverages such as fruit punch. In Bequia, for example the large bottled water containers were returned by the accommodation facilities. Accommodation facilities on the island co-operated in this as there was a deposit on the containers. Similarly, many of the beverage companies also recycled their glass bottles and hoteliers were charged for bottles not returned. This practice helps to support the only type of recycling that takes place in the Grenadines.

A little more than half of the respondents reported feeling satisfied with the garbage facilities on the island. The most satisfied were from the private islands of Mustique, Palm Island and Petite St. Vincent, while the least satisfied were from Canouan and Carriacou, where only one facility on each island was satisfied with the present garbage facilities. In Mayreau one hotelier said that more support from government was needed in improving the garbage collection and disposal system.

In Union Island, some of the facilities were concerned about the pest infestation associated with the garbage from the landfill. In Carriacou, the facilities had very few comments on the effect that their disposal had on the environment as they stated that garbage was regularly collected. It must however be noted, that in Union Island, the landfill is located in the center of the town, whereas in Carriacou, the landfill is located outside of the main town. In Petit Martinique, Palm Island and Petit St. Vincent, none of the interviewed facilities viewed their method of waste disposal as having any impact on the environment. Only two facilities claimed to have ever received complaints from neighbors and guests on their methods of waste disposal. In one case the problem was interference with garbage by dogs and in the other case there were complaints from residents of the hotel disposing of their garbage at sea. These facilities claimed additionally that since these complaints were made, measures had been taken to rectify the situation.

Bulk Purchasing

Forty-seven facilities (74.6%) bulk purchase, whereas 16 facilities (25.4%) do not. Most of those who purchased in bulk, purchased items such as soaps, laundry detergents and fabric softeners (Figure 4.14).

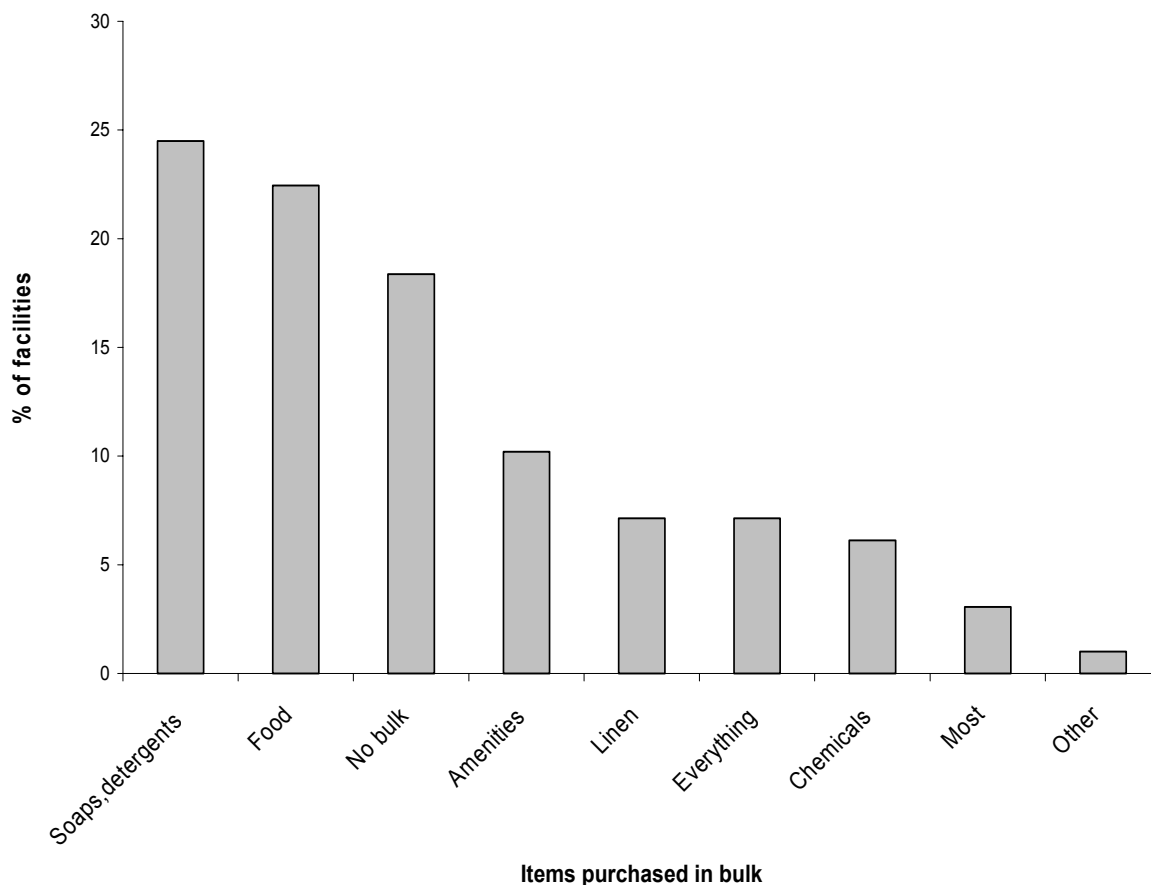


Figure 4.14: Percentage of items purchased in bulk

Those who did not purchase in bulk gave reasons such as bulk products were not readily available or there was no need to purchase in bulk or that purchasing on a needs basis was more economical for small enterprises such as theirs. Other items that were purchased in bulk included linen, food items, chemicals and room amenities.

Table 4.2: Bar chart showing percentage of bulk purchasing done by island

Island	Percentage of bulk purchased	No. of hotels
Bequia	88.5	23
Mustique*	100.0	2
Canouan	75.0	3
Mayreau	100.0	3
Union	54.5	6
PSV*	100.0	1
Palm Island*	100.0	1
Carriacou	50.0	7
Petit Martinique	100.0	1

Bulk purchasing varied greatly from facility to facility and from island to island (Table 4.2). All the facilities on the resort islands of Palm Island, Mustique and Petit St. Vincent claimed to purchase in bulk where possible. The island where facilities were least likely to

purchase in bulk was Carriacou. A statistical analysis was performed to investigate any relationships between bulk purchasing and waste separation and bulk purchasing and those who claimed to implement environmental practices. Both relationships were found to be significant ($X^2 = 7.2$ $\alpha = .05$ $df = 1$ $P = .007$ and $X^2 = 11.3$ $\alpha = .05$ $df = 2$ $P = .004$.)

4.2.4 Hazardous chemicals

Hotels and accommodation facilities generally utilize large amounts of cleaning agents and detergents for cleaning and laundry. Some use hazardous chemicals and others try to use either biodegradable or home-made chemicals. Hazardous chemicals include some types of degreasers, detergents, bleaches, household cleaners, aerosols, antifreeze, air fresheners/deodorizers, disinfectants and paint chemicals. In the Grenadine islands, 56% of the respondents use hazardous chemicals while 44% of the respondents either never or rarely used them. Of the total of 63 respondents, the majority disposed of their hazardous chemicals via the regular garbage (33.3%), while 9.5% dispose of them directly into the landfills and 7.9% stated that they collect them separately and then disposed of them personally into the landfill. In this way they were certain that the proper disposal techniques were applied. Only a few of the facilities (4.7%) said that they disposed of chemicals into the drain, while 1.6% said that they discarded them into the sea. When questioned on the type of chemicals that were thrown in the sea the respondents claimed that they were mainly paint thinners.

Resorts such as Palm Island Resort commented that hazardous chemical disposal from boat maintenance was not an issue for them as their drydock was in Carriacou. Only 55.6% of the respondents claimed to make a concerted effort to purchase environmentally friendly products while 41.2% of them did not. Additionally, 3.2% of the respondents said that they did not believe in the purchase of chemicals to begin with. Those who did not make any attempt at purchasing environmentally friendly products commented on the following:

- Lack of availability of environmentally benign products locally
- Lack of awareness of what “environmentally benign” products were available on the market
- No access to these types of products as they were viewed as “foreign goods”
- Perception that environmentally friendly products are costly

It was clear from their comments that some hoteliers recognized the effects of hazardous chemicals on the septic tanks. Of all the hazardous chemicals used, bleach was identified as being the most common. One hotelier in Mustique indicated that she used many home-made chemicals as she owned a small four-suite facility. When other hoteliers were informed that home-made chemicals can be concocted to obtain environmental and cleaning efficiency, many of them expressed an interest in obtaining these recipes. The type of chemicals used by hoteliers and owners in the accommodation facility should be studied in greater depth to identify in the use of those that can affect the near-shore marine environment. Alternatives to chemicals used and recipes for home-made chemicals may also be addressed for further greening projects.

4.2.5 Pest Management

About one third (35%) of the respondents said that they had a documented pest management system in place. This meant that on a regular basis either a private company or members of staff would spray for various types of pests such as flies, ants, and termites. Many of the facilities (82.5%) claimed to have a problem with pest infestation. The majority (60.3%) said that mosquitoes were their major cause for concern. The second most important pest concerns were flies and sand flies (26.9%). Other pest concerns were roaches (14.4%), rats (9.52%) and ants (7.9%). Other pests such as toads, gnats, centipedes and a variety of insects accounted for 7.9% of the pests. Interestingly a few properties choose to deal with pest infestation via biological control. A few hoteliers in Bequia used fish to control mosquito larvae in ponds and other areas where water collected.

4.2.6 Biodiversity conservation

The Grenadines's natural resources are under threat from a range of issues. These include habitat loss and fragmentation through deforestation for agriculture and marijuana cultivation, hunting, use of agrochemicals, invasive species and natural disasters. These therefore are perhaps also the greatest factors affecting sustainability (Culzac-Wilson 2003).

Most facilities (69.8%) have engaged in activities, at some point in time to conserve biodiversity. The most common of these are replanting of trees and beach cleanups.

In Mustique and Palm Island, natural and man-made ponds promote biodiversity conservation and raise awareness of flora and fauna on the islands. Amongst the walk-throughs that time permitted, only one invasive species was identified in a hotel in Bequia. This was the water hyacinth and it was kept in a contained area (Figure 4.15).



Figure 4.15: Pond with water hyacinth and fish”⁴

⁴ Water hyacinth is considered a highly invasive species. At this hotel it is contained in an historic water basin.

One hotel in Union Island claimed to have a turtle monitoring programme in progress, whereby in the turtle nesting season they measure and monitor the nests in conjunction with a local non-governmental organization (NGO).

One hotel in Canouan had a turtle crossing sign within the vicinity of the property to warn guests and visitors to the hotel of the land tortoises that frequent the area.

The mean rating from 1 to 5 (1 being the lowest and 5 being the highest) on how environmentally aware the guests and staff were in each island is shown in Figure 4.16.

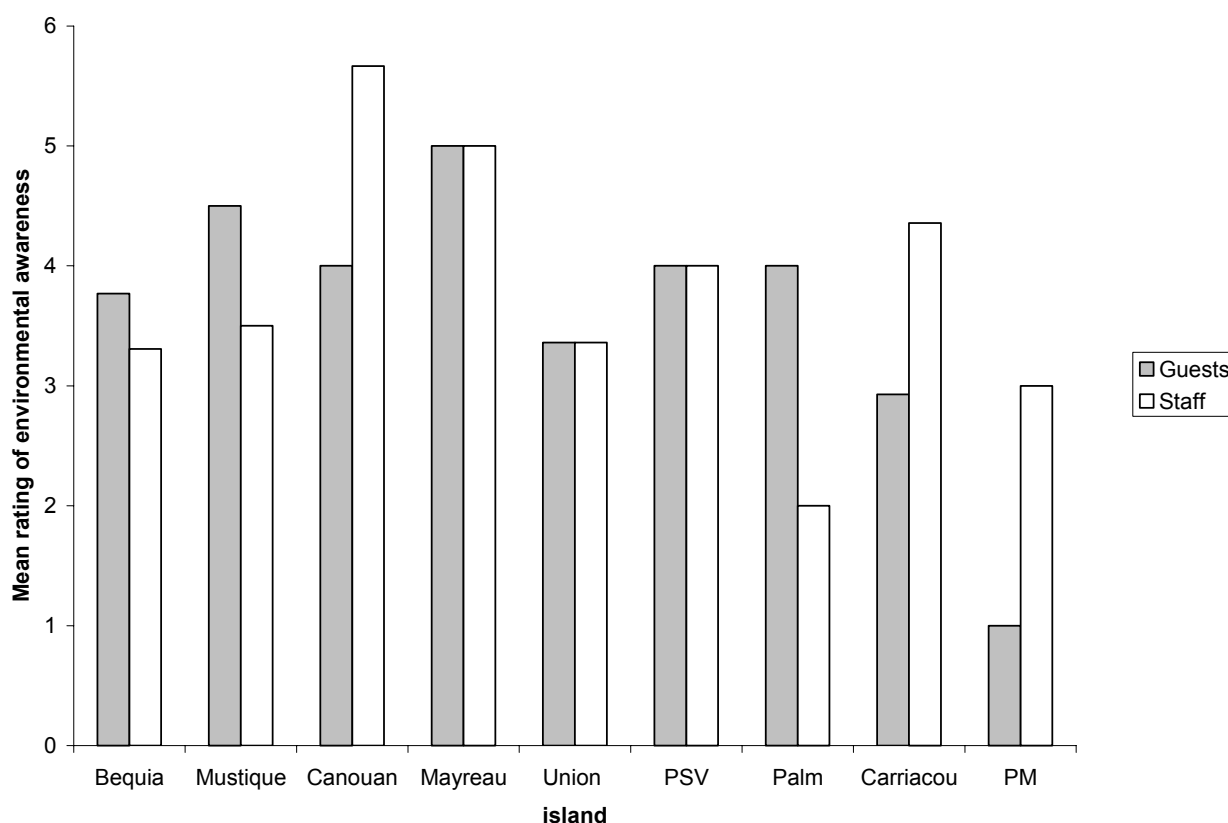


Figure 4.16: Mean rating of environmental awareness of guests and staff by island.

A total of 12 facilities said that they were in close proximity to some type of endangered species. Two species mentioned as endangered were the magnificent frigate bird (*Fregata magnificens*) and sea turtles such as the hawksbill (*Eretmochelys imbricate*) and green turtles (*Chelonia mydas*). In asking this question many hoteliers had to be given an explanation on what the term “endangered” meant and what species would be considered such. Many of the facilities nevertheless claimed to have a variety of other species in their vicinity and on their property which provided entertainment and leisure for their guests and staff. These included the iguanas, various types of doves, opossums, ramier pigeons, parrots, red legged tortoises, kiskedees, blue herons, snakes, manicou, juvenile reef fish and barracudas. In order to facilitate and encourage some of these creatures one Carriacouan hotelier opted to create a bird nesting site that appeared to be an ornament upon first sight. However closer scrutiny revealed that the ornament was indeed a bird’s nest. Practices such as these encourage and preserve biological diversity.

Respondents were asked about the type of environmentally related activities that had taken place in the past few months. Approximately 81.0% of the respondents did no coastal or inland environmental activities while 19.0% of them had done a variety of activities such as beach nourishment, sand mining, clearing of vegetation, coastal construction, 12.7% of the total respondents said that they have cleared vegetation in the recent past. Some 7.9% and 6.4% of the facilities have done beach nourishment and installed coastal engineering structures respectively, while 4.7% and 1.6% have done landfilling and alteration of the coastline. 6.4% of the properties have done construction on the coastline. In the islands of Mustique, Carriacou, Mayreau, Petit St. Vincent and Petit Martinique, none of the facilities claimed to have done any type of coastline reconstruction activities. In Union island, the majority of facilities interviewed stated that they were involved in some sort of activity. Most of these included the construction of jetties, removal of vegetation and alteration of the coastline. These activities all have effects on the environment, particularly marine and coastal ecosystems. These negative effects may include damage to coral reef and mangrove ecosystems, shoreline instability and erosion, threats to marine mammals such as turtles (Eckert and Horrocks 2002) and other marine fish.

4.2.7 Community development

All of the accommodation facilities claimed to have employed locals. Some employed 100% locals while others had only some locals. The vast majority of the respondents felt that it was very important to preserve the local culture, as was evidenced by them selecting 4 and 5 on a scale of 1 to 5 with 5 being the highest rating. 84.1% of them claimed to contribute to the local community through the following practices.

- a) **Purchase of local goods and produce:** This includes goods such as vegetables, fish and meat from local farmers and fishermen. Many of the smaller accommodation facilities claimed to get the majority of their produce in this way as it was cheaper and the fact that they were small facilities meant that small farmers would be able to supply their demands. A few of the larger resorts claimed that they would do this where possible. However there is the obvious issue of small farmers being unable to satisfy their demand.
- b) **Donations to local groups:** According to the respondents, the donations included monetary and in-kind assistance to schools, churches, sports teams. Some facilities claimed that they sponsor sports teams like basketball and cricket teams. Some of groups that have benefited from contributions and donations from accommodation facilities throughout the Grenadines, by island are:

<i>Bequia</i>	<i>Canouan</i>	<i>Palm Island</i>
Local scholarship funds	Common Entrance Scholarship Fund	Hurricane Relief Programme
Rotary Club	Movie night for villagers	Donations to local groups on Union island
Diabetics Foundation	Santa Claus for Christmas	
Sunshine school	Soccer teams	<i>Union Island</i>
Disaster Victims Fund	Basketball teams	Local groups
Bequia Museum	Community morgue	Schools
Game fishing organization		

St. Benedict's Church	Elderly home	Replanting programmes
Local community groups		Home building projects
<i>Mayreau</i>	<i>Petit St. Vincent</i>	<i>Carriacou</i>
Mayreau Educational Fund ⁵	Petit Martinique School	Carriacou Educational Fund
Local community groups	Petit Martinique Library	Local community groups
	Annual Regatta Festival	
<i>Mustique</i>	Donations to local groups	<i>Petit Martinique</i>
Mustique Library		Local groups
Local community groups		

- c) **Promotion of local art and culture:** This may occur through use of local entertainment, sale of craft items. Some accommodation facilities claim that they have local entertainers to play for guests. These however were limited to the larger hotels. Several hotels said that their décor was locally made. In Palm Island for example, the guest brochures were locally hand crafted and some of the lamp shades were made by visually impaired citizens. Similarly in Petit St. Vincent, hand crafted items were used in the rooms.

5 DISCUSSION AND CONCLUSION

The majority of the hoteliers expressed interest in the “greening” workshop proposed by SGP. One of the regional organizations to which many hotels belonged was the CHA. This therefore means that they are able to receive the benefits of CHA through the CAST programme, for example environmental toolkits. As most of the facilities have less than ten rooms, it is important to take small size into consideration when developing best environmental operating practices. Generic best practices promoted by CAST need to be tailored specifically for these small establishments, which may often have limited human, financial and technical resources. Only 40% of the establishments rated their efforts to implement best practices as successful. This therefore reflects a gap in how these practices should have been implemented. As the majority of the establishments were members of various organizations, these organizations should be approached as possible stakeholders for the “greening” process. The CHA, CAST and the SGP can work together to support environmental consciousness among the hotel members. Approximately 50% of the accommodation facilities claimed that they were knowledgeable on environmental practices within the accommodation industry. Very few hotels had an environmental policy. An environmental policy serves as the cornerstone of the organization’s environmental beliefs, goals and practices. The few hotels that claimed to have an environmental policy were found to be among the most environmentally conscious hotels.

Environmental consciousness and the implementation of environmental practices for water conservation were very high. One area in which improvement is needed is in the monitoring of water and electricity, both of which should be done on a regular basis, in order to detect leaks and faults. Most of the facilities in the Grenadines have energy saving bulbs. However some of them claimed that they had difficulty in obtaining the correct ones

⁵ The Mayreau Educational Fund was initiated by the owner of the Wind’s guest house.

from time to time. It is hoped that the government could play a significant role in reducing taxes and levies attached to the purchase of environmentally friendly equipment and products for hotels and other accommodation facilities. This will significantly impact on their readiness to support such ventures and to participate in any future environmental initiatives.

The Green Globe 21 benchmarking specifications entails the daily monitoring of utilities such as water and electricity. This practice should therefore be promoted as it is beneficial, requires little additional manpower and is not costly. The Grenadine Islands are known to be water scarce and so it is vital for all establishments to conserve water. It is recommended that information on ways in which hotels and accommodation facilities can conserve water should be provided to them. Accommodation facilities can expend some money on items such as low flow showerheads, low flush toilets, aerators on taps and laundry water reuse systems in order to conserve water. These water saving fixtures may be expensive in the short term, but offer payback within a short time-frame. One area in which improvement is needed is the monitoring and metering of water on a regular basis in order to track leaks and faults. Environmental practices such as towel and linen reuse programmes can be further promoted to reduce manpower, water, chemical usage and electricity.

Regarding the electricity conservation, there is room for much improvement. It was recognized that not all facilities would be able to afford to install expensive energy efficient equipment such as solar panels and energy management systems. However all facilities have the option and capacity to monitor electricity more often. The study found that less than half of the accommodation facilities (31.8%) monitor energy consumption regularly. This therefore means that there may be energy wastage in the interim that goes unnoticed. Additionally only 3.2 % of the respondents had sub-meters installed. Sub metering is a process that allows facilities to account for energy usage for a given area. In this way energy wastage can be identified as it is location specific. The vast majority of the facilities utilized energy saving bulbs or low energy bulbs. It is said that for every kwh saved, 1.5 pounds of carbon dioxide is also saved. Energy saving bulbs are better for use in accommodation facilities not only because they save energy, but also because they have a longer bulb life. Compact fluorescent bulbs, for example are usually rated for 10,000 hours, which means that they will last nearly seven years if used only four hours per day (as is often the case in a guest room situation) (CAST 2001). This is ten times as long as an incandescent bulb. Lower wattage bulbs also produce less heat, reducing the need for air condition use in some areas and making the area under the bulb more comfortable (CAST 2001).

A large percentage of hotels eliminated their solid waste via burning. This practice is potentially harmful to the environment and human health as burning releases harmful gases into the atmosphere. Dissatisfaction from inadequate garbage disposal was a recurrent theme throughout the accommodation facilities in the Grenadines. This indicates that there is a need to explore ways in which waste being sent to the landfill can be diverted and reduced. Ways in which waste can be reduced and reused should also be explored by the accommodation facilities. The SVG government should explore the possibility of providing incentives for recycling on the islands to minimize the amount of waste that goes to the landfill.

Hoteliers and owners should also be made more aware of the ecosystems surrounding their properties in order to appreciate the type of impacts that may arise as a result of operational practices. Information on fragile ecosystems such as mangroves, coral reef and sea grasses should be provided for the accommodation facilities. Knowledge of these ecosystems and how they survive will assist in their conservation. Some facilities can even use the natural environment to benefit their business by encouraging and informing their guests on how to protect them. More activities relating to the conservation of biodiversity and community development should be promoted in these islands as there is often low appreciation for their responsibility to the community and to the environment.

Only a little more than half of the respondents claimed to make an effort to purchase environmentally benign products. Respondents therefore need to be made aware of environmentally friendly products and clean technologies that exist and are available to them. A full environmental audit ought to be conducted as well, on the type of chemicals used and their potential impacts on the environment as chemical use is imperative for cleaning and sanitizing in the accommodation sector.

In concluding, there are many hotels and facilities that have the potential to pursue Green Globe 21 Benchmarking and Certification based on their knowledge, present structure and acclaimed hotel practices. More information could be provided for these hotels and accommodation facilities on ways in which this can be pursued. However, training on how these establishments can develop their own Environmental Management System (EMS) and action plans is recommended in the short term as this is the first step in understanding and mitigating negative impacts on the environment. There needs to be additionally strong governmental support for such ventures and for general enforcement. The development of an EMS will serve as a basis for policies on air pollution, habitat, degradation, biodiversity loss, depletion of freshwater resources and depletion of marine resources.

6 REFERENCES

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7 APPENDICES

7.1 Appendix 1: Tourist Accommodation Establishments In The Grenadines

CATEGORY	Bequia		Mustique		Canouan		Mayreau		Palm Is.		Union Is.		PSV	
	Est.	Units	Est.	Units	Est.	Units	Est.	Units	Est.	Units	Est.	Units	Est.	Units
Hotels & Resorts	8	87	2	23	2	201	1	8	1	40	5	80	1	22
Apartments	9	70	-	-	2	28	-	-	-	-	2	18	-	-
Guest Houses	3	36	-	-	2	10	1	6	-	-	2	40	-	-
Villas	NA	NA	NA	255	-	-	-		NA	NA	NA	NA	-	-
TOTALS	20	193	1	255	6	239	2	14	1	40	9	138	1	22

7.2 Appendix 2: Properties Registered With SVG-HATA

GRENADINE ISLAND	Hotels & Resorts		Apartments		Guest Houses		Villas	
	Est.	Units	Est.	Rooms	Est.	Rooms	Est.	Rooms
BEQUIA	4	39	3	24	1	7	-	-
MUSTIQUE	1	19	-	-	-	-	-	-
CANOUAN	2	201	-	-	1	6	-	-
MAYREAU	-	-	-	-	-	-	-	-
PALM ISLAND	1	40	-	-	-	-	-	-
UNION ISLAND	3	55	-	-	-	-	-	-
PETIT ST. VINCENT	1	22	-	-	-	-	-	-
TOTALS	12	376	3	44	2	13	-	-

7.3 Appendix 3: Establishments Undergone Environmental Walk-Throughs

#	ESTABLISHMENT	SVG-HATA
1	Clifton Beach Hotel – Union Island	
2	Creole Garden Hotel – Bequia	
3	De Reef Apartments – Bequia	-
4	Frangipani Hotel – Bequia	
5	Gingerbread Hotel – Bequia	
6	Island Inn Apartments – Bequia	
7	Kingsville Apartments – Bequia	
8	Palm Island Resort – Palm Island	
9	Sunny Grenadines Hotel* – Union Island	-
10	Village Apartments, The – Bequia	

* Now “Kings Landing

7.4 Appendix 4: Preliminary Survey of hoteliers in the Grenadines

Island:

Name of organization:

Name of contact person:

1) To which organizations does your hotel/ guest house/other accommodation belong?
(CHA, Small Leading Hotels etc.?)

2) Have you ever heard of environmentally friendly practices for hotels?

Yes ☐ No ☐

3) Does your hotel have an environmental policy?

Yes ☐ No ☐

4) Have you ever attempted to implement environmental best practices at your hotel?

Yes ☐ No ☐

5) If yes how successful were they on a scale of 1 to 5, with 1 as the lowest and 5 as the highest?

1 2 3 4 5

6) Are there any environmental practices currently implemented at your hotel?

Yes ☐ No ☐

7) How important do you think it is for hotels to implement environmentally friendly practices on a scale of 1 to 5, with 1 as the lowest and 5 as the highest?

1 2 3 4 5

8) To what extent do you think that hotels contribute to environmental degradation?

1 2 3 4 5

9) Would you be interested in participating in a “greening” programme for the hotel?

Yes ☐ No ☐

10) What is the biggest environmental challenge facing the accommodation sector in the Grenadines?

Further comments:

.....
.....
.....

7.5 Appendix 5: The Environmental Assessment Survey

Environmental Assessment Survey for Grenadines Accommodation sector

This survey is intended to examine the environmental practices of the accommodation sector in the Grenadine islands. Your assistance in the completion of this survey will be greatly appreciated

Hotel name:

Date:

Name of contact person:

No. of rooms:

No. of restaurants:

No. of pools:

No. of bars:

On beach:

Near beach:

Other facilities:

WATER MANAGEMENT

1. Does your facility have any water saving devices? (low flush toilets, aerated taps, flow diverters, specialized hose nozzles etc.)

Yes ☐ No ☐

If yes please specify which one/which ones and where they are located on the property

2. Are there any water saving programmes in this facility?

Yes ☐ No ☐

If yes please specify which of the following water conservation measures are taken:

Water use monitoring ☐

Leak prevention ☐

Towel or linen reuse programmes ☐

Metering Faucets ☐

Grey water reuse ☐

Other (please specify)

3. Are leaks and faults reported and repaired in the following areas at the earliest possible time?

Guest rooms ☐

Public areas ☐

Back of house ☐

Staff facilities ☐

Landscape/Outdoor facilities ☐

4. How is fresh water for the property obtained?

Cistern ☐

Harvesting Rainwater ☐

Desalination Plant ☐

Local Authorities ☐

Other

Are any of these related facilities are located on the property?

.....

5. Are the staff and management aware of the need to save water?

Yes ☐ No ☐

If yes, how were they informed?

6. Are sewage and waste water treated on the property?

Yes ☐ No ☐

How is your sewage disposed of?

Treatment plant off property ☐

In the sea ☐

Composting toilets ☐

Soak way ☐

Other ☐

7. What is your grey water/ treated black water used for?

Flushing toilets ☐

Irrigation of lawn and garden plants ☐

Grey water/treated black water is not used ☐

Other ☐

8. Does your landscaping include any of the following water conservation measures?

- Use of drought resistant native plants ☐
- Plant groupings according to their needs for water ☐
- Mulch and compost placed on garden beds ☐
- Use of drip irrigation systems ☐
- Reuse of garden trimmings and leaves for mulch ☐
- Other ☐

9. Does the landscaping include indigenous plant species?

Yes ☐ No ☐

If yes, name them

10. Is there a need to increase the amount of water conservation measures at the hotel/apt/guest house?

Yes ☐ No ☐

ENERGY MANAGEMENT

11. Where does most of your energy consumption take place?

.....

12. Which of the following facilities do your guest rooms possess?

- Toaster ☐ Gas stove ☐ Fluorescent bulbs ☐
- Television ☐ Radios/clocks ☐ Microwave ☐
- Electric stove ☐ Ceiling fans ☐

13. Are energy saving devices used on your property?

Yes ☐ No ☐

If yes which ones.....

.....

14. Is the electricity

Metered ☐

Sub metered ☐

Monitored regularly ☐

Other ☐

15. Are there any areas on the property with natural lighting and or natural ventilation?

Yes ☐ No ☐

If yes name them

16. What type of air conditioning system is used on the property?

Split unit ☐

Central air conditioning unit ☐

Other ☐

Not applicable ☐

17. Are staff and guests encouraged to switch off appliances that are not in use or when rooms are vacated? (This includes guest rooms, back of house and office areas)

Yes ☐ No ☐

18. Are any lighting controls used in the hotel/organization?

(Such as timers, occupancy sensors or photo sensors)

Yes ☐ No ☐

Please specify which ones are used.....

19. Is there a laundry located on property?

Yes ☐ No ☐

20. What does most of your laundry consist of?

.....
.....

WASTE MANAGEMENT

21. Does the organization purchase in bulk where possible?

Yes ☐ No ☐

If yes what items are purchased in bulk?

.....
.....

If no, why not?

.....

22. Does the hotel separate waste produced (eg. paper products from organics)?

Yes ☐ No ☐

23. What is the average waste produced by the organization in the “winter season” in truck loads/bags per day?

24. Which of the following waste materials are most commonly produced at your facility?

Yard waste.....

Paper

Organics

Glass

Cans

Plastics.....

Other

25. How is solid waste disposed?

Disposed of at sea ☐

Collected on a regular basis by the local authorities/other ☐

Stored until time of collection ☐

Burnt via an incinerator ☐

Other ☐

26. Do you think that your method of solid waste treatment have any possible effects on the environment and human health?

Yes ☐ No ☐

Please explain.....

27. Have you ever received any complaints from guests/neighboring villagers about your methods of waste disposal?

Yes ☐ No ☐

If yes explain

.....
.....
.....

28. Are any of the following done on the property?

Composting ☐

Recycling on property ☐

Recycling off property ☐

Re-use of materials ☐

29. Are there sufficient garbage collection facilities (such as bins and skips) for the accommodation sector on the island in your opinion?

Yes ☐ No ☐

30. Is there a documented pest management system (Terminex etc.)

Yes ☐ No ☐

HAZARDOUS CHEMICAL USAGE

31. How do you dispose of your hazardous waste materials such as bleach and cleaning chemicals used in kitchens?

In the sea ☐

In the landfill ☐

Sewage plant ☐

In the drain ☐

Hazardous waste is collected ☐

Regular garbage ☐

Other ☐

32. Are efforts being made to purchase chemicals that are environmentally friendly/benign?

Yes ☐ No ☐

From whom are these being purchased?

.....
.....

BIODIVERSITY CONSERVATION

33. What does your facility do to protect the environment?

.....
.....
.....

34. How would you rate the awareness of the guests and staff on biodiversity issues, 1 being the lowest level and 5 being the highest?

Guests: 1 2 3 4 5

Staff: 1 2 3 4 5

35. Are there any endangered/threatened species that you are aware of on the island that may frequent the surrounding environments?

Yes ☐ No ☐

If yes what species are they?

36. Have any of the following been done at the hotel in the recent past?

Clearing of vegetation ☐

Building construction on the coastline ☐

Alteration of the coastline ☐

Beach nourishment ☐

Land filling ☐

Coastal engineering structures ☐

Other ☐

37. Does the hotel experience pest infestation?

Yes ☐ No ☐

If so which ones:

Flies ☐

Ants ☐

Rats ☐

Mosquitoes ☐

Sand flies ☐

What do you do about it?

COMMUNITY DEVELOPMENT

38. Are locals employed at this accommodation facility?

Yes ☐ No ☐

What would you say is the ratio of locals to foreigners?

39. On a scale of 1 to 5, one being the lowest and five the highest, how important is it for your facility to preserve the local culture and beliefs?

1 2 3 4 5

40. Does the hotel contribute to the local community?

Yes ☐ No ☐

If yes how are any of the following practices done at the hotel?

Purchase of local goods and produce ☐

Educational awareness programmes for schools in the community ☐

Donations to local groups (sports groups etc.) ☐

Participation in joint ventures within the local community ☐

Promotion of local art and culture within the hotel ☐

Informative literature for guests on the local culture (food, dance, music etc) ☐

41. Have any of your management or staff been trained on environmental issues affecting hotel operations.

Yes ☐ No ☐

If yes, please indicate which areas and where training was received:

Sewage Treatment ☐

Proper storage and disposal of hazardous chemicals ☐.....
Waste reduction techniques such as composting ☐.....
Recycling and reuse of items ☐.....
Fresh water management ☐.....

42. Does your hotel have an Environmental Officer or a Green Team?

Yes ☐ No ☐

43. Do you have any documentation of the hotel's environmental practices, beliefs or goals?(Request copy)

Yes ☐ No ☐

7.6 Appendix 6: Photo Gallery

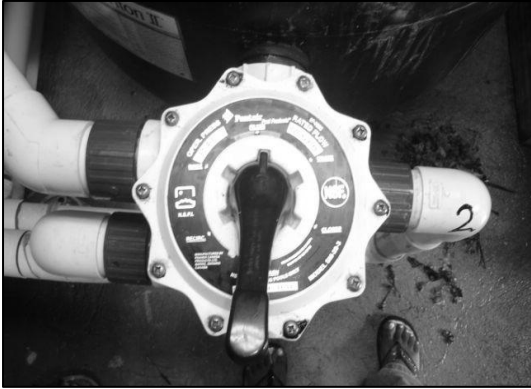


Figure 7.4: Pool pump on timer



Figure 7.4: Solar panels



Figure 7.4: Sink using wood from Manchineel tree



Figure 7.4: Turtle crossing sign in Canouan