ENVIRONMENTAL PRACTICES OF TOURISM OPERATORS IN THE DAINTREE RAINFOREST, NORTH QUEENSLAND, AUSTRALIA

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ABSTRACT

This paper reviews the environmental management practices presently adopted by accommodation providers, nature-based attractions and tour operators in Douglas Shire, North Queensland, where Wet Tropics World Heritage Area rainforest covers 80% of the Shire. Seventy-five tourism operators were surveyed in Douglas Shire by telephone, email survey or postal survey to explore their implementation of techniques for water and energy conservation; liquid and solid waste management; sustainable design; and other sustainable practices. The environmental management practices were derived from Ecotourism Australia's Nature and Ecotourism Accreditation Program (NEAP), other leading tourism associations and previous studies investigating environmental management techniques in use at tourism accommodation. The study found environmental management techniques that are both simple and cost-effective are the most common practices used by tourism operations and these environmental practices are implemented for the reason of better environmental management and to comply with environmental or World Heritage legislation. Issues identified by tourism operators as impeding the implementation of environmental management techniques were the limited collection of recyclable items within the Shire, the high cost of installing and maintaining alternative energy and water practices, and the existing environmental knowledge of some operators. Hence, this study suggests key areas where Shire Councils can assist nature tourism operators to improve their environmental practices.

Keywords: Douglas Shire, Wet Tropics World Heritage Area, nature tourism, environmental management practices, sustainability

1. Introduction

This paper presents the results of a survey of the environmental management practices in use by accommodation, tour operators and nature-based attractions in Douglas Shire, North Queensland. The primary objectives of this study were firstly, to determine the level of voluntary compliance with environmental codes of practice by tourism operations in Douglas Shire, and secondly, to examine whether current environmental codes of conduct or practice are adequate for these tourism operations. The paper evaluates the environmental management practices presently in use by 75 tourism businesses operating in the Douglas Shire. Environmental management practices for water conservation, energy use, liquid waste management and solid waste management, sustainable design and other sustainable practices were investigated in this survey of tourism operators (Carmody & Zeppel, 2004). The 'other' sustainable practices section considered purchasing practices, guest education, local employment, gardening practices, and the monitoring of native flora, fauna and feral animals. The identification of these environmental practices is useful in understanding the reasons for and against adopting voluntary environmental management practices by tourism operations in Douglas Shire and other nature-based tourism destinations. The need for protection and conservation of the natural environment through sustainable tourism operations is now a generally accepted principle. Studies of tourism impacts and moves towards sustainable tourism operations globally suggest that the tourism industry is prepared to foster environmental excellence through the adoption of best practice environmental management techniques (Pigram,

1997). In nature tourism, the term best practice readily translates and extends into 'best practice environmental management' as a means of achieving sustainable development. However, this requires radically different organisational structures and attitudes designed to bring about continuous improvement in a firm's environmental performance. The concept of sustainability within the tourism sector implies meeting current needs without impairing natural and cultural heritage systems or future opportunities for their collective use and enjoyment by visitors (Hawkes & Williams, 1993). While sustainability includes social and cultural aspects, only environmental practices are considered in this paper. This paper begins with an overview of previous environmental management practices in use at small to medium sized tourism enterprises and the proposed reasons for their implementation. The study area of Douglas Shire, including the Daintree World Heritage rainforest, is then introduced followed by the results of a survey of the environmental management practices in use by accommodation, tour operators and nature-based attractions in Douglas Shire .

2. Environmental Management Practices

Tourism can act as a vehicle for promoting environmentally and socially responsible attitudes and behaviour (Hawkes & Williams, 1993). Environmental excellence is fostered by enlightened management practices which incorporate new, cleaner technologies, and an emphasis on resource conservation, recycling, reuse and recovery, in progressing towards sustainability in tourism (Green Globe 21, 2004; Pigram, 2000). The recent development of environmental tourism certification programs (e.g. Green Globe) and the advent of 'codes of conduct' and 'codes of practice' for various tourism operations in particularly sensitive areas support this. Tourism businesses also have an incentive to undertake voluntary environmental protection in order to enhance tourism experiences for increasingly environmentally aware tourists (Huybers & Bennett, 2002). The nature-based resource presented to the tourist is often the unique attraction of that tourism business with protection of the natural, social and cultural environments now a part of holistic community approaches to achieving sustainable tourism destinations (De Lacy, Battig, Moore & Noakes, 2002).

Previous research on environmental management techniques and the sustainability of tourism operations has considered a range of environmental practices, often broadly cited under the headings of waste management, energy management, recycling behaviour, and water conservation. These environmental techniques have been reviewed for small to medium tourism businesses in Queensland (Geno, Dunn & Richins, 2002), in family owned rural tourism operations located in Western Australia (Carlsen, Getz & Ali-Knight, 1998), from the visitor's perspective at ecotourism accommodation (Lee, 2002), and from the manager's perspective in Australian hotels (Wei & Ruys, 1999), at Gold Coast accommodation (Buckley & Araujo, 1997) and in backpacker hostels (Firth & Hing, 1999). Further investigations by Carlsen *et al.* (2001: 207) resulted in the finding that "the simplest environmental improvement programs, and those with the greatest obvious financial return, are more likely to be undertaken than more complex measures whose benefits are hard to quantify". Hence it appears that easy to implement and economically viable environmental management practices and those that suit a tourism operator's lifestyle are mostly implemented. However, Firth and Hing's (1999) examination of the implementation of eco-friendly practices at Byron Bay backpacker hostels indicated managers felt existing green products and energy efficient appliances are too expensive compared to other alternatives. Buckley and Araujo (1997) suggested environmental performance improvements have been adopted principally to cut costs and secondarily to increase gross revenues by targeting environmentally concerned customers.

Whiley and Carter (2002) and Tzschentke, Kirk and Lynch (2004) investigated the reasons for the adoption of environmental management practices in the tourism industry. Tzschentke *et al.* (2004: 118) found the owner-managers of small serviced accommodation establishments of Scotland primarily adopted sustainable measures to be economical, supporting the idea of "reducing costs by increasing levels of operational efficiency". Social responsibility or ethics were also a prime reason behind the adoption of sustainable practices, albeit "the responsible thing to do". However, the research showed the use of energy saving devices was implemented due to the inability to exert control over a guest's use of energy. Middleton and Hawkins (1998: 199) suggest small scale tourism firms tend to adopt a green approach for one or more of the following reasons: "complying with laws or regulations; complying with procurement policies of other firms in the product supply chain; the desire to avoid negative public relations and to act as "good neighbours"; achieving a competitive advantage; reducing operating costs; conserving assets and resources; meeting association membership criteria; and/or meeting customer demands and expectations". When considering the dynamics of the tourism industry, Carter, Whiley and Knight (2004) deem voluntary approaches to environmental management practices as more appropriate for small businesses than command-and-control mechanisms due to legislative and policy complications and the small but cumulative nature of tourism impacts from this size of business. Likewise, Vernon, Essex, Pinder and Curry (2003) indicate many of these smaller tourism operations tend to have a limited understanding of their individual and collective impacts on the environment, and where environmental measures had been implemented, financial and altruistic factors were important considerations in adopting environmental best practice.

Compliance with environmental legislation is often a key reason for adopting best practice environmental measures, particularly for tourism operators in World Heritage areas. However, Carter *et al.* (2004: 55) posits that the adoption of environmental best practices can be summarised as motives driven by either economic desires or ethics: "Ethically driven and resource-independent tourist operations possibly respond more to community environmental values than those held internally. They react to perceived demand as a result of community values and, will express their adopted environmental ethic through addressing waste, energy and water issues". Stoeckl (2004: 146) who reviewed the literature pertaining to the benefits and costs of environmental self-regulation postulates that smaller firms in particular "will view environmental programs which have certain upfront costs and uncertain future benefits less favourably". She recognises there are certain barriers to innovation such as lacking awareness of the private benefits of environmental programs, and more likely there is a lack of resources (time, labour, capital, expertise or cash flow) to implement environmental measures. Similarly, Whiley and Carter (2002) reveal that while economic concerns are significant factors, perception and knowledge of environmental best practice are critical determinants to the adoption of such applications.

There are a number of tourism, environmental and government agencies globally and within Australia that have recommended various best practice environmental management techniques for the sustainable development of the tourism industry (e.g. Ecotourism Australia, Tourism Queensland, Sustainable Tourism CRC, Green Globe) as well as various practitioners who can recommend best environmental management practices for cost effectiveness, energy efficiency, building design and location (Gardner, 2001; Mehta *et al*, 2002). To ensure harmony between tourism development and environmental protection, a holistic approach to ecologically and socially conscious planning and site design, design of infrastructure and landscaping, is necessary (De Lacy,

Battig, Moore & Noakes, 2002). The appropriate design of infrastructure and associated environmental management approaches contribute to impact minimisation. The accommodation and facilities of a nature-based tourism operation are an integral part of the guest's nature tourism experience. These aspects should be harmonious with the cultural and natural landscape of the environment (Gardner, 2001). Buildings designed on ecological principles will have shape and colour in harmony with the natural surrounds and consideration should be given to the capacity to store energy and protect from weather extremes. A good building design will use minimum energy, produce minimal waste and cause minimal site disturbance (Cock & Pfueller, 2000) and energy generated by solar, wind and water sources will provide ecological and economic benefits to the operator and the environment. Methods of minimising water use and recycling water along with reducing, reusing and recycling waste are also necessary to reduce the impacts of tourism on the natural environment. Another aspect of sustainable buildings is the energy and resource costs to build these facilities (Stoeckl, 2004)

Table 1 offers sustainable alternative options for energy, water and waste management, sustainable design and sustainable practices that are often suggested or adopted for the future sustainability of tourism businesses. The environmental management practices were derived from Ecotourism Australia's Nature and Ecotourism Accreditation Program (NEAP), other leading tourism associations and previous studies investigating environmental management techniques in use at accommodation establishments (Buckley & Araujo, 1997; Carlsen, Getz & Ali-Knight, 1998; Firth & Hing, 2001). There are various environmental management practices recommended for different tourism sectors, however the appropriateness of these to the specific location needs to be considered at various tourism destinations. Appropriate materials and technologies suitable for the climatic and geophysical conditions of an area will dictate the most economical, effective and environmentally friendly techniques to be implemented by tourism operators.

Table 1: Environmental Management Practices

Environmental Concerns	Environmental Management Practices
Water Conservation	Dual flush toilets Low flow shower heads Rainwater collection tanks Tap aerators Drip system for garden irrigation Provision of showers only Reverse osmosis supply Roof collection Filtration trenches
Energy Management	Solar power Solar hot water system Wind turbines Cogeneration Hydroelectric power Energy efficient light bulbs Diesel or ethanol blend fuel Ceiling fans only (no air conditioning) Passive & active geothermal or tidal
Liquid Waste Management	Sewage treated for reuse Reuse or recycle grey water Composting toilets
Solid Waste Management	Separate recyclable waste (guests) Compost organic matter Purchase goods in bulk Purchase goods in recyclable packaging Actively practice "reduce, reuse, recycle" Biological treatment Greenhouse filtration Commercial collection of raw materials (glass, aluminium, paper and cardboard)
Sustainable Design	Benefit use of natural light Benefit use of natural ventilation Landscaping reflects natural environment Locally sourced building materials Recycled building materials Exterior colours & materials to suit environment
Sustainable Practices	Purchase local goods and services Grown own fruit & vegetables Practice permaculture Practice organic gardening Regularly mulch gardens Monitor native flora & fauna Monitor feral pests Guests in conservation initiatives Employ local residents or involved with local community Non-chemical cleaning products Bio-degradable cleaning products Voluntary land conservation agreements

Sources: Boele (1996); Buckley & Araujo (1997); Ecotourism Australia (2000); Firth & Hing (1999); Mehta, Baez & O'Loughlin (2002)

2.1 Douglas Shire, North Queensland

The Douglas Shire is a small rural region on the coastline of northeast Queensland extending from Ellis Beach north of Cairns to Bloomfield River and is unique in its locality to the Great Barrier Reef Marine Park and the Wet Tropics World Heritage Areas. The Douglas Shire covers 2,477 square kilometres of land and another 5,550 square kilometres at sea. Over 80% of the Shire is protected by World Heritage status and includes the popular tourist destinations of Port Douglas, Cape Tribulation and Daintree National Park. Much of the shire is occupied by the Wet Tropics World Heritage listed rainforests. Douglas Shire has a population of over 11,000 people and presently accommodates approximately one million visitors a year. As well, the shire is home to one of the oldest intact surviving Indigenous communities in the world – the Kuku Yalanji. In 1999, revenue from tourism accommodation alone in Douglas Shire amounted to $60.46 million (Douglas Shire Council, 2004). Significant areas of habitat conservation are found on private freehold land in Douglas Shire. In total, approximately 363 hectares are under voluntary land agreements (e.g. Nature Refuge, Land for Wildlife), which is equivalent to 14.65% of the Douglas Shire's land area (Carmody & Zeppel, 2004). It should be noted here that north of the Daintree River to Bloomfield River in Douglas Shire, where much of the Daintree Wet Tropics rainforests are located, residents and businesses are without town water or connection to the state electricity grid and rely on diesel generators or alternative energy (e.g. solar power, hydropower) and water (e.g. gravity fed, rainwater collection) systems.

In October 2001, Douglas Shire Council (DSC) became the first Green Globe Benchmarked community in the Asia Pacific, and now has a commitment to sustainable development (Christopher, 2001). There are now five Green Globe communities in Australia/New Zealand (Douglas SC; Redland SC; Surf Coast SC; Freycinet Coles Bay-Glamorgan Spring Bay Council; Kaikoura DC) (Green Globe, 2006a). To be a successfully benchmarked Green Globe community, there must be evidence of continual achievement of performance indicators (Green Globe, 2006b) and the establishment of an environmental and social sustainability strategy. In order to achieve this, the *Douglas Shire Sustainable Futures Draft Strategy* (DSC, 2001) was compiled with the overriding objectives of protecting areas of high ecological value, fostering a sustainable economy mainly based on nature tourism and the maintenance of the cultural, economic, physical and social wellbeing of the community. Within this DSC strategy, tourism operators will be encouraged to link conservation into their daily business practices and use codes of practice to lead to eco-certification.

3. Methodology

Tourism accommodation providers, tour operators and nature-based attractions located or operating within the Douglas Shire was identified from member listings on websites of the three local tourism associations of the area. These were the Port Douglas Daintree Tourism Association (PDDTA), Daintree Village Tourism Association (DVTA) and the Daintree Cape Tribulation Tourism Association (DCTTA). In addition, the Ecotourism Australia (EA) website was reviewed for any certified ecotourism operators located in the Douglas Shire. In total, 176 tourism operators were originally identified in the Douglas Shire from these local tourism associations, comprising of 108 accommodation providers, 59 tour operators and 9 nature-based attractions. All of the identified tourism businesses were first telephoned from the 5th to the 17th of January 2004, and asked if they would participate in a survey about environmental practices of their business. This initial point of communication resulted in 55 tourism businesses completing the survey over the telephone. Where the timing was not convenient, the survey was emailed, faxed or posted to the respondent in the first two weeks of January 2004 according to their personal preference. 167 tourism operators in

Douglas Shire were sent a survey by email or post asking about their environmental practices. Both ecotourism certified and non-certified tourism businesses were included in the study. This method of first telephoning the tourism businesses first and giving the options of completing the survey by telephone immediately, or alternatively sending the survey by fax or email on the same day as the telephone call resulted in a better than average response rate.

In total, 75 businesses completed and returned the *Douglas Shire Environmental Tourism Practices Survey*, resulting in a response rate of 44%. The tourism businesses that responded to the survey comprised of 49 tourism accommodation providers, 21 tour operations and 5 nature-based attractions. These were mainly small to medium tourism enterprises, typical of those in the Shire. The owner/operators or managers of the tourism business were the most likely to complete the survey. The survey responses were coded and entered into a statistical analysis program, during February 2004. The data analysis employed descriptive and cross-tabulation methods.

The *Douglas Shire Environmental Tourism Practices Survey* consisted of an introductory page that explained the purpose of the research and four pages containing three sections of questions. Section A of the survey pertained to background information about the tourism operation; Section B related to environmental or business certification of the tourism operation; and Section C sought information about environmental management techniques in use at the tourism business and future intentions to carry out any of the specified techniques within the next twelve months. As well, respondents were given ample space to freely comment on any of the environmental management techniques listed and to provide any further comments about environmental practices of tourism operators or the sustainable use of natural resources in Douglas Shire. All survey responses remained anonymous. The results presented here focus on the environmental management practices in use at 75 tourism operations located in Douglas Shire.

4. Results

A total of 75 respondents completed the *Douglas Shire Environmental Tourism Practices Survey* during January to February 2004. The types of tourism businesses responding to the survey were accommodation providers (65%, n=49), tour operators (28%, n=21) and nature-based attractions (7%, n=5). The accommodation providers were predominantly self-contained apartments (17), 4-5 star hotel/ resorts (13), bed and breakfast accommodation (8), and caravan and camping parks (5). The tour operators who responded to the survey comprised of 'rainforest tour operators' (9), 'reef tour operators' (6), 'river tour operators' (5) and 'estuary operators' (1). The majority of tourism businesses had been operating for between one (1) and five (5) years. Almost 60% of the tourism businesses have been operating for less than ten years in Douglas Shire.

The most popular activities offered to guests at their accommodation, attraction or day tour were bird watching (58.7%), swimming (54.7%), wildlife viewing (52.0%) and guided nature tours (42.7%). Tree planting (2.7%) and canoeing/ kayaking (9.3%) were the least popular activities offered to guests by a tourism operation. 'Other' activities (12.0%) offered by the tourism business included rainforest interpretation, river cruises, estuary interpretation and fruit tasting. The majority of activities for tourists are held on private freehold land (61.3%), Wet Tropics World Heritage Area land (22.7%) and National Park (18.7%). A further 17.3% cited 'other land' areas and these include predominantly the Great Barrier Reef Marine Park, and the Daintree River. Only 12.0% of

respondents stated that their activities were conducted on Douglas Shire Council land. The survey indicated three 'Land for Wildlife' and three 'Nature Refuge' properties hosted nature-based tourism activities on their property predominantly for native wildlife viewing, bird watching, swimming, and bush walking and guided nature tours.

Over 45% of the survey participants expressed their support for groups concerned with environmental or conservation objectives, with respondents demonstrating stronger support (86.0%) for local conservation organisations and nature-based attractions. Of interest is the marketing support for eco-accredited tourism operations, with accommodation providers (14.4%) recommending eco-certified businesses to their guests. For example, the Daintree Discovery Centre, Rainforest Habitat, Cooper Creek Wilderness, and local conservation organisations such as the Low Isles Preservation Society and Daintree Rainforest Foundation, were strongly supported (i.e. financial, marketing) by tourism businesses in Douglas Shire.

Fourteen of the tourism businesses surveyed had attained ecotourism certification from the Nature and Ecotourism Accreditation Program (NEAP) and two businesses were in the process of attaining NEAP certification from Ecotourism Australia. Respondents who did not have ecotourism certification thought it was 'not considered beneficial or necessary for their operation' (42.6%) or they indicated a 'lack of knowledge of ecotourism certification' (24.6%). Further analysis indicated accommodation operations were the predominant group to cite the above reasons for not pursuing ecotourism certification. Some respondents had adopted environmental guidelines (65%) or codes of practice (33.3%) developed by the Queensland Parks and Wildlife Service, Douglas Shire Council or the Environmental Protection Agency for the predominant reasons of 'better environmental management' (58.1%) and to 'comply with legislation' (29.0%). These results align with the writings of Carter *et al.* (2004) who confirm that although legislation and economic considerations often drive the adoption of environmental management practices, the existence of an individual's environmental ethic also influences the move to competitive sustainable operations. The present study also posits that voluntary adoption of environmental best practice measures is underpinned by personal environmental ethics of operators.

4.1 Environmental Management Techniques In Use

Tourism operators were asked to indicate if they did, did not or intended to implement environmental management techniques for water conservation, energy use, liquid waste management, waste management, sustainable design and other sustainable practices. The operators also made other comments regarding environmental practices or the sustainable use of natural resources by tourism businesses in Douglas Shire.

4.1.1 Water Conservation

Dual flush toilets were the most common technique in use by 78% of the survey respondents, followed by low-flow shower heads (44.6%), and the provision of showers only (44.6%). 'Other' techniques (8.0%) used included reef tour operators using water desalinators and accommodation businesses using gravity-fed water from creeks and springs, and water efficient washing machines. These results are illustrated in Figure 1. Comments regarding water management conservation indicated the use of "rainwater collection tanks for drinking" and that consideration be given by

"local and state governments to encourage rainwater collection and solar hot water by economic rebates".

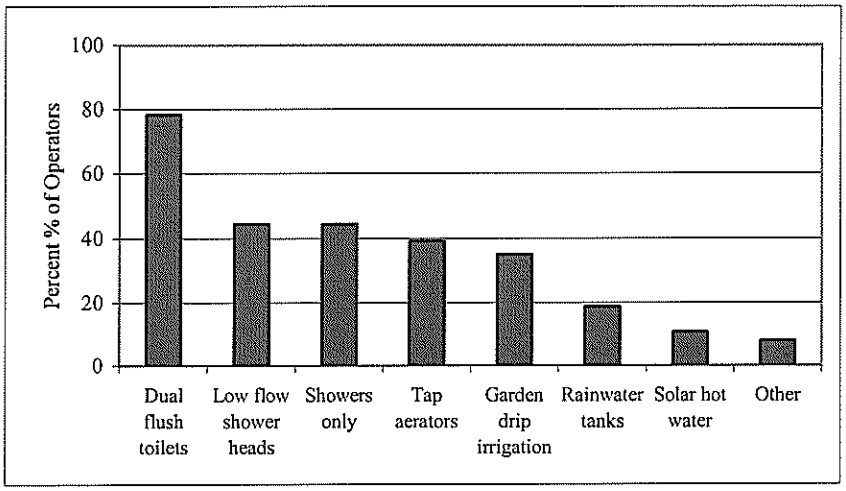

Figure 1: Water Management Techniques

4.1.2 Energy Use Management

Energy efficient light bulbs are a simple but effective technique to reduce energy consumption. Over 65% of the respondents indicated they already have these installed at their tourism business, predominantly accommodation operations. The use of diesel or ethanol blend fuels by 35% of tourism businesses was equally split between accommodation providers and tour operators. Solar power was used by 17.6% of the respondents. Wind turbines (1.4%) and hydroelectric power (6.8%) were the least used energy management techniques. Cogeneration, a method of energy production through the combination of heat and water, was not used by any of the tourism businesses surveyed. Comments received from tourism businesses regarding energy use management techniques indicated the "use of hydroelectric power, generators and some solar panels is not effective" and "alternative energy is unreliable, inefficient, and expensive". However, one accommodation provider proposed "solar power could be encouraged by rebates if [you] can sell excess power back to the grid". The lack of access to mains power and the use of generators north of the Daintree River led one business to state that "two million litres of fuel per year is taken over the Daintree River to run generators, we need something more energy efficient and environmentally friendly".

4.1.3 Liquid Waste Management

Only a small percentage of tourism businesses in the Douglas Shire used any type of liquid waste management technique. 18.9% of the respondents actively participated in the reuse of grey water (for example waste water from washing machines), and 16% of respondents had the required facilities installed for the treatment of sewage for effluent irrigation. The majority of these are accommodation providers. The use of composting toilets (4.1%) by tourism businesses was

minimal, with only one operator each from the accommodation, nature-based attraction and tour operator sectors indicating the use of this technique. Comments directed at liquid waste management techniques emphasised concern with "no pump out collection station or storage facilities on shore at the marina" in Port Douglas for reef tour operators and this leads to "sewage dumping in the shipping channel" as per the Great Barrier Reef Marine Park Authority (GBRMPA) guidelines. These types of comments by environmentally aware tourism operators highlight barriers to the implementation of some environmental best practice techniques.

4.1.4 Solid Waste Management

Simple, effective and reasonably easy to implement techniques were listed for waste management practices, as shown in Figure 2. A high response rate was received for 'purchasing goods in bulk' (83.8%), however this was often indicated with a 'where possible' statement. A high level of awareness of the slogan 'reduce, reuse, recycle' (71.6%) was indicated and the practice of 'separating recyclables' (62.2%) and 'purchasing goods in recyclable packaging' (62.2%) also rated highly. 'Composting organic material' (43.2%) was the least used technique by tourism businesses. This was due to a lack of space, a lack of time for gardening and the mere presence of a compost bin with potential odours in self-contained accommodations. 'Other' techniques included the use of eco-friendly cleaning products by accommodation providers and the use of 'Enjo' cloths for cleaning by a river cruise operator that require no cleaning agents with their use.

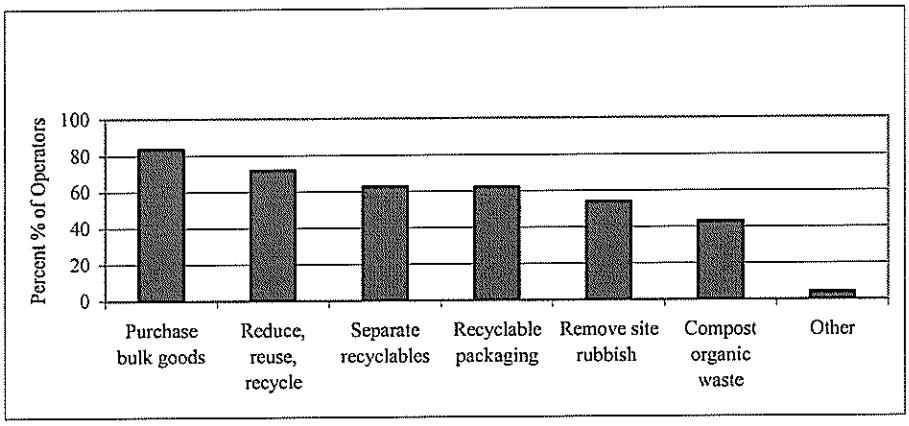

Figure 2: Waste Management Techniques

4.1.5 Sustainable Design

Investigations into sustainable design principles showed 74% of tourism businesses in Douglas Shire used natural light in their design and their landscaping reflected the surrounding natural environment. The use of natural ventilation (71.6%) also rated highly. Only 45.9% of respondents had used 'locally sourced building materials' and 14.9% indicated the use of 'recycled building materials' in the construction of the facility. These two results may be attributed to either a lack of knowledge of the construction of the facility if the respondent was not the initial operator or, in the case of the use of recycled materials, this may be attributed to building codes for new developments (for example, self-contained apartments). Additional comments received from respondents regarding sustainable design or landscaping were encouraging with one tourism business stating

they had "planted over 500 native trees around their property" and others stating they had "reclaimed a weed infested area on their property and replanted with natives", "applied for a grant for replanting" and "natural reclamation by the rainforest is a perfect way of revegetating with correct species". Sustainable design and tree planting minimise energy costs for temperature control of buildings. Tree planting with rainforest species also maintains biodiversity and ecological health of the site.

4.1.6 Other Sustainable Practices

Other sustainable practices investigated included purchasing practices, local employment, community involvement, gardening practices and flora, fauna and feral pest monitoring. Figure 3 indicates the majority of respondents do 'purchase local goods and services' (94.6%), they do 'employ local residents' (85.1%) and they do 'report any environmental changes to the relevant authorities' if necessary (77.0%). 'Educating guests about conservation and sustainable practices', 'monitoring native wildlife for changes or impacts' and 'monitoring feral weeds or animals for impacts' was also highly rated by 68.9% of respondents for each of these sustainable practices. Practices such as 'organic gardening' (29.7%), 'grow your own fruit and vegetables for guest consumption' (25.7%), 'involve guests in conservation initiatives' (17.6%), and 'permaculture' (9.5%) were less supported sustainable techniques. Many operators stated there was limited time and property space to undertake these types of activities. Other sustainable practices indicated were the use of "biodegradable cleaning products", "no chemical sprays" and "changed to non-toxic cleaning products to reduce our chemical consumption". The use of recycled paper for printed matter was also highlighted by a number of tourism businesses participating in the study. Other comments received from tourism businesses regarding sustainability indicated a feeling of dismay when reporting environmental changes to the relevant authorities as previous communications had resulted in no follow-up actions from the regulatory bodies. For example, the proliferation of feral pigs in protected land areas required attention. There was also a general recognition that "facilities lack throughout the Daintree coast to cater for mass tourism, especially in the funding to better staff and manage the National Park areas", and "more important than 'codes' is the attitude and education of owners and operators".

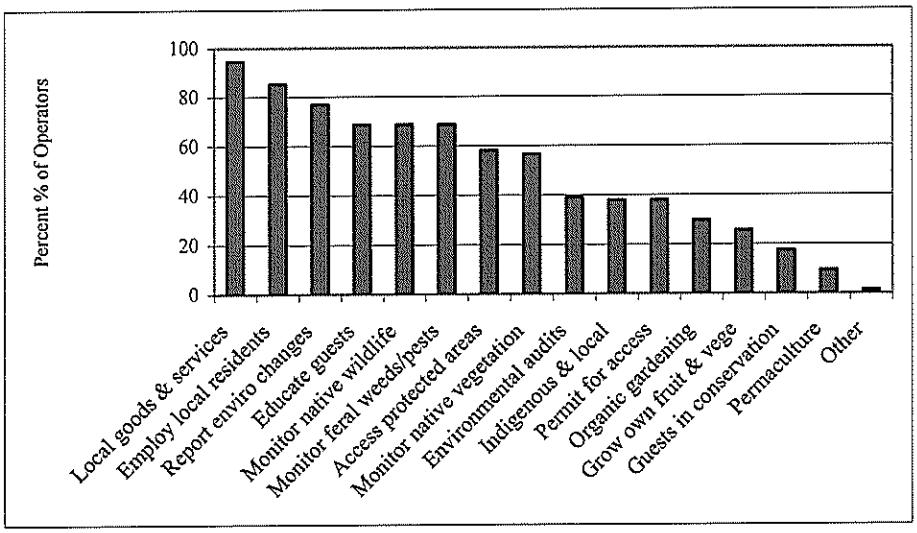

Figure 3: Other Sustainable Practices

5. Discussion

This research in Douglas Shire has proven that many of the environmental practices already used by tourism operations are simple, common sense and cost effective, for example energy efficient light bulbs, dual flush toilets and the use of natural ventilation for building design. These tourism businesses in nature-based destinations such as Douglas Shire have an incentive to undertake voluntary environmental protection in order to enhance tourism experiences for increasingly environmentally aware tourists (Huybers & Bennett, 2002). The tourism businesses (58%) in the study adopted environmental guidelines for better environmental management and to comply with environmental or World Heritage legislation (29%). The issues identified by Douglas Shire tourism operators as impeding the implementation of environmental management techniques, related to the limitations for dedicated recycling waste collection within the Shire, the high cost of installing and maintaining alternative energy and water practices, and the environmental knowledge of some operators due to a lack of information or guidelines. According to Carter *et al.* (2004), within Australia waste generating industries are governed by environmental protection legislation, whereas the service industries tend to be characterised by self-regulation. Eden (1996) postulates that in the absence of regulation, the adoption of environmental management practices is predominantly the result of an economic benefit, competitive advantage, market advantage, individual environmental ethic, or a corporate culture of environmental ethics. "Issues such as a lack of knowledge and resources, verification and compliance obligations and consumer recognition can have a significant impact on the extent to which such systems are operationalised" (Carter *et al.*: 50-51). However, Lee-Ross and Johns (1997) claim issues such as, lifestyle, entrepreneurial status and survival are issues of equal or greater concern for small and medium sized enterprises. An individual in a position of control will have greater opportunities to ensure the sustained adoption of environmental best practice. Most of the tourism operators surveyed in this study owned their nature-based business in Douglas Shire.

An interview with a town planner at Douglas Shire Council in May 2005 by Carmody identified further issues for the promotion and implementation of environmental best practices within tourism.

For example, existing Council by-laws are not the best mechanism for the control of environmental impacts and the promotion of environmental sustainability for tourism businesses.

"The vegetation management local law has environmental considerations. Most local laws are very old and probably not used. A lot hinges on a lack of time, resources and an operational plan/ strategy [is] needed to tie the corporate plan together"

There was limited adoption of some environmental management techniques in the tourism sector:

"Recycling now a monthly collection – certain times of the year are low recyclables, some operators are more committed. The [rubbish collection] truck does less runs (less emissions), better education might be needed as also get contaminated recycled materials"

"More businesses are not as green as they say they are, there seems to be a lack of knowledge of what green should be."

Recommendations are not pursued particularly for the reasons of a low resource base within the Council, although encouragement is provided on good environmental practices.

"If people ask, information can be provided. Best management practice workshops [were] ran last year for all types of operators"

The *Douglas Shire Sustainable Futures Draft Strategy* focused on the triple bottom line approach of environmental, social and economic sustainability (DSC, 2001). In 2005, Douglas Shire considered implementing a sustainability code (water, energy and waste minimisation) in the new planning scheme for all new applications. The council was, however, considering incentives for small tourism operators to implement environmental best practice. The *Douglas Shire Corporate Plan 2003-2007* indicates the implementation of rate incentives/ conservation agreements as a strategy to preserve biodiversity, adopt eco-efficiency principles for waste management, reticulated water supply, sewerage treatment and to promote energy efficient buildings. However, an operational plan and more resources were needed to implement this new sustainability code, approved in 2006.

"Looking to implement a new 'sustainability code' in new planning schemes, would apply to new applications. Sustainability code is more for bigger businesses – water, energy, waste minimisation, building design principles. Council not keen to hit small 'battlers', we are in [the] early stage of thinking about incentives for small operators to implement environmental best practice."

The Green Globe benchmarking of Douglas Shire also needed further development by the Council, local community and tourism businesses.

"We are Green Globe 21 Benchmarked, but it is an extra curricular activity for planning. Green Globe 21 Benchmarked to [Certified] really needs a sustainability officer if possible in the organisational change, plus look after Cities for Climates."

"Council needs to get Green Globe 21 up to date before trying to get businesses to do the same. We need to review the Tourism Strategy. We do have an environmental awards program with a small business category; past winners have had their own personal environmental code. Sustainability and environmentally friendly seem like catchcries though."

The benefits of being environmentally conscious tourism operators will, in the short and long term, have positive impacts for the conservation of the protected Daintree rainforest that tourists and residents enjoy in the Douglas Shire. Further, education about voluntary environmental practices by Douglas Shire and tourism associations should yield a more consistent uptake of environmental

management practices by tourism operators. These need to promote the business benefits of adopting environmental best practice techniques in tourism. The dissemination of information to tourism operators regarding the costs and benefits of various environmental management practices available and the complementary legislative requirements for water, waste and energy conservation should be transmitted regularly to tourism businesses. For example, requirements for solar and gas water heating, the installation of energy efficient light bulbs, grey water reuse, and the control of feral pests, could carry incentives or rebates for tourism operations or be included in the building development approval process. As the first Green Globe Benchmarked community in the Asia Pacific region, Douglas Shire Council can play a leading role in promoting and rewarding these environmental best practices by tourism operators in the Shire. Similar environmental best practice guidelines are also recommended and implemented in Kaikoura (Kaikoura District Council, 2006).

6. Conclusion

This paper has investigated a broad range of environmental management techniques in use by tourism operations in the Douglas Shire, North Queensland. This is an area of high ecological biodiversity with the Daintree Wet Tropics World Heritage Area and a substantial nature-based tourism industry. Environmental best practices are part of the *Douglas Shire Sustainable Futures Strategy*, which aims to protect the natural environment, the economy and community well being while balancing the increasing pressure on natural resources from tourism visitation. This study found environmental legislation and knowledge about best practice measures all influence the adoption of environmental management techniques by tourism operators. It is clear, education about environmental management techniques for residents and tourism operations in the Douglas Shire are fundamental to the future sustainability of this section of the Wet Tropics World Heritage Area. These factors are being examined in a wider doctoral study by the first author, investigating the environmental management techniques and environmental attitudes of specialist accommodation operators near protected areas in North Queensland.

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