Guidance for Best Management Practices for Caribbean Coastal Tourism

study for the

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Caribbean Environment Programme
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by

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Acronyms

BDD	**British Development Division**
BMP	**best management practices**
BVI	**British Virgin Islands**
CANARI	**Caribbean Natural Resources Institute (St. Lucia and St. Croix)**
CARICOM	**Caribbean Community**
CARICOMP	**Caribbean Coastal Marine Productivity**
CBO	**community based organization**
CCA	**Caribbean Conservation Association**
CDB	**Caribbean Development Bank**
CEC	**Commission of the European Community**
CED	**Centre for Environment and Development (UWI)**
CEP	**Caribbean Environment Programme (UNEP)**
CHA	**Caribbean Hotel Association**
CIDA	**Canadian International Development Agency**
COSALC	**Coastal and Beach Stability in the Lesser Antilles**
CTO	**Caribbean Tourism Organisation**
CZM	**Coastal Zone Management**
ECLAC	**Economic Commission for Latin America and the Caribbean (UNESCO)**
ECDPM	**European Centre for Development Policy Management**
EMS	**Environmental Management Standards (ISO 14000)**
ENCORE	**Environmental and Coastal Resources Project (of the OECS/NRMU)**
GDP	**gross domestic product**
GEF	**Global Environment Facility**
GTZ	**German Agency for Technical Cooperation**
I&E	**Industry and Environment Unit (UNEP)**
ICAM	**Integrated Coastal Area Management**
IDB	**Inter-American Development Bank**
IDRC	**International Development Resources Center (Canada)**
IETC	**International Environmental Technology Centre (UNEP)**
IITF	**International Institute of Tropical Forestry (US Dept. of Agriculture)**
IISD	**International Institute for Sustainable Development**
IRF	**Island Resources Foundation**
ISO	**International Organization for Standardization**
IUCN	**World Conservation Union**
MAREMP	**Marine Resource and Environmental Management Programme (UWI)**
NGO	**Non Governmental Organization**
NRMU	**Natural Resources Management Unit (of the OECS)**
OAS	**Organization of American States**
OECS	**Organization of Eastern Caribbean States**
PATA	**Pacific Asia Travel Association**
RCU	**Regional Coordinating Unit**
SIDA	**Swedish International Development Agency**
SIDS	**Small Island Developing States**

UK	**United Kingdom**
UNCED	**United Nations Conference on Environment and Development**
UNDP	**United Nations Development Programme**
UNEP	**United Nations Environment Programme**
UNESCO	**United Nations Educational, Social and Cultural Organisation**
URL	**Universal Resource Locator**
USAID	**United States Agency for International Development**
USEPA	**United States Environmental Protection Agency**
USVI	**United States Virgin Islands**
UWI	**University of the West Indies**
WHOI	**Woods Hole Oceanographic Institution**
WTO	**World Tourism Organization**
WTTC	**World Travel and Tourism Council**
WWF-US	**World Wildlife Fund/United States**
WWF-UK	**World Wide Fund for Nature (UK)**
WWW	**World Wide Web**

1. Introduction and Overview

The Caribbean Environment Programme of UNEP (UNEP/RCU/CEP) is implementing a regional project in cooperation with the United States Agency for International Development (USAID) in support of the International Coral Reef Initiative. The objective of the project is to promote corrective actions on land-based sources of pollution caused by the tourism industry which negatively impact coastal and marine resources.

In this context the Caribbean Environment Programme is supporting a series of studies to determine the level of coastal degradation, the best approaches and practices available, and effective public awareness and training activities. The information contained in these studies will be used *inter alia* to further develop the activities of this project which include pilot projects, training workshops and courses, public awareness activities and networking.

This report is designed to meet several objectives:

To highlight the importance of tourism as an industry in the Wider Caribbean, and to illustrate the remarkably different significance of tourism among the states of the region.

To review information relevant to the environmental effects of tourism-related practices.

To present information on the needs for best management practices to reduce negative impacts on coastal ecosystems. This list covers a wide range of tourism services, but concentrates on design and planning issues because of their importance for the long-term.

Guidance for achieving best management practice by governments and private sector leaders involved in planning, approving, building, operating, and maintaining tourism facilities impacting coastal areas.

To provide a list of current references, biased toward coastal environmental planning and management processes.

The scope and variability of best management practices for coastal tourism are broad and complex. For example, in one sub-section below on “Tourist Development Planning,” we have identified 86 specific kinds of negative impacts that tourism facilities could have on eight major management activities in three different impact areas (pollution, physical processes, and biological systems). In addition, there are positive effects of tourism that need to be reinforced.

Best management practices for any specific site or development will depend on the complex of conditions, opportunities, resources and limitations of that site at a specific time. This paper provides the framework for assessing which areas of tourism facility design and operation need to be given priority attention, and also provides guidance for how to research the specific technologies which are most appropriate for those priorities.

This Section provides an overview of coastal degradation and a three-dimensional framework for analyzing the environmental effects of coastal tourism.

Table 1. Overview of Coastal and Marine Pollution

Countries Listed by Tourism Dependency*	Sewage	Oil	Fertilizers/ Pesticides	Mining& Industry	Solid Waste	Construction Erosion	Lack Info
Cayman Islands	X	X					
Netherlands Antilles(No)	X	X		X			
Anguilla							X
Turks & Caicos							X
Aruba	X	X		X	X		
Montserrat							X
British Virgin Islands	X			X			
Antigua & Barbuda						X	
US Virgin Islands	X	X		X			
Bahamas	X						X
St. Kitts & Nevis	X					X	
Barbados	X	X	X	X		X	
St. Lucia						X	
Martinique	X						X
Guadeloupe	X	X	X	X	X		X
Netherlands Antilles (So)	X	X		X	X		
Belize	X						
Grenada	X		X		X		
St. Vincent & Grenadines						X	
Dominica		X			X	X	
Jamaica	X	X		X		X	
Dominican Republic	X	X		X			
Surinam	X						X
Guyana	X						X
Puerto Rico	X	X		X			
Trinidad & Tobago	X	X		X			
Cuba	X	X		X			
Haiti	X			X			X
Costa Rica	X	X	X				
Panama	X	X					X
Mexico	X	X		X			X
Colombia	X	X		X	X		X
Nicaragua		X					X
Venezuela	X	X		X		X	
French Guyana							X
Guatemala		X				X	X
US Gulf Coast	X	X	X	X			
Honduras	X	X	X	X			

Source: Hoagland et al.*, 1995, Table 11.*

The principal conclusions of this section are:

- tourism impacts in the Wider Caribbean are extremely diverse, depending on differences among state economies, the relative and absolute size of the tourism sector, the rate of growth of tourism, the nature of the tourism facilities involved,

* See following Section for definition of tourism dependency rankings.

and a score of environmental factors ranging from geology to climate and existing natural communities;

- environmental degradation effects from tourism facilities and operations in the coastal area are—except for crowding—seldom dramatic, rarely visible, and usually fall within a broad spectrum of different ministries. They also tend to require a wide range of remedial actions and expertise and mitigation procedures to limit further or continuing adverse environmental effects.

Overview of Coastal and Marine Resource Degradation

Coastal and marine resources throughout the Wider Caribbean Region have suffered major impacts by human actions since early colonial days. A synthesis of major impacts conveys a picture in which virtually every state of the Wider Caribbean suffers from sewage pollution of coastal waters, most suffer some contamination from oil spills and production leakages, a majority of states report coastal pollution from mining and industrial activity, and most of the low income states of the region report solid waste contamination of coastal areas (Hoagland, *et al.,* Table 11). In addition, many states report inadequate monitoring and assessment systems to understand what is really happening in the first place. Table 1 illustrates observed and reported marine and coastal conditions in the region from the late eighties through the present.

Analytical Framework

To cope with the complexity of the region, which is further illustrated in Table 2, and to assist in examining the relationship of tourism and coastal environmental impacts, we have created a simple analytical framework. This framework borrows from a number of regional and international tourism and environmental impact studies over the past two decades. The same framework is used in the report on Environmental Degradation from Coastal Tourism in the Caribbean, where it is explained in greater detail.

Nature of Tourism Impacts

This dimension of the framework encompasses the direct and indirect effects of tourism facilities cited in the Geographic Zones of Environmental Impact. It is important to understand that these effects are dynamic and often interactive. At its most basic, if tourism facilities and activities result in a high degree of environmental impact, it is likely that tourism will be reduced. These problems can compound themselves if the reduction in tourists causes loss in income which results in curtailment of essential services (*e.g.*, operation and oversight of sewage treatment plants) which further alienates tourists. This effect is feared in some of the small island developing states strongly affected by hurricanes in 1995. There is some indication that Hurricane Hugo had this triggering effect on the island of St. Croix in 1989 (USVI Department of Tourism, 1996).

Table 2: Selected Tourism Characteristics of States of the Wider Caribbean

	Population thousand *WHOI	GDP ($millions) CTO & WHOI	GDP/capita (1993)	Tourism % GDP	Pop Density per Km^2	Rooms/ 1,000
Cayman Islands	30	$ 670	$ 23,000	49%	100	115
Netherlands Antilles(No)	36	$ 1,400	$ 7,600	35%	191	107
Anguilla	9.5	$ 56	$ 6,800	91%	75	103
Turks & Caicos	13	$ 69	$ 5,000	81%	21	82
Aruba	78.9	$ 854	$ 13,600	47%	326	78
Montserrat	10	$ 58	$ 5,800	31%	120	71
British Virgin Islands	18	$ 133	$ 10,800	82%	80	68
Average (first quintile)			**$10,371**	**59%**	**130**	**89**
Antigua & Barbuda	64.2	$ 424	$ 6,800	74%	146	52
US Virgin Islands	109	$ 1,200	$ 11,000	59%	284	50
Bahamas	273	$ 2,600	$ 10,200	47%	250	49
St. Kitts & Nevis	42	$ 142	$ 3,500	52%	147	38
Barbados	264	$ 1,800	$ 7,000	25%	612	22
St. Lucia	142.7	$ 250	$ 1,650	69%	251	21
Martinique	360	$ 2,000	$ 6,000	13%	321	20
Average (2nd quintile)			**$ 6,593**	**48%**	**287**	**36**
Guadeloupe	405	$ 1,100	$ 3,300	24%	194	19
Netherlands Antilles (So)	158.3	$ 1,400	$ 7,600	35%	191	19
Belize	211	$ 420	$ 2,165	23%	8	17
Grenada	96.5	$ 250	$ 3,000	15%	247	15
St. Vincent & Grenadins	110.5	$ 171	$ 1,500	31%	332	11
Dominica	73	$ 174	$ 2,100	16%	113	10
Jamaica	2480	$ 3,497	$ 1,431	21%	224	8
Dominican Republic	7157	$ 7,148	$ 976	12%	148	4
Average (3rd quintile)			**$ 2,759**	**22%**	**182**	**13**
Surinam	174	$ 1,941	$ 4,513	1%	3	3
Guyana	305	$ 349	$ 435	9%	4	3
Puerto Rico	3685	$ 22,800	$ 6,200	6%	368	3
Trinidad & Tobago	1257.3	$ 4,939	$ 3,948	2%	242	2
Cuba	10900	$ 17,000	$ 1,580	2%	96	2
Haiti	7041.5	$ 2,641	$ 399	2%	236	0
Costa Rica	632	$ 5,365	$ 1,930	6%	60	0
Panama	230	$ 5,544	$ 2,248	4%	32	0
Average (4th quintile)			**$ 2,657**	**4%**	**130**	**2**
Mexico	5491	$ 286,628	$ 3,321	2%	44	0
Colombia	1603	$ 41,700	$ 1,269	1%	31	0
Nicaragua	88	$ 1,736	$ 456	1%	29	0
Venezuela	7129	$ 53,441	$ 2,705	1%	22	0
French Guyana	83	$ 421	$ 4,390	0%	1	0
Guatemala		$ 9,353	$ 988	2%	85	NA
US Gulf Coast	15600	$ 752,000	$ 22,219	3%	27	NA
Honduras	1131	$ 3,004	$ 567	1%	46	NA
Average (5th quintile)			**$ 4,489**	**1%**	**35**	**0**

*Population of coastal areas for continental states
WHOI = Woods Hole Oceanographic Institute, Hoagland, *et al.*, 1995
CTO = Caribbean Tourism Organization, 1995

Source: Adapted from Hoagland, et al. *1995, and Caribbean Tourism Organization, 1995.*

Available evidence (UNEP 1994a, Hoagland *et al* ., 1995) confirms that the environmental effects of tourism activities in coastal areas occur within national boundaries. The MARPOL study (UNEP, 1994a) indicated little international transport of land-based sources of marine pollution in the Wider Caribbean, and the contribution of tourism to that problem is small.[*] Marine debris aside, the major "international" environmental effect of coastal tourism in the Caribbean may be the impact of yachts, charter boats, or cruiseships in near-coastal and marine environments, especially anchoring in sea grass beds or on coral reefs.

The major tourism effects used in this study include (in order, as illustrated in Appendix A of Tourism and Coastal Resources Degradation in the Wider Caribbean):

- **Displacement of Traditional Uses and Users**
- **Physical Changes and Habitat Damage**
- **Solid Waste Disposal**
- **Toxic Chemicals and Nutrification from Surface Runoff**
- **Groundwater Depletion and Contamination**
- **Change in Sediment Loads**
- **Visual Impacts**

Tourism Facilities in the Coastal Zone

This section identifies six categories of tourism facility. These categories are designed to capture the bulk of tourism activity, but they are not meant to be totally comprehensive or exclusive. That is, for example, a tourism complex could include large and small hotels, restaurants and beach recreational facilities. These categories refer to the activities of tourists, services provided to tourists, and the necessary infrastructure to support those services.

- **Tourism Complexes and Large Resorts**
- **Marine Recreational Facilities**
- **Small Hotels and Resorts**
- **Entertainment Facilities**
- **Shoreside Recreational Facilities**
- **Parks and Protected Areas**

[*] An exception to this generalization is highly visible marine debris, which is often identified with foreign sources (NC Sea Grant, 1995). The Texas State Land Office, for example, finds a significant proportion of marine debris on Texas's beaches comes from foreign and shipping sources.

Geographic Zone of Environmental Impact

The "coastal zone" is not a homogeneous, easily demarcated area. It includes a variety of geological and environmental systems which are impacted and react differently to stress caused by coastal tourism activities.

For this study there are three general areas of impact: 1) mainland, 2) coast, and 3) ocean; and three directions to look for environmental effects: 1) inland, 2) along the coast, and 3) seaward. These classes are similar to the "coastal environments" used by Pearce and Kirk in their 1986 paper on "Carrying Capacities for Coastal Tourism," *UNEP Industry and Environment*, March 1986. We have divided these areas into the following six classes for this framework, approximating a transect through the watershed—from the heights through the limits of the country's exclusive economic zone. For this analytical framework there are no hard edges to most areas of environmental impact. The term coastal zone refers generally to the areas of impact of this study.

- **Near Coastal Waters and Fringing Reefs**
- **Beach and Shoreline**
- **Estuaries, Back Bays, Salt Ponds and Lagoons**
- **Coastal Plain.**
- **Uplands**
- **Offshore Waters**

Documentary Sources of Tourism Effects

Research for this project has surfaced approximately 135 publications (See Section 4, References, below) related to best management practices for coastal tourism. We have reviewed these references to identify only those which narrowly address specific areas in the analytical framework (see the introduction to the References section). It is not alleged that this is the only information available to planners and managers in addressing coastal environmental impacts. Decades of experience in coastal management processes throughout the region, however, teaches that the matrix at the end of the References Section (page 40) provides a qualitative distribution of the information available most immediately to the best informed coastal managers.

The conclusions from this analysis are threefold:

- Information resources for best management practices are not evenly distributed.
- Environmental degradation effects can be reduced by best management practices from a number of disciplines *outside* the coastal environment and tourism planning sector (for example, architectural standards, energy programs, or solid waste management).

- Best management practices for tourism can be supported by broad involvement *and information sharing* among several sectors, such as agriculture, forestry, hydrology, public works, and environmental health.

At one level, this matrix merely demonstrates graphically the often-repeated statement that coastal environmental planning—for tourism and a variety of other activities—is multi-sectoral and multi-disciplinary and requires an integrated approach.

Stimulating best management practices for coastal tourism means shaping the tools for linking potential impacts with mitigation information. As an example, the matrix shows few references which deal with impacts on groundwater resources or sediment loading. But clearly there are hundreds of works on hydrology, landscape engineering and architecture which could be mustered to address these problems, *if* broad-ranging information sharing for environmental impact reduction and mitigation is given a priority.

2. _Tourism Management Requirements

This section lists requirements for management practices which should be addressed by elements of the tourism industry. Major categories include:

- development of tourism facilities, especially resorts, hotels and other major construction activities;
- site and building design
- energy management
- water supply
- waste prevention
- facility maintenance and operations
- cultural effects and displacement of traditional activities.

The discussion of these categories tends to stress the elimination of negative impacts, but there a number of positive effects are also identified.

> Boxed highlights include specific best management practices employed in the region, or in other tourist dependent areas, which minimize or mitigate negative tourist impacts on the environment.

Tourist Development Planning

Table 3 summarizes environmental problems which need to be addressed by management practices for the planning and construction of tourism developments. These include pollution abatement, physical processes, and biological systems during development of tourism facilities. These facilities are potentially highly stressful, and if badly done, can produce irreversible effects which continue throughout the life of the project, or longer.

In the management of tourism development planning and construction, there is a strong incentive to address negative pollution effects directly. It is the task of public sector managers and monitors to ensure that pollution prevention or mitigation activities do not merely displace pollution to other less visible sites or less powerful communities. For physical processes and biological systems, project design reviews need to adhere to *limits* on acceptable change and the introduction of exotic species (Wilkinson, 1990).

Placing limits on acceptable change is a tourism management practice which is being developed to replace the less realistic “carrying capacity” concept. Limits on acceptable change attempt to assess stress in both the natural and the social and economic environment, to define the maximum degree of change which is tolerable. The concept is realistic in suggesting the “political” costs of limiting further development which could be seen to reduce employment growth and to deprive the affected region of modern infrastructure and other benefits.

Table 3. Issues Arising from Tourism Sector Planning and Construction

MANAGEMENT PRACTICE:	POLLUTION	PHYSICAL PROCESSES	BIOLOGICAL SYSTEMS
SITE ACCESS	Noise Petroleum Spills Air quality Vehicle pollution Toxic releases	Surface water disrupted Erosion Sediment Soil damages	Altered/destroyed habitat Altered/destroyed vegetation Reef impacts Exotic species supported
CONSTRUCTION AND LANDSCAPING	Noise Air quality Petroleum Spills Vehicle pollution	Surface water disrupted Erosion Sediment Soil damages	Habitat degradation Vegetation damage Reef impacts Exotic species supported Introduction of exotic food/habitat
ENERGY SYSTEMS	Toxics released or spilled Air quality Petroleum Noise or odors	Soil removed or disturbed	Altered/destroyed habitat Altered/destroyed vegetation Road kills Reef impacts
WATER SYSTEMS	Toxics released Noise, air, vehicles Hot water	Soil disturbed Water flow disrupted	Altered/destroyed habitat Altered/destroyed vegetation Reef impacts Exotic species supported Food chains altered
WASTE DISPOSAL	Odors Noise Air quality Petroleum Spills Vehicle pollution Toxic releases	Soil disturbed Water flow disrupted Groundwater used	Diseases introduced Altered habitat Altered vegetation Roadkills Exotic species supported Food chains altered
COMMUNICATION	Toxics released	Soil disturbed	Altered vegetation Diseases introduced Altered habitat Roadkills Life cycles disrupted
WALLS AND FENCES	Toxics released	Soil disturbed Water flow disrupted	Destroyed habitat Altered vegetation Barriers to wildlife Life cycles disrupted
OPERATIONS AND MAINTENANCE	Noise Toxics released Petroleum released	Erosion Sedimentation Water flow disrupted	Altered/destroyed habitat Altered/destroyed vegetation Reef impacts Exotic species supported Life cycles distrupted

Source: United States Department of the Interior, 1993.

Barbados Coastal Zone Management Plan

The Coastal Zone Management Program for Barbados has developed a large number of best management practices which can be adapted for a variety of tourism-related facilities, especially for the smaller national or regional programs working with tourism development. Among the major practices are:

- *Studies of baseline environmental conditions for all major projects*
- *Standardized monitoring requirements for physical, environmental and water quality conditions;*
- *A series of detailed construction practice principles for the marine area to mitigate construction impacts, including:*
  - *Clean materials and equipment;*
  - *Repair equipment away from the beach;*
  - *Use suction dredges;*
  - *Use turbidity barriers to protect reefs;*
  - *Set standards for suspending work based on turbidity over reefs;*
  - *Clearly buoy reefs, seagrass, and other sensitive areas for construction periods;*
  - *Carefully place anchors and semi-permanent moorings;*
  - *Minimize vehicle movement to reduce compacting of beach sand and use care in storing materials;*
  - *Special steps to protect turtles, including avoiding construction during nesting season, avoiding lights on the beach at night, relocating fresh nests, and so on.*

Source: DELCAN, 1995

Site and Building Design

In many areas of the Wider Caribbean, especially in the extensively used and abused coastal areas which are premium sites for tourism facilities, the land is more damaged than is commonly appreciated by visitors and developers. Furthermore, a wide variety of stresses, including density of settlement, air quality concerns, and marine pollutants, are damaging the ability of natural systems to recover from trauma caused by natural or manmade disasters. Site design considerations must stem from a respect for the landscape and an effort to understand the relationships among soil, water, plant communities and associations, and habitats.

A sustainable approach to site planning and building design starts with traditional practices of inventorying the principal factors of the site, and then goes on to determine the relationships among the factors of the site and how these factors will adapt to change and to the physical structures to be added to the site. The design should include an environmental model which describes the essential functions and interrelationships of the site factors. The model should result in specifications of

COSALC I

Beach Monitoring in the Eastern Caribbean

[Reliable, long-term monitoring of beaches provides essential information for tourism site planning in the Caribbean. The UNESCO-supported COSALC I program, directed by Dr. Gillian Cambers, provides these services using voluntary or government staff in 11 countries of the Eastern Caribbean. COSALC I promotes best management practices and has received support from the UNEP Caribbean Environment Programme.

At a recent conference to assess the directions of the program after 12 years of operation, the following strategy was outlined for future program development.]

Group discussions led to the development of a strategy for "sustainable beach management by the year 2001". The key elements of this strategy focused on the following :

a) The beach monitoring programmes developed by COSALC provide vital information for management. They should be maintained and expanded to include other parameters.

b) Information flow between government departments needs to be improved; inter-agency committees are the proposed mechanism.

c) Increased work in awareness is required to ensure that all groups, especially senior administrators and politicians, have a better understanding of the various issues relating to beach management.

d) Beach resources and their management needs to be brought into the classroom at the primary and secondary level. There is also a need for short courses for persons already working on the COSALC project, these could be provided by national and regional tertiary organizations.

e) Existing coastal development setbacks need to be reviewed with a view to establishing variable setbacks for beaches in each island.

f) Legislative review of existing beach protection laws is necessary.

g) Enforcement is one of the weakest areas of beach management. Its success requires that the socio-cultural aspects of beach management be addressed at the community and national level, so that local residents can police their natural resources. Greater cooperation between enforcement agencies is also required at the national level.

The workshop concluded that in order to achieve effective coastal area management, there is a need for greater cooperation and collaboration at the local, national, regional and international levels.

Source: Meeting notes provided by Dr. Cambers from a workshop entitled "Integrated Framework for the Management of Beach Resources within the Smaller Caribbean Islands" at the University of Puerto Rico—21-25th October, 1996

acceptable change and change thresholds during the construction and operation of the proposed project to ensure that major changes in function and relationships have been fully considered in the planning and approval process. In addition, site planning requires the monitoring of both baseline and in-process changes in environmental activities. This often requires a slower rate of construction (and possibly longer project time and greater costs) than contractors could accomplish if they were free to ignore environmental impacts and mitigation strategies. (Armstrong, 1996; see also the discussion of "Announced Tourism Goals" in Section 3 below)

Other steps in a sustainable site and building planning process include:

- Model the ecosystem;
- Assess social and economic conditions;
- Establish the acceptable limits of change and the phases for re-evaluation of impacts and re-design;
- Design the facility within social and environmental limits;
- Monitor site conditions throughout construction;
- Re-evaluate during construction or between construction phases (United States Department of the Interior, 1993).

Sustainable building design is an extension of the site design concepts, beginning with orientation to the site itself. Sustainable building design also requires an attempt to balance human needs with the limits on acceptable change for the site. Sustainable building design must:

- reflect ecosystem and cultural conditions, rather than imposing new values on them;
- stress support for environmental responsiveness and regeneration, rather than creating new environmental communities;
- focus attention on and appreciation for the natural conditions of the site;
- avoid the use of energy-intensive or environmentally damaging materials or operations (the use of energy for air-conditioning is a special problem for building design in the Caribbean); and
- focus on adaptive use of existing resources to save costs and stress in the construction process (United States Department of the Interior, 1993).

Priority natural factors which the building design needs to address include: climate, vegetation, topography, water bodies, hydrology, geology and soils, natural hazards (including especially hurricanes, seismic risk and tsunamis in the Caribbean), and pests and wildlife.

A discussion of best management practices for tourism planning and design issues must also acknowledge that best management practices for coastal tourism are a special case of the general need for *integrated coastal area planning and management* processes, with all of the problems of jurisdictional conflict and potentially overlapping policy objectives that implies. In jurisdictions with a high dependence on tourism, the high profile of tourism development can be used to showcase and support other good management practices. In areas with less prominent tourism, coastal tourism management practices should be developed directly as components of the wider coastal area management plan (United Nations Environment Programme, 1996b).

Best Management Practices for Planning:
Integrated Coastal Area Management

Integrated Coastal Area Management (ICAM) practices, especially as employed in programs such as the British Virgin Islands Town and Country Planning permit process (Louis Potter, Chief Physical Planner, personal communication), and the United States National Estuaries Program, provide opportunities for early intervention and collaborative review of tourism site planning. By publishing public standards and goals in advance of the submission of plans by private developers, these programs are able to provide guidance before major investments are made in site development. These standards also provide objective measures which can be used by community and environmental NGOs to question specific elements of development proposals.

These planning programs differ from the coastal engineering and restoration objectives of other coastal zone management programs, such as the program of the Barbados Coastal Zone Management Unit, or the Northwest Coastal Zone Program in St. Lucia.

Source: UNEP, 1996b

Energy Management

Best energy management practices for tourism facilities in the Wider Caribbean deserve attention because of the specialized needs of tourism sites in the region.

Many tourism facilities within the region suffer from inappropriate energy use models transferred without appropriate modification from temperate areas. In addition, rapid social and economic change in the region has created a need to design simultaneously for energy efficiency and for difficult problems of high land costs, noise, and physical security.

Energy Management by Ecotourism

Ecotourism resorts have been leaders in pushing for the use of renewable energy resources. For the proposed 150-unit Concordia Estates eco-condo development on the island of St. John in the US Virgin Islands, for example, ecotourism promoter Stanley Selengut has applied for permits to install seven 100-foot towers to assess the feasibility of wind energy systems to power the resort.

There are abundant sources of guidance for both design considerations for minimizing unnecessary energy use and for better control of energy intensive operating practices (United Nations Environment Programme, International Chamber of Commerce, and International Federation of Consulting Engineers, n.d.; United Nations Environment Programme, World Tourism Organization, and Foundation for Environmental Education in Europe, 1996.; International Hotel Association, International Hotels Environment Initiative, and United Nations Environment Programme, 1995). Some of the measures most commonly recommended and adopted in the Caribbean include:

- signage and notes to remind tourists to participate in energy conservation by turning out lights, maintaining moderate air-conditioning operation, and moderate use of hot water;
- solar water heaters;
- designs for open-air public spaces in hotels and resorts;
- motion detectors for room lighting;
- re-engineering of kitchen areas;
- replacement of appliances (*e.g.*, refrigerators) in rooms with more modern, more energy efficient versions;
- reduced-wattage, low-energy, or solar-powered (*e.g.,* for pathway lights) lighting systems.

Water Pollution Management

The Office of Wetlands, Oceans and Watersheds of the United States Environmental Protection Agency (USEPA) published *Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters* in 1993, which provides a number of important resources for management practices for coastal tourism. As employed by the USEPA, there are five areas of guidance, including agriculture, forestry, urban areas, marinas and recreational boating, and hydromodification. All of these guidance areas except forestry have elements which need to be adapted and applied to tourism activities.

Training to Improve Water Quality

*A 1992 survey of water quality conditions in the Caribbean by the Pan American Health Organization found the improper operation of waste water treatment plants by hotels to be a major contributor to poor coastal water quality. The study attributed relatively higher degrees of compliance (*e.g., *Jamaica, with compliance rates about 60% higher than the average of other countries surveyed) with improved training for government inspectors.*

Source: Vlugman, 1993.

The agricultural management guidance identifies measures to reduce and mitigate sediment runoff, nutrients and pesticides. Sediment is a major contaminant from tourism construction, which needs to be controlled by improved design for slowing runoff and by practices which control runoff across vulnerable construction sites. In the insular Caribbean the management of sediment from dirt *roads* is especially important and is treated by the new UNEP report on *Guidelines for Sediment Control Practices in the Insular Caribbean* (CEP Technical Report No. 32, 1996). Nutrient and pesticide management are important for landscaping, and in the design and operation of septic sewage systems. Irrigation activities on hotel and resort properties can be major contributors to depletion of groundwater resources and intrusion of saltwater.

Improved Landscaping Practices

The groundskeeper training programs, such as those practiced by the former Rockresorts in the Caribbean (Little Dix in the British Virgin Islands, Caneel Bay in the US Virgin Islands, and Dorado Beach Hotel in Puerto Rico) or the Anthony's Cay Resort in Roatan, provide both a high standard of training in the use of indigenous plants for resort landscaping, and especially in proper use of chemicals and water to minimize impacts. A community-focussed "horticulture" newsletter was a popular by-product of this program.

It should be noted that these practices are in contrast to other all-inclusive resorts which conduct landscaping with a standardized catalogue of exotic plants which are planted to reflect the resort's signature "look," whether that is appropriate to local environment conditions or resources (such as water use). New corporate owners of the Rockresort chain have not maintained the regional landscape training program.

The USEPA management guidance for urban areas includes measures to control sediment, nutrients, biological oxygen demand, heavy metals and hydrocarbons and biological contamination. These latter elements suggest a series of design and construction activities which will help avoid direct discharges from roadways and parking lots into adjacent rivers and coastal waters. Sewage treatment strategies and the placement of outfalls are important tourism considerations (World Bank, 1991; World Bank, 1995; Salvat, 1987; and United Nations Environment Programme, 1994c).

Marina and recreational boating management measures which will protect near coastal water quality include:

adequate marina flushing design;

rigorous water quality and habitat assessments;

runoff control from the marina, including injections from boat cleaning areas;

fuel station design and operations;

sewage and solid waste control;

disposal of fish wastes; and

boat operation (United States Environmental Protection Agency, 1993, Chapter 5).

Modification of shorelines, channels and the land under the sea from bulldozing, bulkheading, filling and dredging can have direct physical effects on land and habitat, and water quality effects may have more extensive consequences (following the plume from the site of the disturbance) for wildlife, reefs, and bottom-dwelling communities.

Marina Operations

The United States Sea Grant programs, especially in Puerto Rico, south Florida, and the US Virgin Islands have been aggressive in recent years in designing education programs for marina operators in waste management and pollution prevention.

Waste Management

Best management practices for solid waste generated within the tourism industry require design of elements within tourism facilities which make it clear how tourists can properly dispose of waste, and periodic waste audits by tourism facility managers to highlight gaps in current waste management flows. Best management practices for waste management in tourist contexts is a major theme of the *Environmental Action Pack for Hotels* by UNEP and the International Hotels Environmental Association.

Solid waste management issues have received considerable attention in the Wider Caribbean in recent years, with best management practices developed for both land-based pollution (Gladfelter, 1994) and ship-generated waste (Baker, 1994). There are currently two GEF projects and two World Bank-funded projects in the Caribbean dealing with solid waste management issues, and the Meeting of Environmental Technical Experts follow-up to the Summit of the Americas (San Juan, November 1995) dealt with a number of solid waste management issues relevant to tourism.

In spite of this support, there appears to be continuing resistance in the region to supporting international cooperation in solid waste management, especially as international organizations insist on sustainable financing arrangements which require participating countries to assume significant operating costs. These tensions are reflected in this press account from a regional meeting in Trinidad in late 1996:

RE: ENVIRONMENT-CARIBBEAN: REGION DRAGS FEET ...

Via MNI-INFO . . . . . .

PORT OF SPAIN, (Dec. 4) IPS - The failure of a number of Caribbean states to ratify an international convention declaring the Caribbean Sea a "special area" free from solid waste has alarmed environmentalists in the region.

The "special area" provision was annexed to the International Convention for the Prevention of Pollution from Ships (MARPOL) in April 1993. The Convention itself has been in force more than 13 years and is concerned with marine pollutants such as oil, noxious liquid substances, harmful substances and sewage and garbage.

But the reluctance of Caribbean states to ratify the provision has been blamed on a costly requirement to provide adequate reception facilities in ports to match the volumes and types of waste involved.

Source: Greg Chamberlain, INTERNET: 100074.2675@compuserve.com
DATE: 12/6/96 6:14 AM

In addition to the simple expedient of making tourist waste management facilities visible and accessible, it is necessary to devote resources to the maintenance of these systems and in the training and orientation of tourism facilities staff in the waste management strategy. These activities require a considerable investment in public awareness and public education programs, including inculcating in facility operators that they are “hosts” with a responsibility to both maintain their home, and to stimulate responsible behavior by visitors.

Liquid waste management practices in the Wider Caribbean need to be better coordinated with water supply concerns and national strategies for groundwater recharge and maintenance of groundwater quality. Because of the need to reduce the drawdown of freshwater resources, many more tourism facilities in the coastal area need to consider alternatives for treatment and re-injection of gray water systems.

Water Re-Use

Best management practices for liquid waste are employed at an increasing number of coastal resorts on the US Gulf Coast and at large resorts such as La

Romana, in the Dominican Republic, which are using treated waste water in gray water applications such as irrigation and cooling.

Facility Maintenance and Operations

Facility maintenance and operations need to be considered from the beginning of the design process. For major facilities the *maintenance and operations plan* should be part of the approval process for the facility. Maintenance and operations are not, however, constrained only to hotels and resorts. In fact, because maintenance and operations management practices affect almost all levels of overnight visitor facilities, *plus* most of the coastal recreational and entertainment facilities, they are especially significant in limiting negative environmental effects. In addition, tourism-focused maintenance and operations activities have a large carryover and demonstration effect on practices employed by people in other sectors. For example, if pesticide applicators working in the tourism sector employ safe practices, these are likely to be employed in treating private homes. Government attention to hotel and resort operations as priority guidance for best management practices is discussed in Section 3, Selecting Best Management Practices.

Sustainable design features for the maintenance and operation of tourism facilities include the specification of durable or recyclable materials, designs for low energy consumption, user-friendly operation, properly trained staff and oversight by experienced management. Maintenance implications for commonly used construction materials are well known to facility designers in temperate areas (*e.g.,* the frequency that brick walls need to be repointed to maintain structural integrity and a tight building envelope), but these temperate zone criteria need to be rigorously reviewed in the Wider Caribbean because of the stresses imposed by sea and sun in coastal tourism facilities. An ecotourism manual used by the United States National Park Service (United States Department of the Interior, 1993, pp. 100–101) provides a starting point for such assessments.

Among the management features of a maintenance and operations system are:

- An inventory of all elements to maintain.
- Locally adapted maintenance standards, reflecting especially the extra efforts required by the warmth and high moisture which characterizes Caribbean coastal environments.
- Work schedules accounting for local work practices and holiday and vacation practices.
- Work practices, including training and controls for third party contractors often used for many maintenance functions. In areas where contractors provide a large portion of the total services with important environmental effects, such as lawn services or septic system maintenance, national authorities need to consider direct control of the performance of such services, rather than relying on managers of resorts or tourist facilities to police these environmental impacts.

- Logistical services including extra storage requirements for maintenance and replacement of items with long stocking times. The logistic plan should also include a process for periodically reviewing available suppliers to determine the most environmentally benign supplies.
- Realistic long- and short-term budgets. Many development proposals budget only for the early periods of the project, before maintenance and replacements costs for major features of the development begin.

Cultural Resources and Relocation of Traditional Activities

Cultural resources are reflections of past social, economic, historical and environmental conditions and events. Tourism activities in areas containing cultural resources or traditional activities should be encouraged to pursue appropriate procedures from initial planning through operations to ensure that these nonrenewable, environmentally sensitive resources are protected, conserved *and interpreted* for visitors and future generations.

Among the specific practices which need to be applied to the management of tourism areas with cultural resources or populations employing traditional practices are the following (United States Department of the Interior, 1993):

- Proposed development sites should be surveyed for cultural resources and traditional uses, and the significance and integrity of these should be documented prior to the consideration or approval of any tourism development proposal. This is the kind of activity which can be performed by properly trained and oriented volunteers, with the results archived as part of the profile of existing features which should be available in advance to any developers.
- Site and facility designs should include features which preserve and promote significant cultural features.
- Architectural style, landscape design and constructions materials should reflect local cultural elements.
- Cultural resource maintenance should be sustainable within the business plan of the proposed development.
- The operating plan of the proposed facility should include *interpretation* of cultural resources and opportunities to accommodate traditional practices. (For example, provide a seasonal permit in portions of a bay containing a swimming beach to permit fishers to harvest bait fish.)

Negotiating Tourism Use Conflicts

Two recent tourism-focused projects in the region employ a similar range of management practices for mitigating or eliminating unnecessary impacts on traditional activities. These are the Soufriere Marine Management Area in St. Lucia, and the emerging Bird Island Marine Reserve and Wildlife Sanctuary being developed on the northeast coast of Antigua.

Both of these projects involve protracted periods of broad-based community consultation with special efforts to inform, involve and respond to the concerns of traditional workers and residents of the tourism development and reserve areas.

Each project features a role for non-governmental organizations to act as mediators for other governmental and private groups.

3. Selecting Best Management Practices

This section provides guidance for private and public planners, managers, and policy makers in the Wider Caribbean for the adoption of best management practices by tourism facilities and support services.

Announced Tourism Goals

Anyone who has seen Hong Kong, Miami Beach, or Singapore has an inkling that a fixed limit or carrying capacity for coastal or island tourism must be somewhat flexible. This study does not advocate elaborate studies of the limits of development. It endorses instead a public planning process which examines the questions of trade-offs among further growth in tourism, alternative tourism modes (*e.g.*, ecotourism), and other development opportunities facing the country.

Each state in the Wider Caribbean with a major stake in tourism needs to define specific income and tourist goals for its development strategy. Studies of tourism cycles *(e.g.*, de Albuquerque and McElroy, 1992) show a variety of tourism densities which tend to be reflected in tourism activities which range from camping to Miami Beach-style mass tourism. The most significant point of these studies is that there seems to be an inverse relationship between density of tourist activities and retained earnings per tourist[*].

A starting point for tourism planning is the array of broader environmental assessment and planning processes which have been developed in the region, including environmental profiles, national environmental action plans or environmental strategies, and the recent move toward state-of-the-environment reporting begun by Jamaica (National Resource Conservation Authority, 1996). Planning to mitigate the negative effects, and promote the positive effects of tourism, needs to be integrated into these larger frameworks wherever possible.

Public debate of tourism goals has several advantages to tourism development managers in both the private and public sector:

- It sets expectations for acceptable types and intensity of development;
- It helps to identify trade-offs between impact and potential benefits;
- It provides a negotiating mandate and framework for the permitting process;
- It emphasizes the need to protect environmental values throughout the nation to maintain an attractive tourism package;
- It can highlight areas which require remediation or restoration to avoid losing tourists.

[*] As pointed out in the companion study on "Environmental Degradation and Coastal Tourism," policy makers in the Wider Caribbean seldom have sufficient information on the earnings of various tourism facilities and styles to evaluate the real costs and benefits from specific tourism development proposals.

Goal Setting

For countries which have the option to evaluate several styles of tourism, it is prudent to explore lower density, lower impact forms of tourism before opting for mass tourism approaches. Low density tourism options allow greater flexibility in moving local residents into management and ownership positions. Also, lower density forms of tourism provide opportunities to retain a higher proportion of local tourist expenditures, whereas mass tourism options almost always require the importation of more resources and services, including finances, management, and supplies (Patullo, 1996).

Another reason for supporting more integrated public planning for tourism is that both the process and the plan it produces give developers and government program managers much clearer guidance for the kinds of mitigating steps or trade-offs that the local community is likely to endorse for a given type of development. In some communities, for example, providing jobs with strong supports for training and movement into management positions is the most important issue whereas other communities may be much more likely to respond positively to environmental restoration activities (UNEP, 1996b).

Remediation Planning

Public tourism planning programs also serve to identify critical needs for remediation planning, which can also be developed as a part of goal setting. There are throughout the Caribbean areas which are in danger of environmental collapse without corrective action by tourism-related businesses. For example, the fragile peat wetlands of Negril require major investments to recover from loss of water resources and pollution of aquifers and degraded coastal and estuarine areas. Similarly, Rodney Bay and the Pigeon Island causeway in St. Lucia require major changes in physical design and infrastructure to recover from early design and construction decisions.[*] Problems like these can be developed within the framework of public planning processes, in conjunction with guided recovery programs. The long-term program of the Coastal Zone Management Unit in Barbados (14 years with many years still to go) is the kind of activity which has been informed and endorsed by a public planning process.

Too often, remediation programs such as those mentioned above, are seen as the result of economic and engineering studies, but first comes the creation of public awareness and a will for action that can best be developed by public planning activities.

[*] The northwest coast Coastal Zone Programme in St. Lucia is addressing these questions.

Environmental Quality Competition

One of the surest ways to achieve environmental best management practices in tourism activities is to seek ways to introduce competition based on relevant quality measures. Directorate XXIII of the Commission of the European Community produced a study of the environmental effects of tourism throughout the European Community (CEC, 1993) which recommends regional programs to stimulate "environmental competition" among states and destinations of the continent. This concept should be adopted to the Caribbean—especially for those areas already most dependent on tourism.

There are several elements to such a strategy. One excellent model for this at the regional level would be adaptation of the *Blue Flag* program which has been developed by UNEP, the World Tourism Organization and the Foundation for Environmental Education in Europe, to certify the environmental quality of beaches throughout Europe.

The Blue Flag

Awards for Improving the Coastal Environment

The design of the Blue Flag program (which is to be documented in a forthcoming booklet being produced by the Foundation for Environmental Education in Europe) includes decentralized administration through national environmental authorities and standards, which offer important opportunities for states of the region to assess and evaluate the real condition of environmental pollution in coastal areas.

Each participating country commits to a specific set of implementation procedures, and a minimum set of environmental quality indicators which ensure the maintenance of public health and safety.

Environmental Profiles of Sites and Assessments of Facilities

To achieve environmental best management practices for tourism requires improved information use and information sharing about environmental conditions in coastal areas.

The development of tourism facilities of environmental quality is a collaborative process involving developers, local communities, and national authorities. National authorities have a three-part role in this process:

1) managing the relationship with the local community,

2) weighing and approving the development proposal, and

3) providing background information about conditions at the development site.

This guidance recommends new ways for national authorities and developers to work together to manage information about critically important coastal development sites. National governments should organize information on "developable" sites as part of the national resource inventory and information base, with a view to providing both local communities and developers with the most complete picture possible on environmental conditions. Specifically, as part of the national coastal management programs, monitoring data and assessment information for key coastal areas should be catalogued and assembled in one place to support the assessment of trends and to provide baseline data for development proposals and construction impacts monitoring.

The use of Environmental Impact Assessments for major tourism projects is well established throughout most of the Wider Caribbean (Jackson, 1988 and 1990). Systematic collection of environmental data about key sites is an especially useful extension of this process, permitting better assessments by developers and their environmental consultants, and the application of more objective review standards by government agencies.

There is as yet no best management practice in the Caribbean which embodies the use of environmental profiles of development sites, as described above, but some local governments have been successful in "marketing" certain sites to attract new investment and jobs. The approach discussed in this section would require only a small extension of this marketing approach to include environmental information to help protect the long-term sustainability of the development project.

ISO 14000

Within the past decade the so-called "quality movement" has achieved major international recognition with the establishment of international standards for documenting management and quality concerns. This activity has been coordinated by the European-based International Organization for Standardization (ISO), and resulted in the ISO 9000 series of standards for quality management. This standard provides a process by which a firm may be certified as complying with relevant management and quality auditing considerations, across all international boundaries. Therefore a German purchaser of goods and services from a Japanese-based tractor manufacturer certified as meeting ISO-9000 standards, for example, can be assured that these tractors must meet the same strict standards as similarly certified German or Canadian producers.

Although there are limited environmental components to the ISO-9000 standards, beginning in 1991, ISO set up Technical Committee 207 to work on standards [ISO 14000, (Tibor, 1995)] for Environmental Management Standards (EMS) and environmental auditing. Draft versions of the general Environmental Management Standards have been published (May, 1996), but this is only the first phase in a process which includes four work groups for Environmental Auditing, three work groups for Environmental Labeling, two for Environmental Performance Evaluation, and five work groups for Life Cycle Analysis.

Perhaps most significantly, the ISO 14000 process requires setting *sector-specific* guidelines or guidance standards. Countries of the Caribbean should study the development and publication of guidance for tourism, in order to assure that the special environmental conditions of the region are covered by all of the guidance terms. By studying the certification standards of ISO 14000, states of the Caribbean will be able to secure guidance for information and reporting standards that developers should be expected to apply to tourism developments.

Especially for development or management of major tourism facilities, national authorities should require firms to meet ISO 14000 certification standards to be able to participate in development and management of the project. As of late 1996, no country in the Wider Caribbean yet requires ISO certification for construction or operation of major tourism facilities.

Training and Operating Standards

Operation of tourism facilities is a major management practice with multiple environmental consequences. States of the Caribbean should work closely with major tourism facilities on the planning and implementation of operating training processes:

- To ensure that training and operating systems meet acceptable standards that reflect local priorities and conditions; and,
- To work with the leaders of the industry to find ways to provide similar levels of training for staff and operators of smaller facilities, such as small hotels, marinas, taxis, restaurants and guest houses.

In countries which maintain tourism training programs, such a system should be integrated with the industry's training efforts, and on-the-job training provided by operating facilities should be coordinated with and complementary to training schools.

The Green Globe tourism training and management program of the World Tourism and Travel Council and UNEP (Hawkins, 1995) is an important resource in training service workers in the tourist industry. Additional resources from the UNEP Industry and Environment program, and through the information resources of the UNEP IETC Web Site discussed in Appendix A are available to government, NGO, and private users at low cost or on request.

Greening Your Hotel Seminars

More than 100 hotels from 10 different islands in the Caribbean have committed to participate in the "Greening Your Hotel" environmental seminars created by the Caribbean Hotel Association.

Through the seminars, hotels will identify steps that they can take to make their properties more environmentally friendly. The program focuses on water and energy conservation and the reduction of solid wastes. In addition, the seminar will help increase awareness of the economic benefits from going "Green."

An excellent example of an attempt to institute improved training and operating standards directly at the level of tourist activities is found in the UNEP-sponsored Sustainable Diving Checklist, which provides an abbreviated one-page summary of "sustainable tourism" practices in general, which includes both specific actions in the water, as well as an overview of the entire range of planning for the activity and broader community impacts.

SUSTAINABLE DIVING CHECKLIST

Responsible diving and tourism are crucial to protecting coral reefs, which are among the world's most fragile and endangered ecosystems. At the current rate of destruction, up to 70% of the world's coral reefs may be killed within our lifetime. The following questions enable divers, resort owners, dive boat operators and other people involved in dive tourism to ask themselves if their practices are helping protect coral reefs.

Before a Dive Trip

`dive destinations to be visited prior to leaving home?

* *Is pre-trip information about the destination's local customs and proper dive etiquette provided to all visitors?*
* *Are references to educational materials provided to visitors ahead of time to facilitate the learning process?*
* *Is specific attention drawn to coral reef ecology and to guidelines/regulations for boating, snorkeling, SCUBA diving, fishing and other recreational uses of the reef?*
* *Are tours designed to enhance visitor awareness and understanding of the coral reef ecosystems that will be visited?*
* *Are brochures and other trip materials printed on recycled paper?*

Dive Tourism Operations

* *Do tours respect all local guidelines, laws, regulations and customs?*

continued . . . .

* *Are local dive guides and dive masters hired where possible and appropriate?*
* *Are local perspectives sought in planning interpretive programs?*
* *Are pre-dive talks offered by knowledgeable dive masters? Do they educate divers about the special features of the dive sites and reinforce rules for divers, such as:*
* *Maintaining neutral buoyancy;*
* *Maintaining control of fins, gauges and accessories;*
* *No touching, standing on or collecting coral;*
* *No feeding or handling fish and other living organisms;*
* *Abiding by any fishing or game regulations?*
* *Are mooring buoys used when possible, and anchors never dropped onto coral reefs?*
* *Are engines well maintained to avoid release of petroleum products in reef areas?*
* *Are provisions made to dispose of all sewage in a way that does not affect the nutrient balance of the reef ecosystem?*
* *Are environmentally sound methods of trash disposal used on boats and on land?*
* *Are special provisions made for disposal of harmful substances, such as chemicals used for film processing?*
* *Do tour operators limit the group size and frequency of dives?*
* *Do dive masters rotate dive sites to avoid over-diving a particular site?*
* *Do dive masters verify the proficiency of new divers before allowing them to dive at fragile or difficult dive sites?*

General Considerations

* *Are visitors encouraged to participate in local conservation efforts, particularly regarding the use of energy and fresh water?*
* *Are visitors informed of how they can make donations or give other support to local coral reef conservation initiatives?*
* *Do tour operators donate money or assistance to help the local environment?*
* *Do tour operators work with local authorities to minimize the environmental impact of visitors, particularly in marine protected areas?*
* *Is all construction planned to avoid negative environmental impacts on coral reefs, mangrove and seagrass ecosystems?*
* *Is public participation sought and encouraged for all projects affecting the community?*
* *Are local traditions and use patterns for the reefs respected?*
* *Are local naturalists hired when possible and appropriate?*
* *Do visitors stay in locally owned lodges that fit the environment?*
* *Are local businesses and service providers supported as much as possible?*
* *Are visitors encouraged to buy authentic arts and crafts of local artisans and to purchase other products and services which benefit the local economy?*
* *Is purchasing coral or souvenirs made from coral, turtles and other threatened wildlife prohibited or strongly discouraged?*

This list was presented by The Coral Reef Alliance (CORAL) to the UN Conference on Sustainable Tourism in the Dominican Republic and the International Coral Reef Initiative Workshop in the Philippines in 1995. It is based on the "Green Leaf Questionnaire" developed by the Pacific Asia Travel Association (PATA).

Related Guidance

The issues below are of less specific urgency for environmentally benign management of tourism, but they represent important general operating principles which should be considered in any tourism management process.

Include *All* Tourism Facilities and Services

As shown in the "Analytical Framework," introduced in this study (see Section 1), the range of activities under the tourism umbrella is very broad, and *all* phases of the industry should be included in the planning, identification and implementation of best management practices for tourism facilities. Control of grease discharge from beach bars and restaurants, for example, may do as much to protect critical lagoonal environments as any added design criteria for coastal resorts.

"Peer Reviews" for Technical Expertise

The Coastal Zone Management Unit of the Ministry of Tourism, International Transport and the Environment in Barbados has developed a model for getting needed technical skills which can be adapted throughout the region by both national and sub-national jurisdictions. As a matter of routine practice and agency policy in the case of major projects, the Unit seeks a contract or memorandum of understanding with a qualified third-party institution to provide independent consultation and advice (often referred to as "peer review") on technical matters involving the project, as they arise.

This is discussed in detailed in "Tourism and Coastal Resources Degradation in the Wider Caribbean."

Focus on Generating and Disseminating Information

Governments often overlook the importance of their information resources as a tool for directing public policy. To support best management practices for the tourism industry, governments should look for ways to generate improved information on both the immediate and cumulative environmental effects of coastal tourism, and to seek new ways to make this information available *and useful* to the major stakeholders in the private and public sectors.

Disaster Planning and Recovery

One of the few benefits of the high rate of natural hazards encountered in the Caribbean (especially in the coastal zones of those sub-regions most dependent on tourism) is that periodic disasters provide an opportunity to correct conditions which have imposed unnecessary or unwise stresses on the local environment. Caribbean coastal areas are especially subject to

severe damages from hurricanes, coastal and inland flooding, earthquakes and tsunamis. Global climate change is predicted to lead to sea level rise and possibly an increase in the frequency of severe ocean storms and hurricanes. This will increase the risks to tourism facilities, and the risk of environmental damages from such disasters.

In order to take advantage of these "opportunities," states must identify *in advance* those conditions or mitigation activities which should be implemented subsequent to a major disaster. For example, in a coastal resort area without adequate sewerage services, in the aftermath of a major hurricane the state could take advantage of the hurricane destruction to:

- limit reconstruction through a variety or regulatory and economic measures (*e.g.*, purchase of destroyed buildings) in order to reduce high densities on the coast;
- increase set-backs from the surf and dune line to reduce damages in subsequent storms and other disasters; and
- build new sewerage and other utility systems to more safely serve the new target population and tourist services

Discussions of rebuilding and hazard mitigation strategies to be employed in subsequent disasters can be conducted both in the context of coastal area planning activities, and also in special planning exercises organized with tourism investors and local communities in areas which have suffered most in the past, or which are predicted to suffer most in new disasters (Godschalk, *et al*., 1989; Potter, 1995).

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Research for this project has surfaced approximately 135 documents related to best management practices for coastal tourism. In addition, we have reviewed these references to identify only those which narrowly address specific areas in the analytical framework. These specific documents are numbered, and displayed in the matrix at the end of this section in Table 3, below.

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Table 4: Management Practices to Reduce Coastal Degradation By Area and Type of Impact: Selected Documentation

	PHYSICAL ALTERATIONS AND HABITAT DAMAGE	GROUNDWATER DEPLETION AND CONTAMINATION	SEDIMENT LOADING	CHEMICAL AND NUTRIENT LOADING	SOLID WASTE DISPOSAL	VISUAL IMPACTS	TRADITIONAL USE DISPLACEMENT
Upland Areas			13				
Coastal Plain* **-** *tourism complexes* *- small/large hotels* *- entertainment/restaurant facilities* * also impacted by facilities/activities in upland areas	12, 16, 17, 18	05, 17	13, 17, 18	02, 12, 17, 18, 19	02, 05, 11, 12, 16, 17, 18	16, 17	
Estuaries, Salt Ponds, Lagoons* *- recreational facilities* *- parks and protected areas* * also impacted by facilities/activities in upland areas and the coastal plain	03, 04, 11, 17, 18			19			
Beach and Shoreline* *- entertainment/restaurant facilities* *- recreational facilities and activities* *- parks and protected areas* * also impacted by facilities/activities in upland areas and the coastal plain	03, 04, 05, 06, 11, 17, 18			12, 19		04	
Nearshore Coastal Environment* *- recreational facilities and activities* *- parks and protected areas* * also impacted by facilities/activities in upland areas and the coastal plain	01, 03, 04, 05, 06, 07, 08, 09, 10, 17			03, 05, 10, 11, 12, 17, 18	03		04
Marine Offshore Environment *- marine tourism support facilities* *- recreational facilities and activities* *- parks and protected areas*	01, 03, 04, 09, 17			03, 04, 10, 14, 15	03, 04, 10, 15		

Appendix A:
Using the Web to Find Best Management Practices

Within the past two years there has been a revolution in the processes and terms that people need to apply to research for current information on a wide range of topics. UNEP has been a leader in making new information resources available for sustainable development. Access to Internet resources in the Caribbean is among the best anywhere in the world (measured by bandwidth, cost, number of Internet service providers, and web support service companies).

Identifying “management practices” is an ideal subject for research via the Internet and World Wide Web. Thousands of sources of information, including a large number of academic and governmental resources are able to cheaply archive a large volume of “gray literature” on environmental management practices. Similarly, as adopters and workers in the Caribbean gain experience with the particular methods, and the necessary adaptations which increase the effectiveness of specific practices, it will be extremely efficient to add topically focused management practices to the volume of Internet accessible information.

The Green Globe program, of which UNEP is a co-sponsor, provided an early model of Internet access on one of the proprietary networks (America on Line). The World Wide Web provides even broader access to those with access to non-proprietary service networks.

An example of the wealth of information already available, we present the following excerpt from a Web Site presented by UNEP International Environmental Technology Center (URL <http://www.unep.or.jp/>), which would be an excellent starting point for any search of tourism-related best management practices. The Internet is also a remarkable tool for uniting information from around the world; for example, there is nothing in the content of the UNEP IETC page which would indicate that it is based in Japan. Similarly, Internet documentation of many of the Industry and Environment projects of the UNEP are maintained in Paris.

Figure 1: UNEP IETC Homepage


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In 1995 UNEP IETC, in collaboration with UNEP Industry
and Environment/PAC (Paris) and INFOTERRA (Nairobi),
undertook a survey of 400 organizations involved in
Environmentally Sound Technologies (EST) information
dissemination. A report to CSD on this survey has
recently been prepared which identifies 84 EST related
information systems (Categories A to C). Select from the
list below for more detailed information:
   * Global Environment
   * Solid Waste and Hazardous Materials
   * Water Supply and Waste Water
   * Energy
   * Building, Engineering and Construction
   * Natural Resources and Agriculture
   * Cleaner Production and Pollution Control
   * Contaminated Land Remediation
   * Information Vendors and Suppliers
   * Miscellaneous
-----------------------------------------------------
  or more information please e-mail: bbarrett@unep.or.jp
-----------------------------------------------------
For more details on cleaner production and pollution control
related EST information systems, please contact:
       UNEP Industry and Environment/PAC
       Tour Mirabeau, 39-43 Quai Andre
       Citroen
       75739 Paris Cedex 15, France
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This site is in the early stages of construction. In addition to references to a wide range of additional specialized Universal Resource Locators (URLs) which in turn point to additional information resources, the site includes summaries of specific sources of information on best management practices for various topics related to tourism. For example, **Error! Reference source not found.** following is an excerpt from the 25 environmentally sound technologies

identified for energy applications.

Figure 2: Information on Environmentally Sound Technologies (EST) for Energy

Information Sources on ESTs
<Energy>

Abstracts on Selected Solar Energy Technologies (ASSET)

Category C

Organization: Tata Energy Research Institute (TERI)

Technologies Covered: Non conventional energy technologies - solar, bioconversion, wind and energy storage.

Types of Information: Bibliographic, technical specifications and research abstracts.

Source of Information: From existing databases such as JCIST and the US Department of Energy Technical Information Centre.

Year Established: 1979.

System Type: Database designed using micro CDS/ISIS software package.

Number of Records: Not known.

Dissemination Method: Diskette and hard copy - quarterly publication of abstracts.

Update: Not known.

Language: English.

Main Users: Academics and government researchers in developing countries.

Costs: Previously subsidised by UNU. Developed country subscription is $80 and developing country is $50.

Contact Person: Mr. Nalini Ranganathan, Tata Energy Research Institute, Documentation and Information Centre, Darbari Seth Block, India Habitat Centre, Loth Road, New Delhi, 110003, India, Tel: +91-11-462-2246, Fax: +91-11-462-1770.

E-mail: mailbox@teri.ernet.in

Appropriate Renewable Energy Technologies (ARET)

Category C

Organization: Ministry of Energy, Mines and Water Resources - Eritrea

Technologies Covered: Renewable Energy Technologies (both indigenous and external sources of technologies). Solar PV, solar thermal, wind power, hydropower, biogasification, geothermal, improved traditional cooking stoves, etc.

Types of Information: Not known.

Source of Information: The Energy Centre (under establishment), CC: INFO, and GEF publications. Relevant materials sent by numerous consultants and suppliers of finished products and LEAP software for Energy and Environment.

Year Established: Not known.

System Type: Database.

Number of Records: Not known.

Dissemination Method: CD-ROM, diskette and hard copy are currently available. On-line accessibility is envisaged in future.

Update: Not known.

Language: English.

Main Users: Access restricted to staff in the Department of Energy.

Costs: Not known.

Contact Person: Dr. Semere Habtetsion, Ministry of Energy, Mines and Water Resources, Planning and Programming Division, PO Box 5285 Asmara, Eritrea, Tel: +291-1-127-994, Fax: +219-1-127-652.

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Information System on Conservation and Application of Resources
(ICARUS)

Category C

Organization: University of Utrecht

Technologies Covered: Information on saving potential and cost for about 900 energy efficient technologies that can be applied in all economic sectors in Netherlands for the periods 1990-2008 and 1990-2015; energy growth and price scenarios; CO2 emission factors per fuel; energy balance for 1990; etc.

Types of Information: Full text and numeric.

Source of Information: Research undertaken at the University of Utrecht.

Year Established: 1994.

System Type: Database contained in Quattro-Pro spreadsheet.

Number of Records: 900.

Dissemination Method: Diskette.

Update: Not known.

Language: English.

Main Users: Users are research institutes, government, policy makers, utilities companies.

Costs: Free of charge.

Contact Person: Dr. Jeroen G. de Beer, Department of Science, Technology and Society, University of Utrecht, Padulaan 14, Utrecht, NL-3584, Netherlands,

Tel: +31-30-537638/7600, Fax: +31-30-537601.

E-mail: J.deBeer@nwsmail.chem.ruu.nl

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