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# Best Practices for Tourism Center Development Along the Red Sea Coast

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**BEST PRACTICES**  
for  
**TOURISM CENTER**  
**DEVELOPMENT**  
along the  
**RED SEA COAST**



TOURISM DEVELOPMENT AUTHORITY

**BEST PRACTICES**  
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**TOURISM DEVELOPMENT AUTHORITY**

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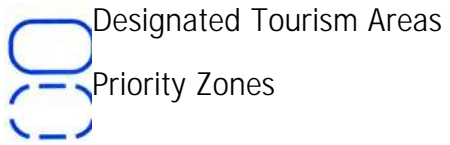
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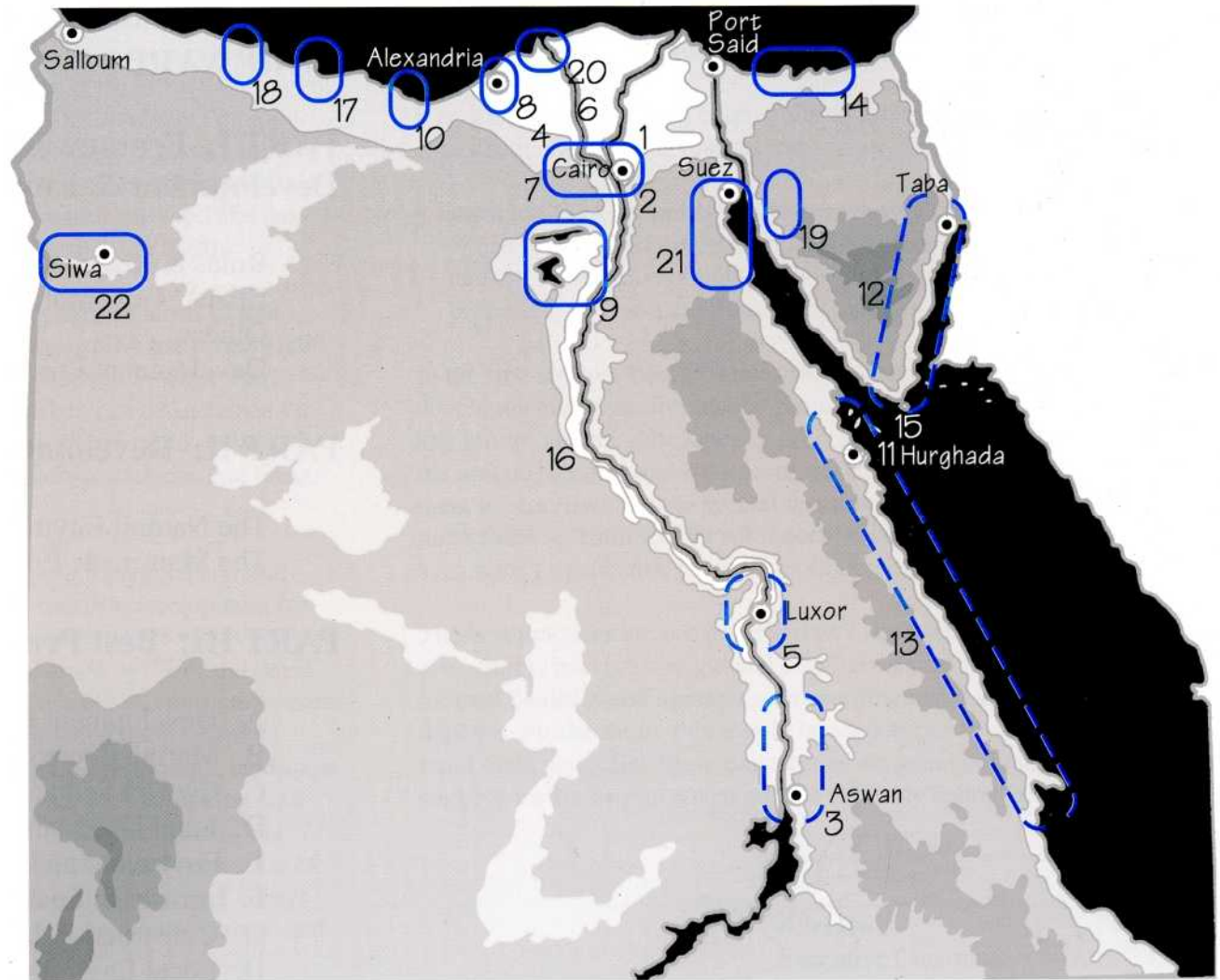
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## Egypt's Tourism Development Areas



- |                                 |                  |
|---------------------------------|------------------|
| 1 Giza Pyramids                 | 12 Gulf of Aqaba |
| 2 Cairo Nile Banks              | 13 Red Sea       |
| 3 Aswan                         | 14 El-Arish      |
| 4 Holman                        | 15 Ras Mohamed   |
| 5 Luxor & El-Gorna              | 16 Nile Valley   |
| 6 Nile Banks                    | 17 Ras El-Hekma  |
| 7 Khan El-Khalili & El-Montazah | 18 Mersa Matrouh |
| 9 El-Fayoum                     | 20 Rashid        |
| 10 Sidi Abdel Rahman            | 21 El-Ain Sukhna |
| 11 Hurghada                     | 22 Siwa          |



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# Foreword

The spectacular coastlines along Egypt's Red Sea and Gulf of Aqaba are the focus for one of the fastest growing tourism economies in the world. In order to accomplish national objectives for growth in permanent, well-paying jobs and in foreign exchange earnings, the Tourism Development Authority (TDA) has launched an initiative to make land available to investors for resort development along these coastlines. As of December, 1997, 6,000 hotel rooms are under construction in the Red Sea region and the TDA has proposals for at least 240 major resorts to be built by the year 2020.

While this program has begun to yield impressive results in terms of new hotel construction, tourism jobs and tourist visitations, TDA has recognized that priority must be given to guiding private development in ways that protect Egypt's natural heritage and insure that tourism can be sustained far into the future. It is clear from experience to date that such rapid growth, if not carefully planned and managed, threatens the very attractions that bring visitors here.

In the best practices described herein, TDA defines well planned and managed--as distinct from haphazard and destructive--tourism development for the Red Sea coastal environment. We look to lessons gained from several case studies of tourism center sites being jointly planned by TDA and development companies and from studies of successful established tourism centers in Egypt and from other parts of the world. We also draw upon technical literature from a variety of related fields, including marine biology, landscape architecture, engineering, tourism marketing, environmental planning, and others. These lessons and research are distilled into best practices for the planning and siting of new tourism centers and for the use and protection of environmental assets adjacent to the centers including the coral reef ecosystems, the beaches and headlands, the setback areas along coastal waters, and the surrounding desert landscape.

This Best Practices handbook is designed to be practical, well-illustrated and easily understood. It covers aspects of tourism center development that will:

- assist the development community to achieve environmentally sound, aesthetically pleasing and market-sensitive tourism centers, and
- assist the TDA and other public agencies by providing benchmarks on which to set environmental policies, guide the location of tourism centers and the subdivision of public lands, judge development plans and proposals, and base environmental management regulations.

In the first section, Best Practices focuses on the framework for tourism development and environmental protection: the roles and responsibilities of key groups and the development process. The subsequent section describes the unique physical and environmental context in which tourism development is occurring and the special measures needed to respect these development shaping features. The subsequent sections address the best practices to accomplish sustainable tourism development.

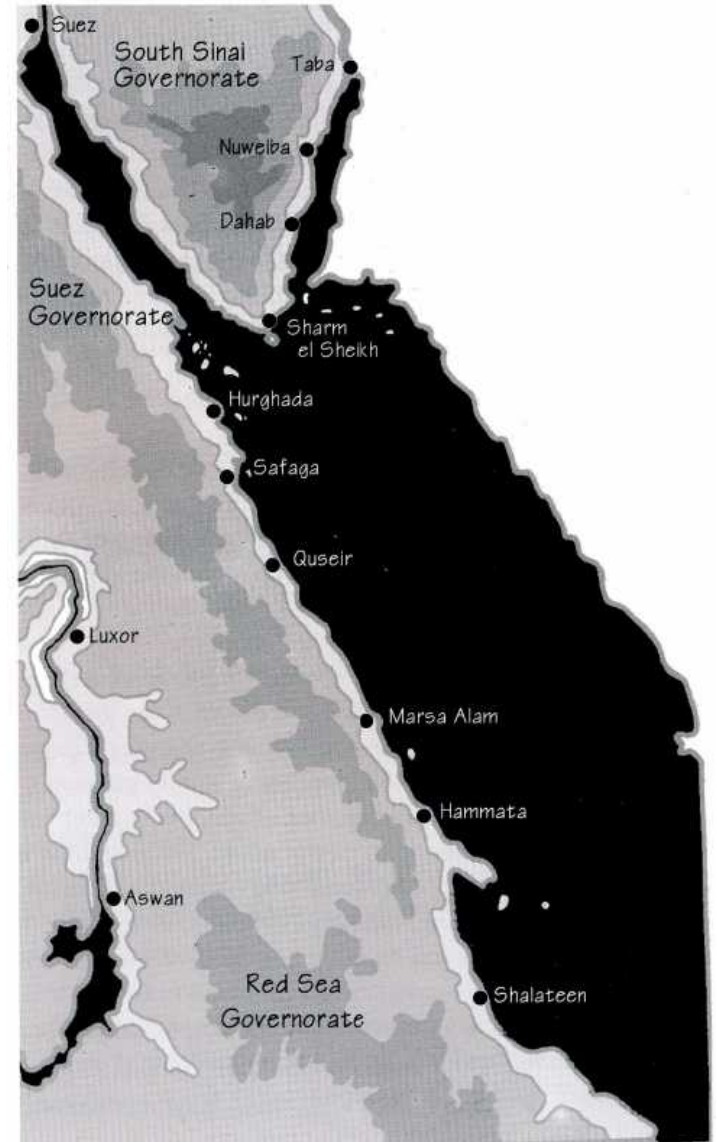
The best practices are not presented as a rigid set of prescribed steps and procedures, but rather as guidance and assistance in designing successful tourism facilities and managing the environmental assets on which tourism depends. Furthermore, this should be seen as our first effort. We intend to build upon and refine these practices as we gain continued experience. Your suggestions for improvement will be sincerely appreciated.



Mel Rady Executive  
Chairman  
Tourism Development Authority



The Red Sea and Gulf of Aqaba  
Tourism Development Area



# Part I: Framework for Tourism Development & Environmental Protection

## Roles & Responsibilities of Key Groups

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## Roles & Responsibilities of Key Groups

The responsibilities for achieving excellent tourism center development along the Red Sea coast are shared by a number of groups. This section discusses six of these groups - TDA, integrated development companies (IDCs), investors/developers/managers, Egyptian Environmental Affairs Agency (EEAA), Governorates, and non-government organizations (NGOs).

### Tourism Development Authority

TDA was established in 1989 to (among other functions):

- encourage environmentally-sound, private investment in tourism development,
- establish tourist zones and oversee the implementation of development plans for them,
- develop infrastructure schemes in these zones and recover their costs,
- dispose of desert lands designated for tourism development projects, and
- monitor the application of environmental regulations.

In carrying out these responsibilities, TDA has the authority to acquire and sell tourism development lands and retain the income and to charge fees for assessing and monitoring projects. Since its inception, TDA has overseen the subdivision of several thousand individual properties within designated tourism centers along the coastlines of the Gulf of Aqaba and of the Red Sea from Hurghada south to Wadi el Gemal. The vast majority of these properties have been sold to private investors. In many cases, TDA works with development companies representing the interests of investors in specific tourism centers to develop self-financing infrastructure services and resolve other development issues.

TDA has therefore already taken a key decision in tourism development: the location, extent and configuration of the initial lands that will be converted from their natural state to resort development and its related uses. TDA has also set the pace of development by requiring that significant development must occur on allocated properties within three years of

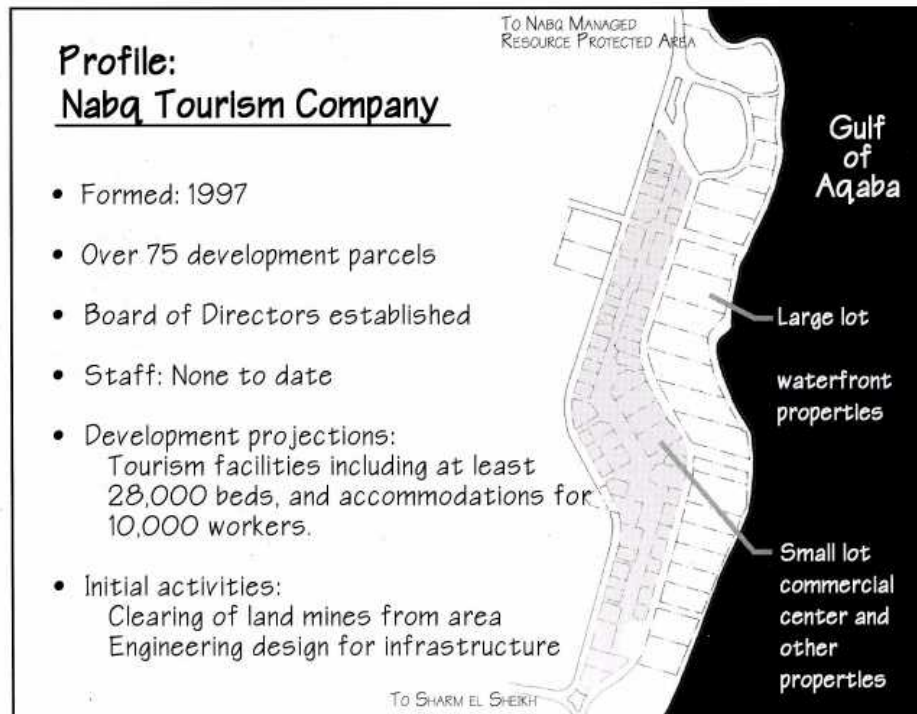
contract inception.

There are many other important development and environmental management responsibilities that reside with TDA. TDA can:

- mandate and assist the preparation of development plans for tourism centers to assure high quality environmental planning and design;
- modify existing subdivisions to achieve development and environmental protection objectives;
- require and assist the protection of important environmental assets that fall within allocated properties, such as wadi floodlines and public access to natural harbors (sharms and marsas) and beaches;
- guide the management of the coastal setback lands (dedicated on all ' waterfront parcels) to assure public access, limit inappropriate treatment of the natural landscape and encourage good landscape design;
- adjust the 3-year provision as needed to enable more careful development planning;
- encourage ecolodge/ecotourism development with consistent resource management policies;
- assist in the formation and strengthening of the Integrated Development Companies;
- provide early technical assistance and information to assist developers in meeting development and environmental protection objectives; mandate preparation of EIAs for each tourism center prior to authorizing development on individual parcels; and work with developers to assure sound environmental impact assessment ( EIA) and mitigation procedures and subsequent monitoring.



One of the first hotels under construction at Nabq Tourism Center



### Tourism Center Integrated Development Companies (IDCs)

In order to develop and maintain profitable and environmentally sustainable tourism destinations, there will be many decisions and activities that should be carried out by the body representative of significant investors/developers/managers of resort properties and tourism facilities of each tourism center--the IDC. While initially conceived as bodies that would address the provision of self-financing infrastructure services for the tourism centers, there are a host of common development and environmental management issues that will have a strong bearing on the financial interests of all (or most) owners and managers and on the quality of environmental protection that can be achieved. These issues and interests will evolve as a tourism center develops over the years ahead and will need to be addressed by the IDCs. They will imply a range of responsibilities only now beginning to be assumed by the IDCs, including:

- preparing a development plan for the land and nearshore waters of their respective tourism centers (see Best Practice A);
- preparing an EIA of the planned tourism center which enables assessing the cumulative impacts of all resort developments and reduces the cost of subsequent individual project EIAs;
- managing the coastal setback lands and other common spaces within the tourism center to assure public access, limit inappropriate treatment of the natural landscape and encourage good landscape design;
- developing and managing the required infrastructure and other services;
- developing and managing attractive and profitable commercial services that improve the quality of visitors' tourism experience;
- developing and managing a range of recreational activities that attract visitors to all properties including horseback, bicycle and walking trails, communal beaches and related facilities, sports facilities at key shoreline locations that serve all resorts, a golf course, etc.;
- providing waterborne emergency services that will assure safety of all resorts' guests enjoying diving, swimming, sailing and other water sports;
- managing the long-term growth of the entire tourism center site including protecting the natural beauty of adjacent undeveloped lands;
- adopting a code of management practices for membership; and
- implementing an environmental awareness program that will encourage tourism center guests to protect the reef, respect the dangers of water sports and more fully enjoy the area's amenities.

## Individual Investors, Developers and Managers

The investor and/or developer of individual properties has perhaps the greatest influence on the tourism development process. Ultimately the design and program of an individual property is a personal and private decision based on the values and information held by the investor or developer. They decide what technical assistance they feel is necessary to meet their development objectives and to satisfy requirements of TDA and other agencies, and thus shape their own information inputs. Because they take the lead at the most critical stage of the development process--before concept plans have been formulated--the investors and developers make the key decisions, however market responsive and environmentally conscious these decisions may be. The key responsibilities of individual investors/developers called for in Best Practices are the following:

- work with and through the IDCs to plan for the common interests and collective environmental management of the tourism center in which the investor/developer's property is located;
- engage the services of all appropriate professional and scientific assistance early in the conceptual design to assure sound development;
- work with the TDA and EEAA early in the design process to obtain environmental planning guidance;
- respect the need for public access to attractions which are adjacent to the planned development; and
- design the project to minimize impact on coastal ecosystems.

Once a resort is designed and built, it is often managed by a professional management company. The resort manager has important responsibilities:

- implement environmental awareness programs for resort guests;
- monitor all potential environmental pollution sources such as wastewater irrigation discharges, solid and liquid wastes, and fuel spills;
- provide environmental training for staff and motivate them to use environmental criteria in carrying out their specific tasks;
- minimize negative impacts of the resort by carrying out environmental audits or using other techniques to assess and improve on water and energy conservation and waste minimization and recycling; and
- work with other resort managers to promote common interests such as use and management of the coastal setback areas.

---

## The World Travel and Tourism Council's Environmental Guidelines

Travel and Tourism is the world's largest industry. A clean, healthy environment is essential to further growth. The World Travel and Tourism Council (WTTC) is working with governments, industry, and international organizations to promote environmentally compatible growth, improve industry practices through education and information, and track Travel & Tourism environment implementation programs. The WTTC recommends these guidelines to companies and governments to take them into account in policy formulation.

Travel & Tourism Companies should state their Commitment to Environmentally compatible development. This includes conducting Environmental Impact Assessments for all new projects and conducting regular Environmental Audits for all on-going activities.

Targets for Improvements Should Be Established and Monitored.

The Environmental commitment should be Company wide. Environment Programs should carry full Support of the Board of Directors, be an Integral Part of Management Practices, and communicated to Personnel and to the Public.

Education and Research Into Improved Environmental Programs Should Be Encouraged.

Travel and Tourism Companies Should Seek to Implement Sound Environment

Principles through Self-Regulation, Recognizing that Nat'l and International Regulation May Be Inevitable &

Environmental Improvement Programs Should be Systematic and Comprehensive, Aiming to ...

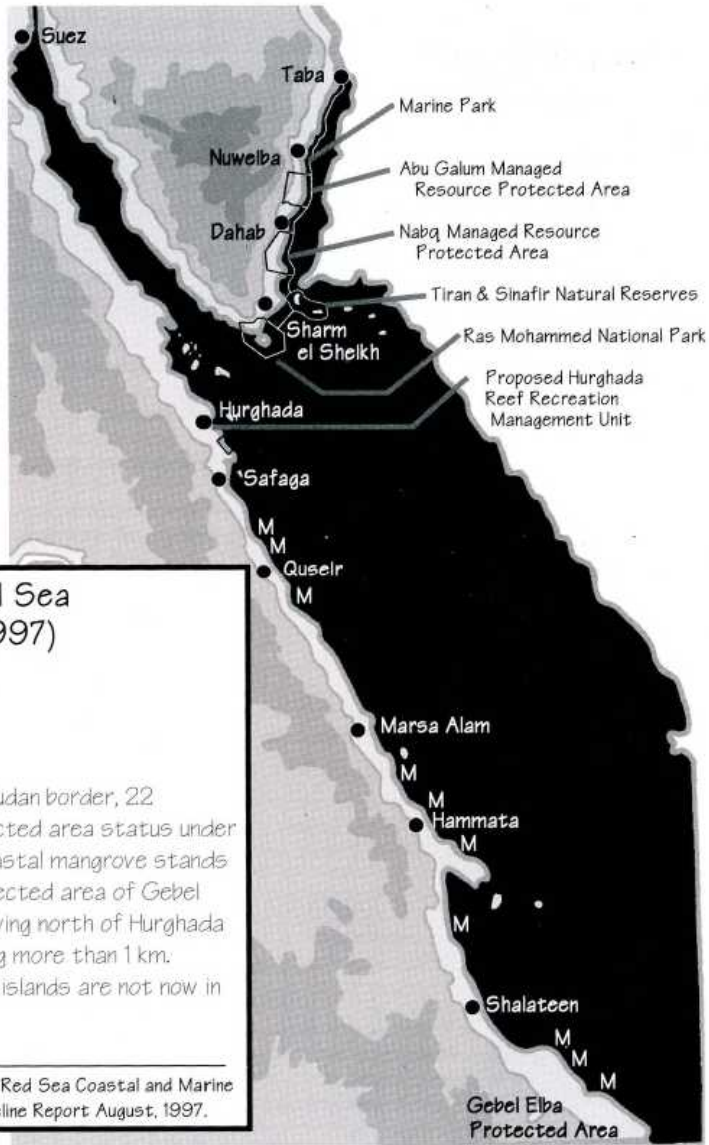
- Identify and continue to reduce environmental impact, paying particular attention to new projects.
- Pay due regard to environmental concerns in design, planning, construction and implementation.
- Be sensitive to conservation of environmentally protected or threatened areas, species and scenic aesthetics, achieving landscape enhancement where possible.
- Practice energy conservation.
- Reduce and recycle waste.
- Practice fresh water management and control sewage disposal.
- Control and diminish air emissions and pollutants.
- Monitor, control and reduce noise levels.
- Control and reduce environmentally unfriendly products, such as asbestos, CFCs, pesticides, and toxic, corrosive, explosive or flammable materials.
- Respect and support historic or religious objects and sites.
- Exercise due regard for the interests of local populations, including their history, traditions and culture, and future development.
- Consider environmental issues as a key factor in the overall development of Travel & Tourism destinations.

*The World Travel & Tourism Council is located in Belgium. Adapted from UNEP Technical Report No. 29: Environmental*

### Egyptian Environmental Affairs Agency (EEAA)

Although responsibilities for environmental protection are dispersed among many government institutions, the EEAA is the central agency charged with environmental protection. Of particular relevance to tourism development along the Red Sea coast is EEAA's mandate for coastal areas protection, its powers to inspect and to enforce all environmental laws, its responsibilities to approve all EIAs for tourism investment projects and its capacity to assist TDA, IDCs, individual investors, and design and planning professionals to understand and to assist in implementing its regulations. Other key roles and responsibilities include:

- prepare baseline data systems for protected areas and other key natural resources;
- prepare and implement protected area management plans;
- work constructively with TDA, developers and design professionals at an early concept stage of each new tourism development in order to influence and provide technical input to design and environmental protection measures;
- develop design guidelines for tourism-related shoreline alteration activities;
- issue standards for solid waste management;
- prepare/enforce regulations governing pollution control, shoreline remediation and other environmental management activities;
- establish protocols with TDA, governorates, IDCs and agencies involved in preparation, review and enforcement of EEAA's EIA procedures;
- promote the expediting of EIA review procedures in order to reduce the developers' costs associated with protracted reviews and to enable full cooperation of all parties to achieve improved environmental practices;
- work with TDA to design training and awareness programs for developers and hotel/tourism facility managers and for design and planning professionals involved in tourism development; and
- work with TDA to identify and encourage adoption by IDCs and individual resort developers/managers of cost-effective environmental equipment, materials, management techniques and the best practices outlined in the succeeding sections.



**Gulf of Aqaba & Red Sea Protected Areas (1997)**

● Existing towns  
M Mangroves

Between Hurghada and the Sudan border, 22 islands have been given protected area status under Law 102/1983, as have all coastal mangrove stands and the extensive inland protected area of Gebel Elba. The "Northern Islands" lying north of Hurghada and the submerged reefs lying more than 1 km seaward from the protected islands are not now in protected area status.

Mangrove locations from Egyptian & Red Sea Coastal and Marine Resource Management Project Baseline Report August, 1997.



## Non-Government Organizations (NGOs)

NGOs can play a vital role in encouraging and assisting high quality tourism development and environmental protection along the Red Sea coast. There is only a small number of environmental NGOs which focus on awareness and protection activities, but there is growing interest in establishing new NGOs as development proceeds and the resident population expands.

The leading environmental NGO in the Red Sea area is the Hurghada Environmental Protection and Conservation Association (HEPCA) which was formed by local diving centers to combat further damage to the marine environment. HEPCA now has 50 hotel and diveshop members and has, among other accomplishments, helped to implement the joint USAID/EEAA mooring buoy installation program along the coastline to deter anchoring of boats on coral reefs. A second environmental NGO is being formed by hotel and diving centers in the Marsa Alam area to address environmental awareness and protection issues.

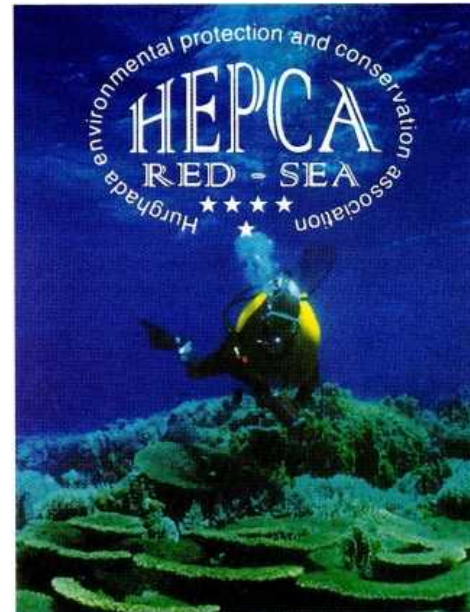
The potential roles and responsibilities of NGOs in tourism development and environmental protection include:

- work with EEAA, TDA, Governorates, and private sector tourism interests to promote public awareness of environmental management issues;
- promote enforcement of coastal management and pollution laws;
- carry out environmental improvement projects such as mooring buoy installation and maintenance and coastal trail development;
- manage important natural areas in cooperation with TDA, EEAA and hoteliers, such as the Wadi el Gemal ecotourism assets;
- work with centers of learning to conduct research on a variety of environmental management topics;
- develop and manage ecotourism activities to raise funds for environmental projects; and
- promote measures to protect key environmental assets such as mangroves, wadis, coral reef ecosystems, wildlife and bird habitat, etc.

## Governorates

Three Governorates--the South Sinai, Red Sea and Suez--have growing responsibilities for tourism development along the Red Sea coast. Although responsibilities and powers are presently centralized in sectoral ministries, the coastal governorates have budgets for administration and social and economic development at the provincial level. Responsibilities related to tourism development include:

- support EEAA and TDA in enforcement of environmental standards;
- facilitate private sector led solid waste management program;
- work with EEAA, TDA, local NGOs and resort managers to increase public awareness of solid waste management issues;
- establish systems for controlled disposal of construction-related waste and debris;
- lead local efforts to clean-up beaches, shorefronts and streets in municipalities; and
- coordinate environmental compliance activities with EEAA and TDA.





## Recommended Tourism Center Development Process

Recommended steps in tourism center development are discussed below and illustrated on the facing page. Each group described on previous pages has a role, with IDCs and developers involved in every step. Initial development will focus on resorts and necessary infrastructure with commercial activities and support services expanding over time to meet the needs of visitors and increasing numbers of residents. Tourism centers may grow into significant towns--some with guest and resident populations of 40,000 or more. From this perspective, development planning decisions assume added importance.

### 1. Form Development Company

The IDC takes the lead in putting in place the infrastructure, support facilities and overall framework within which individual investors realize their own visions. Initially the company may be an informal arrangement of investors working together to solve common problems. Due to complexity of planning, financing, marketing and administration, TDA anticipates more formal IDC arrangements such as operating under a Board of Directors and maintaining a small staff. Initial financing for operations and development activities would be derived as a percentage of projected development costs for member properties. Service use fees (water, sewer, commercial rents, etc.) are expected to recover investments and meet operations and maintenance costs.

### 2. Prepare Tourism Center Development Plan

The "Development Plan" defines a circulation system (roads, cornice, trails), common areas (commercial center, public beaches, marinas), open space (parks, floodways, protected areas) and basic infrastructure and services (desalination plants, wastewater treatment facilities, employee housing). It is within this overall framework that individual investors develop their properties. The Plan describes the vision for the tourism center and becomes the basis for promotion and marketing, reviews and approvals (EIAs and permits), and improvements on specific parcels. Responsibility for preparing the Plan rests with the IDC and its individual investor members.

### 3. Prepare EIA for Proposed Development Plan

An Environmental Impact Assessment is a statement of the expected impacts of a proposed activity on the environment, both in the short term (e.g., during construction) and over its operational life. The EIA outlines actions to mitigate undesirable impacts, and the monitoring needed to determine the extent of damage to the environment. An EIA is prepared by a professional team of scientists, engineers and planners based on field investigations and research. The EIA is submitted to TDA and EEAA for review and approval.

### 4. Make Changes to Subdivisions and Land Allocations

The Plan and EIA may recommend modifications to subdivisions and property allocations. Some environmentally sensitive areas may be kept from development, some may be difficult to develop, and some may have significant values which need to be shared by the entire community. TDA will work with the IDC and investors to find acceptable terms for such modifications.

### 5. Modify Development Plan Based on EIA Process

The tourism center EIA is reviewed by both TDA and EEAA professionals who may request comments from other organizations and individuals. This review may result in changes to the Plan, mitigation measures and monitoring activities. Approval of the Plan is contingent on making these changes.

### 6. Proceed With Design and Engineering

With EIA approval, detailed design and engineering work can proceed for infrastructure and other improvements. Developers will seek permits from TDA, EEAA and a supplemental, streamlined, EIA may be required. This would take advantage of work completed for the tourism center EIA and result in a cost savings and quicker permitting process. Architects and engineers will be expected to follow the guidance of the Plan and EIA.

### 7. Begin Environmental Monitoring/Management of Natural Areas

Environmental monitoring may consist of water quality testing, fish surveys, coral growth measurements, etc., and may be carried out by the IDC, EEAA, TDA, or an NGO. Initial monitoring involves establishing test locations and determining base line levels from which to evaluate changes. Managing natural areas will require defining boundaries, controlling access and use, and promoting awareness of the area's significance. Financing may come from donations, entrance fees, merchandising sales, hotelier contributions, etc.

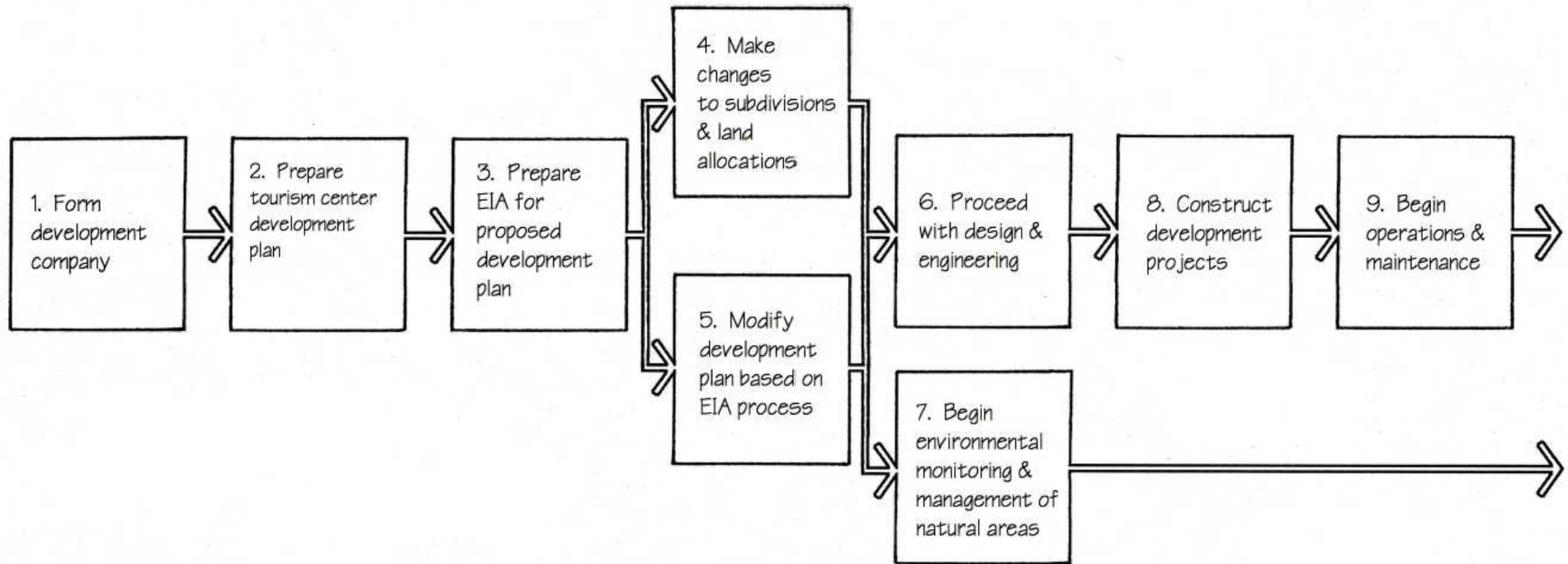
### 8. Construct Development Projects

Construction will minimize potential environmental impacts identified in the Development Plan, EIA and Best Practices described herein. Monitoring for compliance will be done by the TDA, EEAA and the Development Company.

### 9. Begin Operations and Maintenance

As the global tourism market continues to emphasize protecting the environment, more and more resort properties will conduct environmental audits, seek "green" and other internationally recognized certifications, adopt environmental Codes of Conduct, and provide more "ecotourism" services. Once tourism center development is well underway, IDC emphasis will likely shift to promoting environmentally appropriate operations and maintenance.

## Recommended Process for Tourism Center Development



Refer to the following Best Practices:

- A: Development Planning

- A: Development Planning

- B: Marine Recreation Development

- G: Construction Impact Management

- H: Local Environmental Management

- C: Coastal Setback Use & Development

- D: Land Use Management

- E: Environmental & Landscape Design

- F: Infrastructure & Support Facilities

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# Part II: Development Shaping Features

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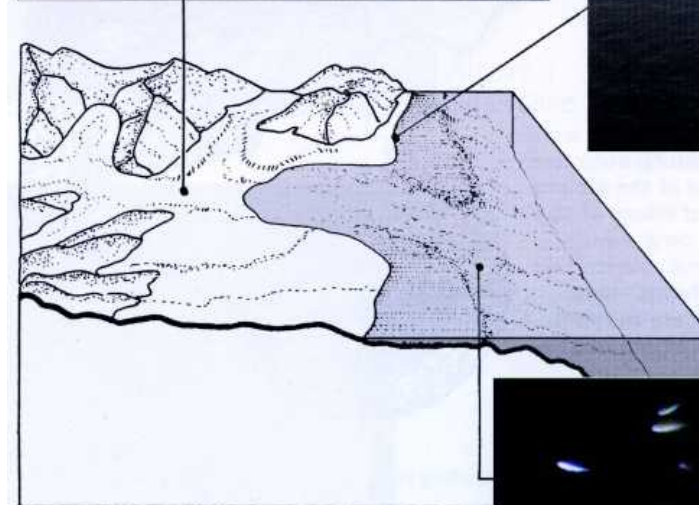
## Part II: Development Shaping Features

The features of the Red Sea region's natural environment and the man-made or "built" environment play significant roles in shaping the development of new tourism centers. Understanding of and respect for these development shaping features will be key to designing successful and sustainable tourism centers. The following pages provide a summary of these features and background for the best practices that follow.

### THE NATURAL ENVIRONMENT

The development of tourism centers along the coast of the Red Sea region is an enormous responsibility. This coastline has stood with its awesome, empty beauty for thousands of years. Over a several decade period, much of this coast is being transformed. Already, tourism-based development has created significant communities at Sharm el Sheikh and Hurghada, and the development of new tourism centers along the entire Red Sea coastline will bring new, permanent development and change to the region.

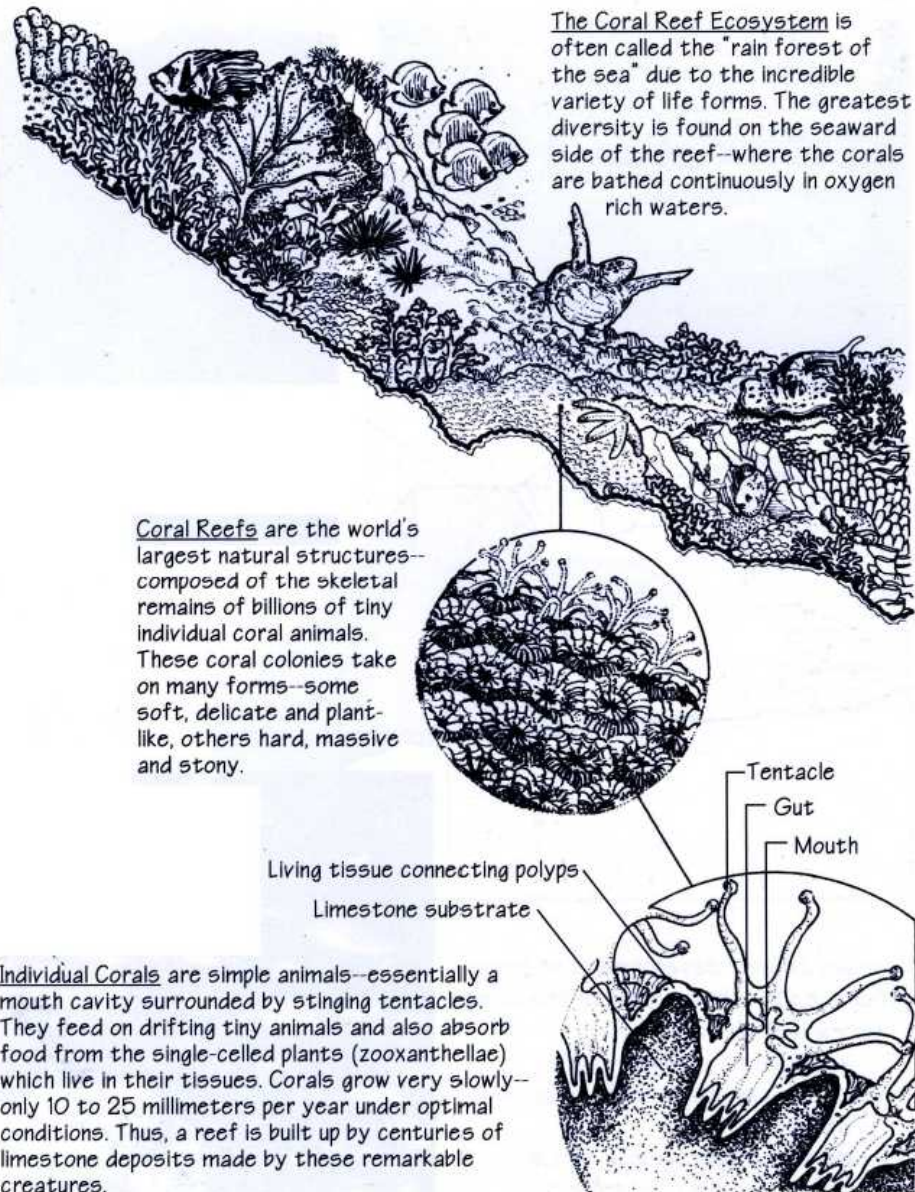
The dramatic natural features of the region - the pristine coral reef ecosystem, the rare but beautiful marsas, sharms and beaches, the powerful sea front, the uncluttered coastal landscapes, the landforms carved out by wadis - are the principal attractions for visitors and provide the basis on which resort profitability depends. To some extent, damaging these features are inevitable impacts of human development. However, many negative impacts can be avoided, and all of them can be minimized, through the application of sound planning, design, construction and operations measures, such as suggested in this Best Practices handbook. If the resources of the Red Sea are to be preserved for the enjoyment of future generations, it is essential that these measures become not just "best" practices, but common practices.



Tourism center development is most influenced by these natural features:

- coral reef ecosystem- its sensitivities and vulnerabilities
- shoreline conditions- limits to access and use
- natural drainage channels- special areas to respect and protect.





### The Coral Reef Ecosystem and Its Vulnerabilities

The Red Sea is known throughout the world for the excellence of its coral reefs and associated marine life. Their beauty and rich diversity is a principal reason for the Red Sea region's expansion as a major international tourism destination. However, these coral reef ecosystems are vulnerable and their protection requires special attention in the design and development of tourism centers.

Coral reefs are the result of a fine balance between the formation and consolidation of limestone (produced by corals and marine algae) and destruction by mechanical and biological activities. They are made up of colonies of tiny animals, called polyps. A coral polyp is a simple anemone-like animal living in a limestone matrix. Corals depend on microscopic plants (algae) living in their tissue - without which they could not survive.

Coral reef structures are composed mainly of the dead limestone skeletons of previous generations of corals. Only the thin outermost layer of the reef is alive with colorful coral polyps. The structures built by corals provide the framework for the coral reef community, by providing a habitat for creatures such as mollusks (snails, clams, octopuses), crustaceans (crabs, shrimp, barnacles), echinoderms (starfish, sea urchins, sea cucumbers) and the seemingly endless variety of colorful and unusual fish. Coral reefs require:

- annual mean water temperatures ranging from 22° to 29°C for reef growth (at high temperatures, polyps expel algae and "bleach");
- clear water to allow adequate light for photosynthesis by the algae;
- firm substrate for attachment;
- stable salinity;
- low sedimentation (sediments can reduce the amount of light and can cover and smother corals); and low nutrients (increased nutrients allow excessive "weedy" algal growth which can cover and damage corals).

While corals can be adversely affected by various natural processes (such as wave damage, sedimentation due to storm water runoff, etc.), the primary risk is human-based. Many human activities associated with tourism development now occurring in the Red Sea region with increasing frequency endanger the health of corals and other marine life. This is true both within a localized area of a specific resort and within a broader area of a tourism

center or larger coastal region. In the development and operation of tourism centers, there are several key coral reef ecosystem concerns that should shape development decisions:

Vulnerabilities to Sedimentation

The prevailing north-south current pattern along the Red Sea coastline transports sand from sources such as wadis. On its journey, a sand grain rests on almost every beach it meets and travels all the time. Therefore, if structures are put along the shore, the sand grain's journey gets altered. Artificial beaches and shoreline construction activities (excavations and construction of berms, solid jetties, sea walls, lagoons, etc.) would lead to changes of natural sediment dynamics, beach erosion, and unwanted accretion. Coastline alterations and construction activities along the shore must be carefully managed in order to not alter sediment dynamics and to prevent introduction of sand or other construction material into the water as this will be transported with the current. This additional sand can smother corals and reduce water clarity critical for coral survival.

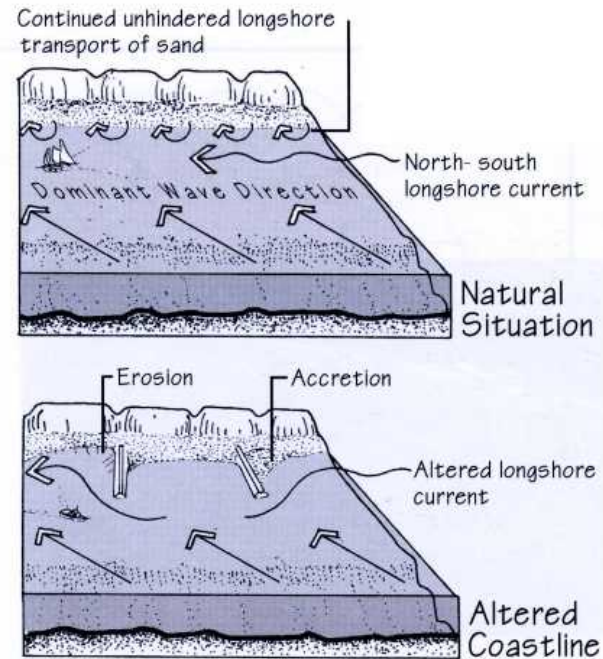
(See Best Practices B, C and G)

Vulnerabilities to Pollution

Improper disposal of sewage and wastewater can lead to seepage and the introduction of phosphorus and nitrogen to the adjacent coral reef ecosystem. This leads to a fertilization of marine algae which then will overgrow and kill the reef. Smelly, or even toxic, algal blooms can also occur. Careful management of all liquid wastes and irrigation water is required. Other sources of pollution associated with tourism center development include pesticides and herbicides used in landscaped areas, including golf courses and gardens. With the introduction of desalination plants, the brine discharges and resultant increases in salinity have become a new threat to coral reef health. ( See Best Practices C, D, F and H)

Vulnerabilities to Overuse The rare occurrences of dive sites, seagrass bed nurseries, swimming areas, sheltered areas for boat moorage, and marine recreation uses implies that each of these amenities will have carrying capacities beyond which use will degrade the resource. Baseline data will need to be collected to understand the importance of the resource and its carrying capacity. It will only be after such studies that it can be determined how many snorkelers can use a seagrass bed nursery area or how many divers can use a particular site or how many boats can find moorage in a particular marsa without significantly degrading these resources. Carrying capacity monitoring programs will need to be established to provide a basis for management of these resources.

(See Best Practices B and H)



Installing and properly using mooring buoys is one of the best ways to protect coral reefs from anchor damage.



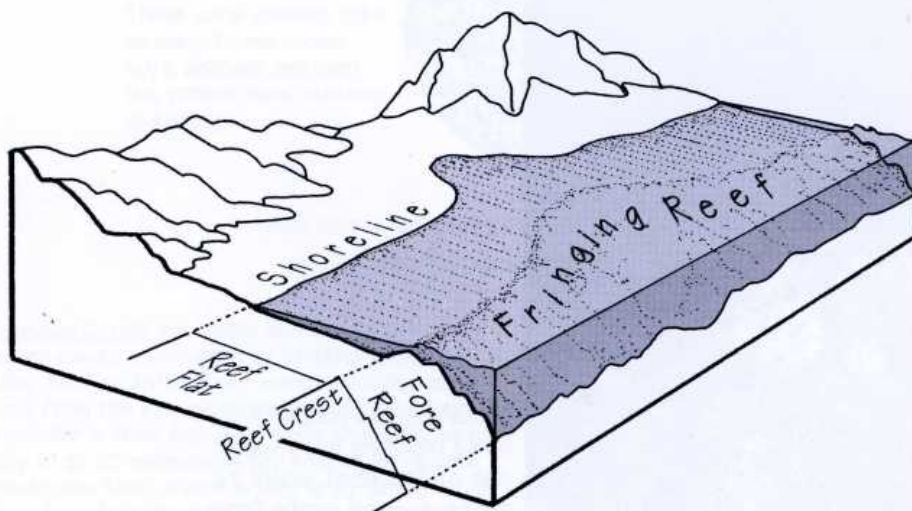
## Development Shaping Features

Surf indicates edge  
of fore reef and  
drop-off into  
deeper water



Shallow reef flat

Note person for scale



## Access to the Sea: Limitations & Opportunities

Due to the physical circumstances described below, there is a small percentage of Red Sea near-shore waters that can be used and enjoyed—except for strolling along and viewing. Those few beaches, marsas or sharms that enable beach diving, swimming and moorage of pleasure craft must be treated as rare jewels and protected accordingly. Tourism centers and individual resorts must plan recreation options for visitors that respect these physical circumstances. Similarly, marina development in location not suitable for such uses should be protected.

### Rough Oceanographic Conditions & Exposed Coastline

Most of the coastline outside the Sharm el Sheikh and Hurghada areas is directly exposed to strong, prevailing northerly winds. Little protection exists against the forces of winds, waves and currents. On many days, access to the sea may be unpleasant and hazardous with the result that boating, swimming and diving can be frequently dangerous. This shapes tourism center and individual resort planning by necessitating that attention be given to alternative recreation opportunities such as providing more extensive swimming pools, inland waterways, dry beaches, walking and bicycle trails, active sports courts, etc. (See Best Practices B and C) In some exposed locations, the wind will also impact visitor enjoyment on land as well as at sea and resort siting must consider measures to reduce its impact.

### The Fringing Reef

Most of the Red Sea coastline is fringed by a wide reef flat (in many places more than 500 meters). This reef protects the shoreline and beaches which would otherwise be directly exposed to high wind and waves. The fore reef and, in some locations, portions of the reef flat offer recreational opportunities, including diving, snorkeling, swimming and wading. However, when affected by wind, waves and current, the reefs can be dangerous to visitors. Practice B-3 suggests a number of safe and environmentally-appropriate measures to provide access for visitors from the shoreline to recreation sites on the reef flat and off the fore reef.

The construction of jetties across a reef flat should be considered only in relatively protected areas, especially if access to boats beyond the fore reef is desired. In many areas, the rough oceanographic conditions prevent building a structure that could provide access to vessels beyond the fore reef. In other areas, important sea grass beds and fish nurseries might be impacted. And in others, the sheer width of the reef flat renders such structures infeasible. (See Practice B-6)

### Marsas and Sharms

Marsas are small bays that enable access to and from the sea. They are formed at the end of water drainage channels (wadis). Reef growth is interrupted by periodic flooding and transport of sand through these channels. The resultant marsa provides an opening to the sea without the need of crossing a wide reef flat. There are often good beaches in these locations and good diving opportunities.

Marsas also provide safe anchorage for diving boats and can be used for small marinas. Large marinas with full facilities are often best situated in the low-lying areas adjacent to the marsa (dredging and flood protection is necessary).

Sharms are similar to marsas, but usually smaller, with unbroken fringing reef bordering most of the coastline. They are also situated at the head of wadis. Sharms frequently offer spectacular diving and can serve as boat anchorages if sufficiently deep.

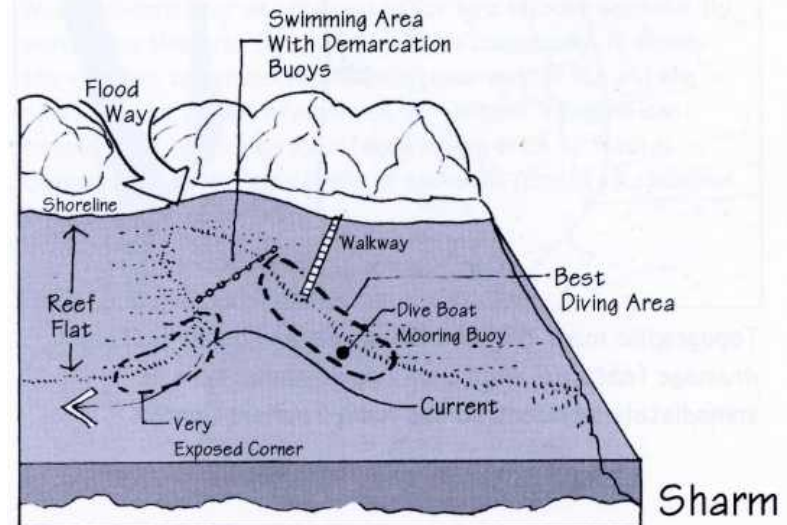
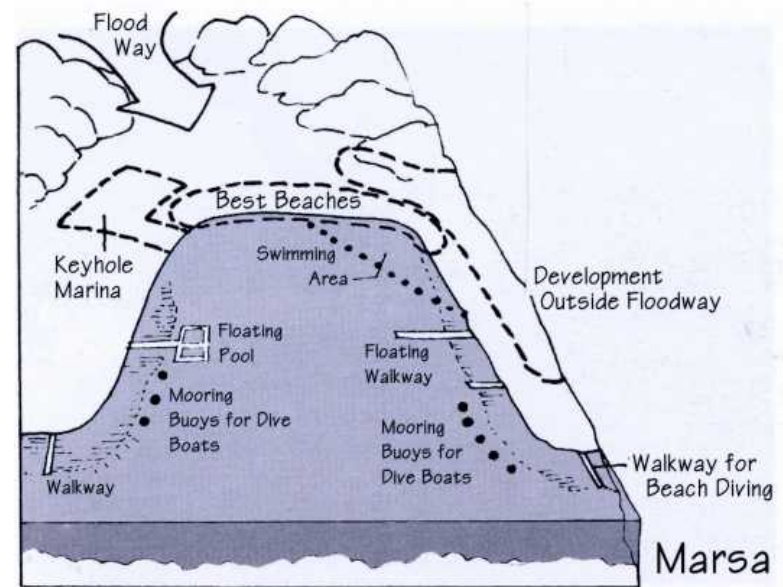
Facilities that can often be installed in both marsas and sharms include:

- mooring buoys • swimming & demarcation buoys
- floating pools for swimming • underwater walkways

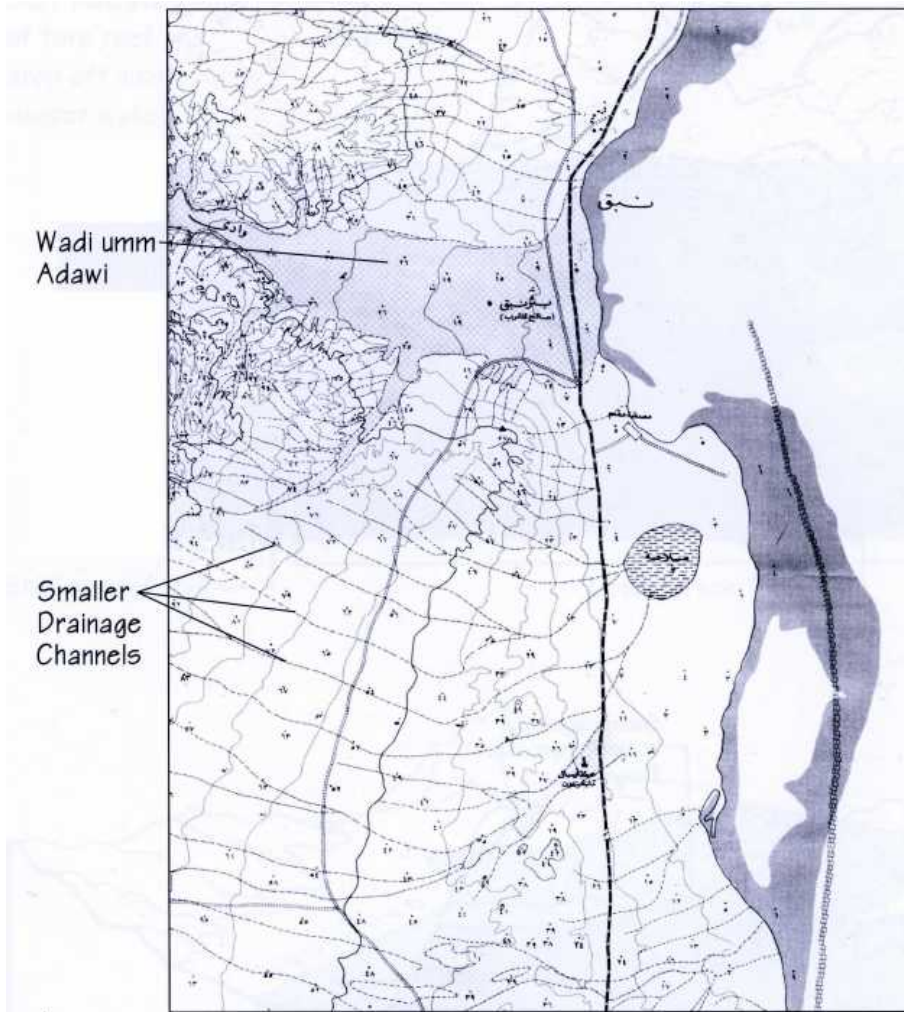
Along the coastline from Hurghada to Ras Banas, marsas and sharms are the only areas that offer protection from high waves and currents, however, there are only a few of these natural features. As a result, the marsas and sharms will come under heavy pressure for diving and other recreational uses as tourism expands along the coast. Carrying capacity analyses and management plans will have to be implemented to control the extent of use of these features. Where possible, it is desirable to maintain marsas and sharms in public ownership to assure access to these rare features by citizens and tourists. (See Practices A-3 and A-4)

### Shoreline Topographic Conditions

Shoreline topography along the Red Sea coast varies from low, flat conditions to rocky, steep bluffs and headlands. In the case of lowland shorelines, building front lines may need to be held back a considerable distance from the mean high water line to protect structures from storm surge. In the case of bluffs and headlands, buildings may need to be carefully situated to avoid dangerous cliffs and strong winds. In all cases, at least a 100 meter setback (50 meters on bluff sites, under certain conditions) is required by EEAA and TDA to enable public pedestrian and emergency access and other public purposes. (See Best Practices C)







Topographic maps help identify wadis and other Surface drainage features. Wadi umm Adawi, Shown here, is immediately adjacent to the Nabq Tourism Center.

### Natural Drainage Systems (Wadis - Both Large and Small)

Wadis are the outwash channels carved out over centuries by flash floods which are produced by powerful desert rain storms that occur periodically throughout the Red Sea region. The often deep sand and gravel beds underlying wadis can be a source of groundwater even during dry periods. Following rainstorms, they may put forth a profusion of vegetation, including grasses and colorful flowers, which may survive for months until the scorching sun causes them to dry and wither. However, the seeds that are produced during these brief periods of growth and fertility will survive in the wadi soil until the next rainfall, which may not come for years into the future.

Wadis are thus both a source of ever-changing natural beauty, and a means of safely channeling dangerous flood waters. They also provide important habitat for birds and animals. For these reasons, they should be left in their natural state, with as few man-made alterations as possible. A considerable investment in civil works is needed in order to make wadis safe for permanent structures, and even then there is no assurance that these man-made interventions will function adequately.

Both large and small wadis in tourism center subdivisions should be set aside as open space to serve functional and aesthetic purposes as well as provide attractive opportunities for nature trails and access to the beach or mountains. In some locations, wadis provide opportunities for tented camps or ecotourism facilities with movable or light structures. Necessary pedestrian and vehicular crossings of wadis should be bridges as opposed to fills whenever possible so as not to impede floodwaters. Wadis with significant watersheds and wildlife resources (such as Wadi el Gemal) deserve special environmental management. (See Practices A-5 and A-10)

## THE MAN-MADE ENVIRONMENT

While the region is quite large in area, it is sparsely populated. Major existing centers at Hurghada and Sharm el Sheikh, smaller communities at Quseir, Safaga, Marsa Alam and others account for a total permanent population of less than 250,000. In addition, the region is home to a small (fewer than 10,000), nomadic Bedouin population.

Investments in airports, highways, electrical power and other infrastructure have fueled a dramatic increase in tourism in the south Sinai and Hurghada areas and have provided the base for further tourism expansion outside those centers. National tourism development policies and TDA's program of stimulating private investment in tourism centers has also been key to this growth.

Key features of the built environment that shape tourism center development decisions include the existence of traditional peoples and their ways of life, the established protected areas throughout the region, the allocation and subdivision of lands for tourism centers, and the location of the coastal highway,

### Traditional Peoples & Cultural Heritage

The small but culturally significant Bedouin people of the region should be an important shaping feature in tourism center planning. Perhaps first and foremost, planning for tourism center activities must respect the values and ways of life of these peoples. Working closely with them, both the Bedouins and the visitors to tourism centers will benefit. These local residents will be able to share their values and skills with visitors and secure a source of income that can help them sustain their ways of life. Visitors can experience local foods and products and have direct exposure to traditional peoples through guided trips to the area's natural features. The visitors will have the opportunity to learn through their Bedouin hosts that the resources that surround them are important, interesting and worthy of respect.

In addition, the land and resource use needs of Bedouin people should be respected. While the number of traditional people and their collective impact on the environment is small, the uses they make of the environment (fishing, hunting, materials for handicrafts, etc.) are vital to their survival. Traditional sites (fish camps, settlements, animal grazing areas) should be protected for their continued use—whether located in protected areas, within TDA lands designated for tourism center development or elsewhere.



Wadi el Gemal Fishing Village

A small traditional fishing village exists at a site just north of Wadi el Gemal near an area slated for two tourism centers. By protecting this site for the use of this community, it allows the villagers to pursue their subsistence way of life and the site becomes a point of interest for visitors. Villagers can expand their livelihoods by offering sailing trips to Wadi el Gemal island or leading safaris up the wadi. (See Wadi el Gemal Ecotourism Plan, pp 33)

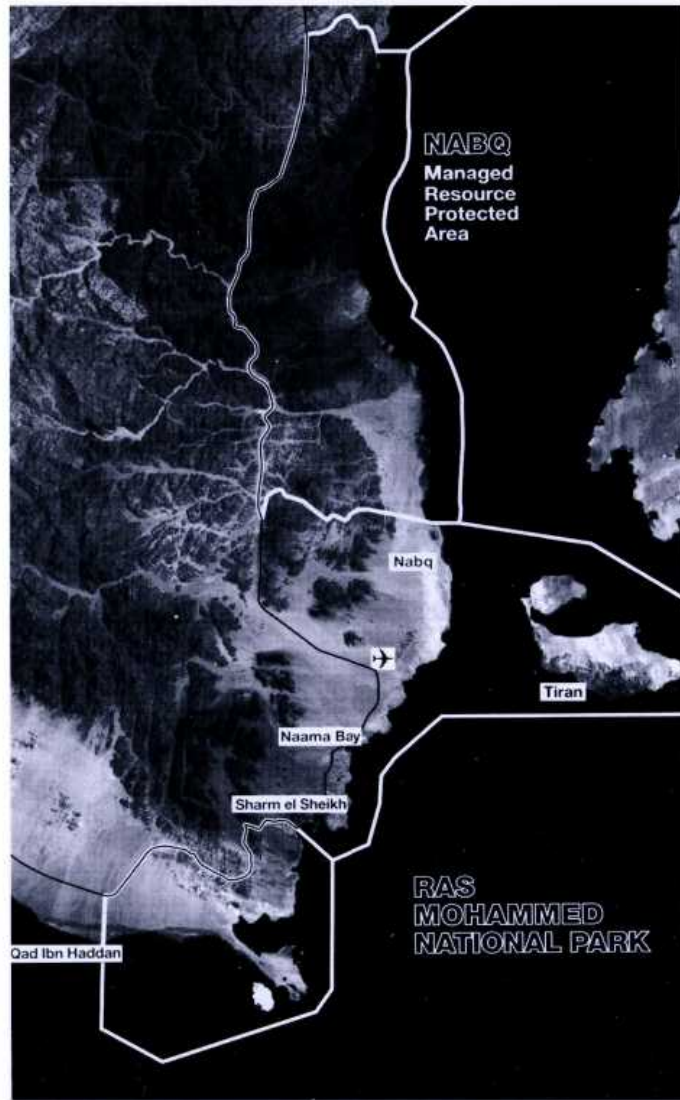


Photo from National Parks of Egypt South Sinai Sector brochure, produced by EEAA

Sharm el Sheikh, Naama Day and Nabq Tourism Center are fortuitously located adjacent to three internationally-significant protected areas. This will enable these centers to benefit from the many natural attractions and assure their potential as world class tourism destinations.

### Protected Areas

There are currently 17 declared protectorates in Egypt, including the world-renowned Ras Mohamed National Park in South Sinai, and the Elba Reserve in the Red Sea Governorate. Included in the Elba Reserve Protectorate are 22 major Red Sea islands, and all coastal mangrove stands. The 22 major islands are scattered along the 700 kilometer coastline, with approximately half located in the Hurghada/Safaga area, and the balance to the south of Quseir. ( See map, page 8)

Once an area has been designated as a Protected Area by Prime Ministerial decree, actions are forbidden that will lead to the destruction or deterioration of the natural environment, harm the biota (terrestrial, freshwater or marine), or detract from the aesthetic value of the protected area or its constituent elements. Regulated areas include the designated Protected Area, together with an adjoining buffer zone whose extent is defined based on local conditions.

Since mid-1997, Protected Area Rangers have been located in Hurghada to initiate monitoring of the protected islands and their surrounding buffer zones. The Hurghada-based Rangers are extending the successful marine park management program first initiated in the Ras Mohamed protectorate in the early 1990s.

The national recognition embodied in declared protected areas serves as an important draw for tourism to the region. Tourism centers located near protected areas benefit from many marketing and promotional opportunities. The trails, information centers, signs and other infrastructure of the protected areas become destination attractions for the tourism center resorts. Ecotourism opportunities as well as opportunities for ecolodge development are made possible. (See Practice D-2)

Working as a partner with EEAA managers of the protected areas, a development company can help to achieve long-term environmental protection of both the declared areas and any important natural features within or adjacent to the tourism center. This can assure long-term interest in the tourism center as an important destination within the rapidly expanding global ecotourism market.



## Land Allocations and Subdivisions for Tourism Centers

In carrying out the national initiative to make land available to investors for resort development along the Red Sea coastline, many significant decisions have been made with respect to lands allocated for tourism centers and to subdivision of those lands. The focus over these years has been to commit most available land along the length of the coastline to tourism center development. An implication of this pattern of development is that most waterfront sites may be "private property" with few opportunities for future upland resort sites to have access to the sea.

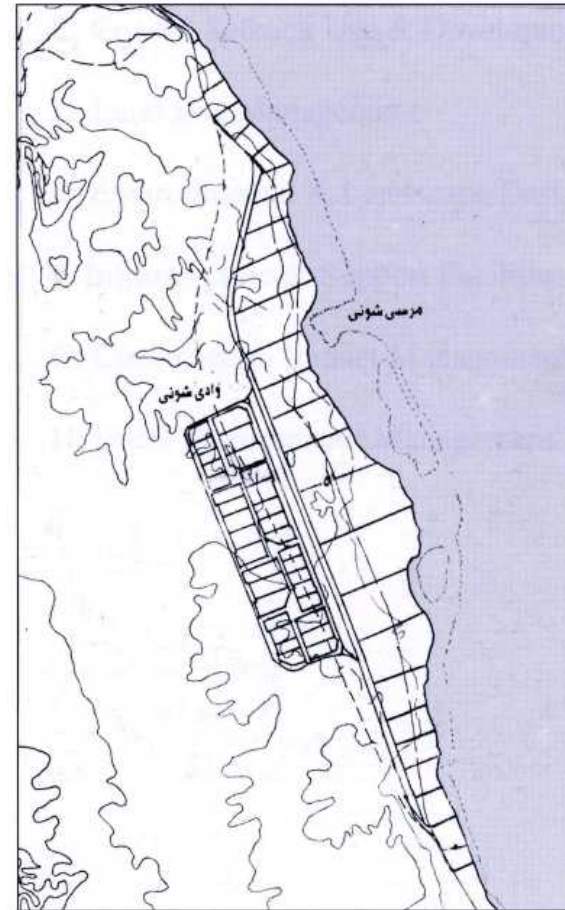
Tourism centers now in the planning stages do have the opportunity to work together with member investors and TDA to alter subdivision plans in order to improve access to the waterfront. Key undeveloped sites between the coastal highway and waterfront amenities such as a marsa or swimming beach may be retained for public use or public access across the site to the waterfront can be secured. (See Practice A-10) By keeping the sea front more open and clustering development in fewer locations, all resorts can claim the seacoast as their "draw." This will enable the region to maintain higher quality resorts and insure the area's overall quality as a tourism destination far into the future.

## The Coastal Highway

The coastal highway system is a significant development shaping feature. It is the spine around which each tourism center is to grow and thus is at the center of a number of development planning issues remaining to be resolved. In most cases, the tourism center subdivisions are planned with parcels on both sides of the highway, i.e., a row of properties on the waterfront side and a row on the upland side. As traffic grows, the highway will become a barrier between the upland resort properties and coastal amenities. It also becomes a safety hazard and noise generator for all properties. As commercial areas evolve in many of the tourism centers, the additional traffic generated by these activities will exacerbate these problems.

As development companies work with member investors on matters related to development planning for each tourism center, the relocation of the highway is often at the center of discussion. While a number of government agencies (including the military) will need to be involved in any highway relocation decision, this is a possibility. In all cases, careful planning of

commercial centers, secondary circulation throughout the tourism center, and vehicular/pedestrian access to coastal amenities (beaches, marinas, dive sites, etc.) can minimize the negative impacts of the highway. (See Best Practices A and F)



This subdivision for a tourism center north of Marsa Alam is similar to others: a row of large parcels lines the coastline and is separated from future upland development by the coastal highway. Planning for this tourism center should attempt to minimize negative impacts of the highway and assure access from upland properties to coastal amenities.

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# A. Development Planning

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Practice A-1

## **Use Multi-Disciplinary Team to Prepare Tourism Center Development Plan**

The financial viability of each tourism center will depend largely on the condition of both the natural and man-made environment. Protecting the natural environment and developing an attractive, integrated, environmentally-responsive system of resorts and related tourism facilities are therefore the most critical investments that the IDCs and individual investors will make over the life of the tourism center. Success in these two endeavors will occur if the IDC (and all investors) make it a high priority and if they join together to prepare a plan for each tourism center that clarifies development objectives and outlines a realistic path to achieve them.

The development planning for a tourism center requires the services of a team of qualified individuals in numerous fields, including at least a landscape architect/site planner, architect, marine biologist and civil engineer. Depending on the nature of the envisioned development activities (e.g., a lagoon, jetty, golf course, or marina), consulting members may include a hydrologist, soil scientist, marina engineer, and others. The team will work under the guidance of the IDC to carry out activities associated with the best practices outlined in this section, including:

- design common facilities including water and waste management infrastructure; recreational facilities; health, safety and emergency services; employee housing; and circulation systems;
- protect the natural environment by identifying conservation areas throughout the tourism center;
- guide investors in the development and management of individual resort properties within the tourism center;
- work with TDA and individual developers to improve subdivision design as needed;
- meet many of the informational requirements and provide the basis for preparation of the tourism center EIA; and
- prepare the final tourism center development plan that achieves integrated design of the entire resort community, including cost estimates and recommendations for phasing development.

## Practice A-2

# Assess Key Environmental Elements to Identify Development Alternatives

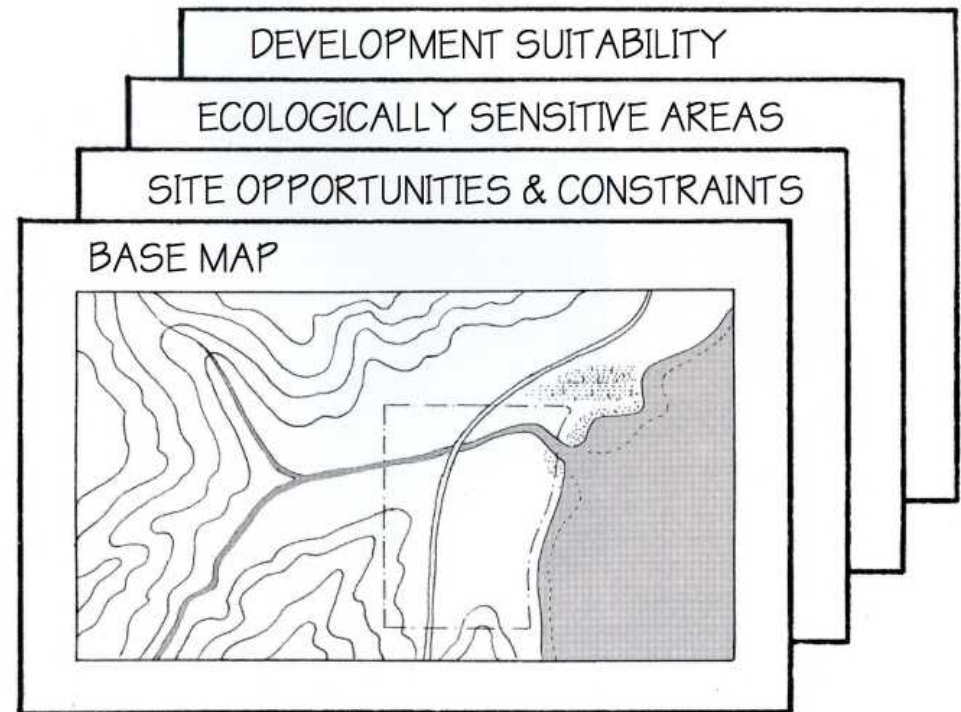
Both the marine and terrestrial environment must be clearly understood to insure that development activities do not degrade the environment and that the costs of development are minimized. With respect to the marine environment, careful analysis of the coral reef community and oceanographic conditions are necessary to determine the carrying capacity of use, required measures for life safety, and design of facilities such as marinas and jetties that will enable visitor enjoyment of these natural resources without degrading them. With respect to the terrestrial environment, careful studies must be conducted of soil conditions and ground water resources to provide a basis for design of sewage treatment, brine discharge and other waste management and for design of special facilities such as golf courses.

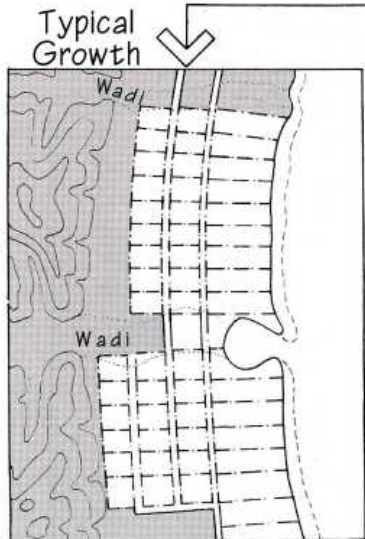
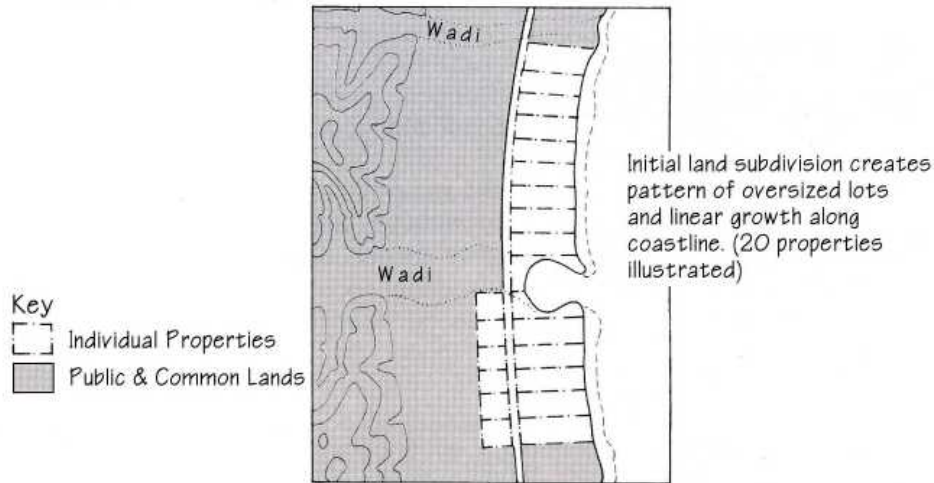
In order to identify appropriate development alternatives, the following steps are recommended:

1. IDC members and the development planning team visit the site to discuss site opportunities and constraints and program requirements;
2. The planning team completes a site analysis as a basis for presenting development alternatives to the IDC, TDA and others. The analysis would consider the subsequent best practices outlined in this section and include at least the following components:
  - a development data base including oceanographic (winds, waves, tides and current) data, soil percolation and groundwater analyses, coral reef ecosystem base line data and mapping, etc.;
  - a base map for the tourism center area, including topography, bathymetry, floodways, setback, building and property lines;
  - an overlay of site development constraints and opportunities including flood zones, steep slopes, reef hazards, wetlands, building sites, etc.;
  - an overlay of ecologically sensitive areas which should be either set aside and protected or which require special development measures (e.g., wadis, wetlands, fish nurseries, dunes, sea grass beds and traditional uses such as a fishing village); and

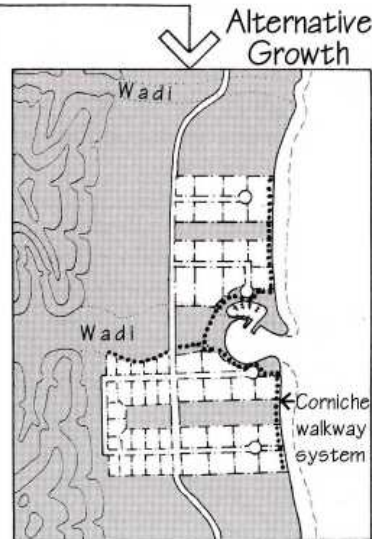
- overlays indicating development suitability for proposed uses such as hotel building sites, wastewater treatment, employee housing, commercial center, visitor center, golf course, marina and jetties.

3. The development team collects data and prepares engineering and feasibility studies for specific program activities requiring special attention, such as marinas, artificial lagoons, waste disposal sites, shoreline modifications, and artificial beaches.





Typical growth continues along road system, spreading development out, making common infrastructure & services expensive and inefficient. Upland properties reduced to 'second class status with limited access to shoreline. (50 properties illustrated)



Initial land subdivision modified to concentrate growth around a commercial center, relocate road and create smaller lots. All properties have easy access to shoreline and community facilities (corniche, marina, beaches). More shoreline land is still available for future growth. (50 properties illustrated)

### Practice A-3 Guide Development to Reduce Pressure on Resources & Increase Visitor Carrying Capacity

The most striking amenities of the area—the pristine, uncluttered coastal landscapes, the fringe reef and occasional marsas and sharms, the landforms carved out by wadis, the pockets of vegetation at the wadi floors—are the principal natural attractions for visitors to the Red Sea coast. The beautiful settings cost nothing in their pure state and yet provide the basis on which resort profitability and national tourism revenues can ultimately depend.

The coastline is a finite resource. Encouraging development along the entire coastal strip may choke opportunities for future development and relegate upland resorts to "second class" status. By keeping the sea front more open and clustering development in fewer locations, all resorts can claim the seacoast as their "draw." This will enable the region to maintain higher quality resorts, insure a higher quality tourism experience for more visitors, and increase the visitor carrying capacity of coastal assets, thereby expanding the number of rooms the region can support.

In addition, the best area for tourism development isn't always along the sea. The strong prevailing winds along the Red Sea coastline can produce uncomfortable conditions in exposed locations. Other sites often offer better protection and some at higher elevations command sweeping views of the desert coast landscape. The development plan should address the following:

- creating destinations of interest in areas other than the waterfront that will attract development to selected upland locations;
- relocating some waterfront parcels to upland locations;
- retaining prime beaches, marinas, and other recreational sites in community ownership and management;
- providing for vehicular and pedestrian easements and access corridors from all area resorts to the key marsas and sharms; and
- redirecting development that would interfere with dramatic coastal vistas or impact important landscape attributes.

**Recommended Resources & Additional Information: Refer to Best Practices B. Marine Recreation Development**

#### Practice A-4

### Develop a Conservation Strategy for Public & Common Areas & Resources

For the reasons noted in *Part II: Development Shaping Features*, only a small percentage of the Red Sea coastline can be easily used and enjoyed — except for viewing and strolling. Those few beaches, marsas or sharms that enable beach diving, swimming and moorage of pleasure craft must be treated as rare jewels and protected accordingly. Committing such assets to one property owner may reduce the enjoyment of citizens and visitors forever. It will also likely reduce the carrying capacity of the area to support extensive resort development.

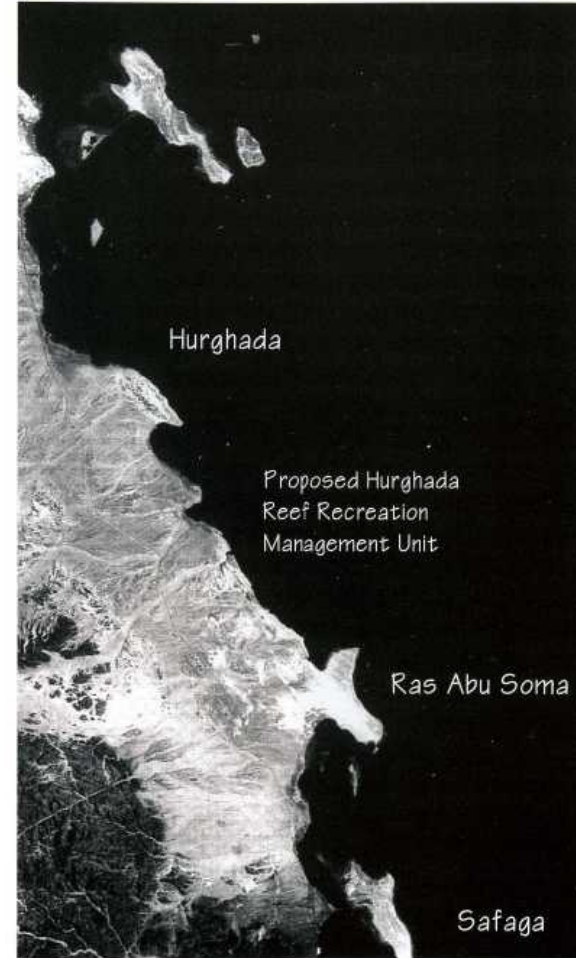
The desert wadi system commands respect both for its functional purpose in stormwater management as well as for the danger it represents at the time of flash floods. Perhaps less appreciated is the habitat it often provides for bird and animal life, for the vegetation it supports and for the aesthetic contribution it makes in the desert landscape. Subdivisions for tourism centers should set these areas aside as open space to serve functional and aesthetic purposes as well as provide attractive opportunities for nature trails and access to the beach or mountains. Wadis with significant watersheds and wildlife resources (such as Wadi el Gemal) deserve special environmental management.

Conservation options include:

- Dedicating important publicly-owned natural areas as protected areas under government, IDC or NGO management;
- Exchanges or purchases of sensitive natural areas from private owners;
- Establishing conservation easements for natural areas on portions of private properties;
- Granting incentives to developers who agree to site planning measures that will protect important natural areas on their properties; and
- Developing carrying capacity standards for use of key resources such as house reefs, wadi safari trails, windsurfing areas and beaches.

#### Recommended Resources & Additional Information:

Refer to Best Practices D. Land Use Management



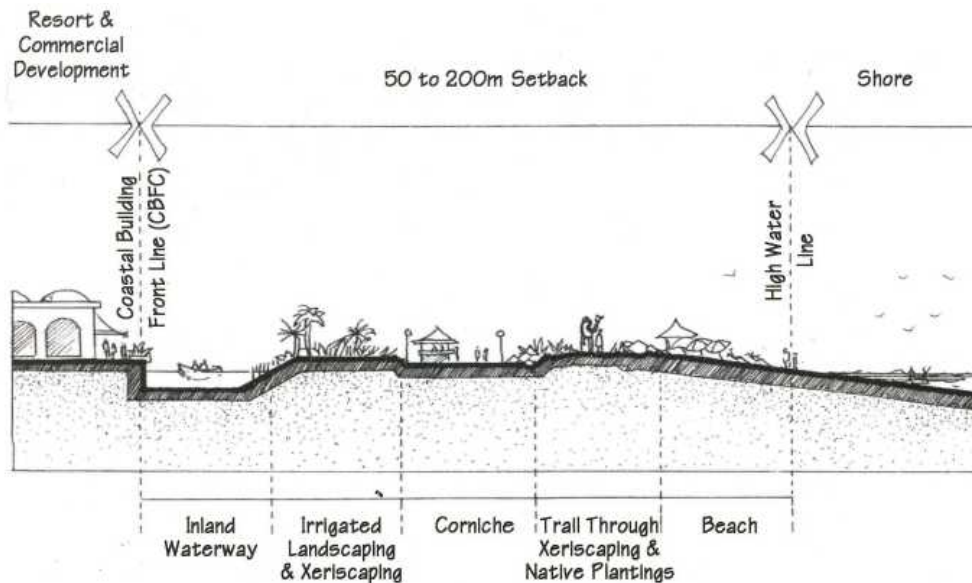
The Red Sea coast from the islands north of Hurghada to the Safaga area on the south is undergoing *heavy* pressure from both community population growth and tourism development. As a result, this area is the focus for considerable conservation attention including:

- Proposals to expand the EEAA marine park management jurisdiction to most of the area;
- Installation of mooring buoys at selected dive sites as part of a USAID/EEAA program;
- Technical studies undertaken by the World bank/Global Environmental Facility Marine Resources Management Project; and
- Mans by resort investors to protect natural areas on their properties and to develop walkways and bicycle paths along portions of the coastline.





Circulation network takes advantage of wadi to reach shoreline at hotel near Sharm el Sheikh.



Building setback provides opportunities for corniche, inland waterways, trails, beaches and landscaping.

### Practice A-5 Provide Networks for Pedestrians, Bicyclists & Horseback Riders as well as for Motorists

Visitors to all tourism centers may walk, bike or ride horses for fun or to reach destinations within the community such as beaches, the commercial center, or an attraction at another resort. In order to facilitate walking, biking and riding, a safe and enjoyable network must be planned to accommodate these forms of circulation.

The setbacks from high water mark to the building front lines (at seafront properties) and other open space in each of the tourism centers represent important opportunities to insure attractive and accessible pedestrian, bicycle and horseback use. A coastal trail (or corniche) transversing the setback along the entire coastline could provide, as the experience at Naama Bay demonstrates, more than a movement path for pedestrians. If it is well planned, it becomes a commercial and social center for at least a portion of the resort community. By its linear nature, it offers the opportunity to link all parts of the resort community using design elements such as paving, planting, "street" furniture and lighting.

In addition to the setbacks, the many wadi systems that penetrate each tourism center offer more opportunities to introduce a network of paths. If the wadi system boundaries were demarcated and these areas dedicated to open space, paths and trails to and from the sea could be provided as well as protecting the stormwater drainage function of these wadis and preserving their aesthetic contributions to the landscape.

Provision of plated walkways between key destination points (marinas, beaches, commercial areas, highway, etc.) is another important way to create walking and riding opportunities. By tying a coastal trail with a system of horseback trails, bicycle paths and walking trails along the wadis and across plated walkways, an exciting and varied system of circulation connects the visitor with the mountains and the sea and to all points of interest throughout the community. This could be one of the distinguishing design features of the tourism centers.

Vehicular networks within the tourism center should meet multiple purposes, including maintenance, security, emergency vehicles, underground utilities, and construction activities. Building roads across pristine sites is a serious intervention, however, that creates nearly irreversible impacts. Planning for the interior road network should address at least the following:

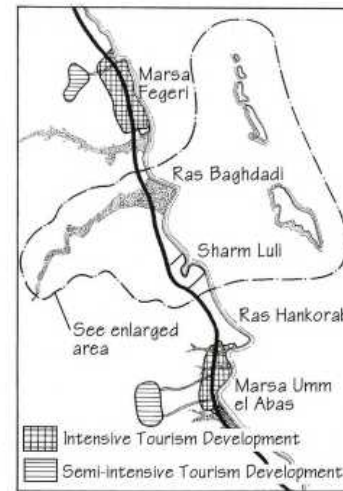
- use a curvilinear alignment to flow with topography and add visual interest;
- reduce speeds by calming devices and more and tighter curves;
- minimize width to reduce cut and fill disturbance;
- provide for bike and pedestrian lanes; and
- restrict vehicles to the edges of development insofar as possible.

Other circulation issues that deserve attention at the development planning stage include:

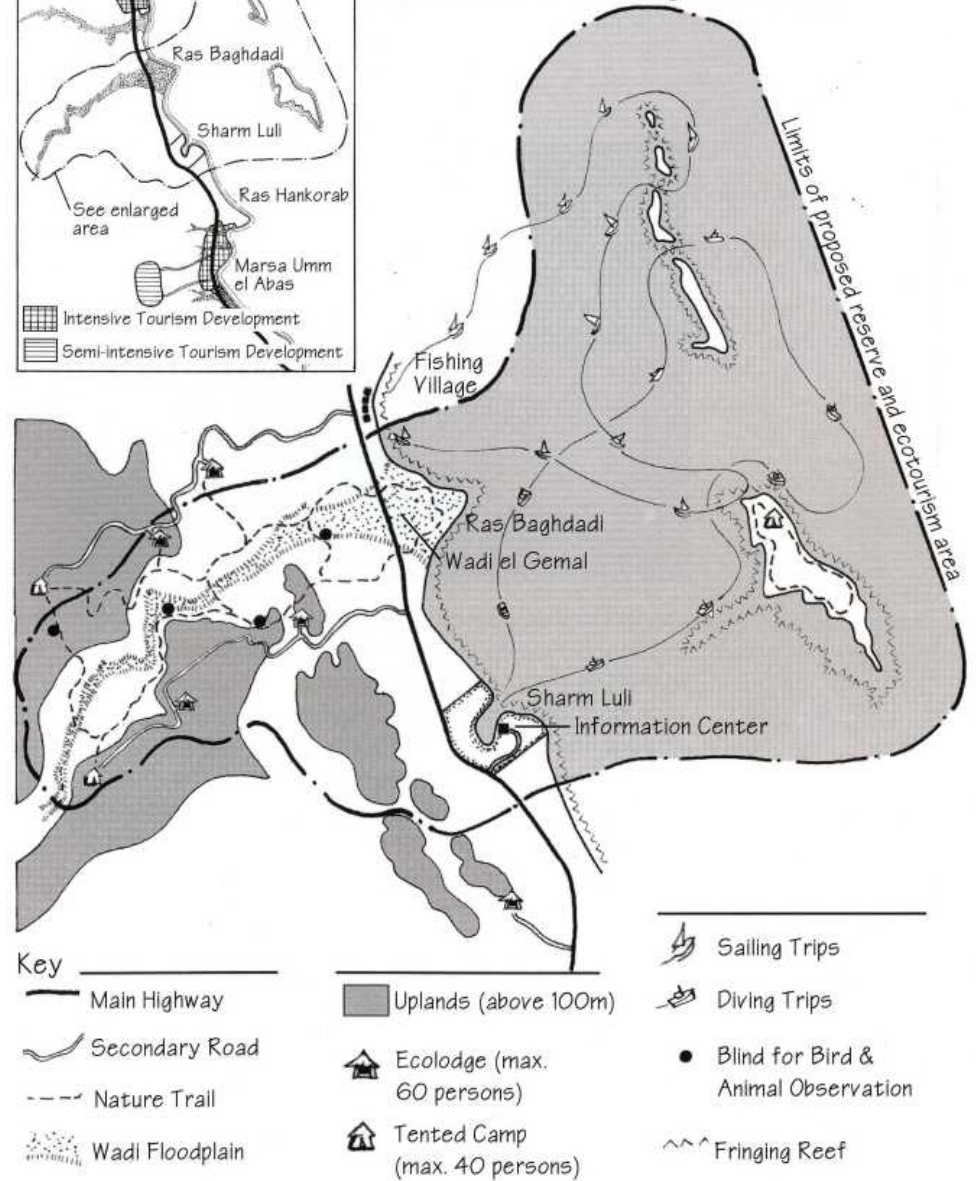
- Introduce an alternative to autos in the form of electric carts, shuttle buses or other "people mover" services in the many tourism centers that are comprised of large development parcels and resultant long distances between resorts, recreation or commercial center destinations, community facilities and employee housing;
- Separate circulation network users (e.g., horseback riding and electric carts) where appropriate for safety and attractiveness;
- Provide for emergency vehicular access for fire, police, ambulances, oil spill control, etc.;
- Focus "hub" of circulation network in commercial center to facilitate access to bicycle, horseback and canoe rentals, maps, signs, etc.; and
- Provide appropriate access to wadis and sensitive natural areas but avoid permanent roadways and structures across them.

**Recommended Resources & Additional Information:**

Refer to Best Practices C: Coastal Setback Use & Development, D: Land Use Management and F: Infrastructure & Support Facilities.



**Proposed Wadi el Gemal Ecotourism-Ecolodge Plan**



Based on a proposal by a TDA/ Winrock International team & Arch. Hector Ceballos Lascrain, November 1997





The Naama Bay corniche is one of Egypt's outstanding examples of planned commercial center design. The corniche is the central attraction of the community of resorts and tourism facilities that make up Naama Bay. It is referred to often in this handbook because it embodies the "best practices" of tourism development and environmental protection. It demonstrates--through its attractiveness to visitors and Egyptian residents, through its excellent design, and through its financial success--that the public purposes of access to coastal amenities and protection of coastal ecosystems make good business sense.

### Practice A-6 **Plan for Economically Vibrant Commercial & Service Centers**

Each tourism center will be a dynamic community of up to 100,000 transient guests, employees and other residents. The commercial activities (boutiques, theaters, stores, travel agencies, etc.) and resort support services (visitor centers, fire stations, post offices, medical centers, etc.) represent both an important financial opportunity for investors as well as an opportunity to create a "community center" environment that provides an attractive social outlet for guests and an important ingredient for the long-term success of the tourism center.

An "urban" design plan should be prepared for this commercial/resort services center much like one prepared for a successful shopping mall or, for example, the corniche at Naama Bay. Such a plan would focus on creating a rich mix of commercial uses, services and pedestrian amenities that would enliven the community center experience; generate pedestrian movement among businesses; and create a safe, convenient and attractive commercial environment for visitors, employees and residents that will enhance the tourism center as a destination.

Commercial and service center planning considerations include:

- Provide sufficient land both to meet initial program requirements for commercial uses and community services as well as to meet future expansion needs;
- Provide clear, easy access for all forms of circulation (vehicles, pedestrians, bicycles, etc.) from all properties as well as from the highway and corniche;
- Respond to site opportunities (views, protection from wind, accessible topography) as well as constraints (flood zones, steep slopes, strong winds); and
- Provide convenient pedestrian and vehicular access for resort employees and community residents.

**Examples of Commercial Center Design:** Naama Bay Corniche and El Gouna shopping areas.

## Practice A-7

# Meet Employee Needs for Attractive Housing & Community Facilities

The tourism center is often both home and place of work for many of the employees of resorts, other tourism facilities (dive shops, safari companies, car rental agencies, etc.) and commercial/service employers. In the Nabq Tourism Center, for example, it is estimated that housing will be needed for at least 10,000 employees.

The development plan should provide for sufficient, suitably-located land and infrastructure systems to meet the needs of employee housing and community facilities and should also address the following considerations:

- Design employee housing that enables long-term creation of community "places" rather than separate housing projects on individual resort properties;
- Commit adequate land for orderly growth and development;
- Locate housing within easy walking distance of the commercial/service centers in order to meet needs for entertainment, shopping, medical and other services for the vast majority of employees who will not have automobiles;
- Include in the housing program community facilities such as a mosque, school, library, recreational facilities and day care center which serve as the glue to bind a community together and create a quality of life that promotes high staff morale and productivity; and
- Introduce community facilities as early as possible in the development process and thereafter phase to keep pace with the development of the tourism center.

**Recommended Resources & Additional Information:** Refer to Best Practices F: Infrastructure and Support Facilities

## Best Practices: Development Planning

### DESIGN RECOMMENDATIONS

#### **Water Supply and Use**

Always use...

- low-flow shower heads, toilets, and sink faucets
- laundry and dishwasher water reuse packages
- low water usage landscaping (xeriscaping)
- elevated water storage sufficient for one day's capacity

#### **Wastewater Treatment**

Always...

- avoid ocean disposal.
- use grease traps.
- avoid food waste grinders.
- use lint filtration for laundry discharge.

#### **Solid Waste Treatment**

Always...

- remove trash in covered trucks.
- use closed waste containers.

#### **Electricity Supply and Use**

Always...

- use high efficiency diesel engines, motors, pumps, compressors, air handlers, etc.
- use high efficiency appliances and lighting (fluorescent indoors, high intensity discharge lights outdoors)
- use energy management and control systems

#### **Energy Systems**

Always...

- insulate buildings.
- use passive cooling and heating features wherever possible.
- use energy management and control systems.
- use hot water storage
- insulate hot and cold water pipes as well as thermal storage.

Adapted from

A Guide for Preliminary Planning and Assessment of Energy Efficient and Environmentally Sound Tourist Villages in Remote Areas of the Sea Coast of Egypt, 1991.

### Practice A-8

## **Locate Infrastructure Components in Environmentally Appropriate Sites**

Tourism centers along the Red Sea and Gulf of Aqaba coasts are often isolated from sources of power and water and do not have inexpensive access to disposal facilities. Each resort therefore has potential impacts on a broad range of natural resources from those of coral reef ecosystems to desert plants and animals and the natural landscape. Early in the development planning process, innovative infrastructure systems must be identified as well as measures to assure environmental compatibility including the treatment and management of wastewater effluent, pollution from windborne solid waste, protection of guests from smells, noise or unsightly facilities and operations, efficiency in distribution systems, etc. A number of site planning measures should be considered:

- Mitigate mechanical equipment noise and treatment odors by site location and buffering;
- Avoid disturbing natural stormwater runoff channels (wadis) but, when necessary, regulate runoff of new storm drainage channels to provide protection from soil erosion;
- Limit night lighting to the minimum necessary for safety to avoid obscuring the dramatic desert nighttime sky;
- Identify extent to which innovative water conservation measures can reduce water supply requirements from desalination plants and design supply facilities accordingly;
- Locate facilities such as desalination and sewage treatment plants, brine outfall areas, and solid waste disposal sites to take advantage of terrain features to visually screen and separate these structures and activities from resorts and residential housing areas;
- Identify sites for controlled materials and heavy equipment storage, automotive fluids discharges, and other potentially hazardous impacts;
- Identify extent to which nonrenewable energy sources (solar, photovoltaic and wind) can meet tourism center energy requirements and thereby minimize environmental impact of conventional systems;

**Recommended Resources & Additional Information:** Refer to Best Practices F: Infrastructure & Support Facilities

## Practice A-9

### Provide Interpretive Facilities for Environmental Awareness

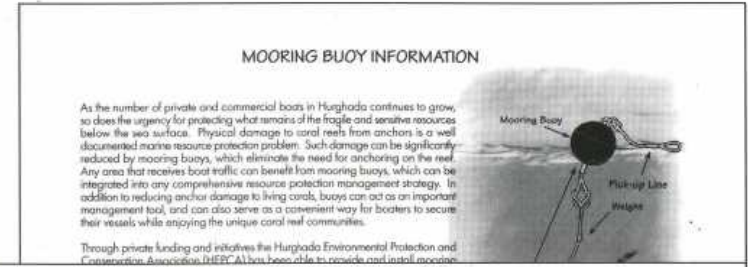
Management of impacts on the natural resources of a tourism center will depend on the priority placed on this by the development company and individual resort managers and by the awareness, good faith and diligence of visitors, residents and staff. Education and awareness are therefore integral components of effective environmental management of tourism centers. Interpretive facilities for education and awareness have space and design requirements that should be considered in the development planning process. Interpretive values cannot be successfully added to a development as a last minute enhancement.

The objective of education and awareness is to attune visitors, residents and staff to the values and fragility of the desert coastal environment. Carefully designed and labelled "nature walks" can provide information about the local geologic, biological and natural resource features. Similar "underwater nature wades" can be provided on local reefs. Such walks or wades can be self-guiding with informational markers that provide gentle guidance on the role of man in the coastal ecosystem and exhibits that reveal unique aspects of the environment. If carefully located and designed, they can become significant tourist amenities.

Environmental information centers are another facility need. Such centers can provide space for tourism center environmental management staff and can provide video presentations, brochures, books and other materials that convey in compelling ways information about reef protection, local natural and scenic amenities, Bedouin culture, dangers of water sports activities, birdlife viewing, trail systems and other features. Through such means, visitors, residents and staff can be encouraged to see themselves as part of a local system and to share in the responsibility of its care.

**Examples of Interpretive Facilities:** Ras Mohammed National Park Visitor Center

**Recommended Resources & Additional Information:** Refer to Best Practices H: Local Environmental Management



**REGULATIONS**

- Do not collect, remove or damage any material, living or dead, from Protected Areas (corals, shells, fish, plants, fossils, etc.).
- It is prohibited to drive off marked tracks
- Fish feeding upsets the biological balance on the reef and is therefore prohibited.
- Fishing and spearfishing are not allowed in Protected Areas.
- All visitors must leave Protected Areas by sunset unless using a designated camping area.
- Access to diving areas is recommended at designated access points only. This reduces damage to reef areas.
- Please take note of any instructions posted in Protected Areas.
- Offenders are subject to prosecution according to the terms of Law 102 of 1983.

**You - leave nothing behind!**

- Parking Area
- Smoking Area
- Toilets
- Visitor Center
- Photo point
- Swimming area
- View point
- Wildlife Fauna

Both the EEAA and HEPCA have produced attractive educational materials such as these visitor guides and maps, training manuals and fact sheets.

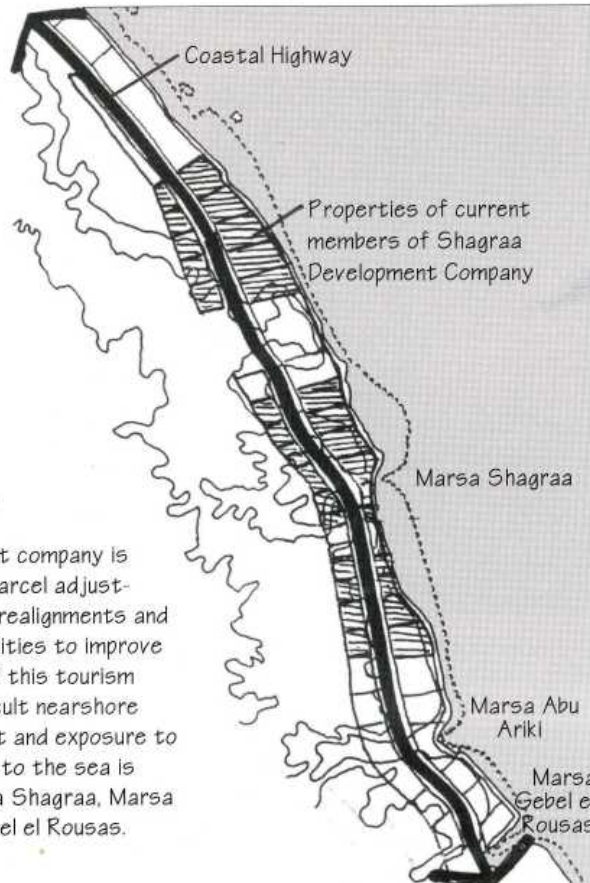
USAID  
الغنون البحرية والتعليمات البيئية  
للعاملين على المنشآت السياحية بمنطقة البحر الأحمر  
HEPCA  
RED - SEA



Practice A-10

## Modify Subdivision Plats to Expand Tourism Potential, Employ Better Environmental Practices and Meet Development Planning Objectives

The financial future of the resorts in each of the tourism centers are directly linked to the extent to which environmental assets are maintained and to the satisfaction of visitors with their overall tourism experience. There may be several key improvements to the subdivision plats that are necessary to assure these centers live up to their potential, including:



### Shagraa Tourism Center

The Shagraa development company is considering options for parcel adjustments, possible highway realignments and shoreline recreation facilities to improve the long-term viability of this tourism center. Because of difficult nearshore conditions (wide reef flat and exposure to wind and waves), access to the sea is principally through Marsa Shagraa, Marsa Abu ArikI and Marsa Gebel el Rousas.

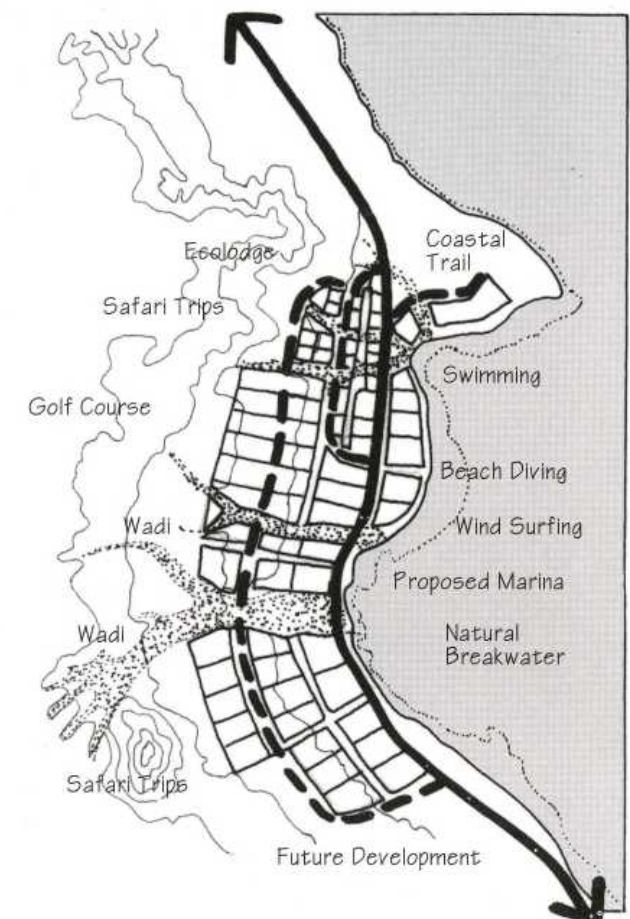
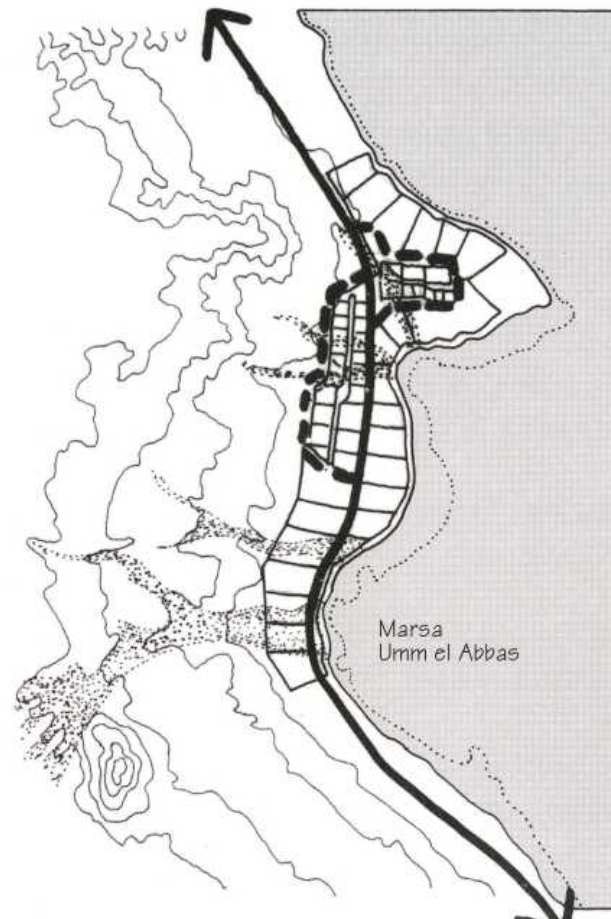
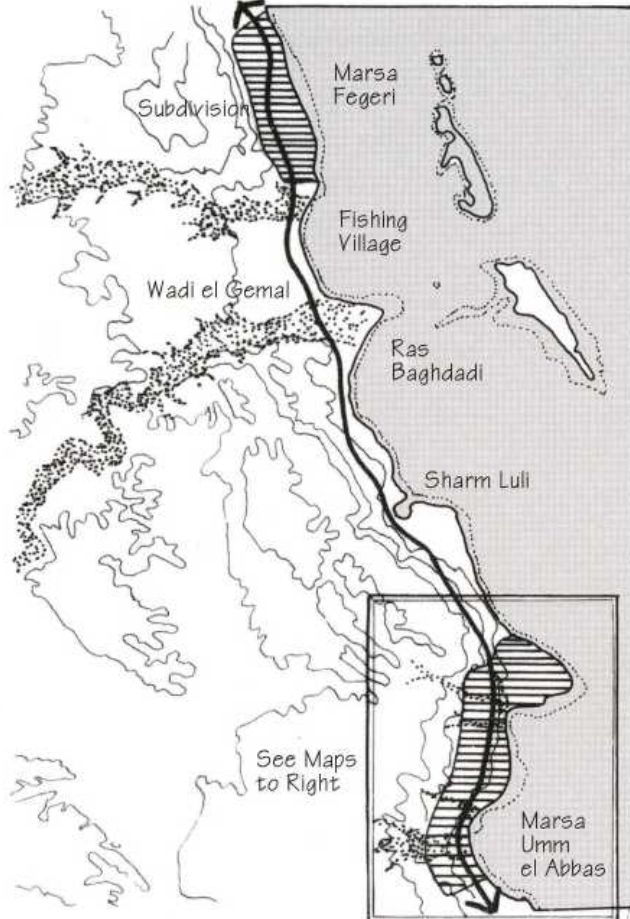
- Demarcating the wadi system boundaries and dedicating these areas to open space in order to protect the stormwater drainage function, preserve the aesthetic contribution to the landscape of these wadis and provide bicycle and walking trails to and from the sea;
- Restructuring the plat or providing easements to assure public access to all key destination points including proposed marinas and swimming, snorkeling and windsurfing areas;
- Relocating some waterfront parcels to new areas offering more protected (from high winds) and view-commanding sites and thereby enable preserving key coastal resources;
- Restructuring the plat as needed to provide for employee housing, recreation and infrastructural facilities, and other uses and services identified in the development planning process; and
- Modifying the siting and layout of the commercial and service centers to respond to the urban design objectives outlined above.

It will be in the collective financial interests of development company members to modify and improve the existing subdivisions. The positive features created within the modified subdivisions (excellent access to all recreational amenities) coupled with proper management of the environmental assets throughout the area can form the basis for an environmentally oriented marketing strategy highlighting the benefits of visiting a desert coast where every visitor can enjoy full access to all amenities. Not just a few fortunate resorts on the coast will enjoy the area's environmental assets; all resorts can. This will encourage higher quality resorts and maintain the area's overall quality as a tourism destination far into the future. It will enable the investors to capitalize on the amenities that have been preserved or provided within the development and achieve greater returns on their investments.

Acceptable modifications to the subdivision plats need to be defined and an implementation plan for these modifications prepared in close coordination with TDA. This development planning task should also articulate the range of options available to TDA and developers to realize desired modifications including purchases, exchanges for other properties, establishment of easements, and cooperative management of sensitive natural areas.



## Case Study: Tourism Center at Marsa Umm el Abbas (Wadi el Gemal area)



Development shaping features of this site include:

- Coastline very exposed to wind, waves & current
- Wide fringing reef making access to the sea high winds difficult in many locations
- Wadi flooding
- Excellent water sports opportunities in marsa
- Excellent marina site
- Expand resort sites to higher elevations

The initial subdivision included:

- Parcels located in wadis and in areas exposed to high winds
- Inadequate public access to water sports areas
- Relocate some parcels from wadis & windy areas
- Commercial areas divided by highway
- Insufficient development space retained around to insure access to all amenities

Recommended modifications include:

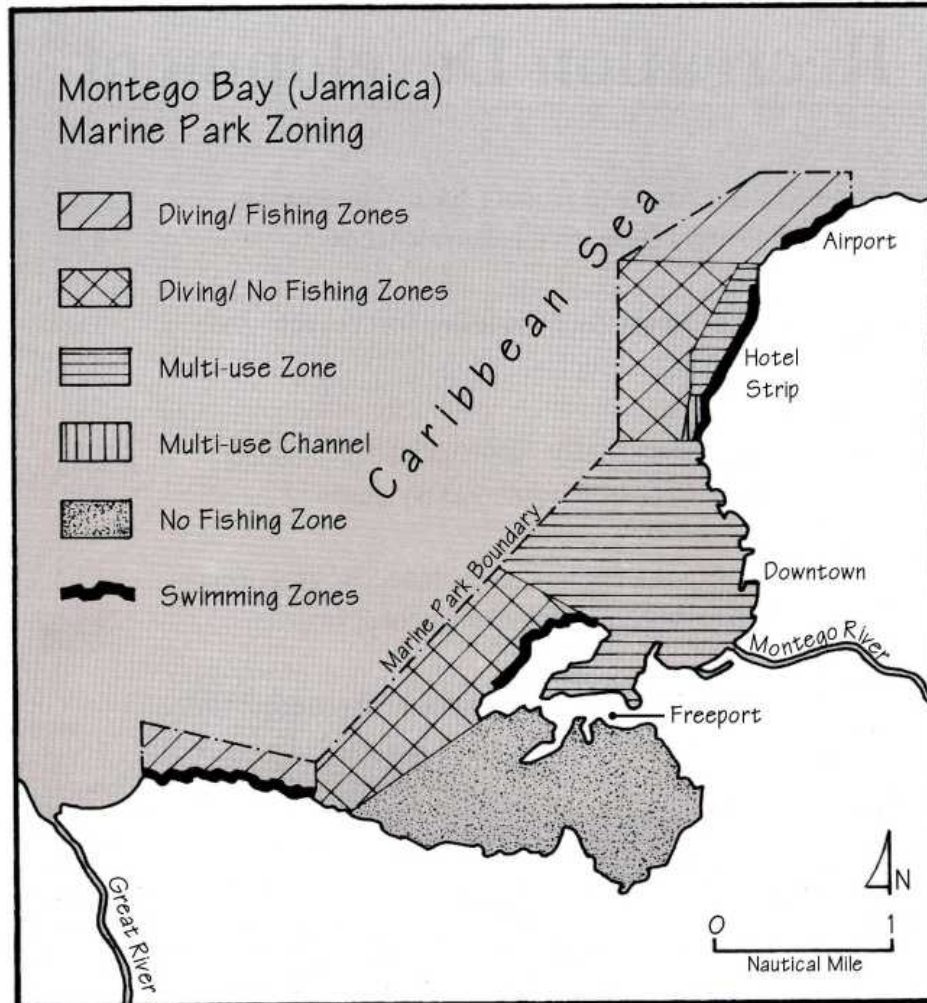
- Set the wadis aside as open space
- Provide a trail along the coastal setback
- Insure sufficient space for marina development

Refer to Wadi el Gemal Ecotourism Plan (pp 33) marina site

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# B. Marine Recreation Development

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Marine Park Zoning: Montego Bay Marine Park, Jamaica

The Montego Bay Marine Park encompasses a coral reef ecosystem and excellent beaches adjacent to a city of 100,000 people. The waters are zoned for diving, fishing, swimming, multiple uses and vessel channels. Compliance is carried out by rangers serving under the direction of a partnership of government and a local NGO.

### Practice B-1

## Zone Marine Areas to Ensure Safe Watersports Use and Protect Sensitive Natural Areas

Zoning can be an effective means to separate incompatible uses (such as swimming and boating), direct users to appropriate areas (such as best dive sites) and protect particularly sensitive areas (such as fish nurseries). Because the ocean is public property, approval from the appropriate government authority must be obtained before creating zoned areas and installing demarcation or mooring buoys. Within or adjacent to designated protected areas, all zoning or installation of buoys must be implemented under the direction of EEAA. Outside protected areas, the EEAA, TDA, Governorate, Coast Guard and military will review and may approve such plans. Once government approval is obtained, effective marine recreation zoning requires the following four components:

**1. Statement of Purpose:** The reasons for the zones must be clearly defined. The best results are achieved when all stakeholders (government agencies, development company members, NGOs, dive shop operators, etc.) participate in defining zones and associated regulations.

**2. Demarcation:** There are various ways to demarcate an area and these will be determined by the use and size of the zone. Single anchored spar buoys (labeled appropriately) spaced at appropriate distances work well when boat traffic must transit between zones. A string of round or hot-dog shaped buoys work well for "no boating" zones.

**3. Compliance:** Zones are only meaningful with effective compliance. Within protected areas, Rangers usually lead this effort. Outside such areas, a development company may need to provide this function perhaps in partnership with a local NGO.

**4. Public Awareness:** An important part of user compliance is awareness activities including information signs, maps and brochures, and training of staff to improve communication with visitors about the reasons for zoning and how to comply with the demarcation system.

**Example of Marine Recreation Zoning:** Red Sea Marine Peace Park (Aqaba, Jordan). Zones have been established for swimming, diving, and research reserve-no entry.

**Recommended Resources and Additional Information:** EEAA Protectorate Development Programs and HEPCA.



## Practice B-2

# Protect Coral Reefs by Providing Vessel Mooring

Mooring buoys are an essential tool for limiting anchor damage on coral reefs. When integrated into a dive site management plan, the number and location of mooring buoys can also be used to keep dive site use within estimated carrying capacities. By monitoring the use of buoys, a record of the location and intensity of diver use can be maintained. Mooring buoys also direct diving activities to the most appropriate sites.

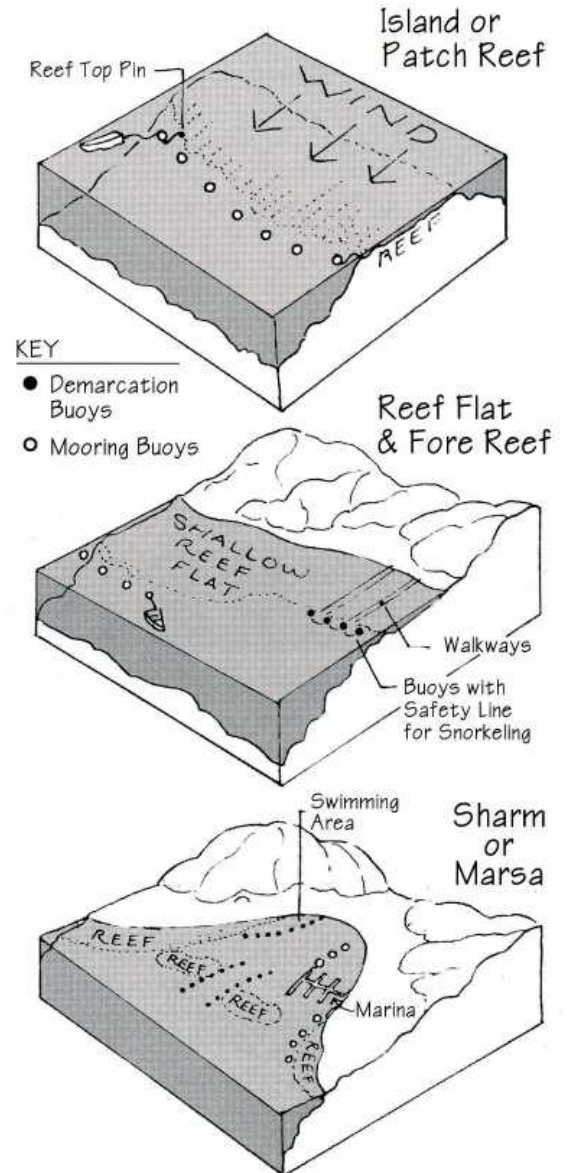
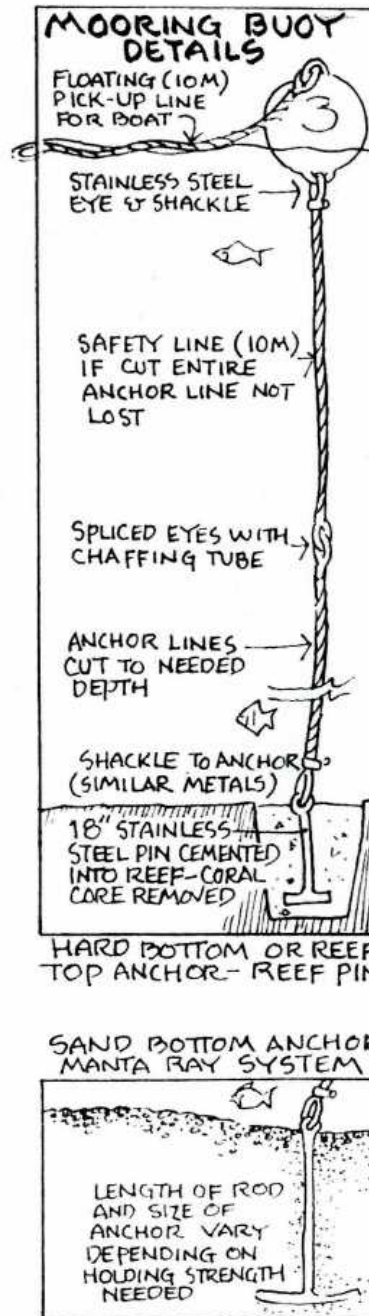
A good mooring buoy system consists of a polyethylene foam-filled buoy with stainless steel eyes and a center pipe with bushings. Stainless steel shackles are used at either end of the buoy for attaching the boat pickup line and the anchor down line. UV-treated polypropylene line is used for strength and long life in sunny, saltwater conditions. Chafing hose is used to reinforce all eyes. Similar-metal shackles are used to connect the buoy line to the anchor eye.

Two recommended anchoring systems are illustrated. The Manta Ray is used in sandy substrates. The reef pin is used in hard coral substrates. Both systems require hydraulic installation equipment and rigging.

Once installed, anchors must be checked monthly to insure that they are not loose. Mooring systems must be cleaned monthly to increase life span, as boring and corroding organisms can degrade system components.

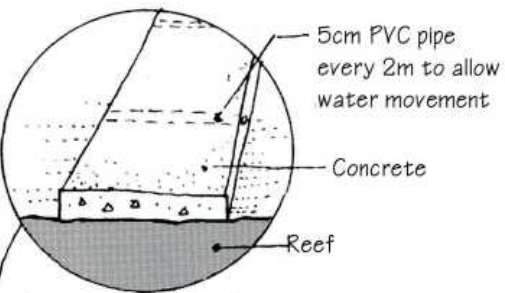
**Examples of Mooring Buoy Installations:** In 1997, under a jointly sponsored USAID/EEAA program, HEPCA began installing mooring buoys at popular diving sites. To date this NGO has installed over 250 mooring buoys and reef top pins and plans to install another 150 mooring buoys to the south. HEPCA also provides formal training to diving vessel skippers that stresses anchoring procedures and safety practices. Other examples may be seen at Ras Mohammed National Park and the Red Sea Marine Peace Park, Jordan.

**Recommended Resources and Additional Information:** Ras Mohammed National Park management staff and HEPCA.

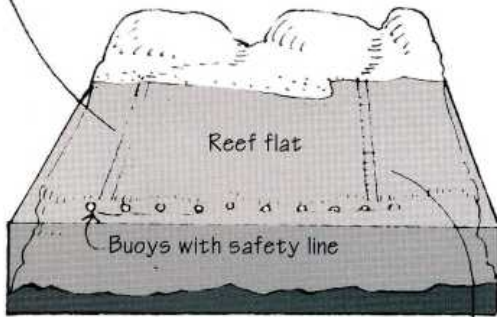




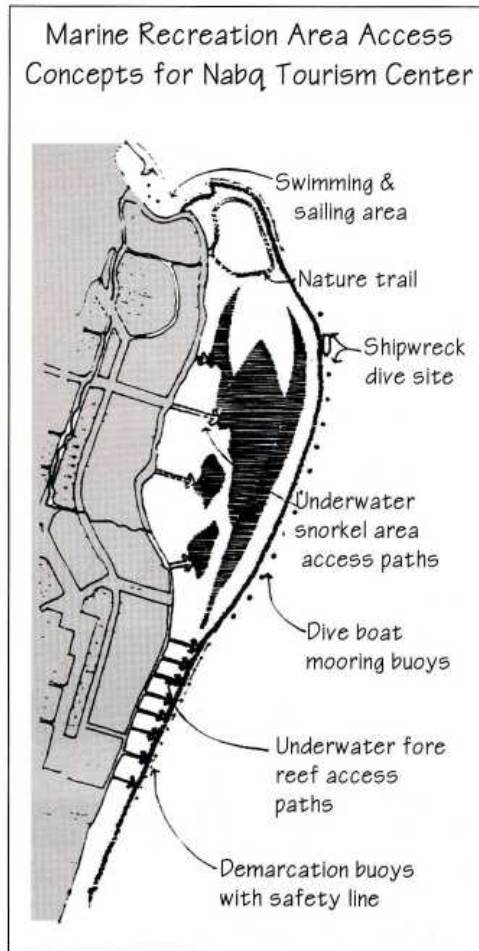
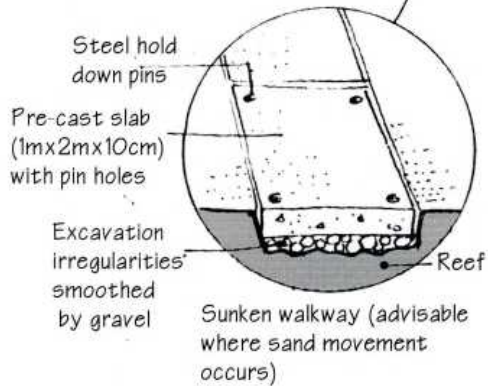
## Best Practices: Marine Recreation Development



Concrete path directly on reef (suitable only in areas without sand movement)



Concrete Walkways Across Reef Flat



### Practice B-3

## Design Environmentally Appropriate Access for Use & Enjoyment of Marine Ecosystems

The coastal features attractive to visitors include areas that offer swimming, diving, boating or wading opportunities and/or views of marine life, the fore reef, sea grass beds or fish nursery areas, and other sights. Access options to these features depend on the site itself—its vulnerabilities, its dangers, and its special physical features. It is important to provide safe and environmentally appropriate access for visitors, especially those with special needs, including young children and elderly or handicapped citizens. The purposes of each of the following access options are to provide safe and easy passage to attractions while doing minimal damage to marine ecosystems.

- **Shuttle Boats** In a few sheltered locations, it is possible to simply provide small boats at or near a beach that can offer transport to marine life viewing areas, to dive sites, beaches, islands, and other attractions.
- **Floating Walkways** In relatively protected areas where there are not extensive reef flats and excessive wind and where there is sufficient depth at low tides, floating walkways may provide a good means of access to dive boats and other craft and to swimming opportunities. These are often made of polyethylene float modules secured together to provide a relatively stable walking surface. They are anchored by pin to adjacent reef structures or by a Manta Ray anchor to sand substrate (see Practice B-2).
- **Submerged Walkways** In areas of extensive reef flats where bottom conditions are difficult for wading or where fragile conditions require directing users to a selected route, submerged walkways provide an excellent means of access to recreation and viewing destinations. (See construction details in adjacent graphic) In the Nabq Tourism Center, submerged walkways are planned to be used for a reef flat nature trail, access to snorkeling areas and for access to the fore reef. Submerged walkways require cleaning to maintain a non-slip surface. (See adjacent graphic)
- **Raised Walkways** In areas of narrow reef flats or relatively short distances, raised walkways provide a comfortable but costly and sometimes visually obtrusive solution. Ladders, stairs, or other means provide access to swimming, snorkeling, and diving areas beyond the reef edge. Such walkways require pilings set into the reef and this must be carefully done to minimize disruption to the reef surface. (See Practice B-5)

**Examples of Marine Access:** Raised walkways near Movenpick, Quseir

## Practice B-4

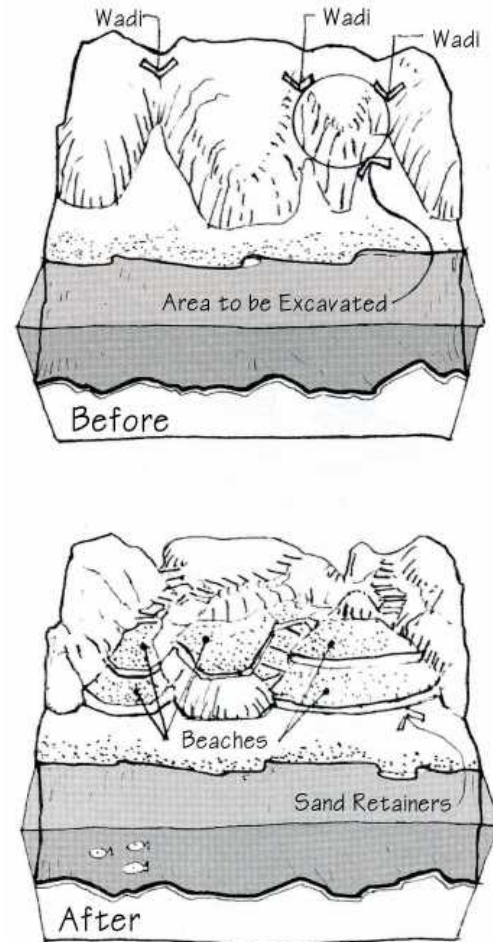
# Design Artificial Beaches to Increase Recreational Opportunities and Avoid Environmental Impact

Except for the Sharm el Sheikh and Hurghada areas, much of the coastline is often exposed to strong winds, waves and currents. The fringing reef that protects the coastline has few natural beaches and provides relatively few opportunities for safe diving and other water sports activities. In order to meet visitor expectations for water sports-related recreation (sunbathing, swimming, people-watching, wading, etc.), tourism centers and individual resorts often seek to provide artificial beaches. There are three locations where artificial beach environments are developed:

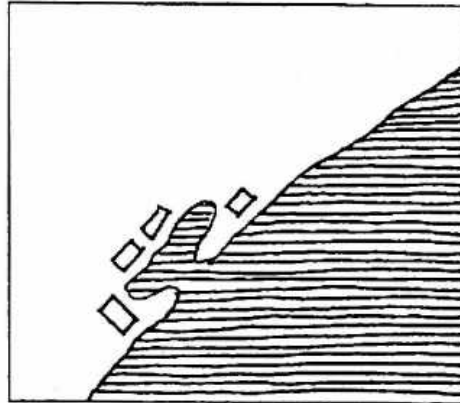
- **In the water** The "floating pool" or "floating platform" is a variation of the floating walkway described in Practice B-3. In relatively protected areas where there are not extensive reef flats, floating walkways can be configured in such a way as to create a protected, enclosed swimming area. This enables visitors to sunbathe, get into the water and enjoy the social aspects of the "beach scene." This option has only minimal environmental impact.
- **Along the shoreline** The "wet beach" concept produces an artificial beach at the edge of the natural shoreline somewhat below the mean high tide line. The shoreline is regraded, sand is brought in and containment structures are introduced to protect the wet beach from erosion by the sea. The environmental risks associated with this concept include changes in sedimentation patterns (erosion and deposition resulting from containment structures being placed in the sea) and erosion of the wet beach which can deposit sand onto the reef. This additional sand can smother corals and reduce water clarity critical for coral survival.
- **Back from/above the shoreline** The "dry beach" concept is an effective way of producing attractive beaches without costly changes of natural contours. Sand retainer walls are used to create holding basins for sand. These retainers can be located on top of a cliff or even on a slope, creating a stepped or terraced beach. Local rock may be used to blend into the landscape. The beach never comes in contact with the sea, therefore no erosion takes place. On steep headlands or bluffs, the cliffs are broken by small wadis in regular intervals. These can be modified into attractive "pocket" dry beaches with minimal change to the original contour of the land. Dry beaches are cheaper to maintain and better environmental solutions than wet beaches.

**Examples of Artificial Beaches:** Dry beach adjacent to east end of Naama Bay corniche; floating platform at Sheikh Coast

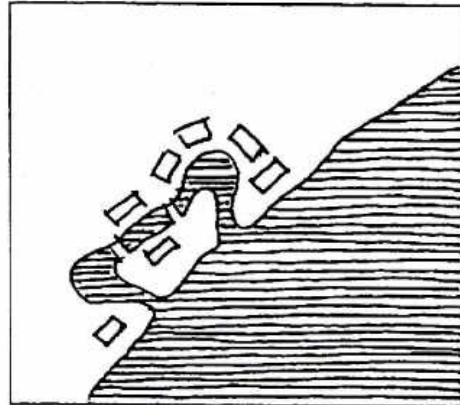
Modifying Small Wadis into Dry Beaches



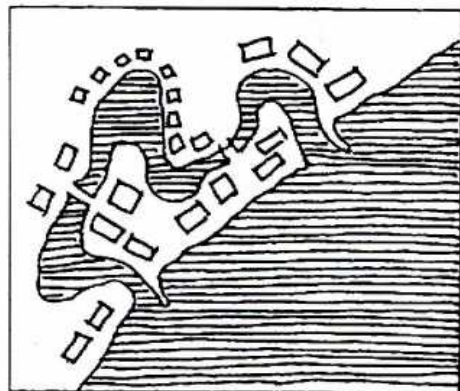
Single inlet, natural lagoon within an individual resort



Two inlet, semi-natural lagoon with limited mechanical support serving one or more resorts



Two or more inlets, semi-natural lagoon with breakwaters and extensive mechanical support serving multiple resorts and common facilities



### Practice B-5

## Design Artificial Lagoons to Avoid Environmental Impact & Ensure Good Water Quality

There is a trend in new resort communities to develop lagoons and inland waterways that provide swimming and small boat recreational opportunities, improve site aesthetics, and increase the number of units overlooking the water. Especially in areas where access to the sea is difficult, lagoons can provide an attractive option.

There are but few coastal settings, however, where the introduction of lagoons may be environmentally appropriate. In order to secure the approvals of EEAA and TDA, developers will need to demonstrate that levels of water exchange necessary for healthy and clear water can be achieved, that risks of failure due to design or equipment are minimal, and that neither operation nor construction of the lagoon will cause substantive negative impacts on marine ecosystems.

Waterways connected to the sea may be termed "natural" lagoons when the water exchange in the lagoon depends only on the natural phenomena of tides, winds and currents. They are "semi-natural" when mechanical means are needed to complement natural forces to achieve the proper water exchange. And they are "mechanical" lagoons when they rely solely on mechanical systems. The best practices to achieve successful natural and semi-natural lagoons are summarized here.

Lagoons may be artificially formed by dredging and connecting to the sea with one or more inlets. Where shallow coastal lagoons or sabkhas exist, dredging to increase water depth and establish inlets may also form lagoons.

The key to design of a successful lagoon system is early participation on the development team of the necessary technical specialists, including a marine engineer and a marine biologist. The lagoon design will be an important determinant for the master planning of the overall tourism center. Working with the developers' planners and architects, these marine specialists must carry out a feasibility assessment and schematic design of the lagoon system with the objective of achieving proper flushing and water exchange. This is essential to assure a lagoon system that maintains attractive and healthy water quality and avoids stagnant water areas with excessive sedimentation, algal growth and other negative characteristics. Once the lagoon system concept is established, these specialists will also develop plans for constructing, operating and maintaining the system.



### Information Needs for Planning & Managing a Lagoon System

As a basis for assessing the feasibility and planning the configuration of a lagoon, a number of baseline surveys and measurements are necessary.

- Topographic land surveys and bathymetric (sea water depths) surveys are essential to define the relationship of sea and land levels at the development site.
- Measurement of current speed and direction (at two or more locations close to the inlets of the proposed lagoon) and of seawater salinity, density and temperature will provide a basis for a lagoon water exchange study (see below).
- Collection and analysis of seabed samples are necessary to indicate the size and movement of seabed material (sediment transport).
- An underwater survey is necessary to evaluate the density and distribution of corals and other marine life seaward of the development.
- Wind and wave data are needed to estimate nearshore wave conditions seaward of the development.

### Planning the Lagoon System

The lagoon system should be designed to meet the following objectives:

- Assure sufficient water exchange to flush nutrients, sediments and pollutants from the system.

The lagoon's water depth should be at least 1-2 meters below the lowest low tidewater level. Flushing performance is enhanced by having two inlets rather than one. The proposed lagoon should not be situated close to or be part of a marina and should be far from any local sources of pollution.

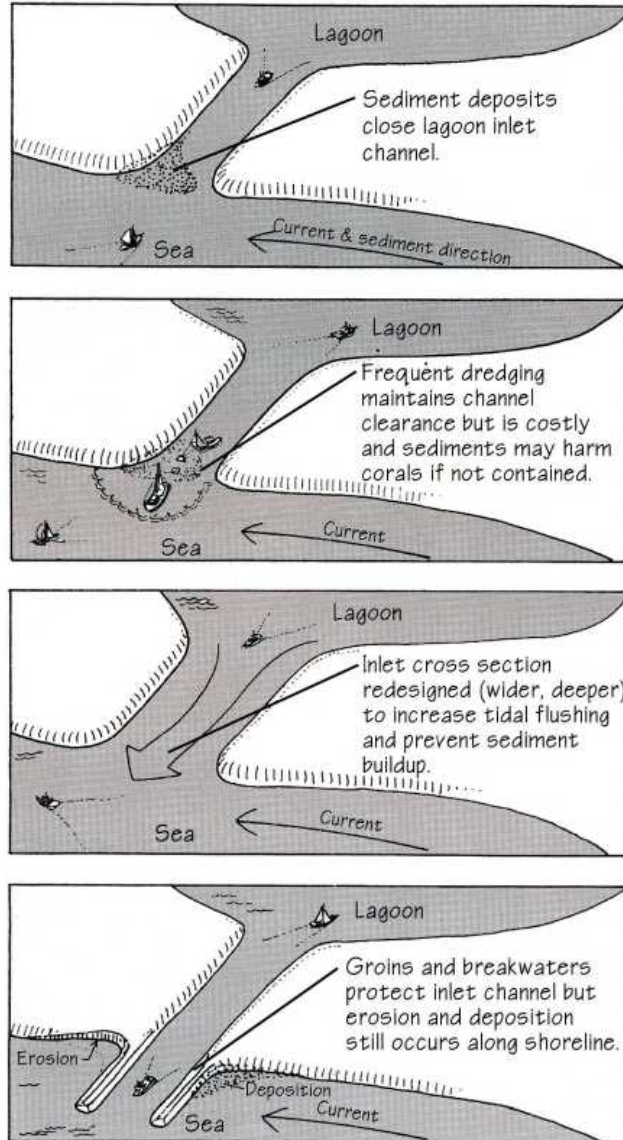
The marine specialists should prepare a preliminary assessment of the "global" water exchange in the proposed lagoon due to tidal effects, wind and other factors. Experience in the Red Sea region indicates that a lagoon of about 120,000 cubic meters of water volume with two inlets and a tidal action of one meter can achieve a suitable exchange rate close to the inlets, but not throughout the lagoon. If it is determined that the global exchange rate is not adequate, all professionals should work with the developers to reconsider the design of the lagoon, including reducing the water volume or introducing a mechanical system.



The marina at El Gouna is isolated from the lagoon System to prevent the entry of pollutants and to Separate vessels from swimming and non-motorized boating in the lagoon.



One of the swimming areas within the lagoon at El Gouna is located in an area that receives maximum water exchange to assure satisfactory water quality.



- Minimize stagnant areas by improving circulation.

Once schematic design of the lagoon system offers the promise of satisfactory global water exchange levels, more detailed analysis will be needed to determine "local" water exchange rates at different parts of the lagoon to identify "dead" or stagnant areas. Mathematical models will assist in determining the final design including the locations of mechanical intakes (suction) and intake discharges to enhance circulation as well as aerators to improve water quality at extreme landward and isolated locations of the lagoon.

- Control sediment entry and buildup at the inlets.

Significant movement of sediments from waves and currents can cause deposits at the inlet channels which can result in complete closure of the inlets within six months or less. Developers have three means to overcome this problem: 1.) design the inlet cross-section to ensure that the tidal volume per tidal cycle at the inlet is much larger than the total sediment transport; 2.) frequently dredge the inlets; and 3.) protect the inlets by breakwaters (groins).

Installation of breakwaters may also require dredging over the long term depending on their impact on the shoreline. Breakwater design studies can predict the extent of accretion on the updrift side and erosion on the downdrift. If the shoreline changes are expected to be minimal, the sediment buildups at points of accretion and in inlets can be periodically removed and placed at the location of erosion.

- Prevent entry of pollutants and nutrients to the system and loss of lagoon water to surrounding areas.

While the lagoon water level is the same as the surrounding water table near the seafront, there may be a difference in water levels landward which can generate water seepage away from or infiltration into the lagoon. This is not acceptable as it may result in losing part of the lagoon water, impacting foundations of nearby buildings, or allowing leaching of materials (such as fertilizers) into the lagoon. In order to overcome both seepage and infiltration, a geomembrane may be used as a lining to serve as a barrier. Special nutrient and pollutant trapping buffer zones may be necessary around golf courses, parking areas and other significant sources.



- Allocate adjacent land uses based on capacity of lagoon system to support development activities.

Certain areas of the lagoon may better accommodate intensive use (swimming and beach recreation activities, boating, etc.) and potential pollution and nutrient sources (parking lots, golf courses and agricultural areas) than other areas. Land uses along the lagoon should be located in response to its carrying capacity characteristics. Certain land use and landscaping measures (boardwalks, building setbacks, retaining walls, and plant materials) may be necessary to protect sensitive areas subject to intensive use.

### Managing Construction Activities and Long-Term Operations

There are potential lagoon development impacts which will need to be considered in the system construction, operation and long-term maintenance as well as addressed in the project EIA.

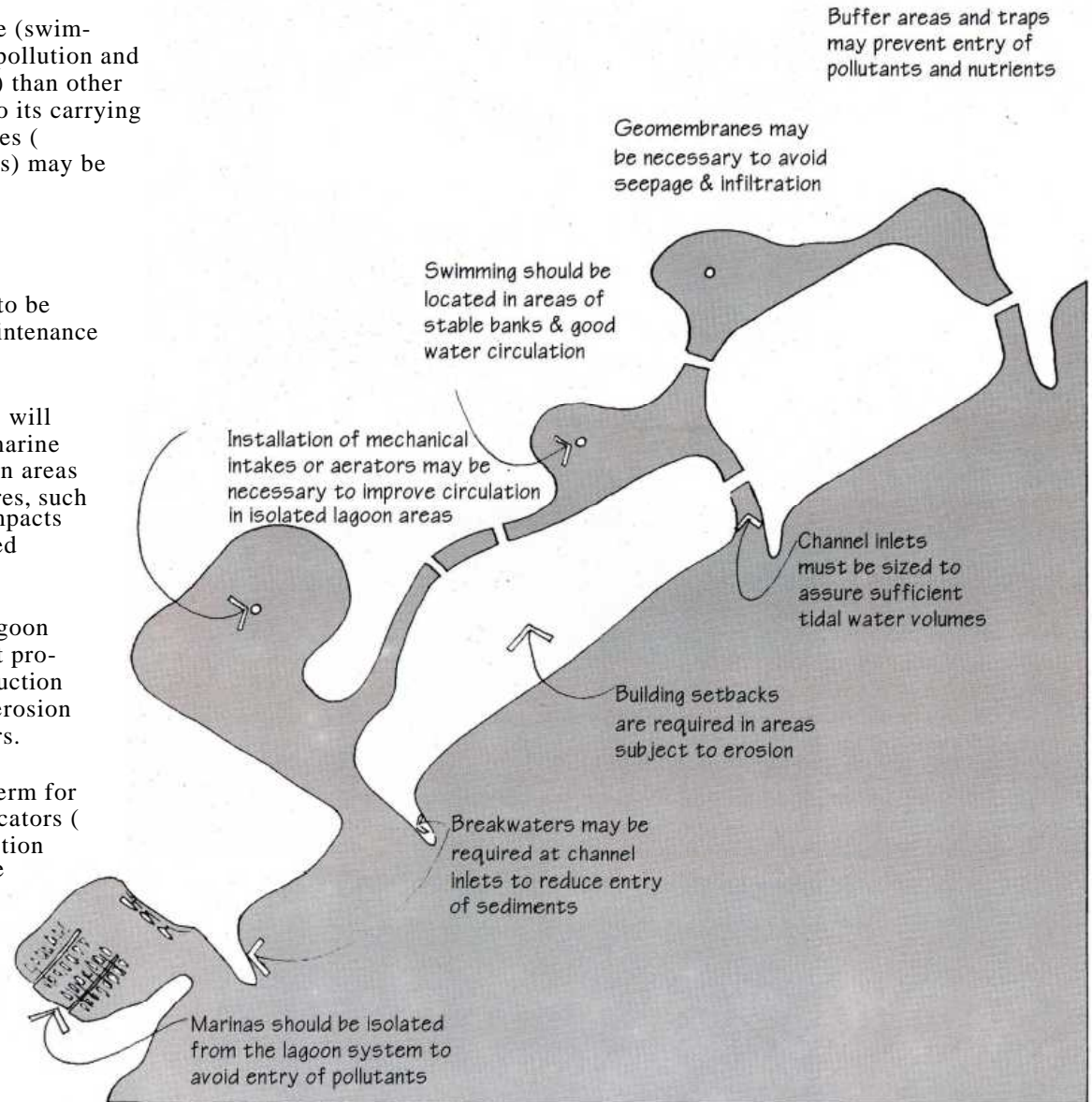
During construction, dredging of the lagoon and its channel inlets will disturb bottom sediments and may cause a variety of impacts to marine ecosystems. Dredging should be carried out only with great care in areas near coral reefs or other special marine habitats. Mitigation measures, such as use of silt curtains or covering corals with screens to reduce impacts during dredging, should be employed. Disposal or reuse of dredged material must be addressed.

Dredging of channel inlets may be required over the life of the lagoon system to ensure they remain unblocked by sedimentation. If inlet protection structures (breakwaters) are required, the impacts of construction and maintenance should be addressed. Especially significant are erosion and other shoreline changes due to construction of the breakwaters.

Finally, lagoon water quality should be monitored over the long term for sedimentation, water clarity, nutrient levels and public health indicators (coliform bacteria). Such a program should begin prior to construction and be designed to detect water quality changes in order to enable early corrective actions.

### Examples of Lagoons and Inland Waterways: El Gouna

### A Hypothetical Lagoon System:



### Practice B-6

## Design Jetties & Marine Structures to Minimize Impact on Ecosystems

Fixed jetties on piles in El Gouna (below), and a longer one in the Movenpick of Quseir (far below).



Jetties are marine structures that can be used to access recreational fishing and diving, or as docks for small yachts or boats. They are not, however, capable of providing all-weather protection for boats.

Open-type jetties are usually constructed from the shoreline and extend seawards. They are generally almost perpendicular to the shoreline. They may be fixed or floating depending mainly on water level fluctuations in the area, the intended use, appearance, subsoil foundation conditions, water depths, and cost. A dual type facility, with a fixed design near shore and a floating structure at the seaward extreme, connected by a movable ramp, can also be considered.

Jetties should be constructed in sheltered or semi-sheltered areas, especially if access to boats is required. Prior to selection of the jetty location, site reconnaissance studies should be carried out by specialized coastal/harbour engineers to identify the most appropriate locations. Following initial identification of suitable jetty locations, and prior to undertaking the design, necessary field surveys and investigations should be carried out. These would include:

- Bathymetric surveys to identify the water depths
- Geotechnical investigations to determine the soil formation
- Underwater surveys to determine the areas where live corals and special species exist.

Fixed type jetties are considered as a fixed dock which may be used for fishing or to access boats. They may also be used within marinas and small craft harbours. The typical fixed dock used in marinas is a pile supported structure. This form of structure is relatively easy to design and construct and is often a least-cost alternative.

Pile supported docks may be built by a variety of materials including concrete, timber, and steel. The most common materials are timber or concrete frame and deck structures supported by steel, concrete or wood piles. Regardless which system is being adopted, these systems require continuing maintenance and coating against corrosion and other types of damaging effects from the sea waters.

On the other hand, there is a wide variety of choice in manufactured floating dock systems. Depending on the use and the functional requirement of the jetty, specialized coastal/harbour engineers will be able to select the suitable class of floating dock structures. There are three basic classes of floating docks systems:

- ***Economy-class floating docks*** which are often used for small developments and small marina facilities. These systems have relatively low strength, often are light weight for ease of handling and reflect their economy in a low cost. This class, however, is not suitable for heavy duty conditions.
- ***Middle-class floating docks*** which are suitable for most marinas, and are used for normal site conditions and middle-size marinas.
- ***First-class floating docks*** including a full range of amenities and significant load carrying capacity. As a result, this is the most expensive category of floating docks.

Floating dock systems offer a wide range of material types. Major and minor installations have been constructed in wood, glued-laminated wood, steel, aluminium, concrete, glass reinforced concrete (GRC), fibre glass and other plastic materials. Each material has its own characteristics, advantages and disadvantages, which should be assessed in the light of local site conditions, and the type and intensity of expected uses.

*Not every site is suitable for building a jetty. To do so, a number of studies have to be conducted, and the decision on whether or not to build a jetty, or on which type of jetty is more appropriate is merely a technical question. Aesthetic issues must also be considered, otherwise the beach will be divided with a series of jetties that can degrade its beauty.*



A floating jetty in  
Kafr el Gouna



Practice B-7

## **Locate and Design Marinas to Respond to Site Conditions & Provide Public Access**

A marina is a small craft harbour providing all-weather facilities for recreational boats. Given the scarcity of good marina locations along the Red Sea coast, and the high expected demand for marina facilities, all marina facilities should be designed and operated to provide public access to the maximum degree feasible.

Unless pre-empted by strategic decisions, a market survey study should be carried out before entering into the planning and design stage, and prior to coming to final decisions for designing and constructing a marina. The study will assist the marina designer in the preparation of the marina layout by providing guidance on the types, sizes and numbers of boats to be accommodated, and on other marina service facilities which are desirable.

An ideal marina site will be protected from wave exposure from all directions, will be provided with protected access, and will enjoy a comfortable wind and wave climate within the marina itself. Rarely, if ever, can these conditions be met in total. The evaluation of a potential site for marina development should consider the following:

- Conformance with public plans for the use and development of the area.
- Ability of the marina site to provide natural protection from wind and waves, thus minimizing the need for expensive and potentially environmentally damaging breakwaters
- Sufficient water depth, to avoid or minimize dredging requirements
- Adequate upland area for development of offices, shops, fuel storage facilities, etc., thereby avoiding the need for landfill to create space for these landside functions
- Adequate water frontage to accommodate needed slips and their access
- Not adjacent to a public beach or other active marine recreational sites
- Satisfactory with respect to foundation conditions

The Marriot marina is a small, but well served and managed one.



Prior to preparing detailed plans and designs for the marina, necessary baseline data collection and other field investigations should be carried out by specialized contractors. Such works include the following:

- Bathymetric survey, water level recording, and current measurements
- Underwater survey
- Ecological survey of fixed (e.g., corals) and transitory (e.g., fish species, etc.) marine natural resources
- Topographic survey of adjacent upland areas
- Soil borings and analysis (onshore and offshore), with particular attention to sediments which may be dredged or otherwise disturbed
- Identification of sites for land disposal of all dredged material (offshore disposal not to be allowed)

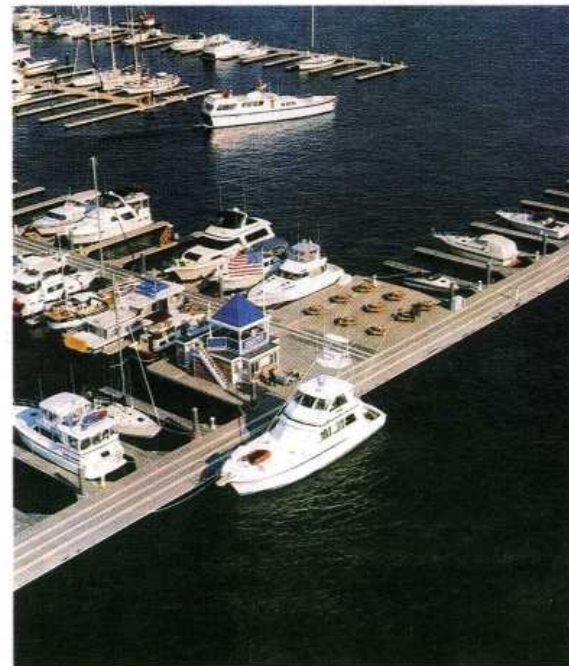
The design of the marina channel alignment needs to be interrelated with the location of protective structures such as breakwaters. It is better to use the natural channel alignment, with as few modifications as possible. Changing the direction of the natural flow may prove difficult and costly, and may result in other unanticipated impacts on natural features and marine life.

Channels should also be as straight as possible. The width of the entrance channel depends mainly on the number and size of yachts using the channel. In most cases, two-way traffic must be accommodated. Channel depth depends on the sizes and types of yachts, the speeds at which they travel, and the magnitude of waves occurring in the channel.

Depending on the nature of the site, one or more breakwaters may be required. It is recommended that the length of the breakwater be as small as possible. Maximum reliance on naturally-occurring features, such as rock headlands in the area, is to be preferred.

Breakwaters may be of different types. The selection of a suitable type of breakwater is limited by consideration of water depth and wave height. In general, breakwaters may be classified as rubble mound, vertical face, composite type, pneumatic, and floating. Pneumatic breakwaters are only

Well designed marina slips will increase the utility and convenience of the facility.





## Best Practices: Marine Recreation development

appropriate where waves are low and are of a length less than 3 times water depth.

Once the layout of the marina basin with breakwaters has been prepared, specialized coastal engineers should study wave disturbance inside the marina to ensure that wave heights are acceptable for berthing of yachts.

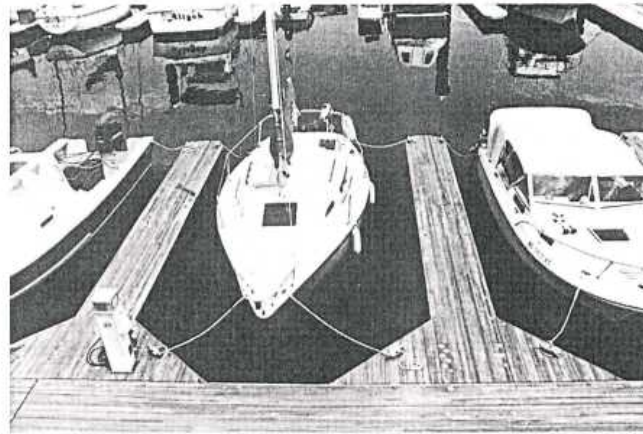
Having determined the basic design features of the marina, some additional studies are required to assure optimum operations of the facility:

- Study of the harbour resonance (which is the amplification inside a marina of waves in the sea having periods between 20 seconds and 1 hour)
- Water quality in the marina (baseline water quality data, combined with the ecological survey data noted above, will provide information needed to track possible changes in the health of nearby marine resources as a result of marina operations)

Besides the above mentioned studies, a sediment transport study should be carried out by specialised coastal engineers to determine future shoreline evolution due to the construction of the marina especially if there are breakwaters. Siltation at the entrance channel and basin should also be predicted to determine maintenance dredging program.

Finally, drawing upon the technical data and analyses generated during the planning and design phase, a complete environmental impact assessment study (EIA) should be carried out addressing all impacts related to construction, operation and maintenance activities related to the marina.

***There are few places along the Red Sea coast where a good marina can be built, so public access to the marina and its facilities should be secured. Electricity, water, fuel, mechanical services and supplies, restaurants, communication center, temporary accommodation, and banking facilities should also be provided in addition to the physical setting of the marina itself***



## C. Coastal Setback Use & Development

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### Practice C-1

## Maintain Public Access to Coastal Amenities

The setback areas along coastal properties represent an important opportunity to maximize use of shoreline recreational assets. Setbacks were established by Egyptian law to protect sensitive coastal features, provide access for security police and coastal guards and assure access for all Egyptians to coastal amenities. This 50 to 200 meter ribbon along the coast, if designed and managed properly, can serve as the building block for an interconnected network of open spaces and trails that provides access to extensive coastal and upland areas for visitors and residents alike.

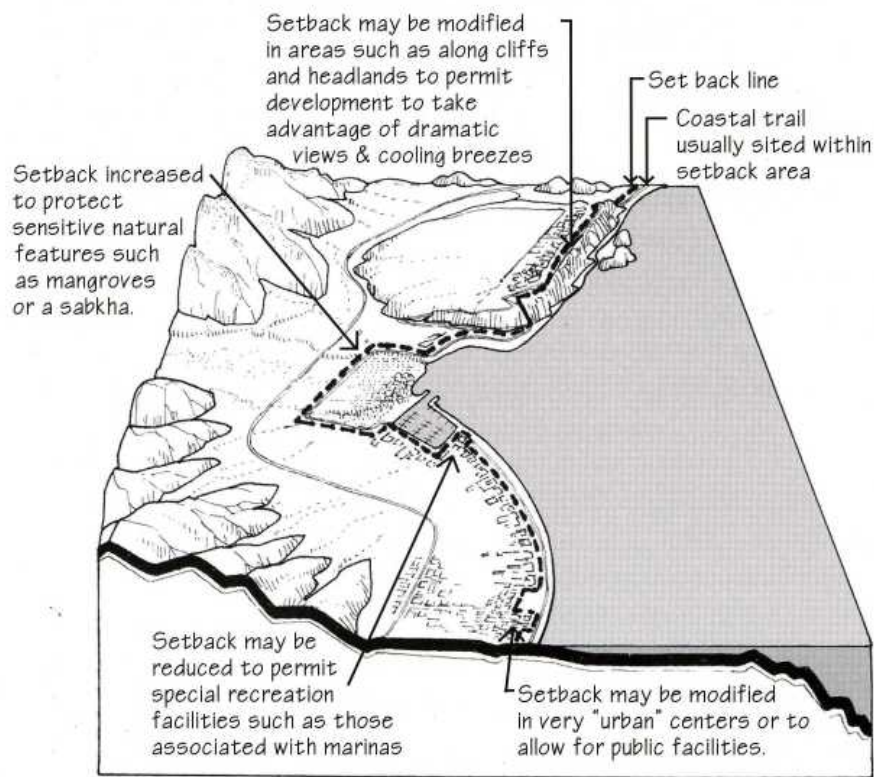
The setback distance from high water mark to building front lines is determined by the physical conditions of the site, including the topography, shoreline attributes, wind exposure, presence of wetlands, wadis, dunes or other sensitive environments, parcel size, and prior development. Most setbacks are set at 100 meters, however, greater or lesser setbacks may be required based on these physical circumstances. During the development planning process (see Practices A-1 to A-10) of a tourism center, the development company and individual investors should pursue the following steps:

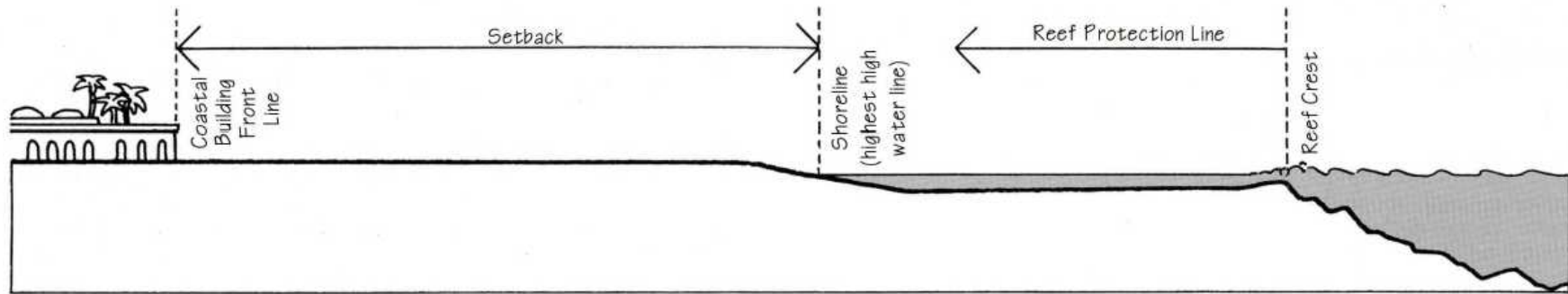
- identify key physical conditions that require a greater or lesser setback;
- prepare accurate surveys and other justifying information;
- delineate suitable access corridors from upland properties to the setback area;
- demonstrate that access to and through the setback will not be impeded by fences, security checkpoints or other measures;
- propose a setback area boundary to EEAA and TDA for review and approval;
- if approved, survey and demarcate the setback and insure that this area is disturbed as little as possible; and
- prepare an operations plan for maintenance of pathways, vegetation and other features within the setback.

**Examples of Public Access in Setback Areas:** The setback area beyond the east end of the Naama Bay cornice

### Recommended Resources and Additional Information:

Refer to Best Practices A. Development Planning





### Setback Line

Any establishment on the sea shore is prohibited to a distance of 200 meters inwards from the shoreline (and also construction is prohibited on areas previously landfilled) unless the following conditions are fulfilled:

- The land is located inside the city limits
- The land filled had already been purchased and either fully or partly paid to the Governorate or the concerned administrative authority before issuing Law No. 4, 1994 where the owner should limit the height of the buildings on the land filled areas to not more than 4.5 meters
- Approval of the concerned administrative authority in coordination with EEAA is obtained

For coastal areas within the Hurghada 'city limits' which had already been assigned before the Law No. 4, 1994, in cases where the distance between the shoreline and the right of road is less than 450 meters, the setback line could be located not less than 50 m from the shoreline.

### Coastal Building Front Line (CBFL)

The CBFL represents the front limit of any future construction along the coast and is identified as follows:

- In undeveloped land zones, i.e. virgin coastal stretches, this line should be located not less than 200 meters back from the highest high-tidal shoreline in accordance with Law No. 4, 1994.

- In already partly developed zones, before issuing Law No. 4, 1994; the line may be plotted as follows:

For undeveloped areas located between already existing structures or structures under construction where the distance between these structures does not exceed 400 meters, the setback line limit for these undeveloped areas between existing structures is determined as the continuous line connecting the front side of the existing structures even if the setback line is less than that set by the law. Natural barriers such as flash floods are considered as a structure in this case.

For undeveloped areas located between structures or natural barriers with distances exceeding 400 meters, the setback line is determined as a continuous line connecting the structural fronts and the setback line distant 200 meters from the shoreline set by the law with slope 1:1.

- In rocky or cliff-shore fronts, a reduced setback distance, i.e. less than 200 meters may be adopted on the condition that proper construction safety measures are fulfilled. A minimum distance must be set by inspection by the administrative authority in coordination with Egyptian Environmental Affairs Agency.
- For narrow coastal valleys that are bounded by series of coastal mountains and distance less than 400 meters

from the shore line; the setback line could be located at a distance less than 200 meters according to the site nature but should not be less than 120 meters.

- For beaches where swamps, pools or salt marshes exist in its backyard at a distance less than 400 meters from the shore line, and had already been assigned for limited developments, the setback line could be located at a distance less than 200 meters according to the land topography but not less than 120 meters. Areas which have not been assigned yet are to be left virgin without development and will be considered as part of the diffraction zone and used as public beaches.
- For beaches in which the distance between the shore line and the main road is less than 200 meters, development and construction should take place on the other side of the road. The beach area could be utilized for daily activities of the project or to be left as a diffraction zone or as public beach.

### Reef Protection Line

The reef protection line should not be exceeded by any future shoreline training operations and should not be drawn less than 100 meters from the fringing reef, i.e. landward from the reef crest.

From **Environmental Guidelines for Development In Coastal Areas**, March, 1997, prepared by EEAA Environmental Management Sector

Practice C-2

## Establish an Attractive Coastal Trail System

The coastal setback provides an excellent opportunity to create a trail system that would enable access to all coastal amenities and facilities within and beyond a tourism center, provide opportunities for bicycle, horse and other recreational transport, and meet needs for emergency and security services. With careful design, the trail system can serve as the spine that links all entertainment and recreational activities and can become the social focal point and key attraction of an area. The coastal trail system can form the basis for an environmentally-oriented marketing strategy highlighting the benefits of trails running along the entire coastline, paralleling wadis or traversing ridgelines and making all of the region's natural, recreational and social attractions available to the visitor.

The design of the trail system is important. During the development planning stages of a tourism center, it is essential to create a trail plan that will serve as an interconnected network of trails throughout the center. Each property



The coastal path near the east end of the Naama Bay cornice meanders along the natural terrain of the site and provides a comfortable, scenic and safe walk for visitors.

should link to adjoining properties and all other attractions within and beyond the center including commercial centers, beaches, marinas, sports areas, viewpoints, upland attractions, nature walks, restaurants and visitor centers.

Every effort should be made to connect each trail with another so dead ends will be minimized (except those desired such as at viewpoints or other attractions). A looping design can provide alternative routes for the return trip as well as adding diversity to the trail experience. Bridges or boardwalks should be used to cross wet areas or small wadi channels, rather than placing fill.

Long straight trail segments should be avoided. The alignment should follow the natural landforms of the site avoiding steep grades or providing stairs when necessary. Whenever possible, alignments should produce "terminal vistas" of open space elements, the sea, or the mountains.

Frequent rest areas are essential. Clear, frequent and multilingual signage is needed to assure adequate information is available concerning directions, distances, special points of interest and environmental interpretation. Nighttime lighting is desirable along many trail segments within the tourism center although not necessary beyond the center.

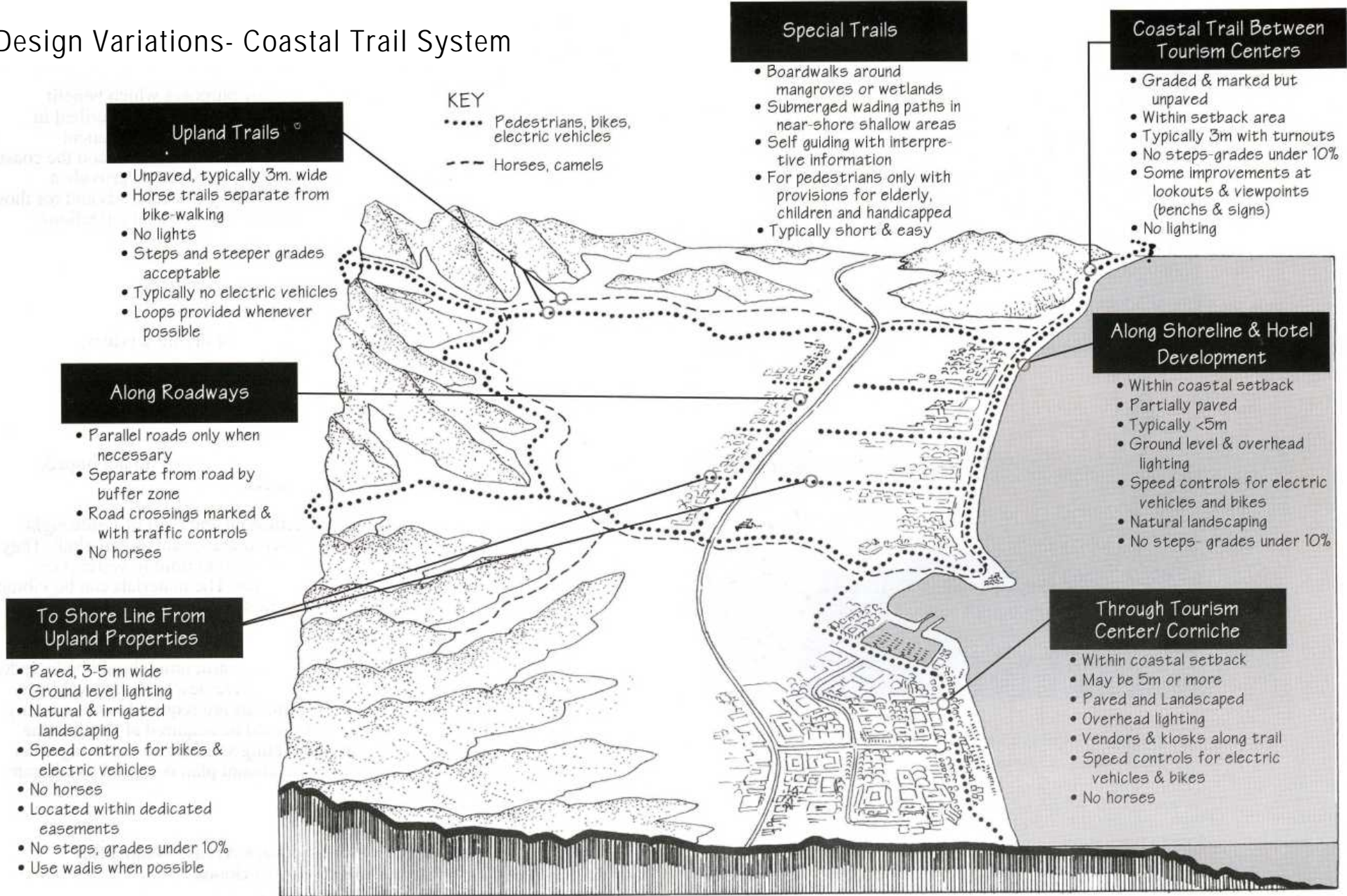
The trail system in most tourism center settings will be designed to serve pedestrians and cyclists. Within at least the setback areas and heavily-used corniches, provision needs also to be made for emergency vehicles and for small electric vehicles which serve very young and old people and the handicapped. In tourism centers where horseback or camel riding is planned, special attention must be given to the design of riding trails, and these should be separate from pedestrian/cycling trails.

The width of the trails will vary depending on location and use. A heavily-trafficked cornice plied by pedestrians, bicyclists and electric vehicles may require a width of up to 10 meters. In less intensively developed areas, a 3-5 meter path will serve pedestrians and bicyclists as well as emergency vehicles and outside of tourism centers, a 1-2 meter trail will be sufficient. The surface treatment of the trails will also vary. A smooth paved or concrete aggregate surface will be needed in heavily trafficked areas; a soft surface without paving will be desired in hiking trails and horse and camel paths; and a wooden boardwalk may be necessary in wetland areas.

**Examples of Trail Systems:** Naama Bay cornice and extensions; the Movenpick/Quseir coastal path; and the El Gouna boardwalk and path.



# Design Variations- Coastal Trail System





These well-designed light structures provide good examples of the variety of building types appropriate for the setback areas.

### Practice C-3

## **Build Light Structures Only within Setback Areas**

The setback areas have been reserved for many purposes which benefit residents, visitors and the developers of resort properties, as described in Practices C-1 and C-2. In order to achieve these purposes, permanent structures are not permitted between the mean high water mark and the coastal building front line. It is recognized, however, that in order to provide a comfortable, attractive environment for those using coastal trails and for those walking from resort properties to the beach and other coastal attractions, various facilities are desirable, including:

- shaded sitting areas;
- food and beverage services (not full-service restaurants);
- ice cream and juice stands;
- small commercial stands such as bike rental or diving services;
- information kiosks;
- viewing platforms;
- first aid stations;
- public restrooms and changing rooms;
- security kiosks; and
- low fences and other physical dividers, provided they do not impede continuous public access across the setback

These "light" structures should be non-permanent and built of lightweight materials including wood, bamboo, steel membranes, canvas and cloth. They are substantially open air structures, without air conditioning systems or significant plumbing and electrical requirements. The materials can be vibrant and colorful and make an aesthetic contribution to the use and enjoyment of the setback areas.

The proposed location, design, and uses of these structures should be included in the setback plan prepared for EEAA and TDA review and approval (see Practice C-1). Similarly, where special approvals are required to operate any activity in such a structure, the approval should be acquired at the time the setback plan is being reviewed. Uses generating solid waste or having other environmental impacts should have an operational plan designed to mitigate any adverse impacts.

**Examples of Light Structures within Setback Areas:** Naama Bay Corniche; Lagoon structures at Movenpick, El Gouna



## Practice C-4

### Minimize Excavation & Fill of Natural Terrain

Within the coastal setback area, some development activities may require modification of the existing topography. These might include:

- creation of artificial beaches and sunbathing areas;
- development of trails, walkways, stairs, and ramps to the water's edge, along the shorefront and to the reef top;
- installation of breakwaters and other shoreline modifications;
- construction of marinas and attendant landside facilities; and
- site work for light structures and landscaped areas.

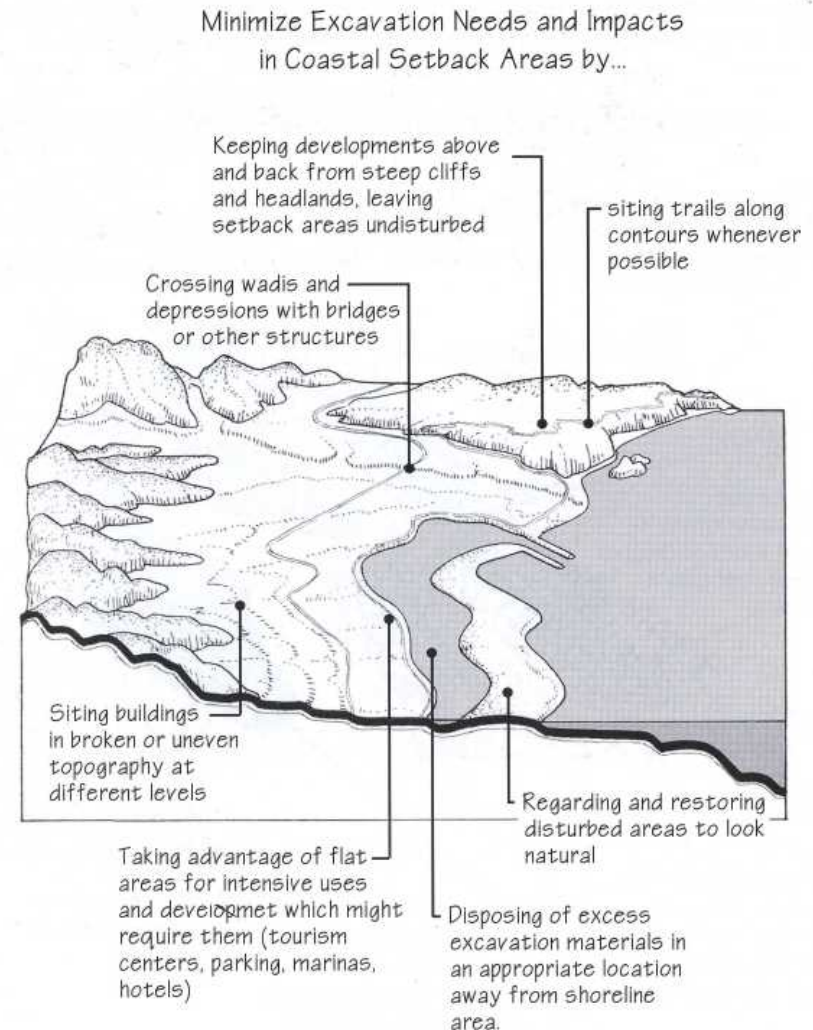
Excavating, filling and other alterations should be minimized because they can easily jeopardize the balance of natural processes at work (flooding, drainage, sand movement, wind forces) and lead to unanticipated consequences including harm to sensitive marine ecosystems. This can require extensive investment in measures to reduce impacts of such changes.

The natural terrain of a setback area often constitutes the site's most interesting feature and an aesthetic value which cannot be easily replaced. Examples include the naturally vegetated wadis, the stone-covered desert topography, and attractive rock out-croppings along the water's edge. Natural terrain can also be used to protect areas along the shoreline from strong winds which often disturb recreation and sunbathing activities.

Where cutting and filling is required, measures should be used to minimize wind and water erosion and resultant sedimentation, particularly in areas close to the shoreline. Every effort should be made to use local materials, such as rock and sand, for retention and stabilization purposes. Use of heavy timbers, reinforced concrete and the like for retention structures should be minimized. Reconfigured land forms should closely mimic naturally occurring features and provide adequate surface runoff and drainage channels. Excess cut material should be removed from the area and properly disposed (leveled and contoured at the disposal site, rather than being dumped in truck-load sized mounds.) "Finish" techniques should blend the new surface into the landscape rather than introduce unnatural plant materials, colors, and textures.

All modifications to the natural landscape should be clearly described and included in the proposed coastal setback plan that is submitted to EEAA and TDA for review and approval.

**Examples of Excavation and Fill Practices:** Setback area to east of Naama Bay Corniche; Utopia Resort near Quseir

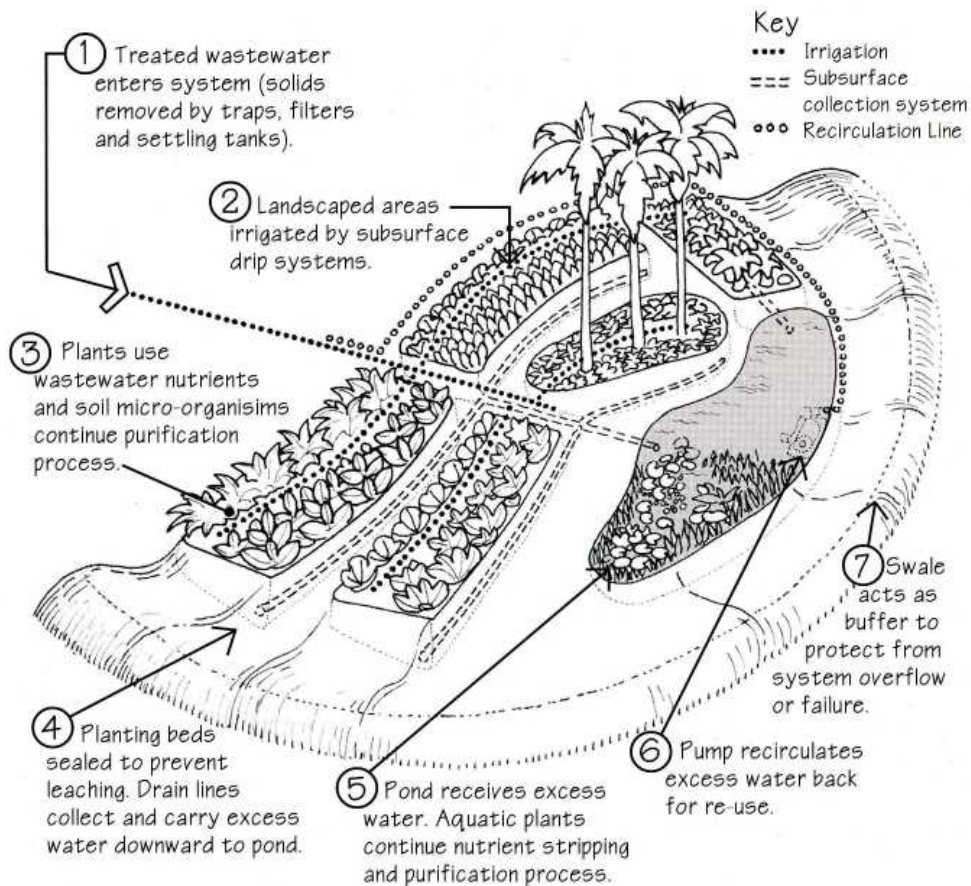


Practice C-5

## Manage Irrigation Wastewater to Protect the Marine Environment

In many Red Sea resorts, treated wastewater effluent is used to irrigate landscaped areas in the setbacks and in gardens near the resort buildings. This practice reduces demand for fresh water and provides a means of disposing treated wastewater effluent. Unfortunately, much of the

### Principles of Wastewater Irrigation Use and Recycling



irrigation wastewater can easily reach underground shallow aquifers or move seawards and cause numerous negative impacts, including:

- excessive amounts of natural and chemical nutrients contained in wastewater causes algal overgrowth on coral reefs;
- chemicals and other pollutants which may be present in the wastewater may harm marine organisms or pollute the groundwater;
- evaporation of excess irrigation wastewater may cause undesirable salt build-ups and deposits;
- pesticide and fertilizer residues applied to landscaped areas may also be transported to receiving bodies; and
- wastewater associated with inadequately treated human wastes may contain pathogens which could be airborne (from surface sprinkler applications) or contaminate swimming or wading areas.

In order to minimize the quantity of wastewater that reaches and affects underground aquifers or the marine environment, a proper management scheme must be implemented. A key component is to properly irrigate a planted area to its optimum needs. This can help to avoid excessive irrigation and reduce the amount of wastewater.

The typical scheme is a pipeline network (gutters) with impervious membranes that spread underneath the vegetated and irrigated areas to intercept and collect the wastewater. In order to be effective, such systems must be placed at the lowest points of the landscape. Inclusion of a buffer zone between irrigated areas and nearby water bodies will also help reduce the risks of contamination. Other irrigation wastewater use guidelines include:

- minimize pesticides and fertilizers in landscape maintenance;
- separate graywater (sink, shower use) from blackwater (toilet use), and only use treated graywater in irrigation;
- use drip and other sub-surface applications rather than sprinklers;
- encourage water conservation by visitors and workers;
- minimize landscaping within the coastal setback area which requires irrigation (use of xeriscaping and drought tolerant plantings);
- pump or direct nutrient rich waters to sealed man-made ponds/wetlands with plants to absorb these nutrients, preventing their movement into groundwater or the sea (a form of "tertiary treatment");
- use mulches to reduce evaporation and soil salinization; and
- establish sampling sites in appropriate locations where possible adverse impacts from irrigation can be regularly monitored.

**Examples of Irrigation Wastewater Management:** Nubian Museum, Aswan; Movenpick/Quseir; Coral Bay, Sharm el Sheikh

## **D. Land Use Management**

- D-1 Encourage Access to and Protection of Birds and  
other Wildlife Habitat 64
- D-2 Encourage the Development of Ecolodges as a Complement  
to Conventional Development 66
- D-3 Manage Undeveloped Uplands to Create Tourism Attraction  
68



Practice D-1

## Encourage Access to and Protection of Birds and other Wildlife Habitat

The Red Sea region is still, to a great extent, a virgin land. This is especially so beyond the thin coastal strip where nearly all of the present development occurs. Certain areas still have unique natural qualities that attract numerous, sometimes unique, kinds of wildlife. Areas like Wadi el Jemal, south of

Marsa Alam, and numerous smaller wadis along the Red Sea coast form oasis-like places for migrating birds to rest, and for a large number of wild species to breed. Some of these areas have been declared as natural protectorate areas. However, most of them are unprotected and thus vulnerable to change.

These wildlife habitats can serve as major attractions for people looking to see and learn about natural life within its local environment. However, the environments, or habitats, are often so fragile that they need special attention when visiting them. Unrestricted access, both spatially and temporally, can quickly endanger and damage these unique and sensitive areas. Breeding and nesting areas need special protection, especially when in use. Special trails may have to be built to accommodate pedestrians and possibly a

limited number of vehicles (as may be specified by the management plan of the site). Open spaces, signage, and information centers, together with other complementary facilities and services, have to be established and installed in an environmentally sensitive manner. Trained guides and Rangers are needed to educate and direct tourists so as to avoid impacting the resource itself.

A clear example when such quality environment lies within the development site itself is Marsa el Nabi el Sagheer where natural small ponds and wet lands constitute a major portion of the land area. The scenery of this place is superb, especially when looking from the elevated lands which are to be used in the future for the built-up area. In addition to its scenic value, however, this site provides an irreplaceable refuge for local wildlife and

Migrating birds south of Quseir



Wetlands in Marsa el Nabi el Sageer



*If your land falls within or near a natural wildlife habitat, establish trails and open spaces that encourage access to and protection of this habitat. If your site is some distance from such an area, consider putting some effort and investment with other nearby investors into an off-site natural attraction for your guests to visit during their stay in your facility. This effort is worthwhile and will pay back generously. Buffer zones being established by the TDA between major tourism development centers can be managed in this way.*



Wadi el Jemal:  
natural vegetation at  
Ras Boghdadi

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### Steps in Developing a Management Plan to Protect Birds & Other Wildlife Resources:

#### Step 1: Wildlife Resource Identification

- Identify resident species on and near the project site, especially any rare and/or endangered species (this should be done during the EIA process and will require input from a qualified wildlife biologist).
- Delineate natural habitat areas for key species (these will generally extend beyond the project site); give particular attention to breeding and nesting areas.
- Propose set-asides of land areas for protection of key species (these can be formal, publicly owned protectorates, or informal privately owned nature reserves).

#### Step 2: Develop Sustainable Use Management Plan for Wildlife Conservation

- Create a management plan for the public wildlife protected areas or private reserves:
  1. state goals and objectives to be achieved;
  2. identify resources available (staff and funding);
  3. delineate precise management area boundaries;
  4. determine carrying capacity (maximum numbers of visitors, and timing of visitations);
  5. assign responsibilities for management plan implementation; and
  6. develop procedures for monitoring and modifying the plan over time.
- Creation of a management plan should involve the EEAA's Nature Conservation Sector and local environmental NGOs. Each of these groups, together with the private sector, should participate in the management plan development activities.
- The wildlife biologist involved in the EIA studies should also be included in the process of developing a management plan.

#### Step 3: Implement the Management Plan

- Create a management institutional structure (using public/private partnerships, including local NGO participation).
- Assure financial sustainability, from visitor revenues and investor contributions.
- Train management staff, environmental guides/rangers, security and supervisory staff.
- Install signage and construct visitor center, walkways, protective fencing, shelters, etc.
- Develop educational and awareness materials for tourists and local residents.
- Market the protected area/wildlife reserve as a tourism destination through brochures, information packages, web sites.
- Monitor visitation and impacts on the natural resource base; make adjustments to the management plan as necessary to assure sustainability of the protected area/nature reserve.

What is ecotourism?

*"Environmentally responsible travel and visitation to relatively undisturbed natural areas, in order to enjoy, study and appreciate nature (and any accompanying cultural features-both past and present), that promotes conservation, has low visitor impact, and provides for beneficially active socio-economic involvement of local populations."* -  
-IUCN, The World Conservation Union



The ecolodge can be built from local natural materials to cater to the basic needs of the guests..



.. or can 12e even just a camp ... it does not matter. What matters is the quality of the surrounding environment, and the activities taking place within the ecolodge.

### Practice D-2

## **Encourage the Development of Ecolodges as a Complement to Conventional Development**

According to the estimates of WTTC (1992), nature-based ecotourism accounts for 10-15% of all international travel expenditures (total expenditure is around US\$3.5 trillion annually). Unfortunately, less than 1% of this market is being captured in Egypt, despite some of the most attractive marine, desert and mountain environments in the world. Why ? Partially because there are few proper facilities in the country that can serve the needs or meet the expectations of these ecotourists. Facilities which emphasize the values of natural environment and wildlife habitats-called ecolodges-are almost absent from the travel packages to Egypt.

The term "ecolodge" is used to identify a nature dependent tourist lodge that meets the philosophy and principles of ecotourism. As is often said, " the most important thing about an ecolodge is that the ecolodge is not the most important thing, but rather it is the quality of the surrounding environment that most counts; the nearby natural and cultural attractions; and the way ecotourism circuits are set up, operated and marketed, and also the way in which local populations are actively involved in the process." ( H. Ceballos-Lascurain, Ecotourism Facility Planner)

However, there is no need to be rigidly formal: even traditional hotels could significantly expand their market share by adopting some of the design and operating principles of the ecolodge. One section of a larger resort might be designed and organized to appeal to the non-conventional tourist, with special programs and activities organized along environmental tourism themes.

Ecolodges are frequently located within or near national parks and wilderness preserves, where they can provide environmentally suitable lodging for park visitors, and in turn contribute-financially and operationally-to the sustainable management of the park. However, given the variety, richness, and extent of the available environmental resources, a system of ecolodges in Egypt could include numerous sites having little or no relationship to



natural parks or officially protected areas. Diving centers, desert safari camps, even culturally-oriented lodges serving Bedouin areas or renovated older buildings in historic cities such as Quseir, can support one or more ecolodge facilities.

Ecolodges generally do not provide many of the entertainment and luxurious services which are normally provided by conventional hotels. This means initial investment in an ecolodge facility is often much less, and the environmental impacts resulting from operation of a more complex hotel or resort facility can be avoided or minimized. The main theme of ecolodges is to be as simple as possible; to take advantage of natural phenomena to build, run, and manage the facility; to contribute to the maintenance of the local economy and social values; and above all, to help conserve environmental resources.

*In addition to the conventional tourist who is looking for luxurious services and facilities, there is also a large demand for simple and nature-based facilities where people can enjoy the natural environment and the wildlife habitat. To attract this market, consider the development of ecolodges as a complement to conventional development. Ecolodges involve a low investment and produce a moderate to high return. They attract quality tourists with a willingness to pay for a unique and interesting experience, and who will normally be concerned to keep your facility and your valuable site intact.*

Ecolodges do not compete with conventional hotel and resort developments. Rather, they serve an entirely different type of tourist who is looking for highly specialized activities and services. So, ecolodges actually complement conventional development by providing these services which are lacking. Some conventional facilities might consider establishing ecolodges linked to their facilities to provide one or two days in the wild nature for their guests.

TDA is seeking to encourage ecolodge development designed to attract and serve a broader ecotourism market. A classification system is being developed to ease the regulatory process for constructing and operating ecolodges,

TDA will also assist interested developers to find suitable sites, to secure financing, and to develop easements and other legal instruments to assure the maintenance of the natural environmental conditions and values on which the ecolodge project is based.

### Traditional Lodge Versus An Ecolodge

Traditional Lodge	Ecolodge
Luxury	Comfortable basic needs
Generic style	Unique character
Relaxation focus	Activity/educational focus
Activities are facility-based: e.g., golf, tennis, water sports, pools, gymnasiums	Activities are nature/recreation: e.g., bird watching, hiking, snorkeling, diving, horse trekking
Enclave development	Development integrated with local environment
Uses non-local materials and imported technologies	Features use of local materials and technology
Relies on outside labor for construction and operations	Utilizes local labor markets to maximum extent
Group/consortium ownership	Individual ownership common
Profit maximization based on high guest capacity, services & amenities, design, location & prices	Profit maximization based on low capacity, uniqueness, special services, attractive price
High investment	Moderate/low investment
High rates of consumption for water and energy resources	Water and energy conservation are central operating principles
Key attractions are the facility itself	Key attractions are surroundings and facility
Gourmet meals, service and presentation	Good/hearty meals and service, often a local cultural influence
Market within chain	Market (normally) independently
Guides and nature interpreters minor feature of operation	Guides and nature interpreters principal focus of operation

Hawkins, Donald E., Megart Epler Wood, and Sam Bittman (Eds.), 1995, *The Ecolodge Sourcebook for Planners and Developers*. The Ecotourism Society, North Bennington, Vermont, USA.

Practice D-3

## Manage Undeveloped Uplands to Create Tourism Attraction

Tourism development on the Red Sea coast is concentrated within the narrow strip adjacent to the coast line. Little attention has been given to developing the uplands regions behind this coastal strip. However, the uplands:

- constitute the natural habitat of a large number of rare animal and plant species;
- contain interesting and sometimes unique geological features and landforms;
- offer spectacular views and vistas;
- contain ancient mining and historical sites, and other cultural relics from Pharaonic, Roman, Coptic and Islamic periods; and
- are presently the home of indigenous Bedouin cultural groups.

Few people know the uplands regions well, and it is often difficult for tourists to reach them. Some hotels and tour operators have begun to organize various kinds of safari trips to the uplands, but unfortunately, little has been done to identify, regulate, and properly protect the many resources found in these areas for the benefit and enjoyment of future visitors.

These uplands resources need identification and recognition by the different interested groups. They also need a sustainable management plan to secure a proper utilization which serves the purposes of tourism development and environmental conservation at the same time.

The following table outlines basic steps to be followed in developing management plans for the use and protection of upland resources. The steps are flexible: they can be used by one party to plan for use of a single resource, or they can be adapted to be applied in a more complex regional study involving many parties and resource areas.



Uplands cultural and historical attractions can be, if well developed, a complement to beach activities.

St. Antony's Monastery in the Eastern Desert.

***The uplands regions can become a major attraction for tourism development in the Red Sea, to complement the predominantly shoreline development that has already occurred. However, these resources currently lack the services and the management required to make them into effective tourist attractions. Consider putting investment in creating and managing upland sites to increase your marketing advantage. Ecotourism can be a perfect solution for investment in these lands.***





In El Gouna, north of Hurgada, the developer created a meeting and dinner place up in the mountains where his guests can enjoy Bedouin meals and night-time entertainment. The oasis has become a major attraction for the resort.

### Steps in Planning to Protect and Manage Undeveloped Upland Resources for Tourism

#### Step 1: Resource Identification

- Identify upland resources, including natural areas/wildlife habitats; scenic areas; unique geological features; historic and cultural sites.
- Establish current ownership and/or management responsibilities. Most upland sites are under military control. Local population may also have traditional rights which must be considered.
- Secure an agreement and active cooperation of all responsible governmental authorities and local residents before proceeding with further tourism planning activities.

#### Step 2: Develop Sustainable Management Plan for Resource Utilization and Conservation

- Delineate management zone boundaries as may be needed to control access to and use of identified resource areas.
- Create a management plan for each resource management zone, including:
  - a) statement of goals and objectives to be achieved
  - b) identify resources available (staff and funding)

- c) determine carrying capacity (maximum numbers of visitors, and timing of visitations)
- d) assign responsibilities for management plan implementation
- e) develop procedures for monitoring and modifying the plan over time

Creation of a management plan should involve all stakeholders including responsible governmental authorities, local groups, NGOs, and the private sector participants from the tourism industry.

#### Step 3: Implement the Management Plan

- Clarify the management institutional structure (including all stakeholders involved).
- Assure financial sustainability, from visitor revenues and investor contributions.
- Train management staff, tour guides/rangers, security and supervisory staff.
- Install signage and construct access roads and trails, visitor center, walkways, protective fencing, shelters, etc.
- Develop educational and awareness materials for tourists and local residents.
- Market the protected area/wildlife reserve as a tourism destination through brochures, information packages, and web sites.
- Monitor visitation and impacts on the natural resource base; make adjustments to the management plan as necessary to assure conservation of the protected area/nature reserve.

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# **E. Environmental & Landscape Design**

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Practice E-1

**Use Building Forms and Colors that Blend with the Desert Landscape**

This might be one of the most controversial issues regarding the design and implementation of touristic facilities. Tastes vary, and agreement on 'appropriateness' is not easily achieved. However, there are several fundamental aesthetic and design principles, discussed below, which are generally accepted.

Building forms have two main aspects: aesthetic, and economic/functional. The perceived quality of a building's shape and form stems from its suitability to its functions. This is to say that international building designs do not necessarily attract the attention and hearts of tourists - they frequently see these forms in their homelands. Tourists generally look for an interesting environment with a different architectural sensibility. One can fabricate and manipulate Caribbean styles in arid areas, but this is not what the visitor to the Red Sea is looking for. Traditional architectural forms, if well designed and constructed, usually attract the attention of locals and expatriates. In the case of the Red Sea, the traditional architecture of Quseir, for example can be a useful source of inspiration for architects who are looking for a uniquely designed facility.

The economics of building forms may be easily understood by looking at traditional building processes and buildings that utilize these traditional technologies. In an area as remote as the Red Sea coast, shipping costs of imported building materials such as cement and reinforcement steel can be a significant component on the balance sheet of any development. In addition, the cost of moving and accommodating non-local builders and staff can be an inordinately exhausting experience. The beauty of traditional building processes is that they employ local builders and building materials at local rates with minimal costs for transportation or accommodation. It also provides the local community with temporary and permanent jobs in the area of construction and building maintenance. The use of appropriate technologies also encourages the development of local traditions which are attractions themselves.

Utopia Resort, South of Quseir, is a good example of how to utilize local materials and building traditions.



***Consider local and traditional building forms and building processes. This can be far less expensive and more attractive and unique than conventional styles. Curved roofs or natural local stone walls can provide countless variations for architectural designs, and yet they contribute to a uniform and harmonious landscape. They are gentler, modern in thought, and they are appropriate to their sites. Their natural texture and color may be left intact, or when necessary, light colors that protect the building's inner environment may be used.***

The structure of traditional buildings usually follows the intended purpose of the building and the natural forces to which the building is exposed. Traditional wisdom understood centuries ago that a major economic factor in construction is to expose the building to as few tension forces as possible, to maximize distribution of these forces within the building and to minimize the quantities of materials needed to bear these forces. As such, curved roofs, domes and parabolic vaults which distribute their weight equally to bearing walls with few openings serve as the ideal structure, which in turn produces the architectural forms that today we call *traditional*. These structures are traditional, but they are also modern if the logic and wisdom on which they are based is considered.

Curved roofs and massive bearing walls are also extremely functional and economically feasible in areas such as the Red Sea since they provide the maximum protection against the burning sun and heat of the region. If time is considered as a factor into the equation, traditional buildings are usually cheaper and more sustainable than conventional reinforced concrete structures. For example, it takes one builder and an assistant only one and a half days to cover a 3x3 meter room with a brick dome, while it takes at least two weeks and an army of workers to cover the same area with a flat reinforced concrete slab.

On the other hand, local building materials such as natural stone do not generally require plastering. The natural colors of these materials blend and work harmoniously with the desert landscape since they are, after all, part of the desert. This relieves the architect and saves time and money for the investors since they do not need to choose colors that may prove to be unattractive, costly or impossible to maintain in the difficult desert environment.

However, sometimes plaster may be required, especially when coarse bricks are being used. In this case, it is better to use light and bright colors to maximize solar reflection thus minimizing cooling costs. The plastering materials themselves can be brought and fabricated on site using the traditional technology for exposed surface plastering. This is not only less expensive, but it facilitates future re-plastering with minimal costs and efforts.

The architecture and design details of Kafr el Gouna is another example of modern application of traditional design concepts and technologies.







The natural sea and mountain view is spectacular at any time, but especially at dawn and sunset. It should be an obligation to maintain and enhance these views. Guests and other people deserve to enjoy this luxury of nature.

Location: Soma Day, view from the Robinson Club.

### Practice E-2

## **Maintain Views of the Sea and Mountains**

In the Red Sea region, the stunning views of the sea and mountains are tourist attractions in themselves. Development that ignores or impairs these views is unwise. At the same time, it may not be possible to give every guest an equally outstanding view. Developers often insist that every individual room must have a sea view. The result can be an accumulation of buildings with rooms that front onto the sea, with corridors or toilets facing the mountains. Viewed from the highway or the interior of the tourist development, one will see a long and rarely broken line of buildings that frequently block the view of the sea.

The use of fencing in tourism developments is also a major issue of concern. Fences present a hostile face to passers-by. Moreover, construction of fences is expensive and time-consuming. Fences basically serve as a statement of ownership and boundary marks, and to protect the property and privacy. However, new surveying technologies and mapping systems can prevent any confusion over boundaries or ownership status. Protection and privacy issues can also be achieved through appropriate landscape and architectural design that maintains private spaces, yet keeps the sea view between buildings open to everyone.

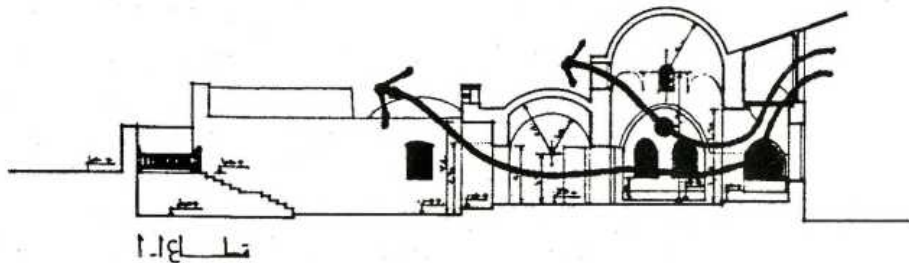
Multi-story construction is also a matter of concern; although they provide spectacular views for guests, they degrade views to (and from) the sea or mountains for non-guests. Multi-story construction frequently ignores the qualities of the site and tends to treat its unique location as a proto-typical urban development site. If sea and mountain views can be developed and accented in the architectural design, the facility would be greatly enhanced.

*Fencing should be limited to sensitive functions within the facility and give the public a better view of it as well as the sea and mountains. If necessary, fencing should generally permit an unencumbered view of the sea and mountains. As for guestrooms, they are used primarily for sleeping. Preserve the best sea and mountain views for more shared functions that people really enjoy. Remember that provision of a sea view is not the only criteria for a good guestroom.*

## Take Advantage of the Micro-climate of Your Site

The Red Sea coast enjoys pleasant, sunny and breezy conditions throughout the year. This results in a hot, arid climate with fine dust and sand. Air conditioning can reduce temperature and humidity to a comfortable level. However, it takes a great deal of investment to design, install, run and maintain air conditioning systems. Sharp differences in temperature between closed and open spaces can also create an unpleasant, even unhealthy, environment for your guests. The best solution to overcome these problems is to employ natural and passive ventilation and air conditioning systems whenever feasible, and to limit the use of mechanical air conditioning to conditions where it is essential. This will be cheaper and more sustainable than the energy-consuming conventional option for climate control.

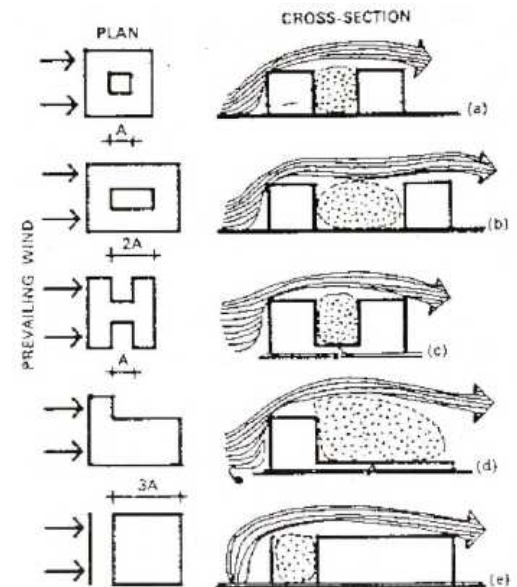
In its regulations and rating system for tourism facilities, the Ministry of Tourism requires the provision of an average room temperature without reference to the means of achieving that temperature. This flexibility will allow well-designed passive climate control solutions to be examined and implemented



The application of the building orientation towards the prevailing winds, using wind catches and appropriately designed openings, shade and shadow, fountain and water surfaces, cross-ventilation, heat resistant and thick walls, and other passive and natural techniques are all free and accessible. This typical section of the pioneer architect Hassan Fathy is a sample of how some of these techniques can be utilized.

*The morphology of the architecture can by itself solve a lot of local climate problems. Courtyards, for example, if well designed give protection from sand and most of the wind-borne dust; orientation unimportant. Fully exposed spaces, on the other hand, require barriers to provide protection from overhead dust and side swirls. In this case, protection is function of length and height of barrier and distance from face of building.*

Source: Saini, B.S. (1980), *Building in Hot Dry Climates*, John Wiley & Sons, Toronto, pp. 59.



*A lot of resources can be saved if conventional air conditioning systems are not needed, while providing a comfortable conditions for the quests. Ask your consultant to consider natural and passive ventilation and air conditioning techniques. In the short term, this is cheaper and more environmentally friendly. In the long term, this is environmentally sustainable. (See Best Practice F-1 for further guidance in these areas.)*

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# F. Infrastructure & Support Facilities

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Practice F-1

## **Design & Manage Facilities to Conserve Energy & Water Resources**

The architectural and engineering design phase of any tourism development project is an excellent time for incorporating environmental sustainability concerns into the project. In this phase, it costs nothing to add and remove items "on paper". A broad range of options exists (see Table 1) for achieving improved environmental performance of infrastructure systems. Some of these options are most appropriately considered at the single-project scale; others may also be feasible for application at the tourism development center scale, where certain infrastructure systems can be shared by several projects. In either case, a thorough analysis by a capable civil/mechanical engineering design team will identify options for minimizing resource consumption and maximizing operating savings. These findings may lead to changes in the design of the project, not only in the selection and use of equipment - such as generators, transformers, water supply equipment, wastewater treatment equipment, and the like - but also in basic decisions concerning site planning and building design.

However, even if a project has already been constructed, opportunities remain for replacing or retro-fitting existing structures or mechanical systems to improve operational efficiencies and performance. Such changes often offer investment 'pay-back' periods of surprisingly short duration, resulting in the double benefit of reduced operating costs as well as reduced environmental impact.

The link between good design and environmental performance is clear: the better design solution is the one that achieves the greatest output per unit of input. Such a solution is more efficient: it generally requires the least input of resources, which are costly, while generating the smallest number of wastes, which are also costly to treat and dispose of. In addition to clear financial benefits, the environmental benefits resulting from reduced resource use and lower pollution levels can be significant.

Power generating plants can be a source of noise and air pollution. Proper fuel storage is also an issue to be considered. Well designed and managed power plants and power management systems are needed to enhance power consumption economics, as well as environmental performance.





*Use of Environmental Audits to identify water and energy saving options: In a series of hotel environmental audits sponsored by USAID's Environmentally Sustainable Tourism (EST) project, and conducted by the Energy Conservation and Environmental Protection (ECEP) project, nine Hurgada-based hotels carried out in-depth surveys of their environmental policies and practices. In each case, a series of actions ranging from "no cost" and "low cost" measures, to significant capital investments, were identified, described, and evaluated. Both financial and environmental implications were clearly stated, and the participating hotels were enabled to reach informed judgments regarding the recommended improvements.*

It is important to analyze costs and savings in a systematic fashion, using a "life cycle" basis for comparison of alternative solutions. This will include consideration of several cost components:

- Initial investment costs (construction, equipment acquisition, and installation costs).
- Operation and maintenance costs over time (including cost of resources consumed, and costs for treatment and disposal of waste products)
- Replacement and decommissioning costs (purchase of new equipment and disposal of used equipment.)

The least expensive initial investment often may prove not to be the best course of action, or the most effective environmental solution over the long term. Proper facility design and equipment selection may require higher initial costs, but this initial investment can often be recovered quickly through savings in operating costs. Similarly, an effective facilities management program - including periodic performance audits and preventive maintenance - can help produce additional significant savings over the life of a project.

**Table 1: Techniques and Technologies for Achieving Environmentally Sustainable Infrastructure Design of Touristic Sites**

Water Supply	Wastewater/ Sewage Treatment	Electrical Supply	Thermal Energy Supply	Building Climate Control
wells	connection to local sewerage system	grid connection	solar space heating	passive heating & cooling
pipeline	aerobic package treatment plants	diesel generators	solar water heating	energy management and control systems
tanker trucks	wastewater stabilization ponds	gas turbines*	waste heat cogeneration	distributed and central cooling system
reverse osmosis	intermittent sand filters	photovoltaics	hot water storage	ice storage
vapor compression	septic tanks	wind electric systems	seawater active/passive cooling	desiccant dehumidification*
multi-stage flash distillation*	chemical disinfection	hybrid systems		occupancy sensors/ key cards
multi effect distillation*	ozone disinfection*	solar thermal*		laundry equipment
Thermo compression*	ultraviolet disinfection*			kitchen equipment
Electrodialysis*	Sea disposal			
cold distillation*	soil based disposal			
solar distillation*	re-use system			

Source : A guide for preliminary planning and assessment of energy and environmentally sound tourist villages in remote areas of the Red Sea coast of Egypt-IDEA, INC., 1991.

\* Not recommended for single, isolated touristic village

Renewable energy sources hold great promise in the Red Sea region.

Wind field north of Hurghada.



The list of 'best practice' equipment, process options, and management measures that can be considered is a long one. Some of the individual design and equipment issues to be investigated in coastal tourism projects include:

**(a) Options to reduce water consumption:**

- Install low-flow showerheads and toilets, and flow aerators in faucets
- Use kitchen grey water and waste water treatment effluent for irrigating landscape plantings, and avoid irrigation during daylight hours; use drip irrigation systems; use plants which are drought-tolerant
- Install laundry and kitchen dishwashing water re-circulators
- Avoid excessively sized swimming pools and water features; use pool covers to reduce evaporation at night
- Offer hotel guests the option of having bed linens and towels changed less frequently
- Install flow meters and check regularly for distribution system leaks

**(b) Options to reduce energy consumption:**

- Maximize use of solar and wind energy and other renewable sources, especially for water heating
- Consider stand-alone wind or photovoltaic power generation in remote settings
- investigate passive solar design, especially to reduce solar gain (and resulting space cooling needs)
- Consider evaporative cooling systems
- Use high efficiency motors, pumps, compressors, air handlers, etc.
- Use high efficiency lighting fixtures (i.e., replace incandescent lamps with compact fluorescent lamps)
- Avoid over-lighting, especially in hallways and other public areas; use natural lighting wherever possible
- Turn off air conditioning systems when hotel and function rooms are not in use, and/or install occupancy sensors or key-cards
- Explore feasibility of using waste heat from power generation facilities to produce potable water and/or to heat water
- Improve boiler and steam line efficiency
- Install meters and perform annual energy audits

Among the highly desirable and recommended types of energy available for touristic sites, renewable energy sources remain on top as they are considered to be "clean sources of energy." Below is a list of exploitable types of energy generation options, among which sunshine and wind are abundantly found in the Red Sea area:

Renewable resource	Energy technology/application
Sunlight	Power generation, photovoltaics, solar cooling, power generation
Wind	Power generation, water pumping
Geothermal heat	Power generation, space heating
Plant matter (bio-mass)	Power generation
Warm sea water	Power generation

Source : *A guide for preliminary planning and assessment of energy and environmentally sound tourist villages in remote areas of the Red Sea coast of Egypt-IDEA, INC., 1991.*

Table 2 presents anonymous (but actual) conditions at selected hotels analyzed by USAID's *Energy Conservation and Environment Project* (ECEP), showing initial investment costs, savings, and pay-back period for the identified equipment and operations improvements.

It is important to remember that water and energy conservation strategies need not result in a lowering of hotel guest satisfaction levels, but rather should correct deficiencies in the system resulting from phenomena such as, for example, leakage, which affect both the quality and quantity of the input and output.

With Egypt's current population growth economic renaissance, demand is anticipated to grow rapidly in the energy and water supply sectors. Since the great majority of Egypt's fresh water comes from a fixed quota of the River Nile's water, or from even more costly desalination plants, and the bulk of the nation's energy is based on non-renewable fossil energy, resource conservation and non-traditional clean power generation will increasingly be seen as important considerations for economic reasons, not only because of the environment.

**Table 2: Cost Analysis of Improvement Options**

Hotel	Option	Description of option	Initial cost (LE)	First year savings (LE)	Pay-back period (month)
<b>Summary Cost Analysis of Energy System Improvement Options</b>					
A	1	Consolidation of electrical load	38,500	14,892	31
	2	Use of occupancy sensors	178,322	50,448	42
	3	Returned air for AHUS	N/A	44,421	--
	4	High-efficiency chiller and sea-water/water exchanger	540,000	147,898	44
	5	Rewiring of lobby wiring	10,000	17,500	7
	6	Use of hot water in laundry	very low	11,502	immediate
	7	Control of lighting & AC in casino	5,000	64,700	1
B	1	Consolidation of electrical load	very low	3,312	immediate
	2	Install high-efficiency lighting	22,862	15,533	17
C	1	Consolidation of electrical load	very low	17,398	immediate
	2	Use double roof to reduce AC load	38,400	26,856	17
	3	Install high-efficiency lighting	9,600	10,666	11
D	1	Consolidation of electrical load	very low	33,042	immediate
<b>Summary Cost Analysis of Resource Conservation/Pollution Prevention Options</b>					
1	Laundry	Recycle effluent from laundry (172m3/ day) & use chemicals dosing pumps	60,000	45,000	16
2	Kitchen and House	Consolidation of electrical load Install high-efficiency lighting	3,000	13,300	3
3	Guest rooms	Use dispensers for shampoo and use water savers	88,000	250,500	4
4	Public rest rooms	Replace fabric hand towels with warm air electric dryers equipped with photocell	6,000	21,000	4
5	Sewage treatment	Install package sewage treatment plant and reuse effluent	500,000	250,000	24
6	Water desal plant	Reconsider the intake side and the discharge side of the RO system, and fix leaks	4,000	17,000	3

Source : *ECEP Case Study Vol. 1, No. 15 (October 1996).*

Practice F-2

## Collect & Properly Dispose of Solid Waste

Unlike other waste streams, which are less tangible and thus sometimes difficult to notice, solid wastes can be highly visible and movable: desert winds and sea currents transport wastes, or litter, over long distances from their point of generation. Particularly in desert environments, where the rate of decomposition is slow and the visibility of litter wastes is high, proper management of solid wastes in tourism areas is very important. Equally, sensitive marine environments are susceptible to severe, sometimes irreparable, damage from wastes of all kinds. Toxic and hazardous material wastes can be dangerous to humans as well as to other living things.

However, the visible litter which the tourist sees is only a small percentage of the total waste stream. Most solid waste generated by hotels and other tourist facilities is collected and disposed in an environmentally acceptable manner. In addition to the obvious environmental benefits, proper disposal of solid wastes serves a number of important economic purposes as well:

- Tourists enjoy a very competitive market where attractively-priced packages are offered to them for destinations which provide luxury, cleanliness, and - increasingly - unspoiled nature. The presence of setting free of visible solid waste is an important marketing asset;
- Solid waste collection, transport, and disposal costs are high. Any reductions in the waste stream due to minimization or recycling will translate to operating cost savings;
- Composting of organic wastes can produce soil mulch and nutrients - a useful commodity in a relatively sterile desert growing environment.

The key steps in the solid waste management cycle must be made very clear to everyone involved in it, i.e., the tourist, the hotel investor/manager, the waste collector/transporter, the policeman, local administration personnel, and the organization responsible for the disposal site. If any link of this chain is not adequately performing his task, serious breakdowns will inevitably occur.

Without a well managed plan for the disposal of solid waste, there is a clear danger that wastes will continue to litter the coastal landscape.



Care should be taken to guarantee the existence of proper facilities and equipment to execute the job. In addition, public awareness and education programs are essential components of a successful solid waste management strategy, without which equipment and systems may be rendered ineffective.

Solid wastes generated by hotels encompass a broad range of materials, but usually fall within the following general categories, or waste streams:

- Food wastes from kitchens and restaurants
- Combustible materials (paper, cardboard, wood, cloth, plastics, etc.)
- Non-combustible materials (glass, metal, etc.)
- Other large items (broken or obsolete appliances, furniture, etc.)
- Sewage bio-solids
- Construction and demolition wastes

Whether designed for an individual tourist facility or for an entire tourist village, solid waste management programs should utilize a balanced approach, including:

- *Waste minimization*, where the quantity of solid wastes is kept to the smallest amount possible.
- *Waste recycling*, where preference is given to the purchase of goods which are amenable to recycling. Composting of organic materials, and reuse of various paper, plastic, and metal wastes are prime examples of feasible recycling programs. (Often, recycling can produce revenues from the sale of reusable materials, as well as savings from the reduction in the volume of wastes requiring transport and disposal.)
- *Waste handling*, which involves the proper collection and storage of waste products. Although each waste streams requires special handling and treatment, particular attention must be given to the handling of hazardous wastes, especially in the vicinity of environmentally sensitive resource areas.
- *Waste disposal*. Most tourist centers will not themselves transport and dispose of residual wastes, but will instead contract for these services

with a local service provider or governmental body. (However, if only from self-protection, tourist centers should thoroughly investigate the disposal practices of the organizations which handles their wastes, and request changes in their practices where necessary. Improper burial or burning of solid wastes, for example, can create serious impacts which will adversely affect the community at large as well as the tourism industry generally.)

Each site has its own properties and characteristics which might differ according to fragility of the eco-system, distance from the disposal site, efficiency of the transportation processes, availability of separation and recycling mechanisms, etc. In Table 1, general recommendations are given to site designers in order to render the management of wastes more efficient.

**Table 1: Recommendations for Sustainable Solid Waste Systems in Touristic Villages and Development Centers**

Always use these options	Usually use these options	Consider these options
<ul style="list-style-type: none"> <li>• Use closed waste storage containers</li> </ul>	<ul style="list-style-type: none"> <li>• Separation of waste streams</li> </ul>	<ul style="list-style-type: none"> <li>• Joint collection/disposal programs with adjacent hotel owners</li> </ul>
<ul style="list-style-type: none"> <li>• Remove trash in covered trucks</li> </ul>	<ul style="list-style-type: none"> <li>• Composting of organic matter</li> </ul>	<ul style="list-style-type: none"> <li>• Incineration and energy recovery</li> </ul>
<ul style="list-style-type: none"> <li>• Avoid food waste grinders</li> </ul>	<ul style="list-style-type: none"> <li>• Recycling</li> </ul>	
<ul style="list-style-type: none"> <li>• Avoid 'single use &amp; throw away' products</li> </ul>		
<ul style="list-style-type: none"> <li>• Use special care with hazardous materials</li> </ul>		
<ul style="list-style-type: none"> <li>• Train all hotel employees in proper waste minimization and handling techniques</li> </ul>		
<ul style="list-style-type: none"> <li>• Initiate guest/visitor awareness programs</li> </ul>		

*Source : A guide for preliminary planning and assessment of energy and environmentally sound tourist villages in remote areas of the Red Sea coast of Egypt-IDEA, INC- USA, June 1991.*



In addition to wastes which are generated during the normal course of the hotel business, several types of tourism facility-related wastes deserve special attention. These include:

- *Hazardous wastes.* Commonly used hazardous materials in a hotel generally include kitchen detergents and cleansing agents; laundry bleaches and dry cleaning chemicals; housekeeping cleansers and sanitation chemicals; swimming pool chemicals; landscaping fertilizers and pesticides; waste oils from various kinds of equipment; fuels used in central heating and power generation; and inks, solvents, photocopier wastes and other items produced by administrative and office activity. Since most hotels do not have the capability to properly dispose of the wastes generated by the use of these materials, the issues of providing secure short-term storage, and arranging for timely off-site disposal, need to be addressed. It is important to recognize that hazardous materials can sometimes produce even more noxious substances if they are accidentally mixed or combined while in storage awaiting disposal. All staff involved in the handling of these substances will require special training in order to protect their health as well as the health of the hotel guests.
- *Construction wastes.* The construction process produces a considerable volume of solid waste material which must be contained and properly disposed of. One effective measure is to fence the construction site to help contain small cans and waste papers (boxes, wrappers, cement bags, and other packaging materials) which would otherwise be carried about by the winds. Another useful measure would be to bury and re-grade sites where excess excavate and other construction debris is disposed of, rather than leaving unsightly mounds at the back of an otherwise attractive new development site.
- *Ship and marina wastes; desert safari wastes.* Much of the tourism activity of the Red Sea revolves around recreational access to the sea, for snorkeling, diving, windsurfing, and fishing; or to the desert and mountains, for day or overnight camping trips. These recreational activities can produce significant quantities of solid wastes, which must

Separation and organized collection of empty water bottles is essential for appropriate recycling and management of their disposal.



be brought back for proper disposal. (Similarly, liquid wastes from ships - such as sanitary sewage, oily bilge water, and waste engine oils - must also be dealt with properly.)

In Table 2, various technologies which could be used for the treatment of solid wastes are described.

**Table 2: Technologies Used for Sustainable Management of Solid Wastes in Touristic Villages**

<b>Technology</b>	<b>Advantages</b>	<b>Disadvantages</b>	<b>Comments</b>
<b><i>Sanitary Land filling</i></b>	Stabilizes solid waste in concentrated, remote area	Requires significant land area. Daily maintenance required.	The only feasible ultimate-disposal approach for much of the solid waste generated by the tourist village
<b><i>Composting</i></b>	Converts garbage into a valuable soil conditioner. Reduces volume of solid waste that must go to the landfill.	Requires daily maintenance as well as land area can release unpleasant odors if not closely managed.	Off-site composting should be considered. In-vessel composting may be a feasible approach for single villages; it is less land intensive and requires less water input.
<b><i>Separation and recycling</i></b>	Reduces volume of solid waste that must go to the landfill.	Requires regular maintenance.	Separation and recycling may be a useful volume reduction technique.
<b><i>Incineration and energy recovery</i></b>	Significantly reduces the volume of solid waste bound for the landfill.	May require diesel or other fuel. Can release unpleasant odors and smoke.	The relatively small amounts of solid waste generated will probably not support the economic operation of an incinerator.

Source : A guide for preliminary planning and assessment of energy and environmentally sound tourist villages in remote areas of the Red Sea coast of Egypt-IDEA, INC., 1991.

Practice F-3

**Recycle and Reuse Wastewater & Properly Dispose of Brine from Desalination Plants**



If not dealt with properly, the disposal of sanitary wastewater and desalination plant brine can pose both a health and an environmental risk. Marine species are especially sensitive to biological and chemical contaminants, and even to sudden changes of temperature, salinity, or nutrient levels.

In the Red Sea region - an area well known for its aridity - wastewater should be managed, first of all,

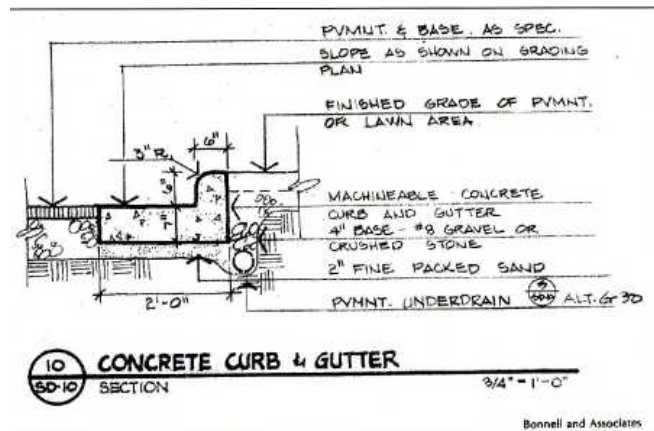
by implementing water use conservation techniques. Using less water means less will have to be produced in the desalination plant, and less will have to be processed at the sewage treatment plant. In each case, wastewater disposal problems - and costs - are reduced.

The second step will be to properly plan, design, and equip the sewerage system, bearing in mind a very simple philosophy: "what you discharge and you don't currently see, might not always remain as such." The long term vision should aim at decreasing costs for the investor (or group of investors, where a shared treatment and disposal option is available) by carefully designing the waste water treatment and discharge system.

The third step, which involves community participation and private/public sector cooperation, is the treatment of the effluents, whether liquid, solid or gaseous. The proper treatment and reutilization of the discharges can help achieve several objectives :

- Reducing the cost of obtaining fresh water for non-drinking activities.
- Reducing the potential fines imposed by law in situations where leakage or improper disposal of effluents occur.
- Safeguarding the surrounding backbone of the tourism industry - the natural ecosystem - from physical degradation.

Even the smallest portion of a site drainage system should be integrated into a plan for the recycling and management of waste water, and to minimize leaking to the natural environment.



Treatment of the discharge itself could take many forms depending on the budget available, the final purpose of reuse for the treated water, the number of participants within the system and therefore the volume of the effluent flows to be treated, and last but not least, the technical specifications set forth in the Executive Regulations of Law # 4/1994, which are designed to protect the Egyptian environment.

Substantial quantities of organic material and associated fresh water are produced in concentrated isolated communities such as the Red Sea touristic sites. Uncontrolled sewage has a potential to seriously damage the ecosystem, and to threaten human health.

Brine discharge from desalination plants depends on the particular process used, total dissolved solids concentrations may be very high, well above levels that are lethal to most aquatic animals and plants. Also, it may

contain metals and other contaminants from erosion, corrosion, or input water.

Accidental liquid discharges and leakage into the land or marine environments occur daily. Petroleum liquid products, specialized industrial liquids and pesticides are in use in many human activities. Hotel staff responsible for the use and storage of these products should receive special training in ' quick response' techniques for dealing with accidental spills.

The following table illustrates the potential impacts, site evaluation, and impact alleviation of the three different discharges.

**Issues to be Considered in Disposal of Liquid Wastes**

Potential Impacts	Site Evaluation	Impact Alleviation
<p><b>Sewage</b></p> <p>Coral reefs cannot survive under concentrated continuous flow of sewage. High nutrient levels cause algae growth, which can smother the corals. Also, beaches and eventually humans can be severely affected from the pathogens contained</p>	<p>Making use of the treated wastewater is an option that needs to be carefully studied. Disposal of the dried sludge should also be considered. It may be suitable for mixing with other organic wastes, such as food wastes, that are being composted.</p>	<p>No sewage should be directly discharged into the sea, while accidental spills should be closely monitored and treated. The solid components of sewage should act as a fertilizer for greenery after being composted with bulking agents and moisture.</p>
<p><b>Brine Discharge from Desalination Plants</b></p> <p>Land disposal of brine destroys local animals and plants and renders the site unusable for decades; while discharge of concentrated brine into the marine waters can be fatal to all kinds of marine life unless proper mixing and dilution occurs.</p>	<p>Samples should be taken of local currents, water column salinity, and dissolved oxygen levels. These measurements should preferably be long term (taken 3 or 4 times under various conditions over at least one year).</p>	<p>Land disposal of brine should not be considered; while based on local water conditions, the discharge end-of-pipe should be sited so that dilution of brine will make the elevated salinity unmeasurable before the plume contacts any bottom sediments or coral reefs.</p>
<p><b>Accidental Liquid Discharges</b></p> <p>Many of these liquid wastes are toxic to wildlife. Moreover, any discharge of non-biodegradable liquids into the ground can result in its migration through the soil and then into underground aquifers or the sea.</p>	<p>Construction and operations planning should include provision for convenient, controlled storage and mechanical repair areas.</p>	<p>The training of personnel to avoid "sloppy housekeeping" is essential in minimizing accidental liquid discharges. Provisions should be made for collection, transport, and disposal of automotive liquids, solvents and residual pesticides.</p>



The water desalination and sewage plants of El Gouna Resort are well disguised and located in a remote and isolated area of the site.



#### Practice F-4

### **Site Water Treatment & Wastewater/Sewage Treatment Facilities in Environmentally Appropriate Locations**

Proper zoning of water supply and wastewater treatment facilities is important in order to eliminate or reduce risks of unpleasant odors and noises (from pumps and other mechanical equipment); avoid harmful discharges, and provide for adequate mixing by locating discharge points at a suitable distance from fringing reefs or other resources.

Site planners and engineers should assess the following factors in making facility siting decisions:

- Locate treatment facilities, pumping stations and other mechanical equipment where view, odor and noise will not be a problem, or where visual screening and noise controls are feasible;
- If treatment or settling ponds are used, locate and design them to appear as natural as possible, and to provide bird or wildlife habitat;
- Utilize gravity flow as much as possible to minimize pumping requirements (thereby saving energy costs and reducing noise);
- Locate and design emergency overflow and buffer zones to prevent contamination of marine and other sensitive natural areas;
- Estimate and allow sufficient space for future expansions of system capacity.

The economics of infrastructure and piping can be a serious factor in determining the zoning of site facilities. However, the potential health risks and disturbances by these facilities must be assessed and considered. Whereas the site constraints necessitate that situation, all means must be provided to mitigate these risks.

In situations where harmful discharges to marine environments cannot otherwise be avoided, consider the feasibility of subsurface injection well disposal techniques, rather than discharges to the sea.



## Practice F-5

# Develop Attractive and Efficient Employee Housing and Support Facilities

Tourism facilities create great job opportunities for hundreds — even thousands — of employees who are sustaining families, either on site or elsewhere. In fact, the workers - whether living with or without their families — will probably spend more money at the employment site than in any other place. The development of attractive and efficient employee housing areas can thus be a major factor complementing the success of the project as, in simple terms, it:

- Develops a sense of community cohesiveness and permanence, thereby encouraging more tourism industry workers to settle with their families near their place of work, rather than traveling to and from a distant permanent residence;
- Encourages workers to feel more positively of themselves and of their employer, and to consider themselves to be integral contributors to the success of the project;
- Increases the sense of 'ownership' and loyalty to the project, so as to encourage the staff to bear more responsibility for the various tasks delegated to them.

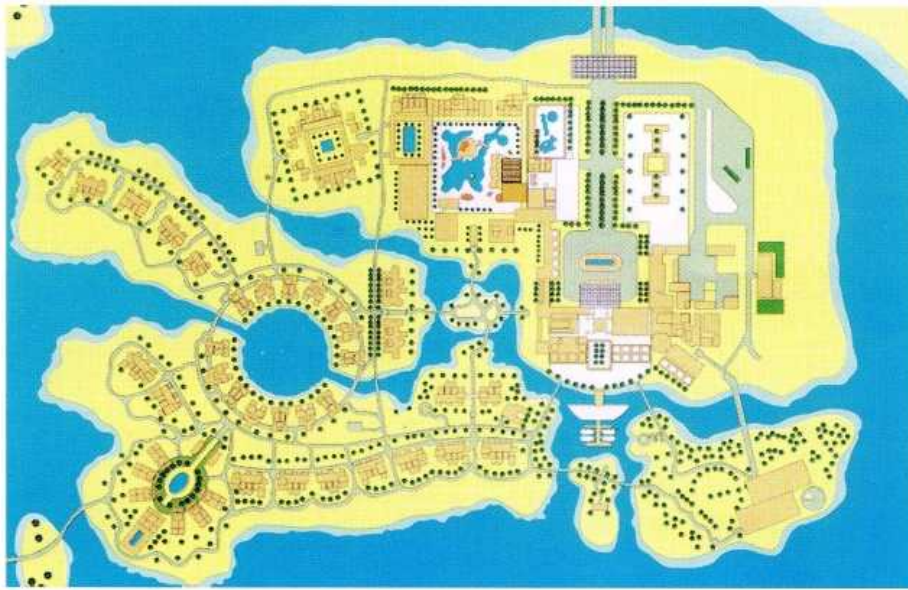
Since many Red Sea tourism centers will be developed outside traditional municipal boundaries, infrastructure systems must therefore be sized to accommodate the reasonably foreseeable needs of workers who are directly employed in the tourism facility.

In addition, tourism center planning should also take into account the development of related businesses and population growth, as a result of the economic activity generated by the tourism industry. Thus, there will be a need for a full range of shopping facilities, schools, medical clinics, religious facilities, parks and recreation facilities, and other basic community facilities and services.



Kafr el Gouna is setting an example of how to integrate well designed and built staff housing (up) and facilities (down) into an overall project design to create a small community center.





The new Sheraton in El Gouna, designed by Michael Graves, shows how vehicle and pedestrian movement can be functionally and visually separated.

#### Practice F-6

### **Employ Traffic Calming Measures Within Tourist Centers**

Heavy or unrestricted vehicular traffic within tourist centers can both pose safety hazards, and create nuisance conditions. While some level of traffic is unavoidable, and perhaps even necessary (for emergency and service access), every precaution should be taken to protect the safety and comfort of guests.

As a basic planning principle, first priority should be given to serving and protecting pedestrians and the handicapped, followed by cyclists, horseback riders, and lastly, persons in electric carts and motor vehicles. Some simple and easily implemented traffic control measures would include:

- Use of speed bumps (provided they are well designed and properly marked);
- Clear delineation and separation of pedestrian and bicycle pathways from vehicular pathways;
- Clearly marked crosswalks - using different paving materials, and clear signage and lighting;
- Pull-outs for micro - buses, so they don't block traffic flows or pedestrian crossings;
- Provision of adequate parking, and enforcement of no parking restrictions;
- Restricting service vehicle access to early morning or nighttime hours, where feasible, in order to reduce conflicts with others.

All of these measures have the double objective of improving internal traffic (and pedestrian) flow efficiency, while reducing safety risks, especially to pedestrians.

# G. Construction Impact Management

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Practice G-1

## **Implement Construction Impact Mitigation Measures Identified in the Project's EIA**

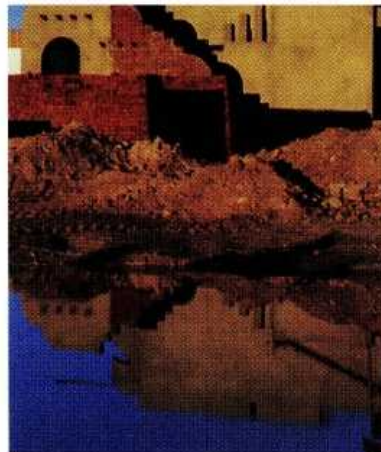
Construction activities in a coastal setting are major sources of environmental impact. Possible construction impacts and potential mitigation measures should be identified and analyzed in the project EIA. To perform this task properly it will require:

- Comprehensive inventory of significant environmental resources on and near the project site;
- Quantitative description of all major project components, including site preparation work, infrastructure systems, and building types, sizes and locations;
- Identification of construction methods and practices; and
- Implementation schedule of construction activities.

By inter-relating these four factors, an understanding of potential construction impacts can be determined, and appropriate impact mitigation measures selected. In addition, and as part of the EIA review and approval process, a construction management plan with impact mitigation measures and a field monitoring protocol, should be made a condition of project approval. This step is necessary to attract the attention of investors and their consultants to the importance of considering construction impacts for the success of their future investment.

The kinds of impacts that may occur during the construction period are extremely broad, and cannot be defined in detail except on a case by case basis. The following table, however, identifies likely areas of concern in coastal settings, and will help in the formulation of effective construction impact mitigation measures and monitoring programs.

Building in coastal areas can be seriously damaging to the natural environment. Here, land filling and construction waste near the coast can be clearly seen.



Construction Activity	Change to the Environment	Potential Impacts	Mitigation Measures
<b>Marine dredging &amp; disposal of spoils</b>	<ul style="list-style-type: none"> <li>• Turbidity</li> <li>• Sedimentation</li> <li>• Benthic destruction</li> <li>• Toxicity from spoils</li> </ul>	<ul style="list-style-type: none"> <li>• Water quality degraded</li> <li>• Habitat destruction</li> <li>• Economic losses</li> <li>• Aesthetics</li> </ul>	<ul style="list-style-type: none"> <li>• Avoid disturbing high quality areas</li> <li>• Use siltation control:               <ol style="list-style-type: none"> <li>1. silt curtains</li> <li>2. settling ponds</li> <li>3. use appropriate dredging techniques</li> </ol> </li> <li>• Productive use of dredge spoils</li> <li>• Proper disposal of contaminated spoil</li> <li>• Compensatory habitat creation</li> </ul>
<b>Site Preparation</b>	<ul style="list-style-type: none"> <li>• Altered landscape and beachfront</li> <li>• Damage to vegetation cover</li> <li>• Disruption or constriction of floodway channels</li> <li>• Noise, dust, visual blight</li> <li>• Use of fertilizers and pesticides in landscape phase</li> </ul>	<ul style="list-style-type: none"> <li>• Soil erosion</li> <li>• Increased runoff and risk of flooding</li> <li>• Habitat destruction               <ol style="list-style-type: none"> <li>1. marine life</li> <li>2. terrestrial life</li> </ol> </li> <li>• Air and water quality degradation</li> <li>• Unsightly disposal of excess excavate</li> <li>• Destruction of cultural &amp; archaeological resources</li> </ul>	<ul style="list-style-type: none"> <li>• Avoid disturbing high quality areas, especially shorefront</li> <li>• Work with natural topography as much as possible</li> <li>• Time construction to avoid migratory &amp; spawning seasons</li> <li>• Apply grading controls and require rapid re-landscaping of disturbed areas</li> </ul>
<b>Building Construction Activity</b>	<ul style="list-style-type: none"> <li>• Noise and dust</li> <li>• Machinery emissions</li> <li>• Increased traffic and congestion</li> <li>• Change to visual character</li> </ul>	<ul style="list-style-type: none"> <li>• Reduced worker safety and comfort</li> <li>• Habitat destruction</li> <li>• Degradation of visual quality</li> </ul>	<ul style="list-style-type: none"> <li>• Fencing of construction sites to contain litter and secure construction materials</li> <li>• Daily pick-up and proper disposal of construction litter and trash</li> <li>• Avoid disturbing high quality areas</li> <li>• Apply noise and other emission limits</li> <li>• Control use of dangerous and hazardous materials</li> <li>• Time construction to avoid migratory &amp; spawning seasons</li> </ul>

Source: Adapted from Carpenter, et al., *How to Assess Environmental Impacts on Tropical Islands and Coastal Areas*, South Pacific Regional Environment Program, 1989.



Practice G-2

## Reclaim and Restore all Disturbed Areas

When the natural landscape is disturbed, serious environmental consequences can result. Erosion of soil particles by wind or water can degrade air and water quality along coastal shores, and cause high mortality among sensitive marine and terrestrial species. Especially in sparse desert settings or sensitive coastal shorefronts, removal of vegetation or modification of natural

landforms, can lead to increased movement of sand and soil particles. The lack of vegetation may also affect birds and other wildlife by removing a natural source of food and cover. In addition, the indiscriminate dumping of excess soil excavate and other construction debris can cause serious degradation of visual quality in areas adjacent to tourism villages.

Most of these impacts can be mitigated by early attention to re-grading and replanting of disturbed areas. The landscaping plan for any tourism center should calculate the extent of disturbed areas during each phase of construction. Re-grading and replanting should be undertaken as natural and normal stages in the development of a center, and not neglected or postponed. The introduction of fast growing plant species or the use of inanimate soil and slope stabilization measures should be considered in locations where high rates of erosion are to be expected. Where excess material is produced during the site preparation process, its use for the development of artificial outlook (viewing) points, barms for visual and wind buffers, and the like, should be considered.

Failure to incorporate simple restoration measures such as indicated above can result in needless damage and increase remediation costs far above what would be incurred if early response was given. This can also be managed in a creative manner that even refines the quality and economics of the project. The project consultant and landscape architect should cooperate in order to achieve the maximum utilization of the site, with minimum changes in its natural setting.

Earth work can provide opportunities for creating artificial hard landscape and viewing platforms. Instead of just dumping excess excavated material, it can be reused on-site, at a cost savings.



### Practice G-3

## Use Local Materials if Extraction and Processing are Low-Impact

The use of local materials has a number of economic and environmental benefits, provided the impacts of extraction and processing are not substantial:

- Creation of new business and employment opportunities in the local economy;
- Reduction of transport costs and its associated environmental impacts;
- Creation of a "sense of place," where the architecture of new tourism facilities is more directly rooted in local traditions and culture.

Raw materials such as sand, gravel and building stone are obvious high-weight, high-volume materials which should be obtained from local quarries, if available, with an appreciable savings in transport costs. Other construction materials - such as bricks, tiles, woodwork, and the like - can also yield financial and economic benefits if locally procured.

Even where raw materials may need to be brought in from outside the region ( wood products, for example) the use of local craftsman for finishing and installation will produce important job opportunities for local residents while also helping to continue local design and building traditions. The distinctive balconies and window and door details of the historic core of Quseir, for example, can be applied as decorative elements to maintain a 'Red Sea' style of architectural ornamentation.

*Whenever possible, use the output of site extraction to produce local building materials. This will save a substantial component of the project investment budget, and will also boost the local culture and employment market. Natural and local building materials live in harmony with the local environment and give the project a unique architectural character that can be an attraction of its own.*



Natural stones are readily accessible, cheaper, and help create a sense of place.



The fine architectural details of Quseir can be a source of inspiration for new design and decoration.

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# H. Local Environmental Management

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## Practice H-1

### **Encourage Leadership by Development Companies for Local Environmental Management**

Use of the best design and construction practices will only be partially successful in achieving environmentally sustainable tourism development. Environmental management practices employed during project operations will also be needed to address long-term environmental issues, including: conservation of scarce resources (such as water and energy supplies); proper treatment and disposal of wastes (such as desalination brine, sanitary sewage, and solid waste); management of public open space (such as the TDA buffer zones and other public beaches); and protection of overall visual quality.

In a rapidly developing area such as the Red Sea coastal region, governmental authorities may not be in a position to carry out all of the necessary environmental management tasks by themselves. Tourism development companies will have to assume some environmental management responsibilities at the community and regional scale, as well as at the project scale. For example, regional solid waste management strategies have been proposed for both the South Sinai and the Hurghada/Safaga areas. TDA has issued a Request for Proposals from investors for development of private-sector solid waste management systems to serve growing tourism developments and neighboring residential communities. Such an approach recognizes that environmental management enterprises can often be organized as profit-making ventures, and managed by private-sector companies, as well as providing a needed public service.

Other environmental management activities may be undertaken on a volunteer basis, often in concert with environmental NGOs and local residents. These could include beach and shallow water clean-ups; landscaping of streets, sidewalks, and other public areas; and management of public beaches and open space areas. The list of possible activities is as broad as the problem may require. The activities presented in the following table are merely illustrative.



### Local Environmental Management Activities in Tourism Development Centers

- Project scale:**
- Build and operate project infrastructure facilities and equipment in an environmentally sustainable manner
  - Promote environmental awareness on the part of hotel guests
  - Prepare and implement facility environmental management plans which identify key problems/issues, describe resources available to address them, and schedule actions required
  - Hire and train staff to conduct all project activities and operations in an environmentally sustainable manner
  - Monitor environmental conditions and changes at the project scale

- Community scale:**
- Work with other investors and with governmental authorities to create viable communities and community facilities for workers and other local residents
  - Promote environmental awareness on the part of local residents, especially in schools
  - Undertake community environmental projects and activities, such as public landscaping and clean-up activities, or public beach/open space management programs
  - Develop public/private/NGO partnerships to undertake and/or coordinate environmental management programs and projects

- Regional scale:**
- Secure sustainable funding for environmental management programs and projects
  - Prepare and carry out management plans for regionally-significant environmental resources, such as open space/nature reserves

*The Cornish in Naama Bay, Sharm El-Sheikh, is an excellent example of coordinated environmental management of an important public amenity. The Hotel General Manager's Associations and dive centers of both Hurghada and Sharm El-Sheikh have sponsored periodic beach/shallow water trash clean-ups. A newly formed environmental NGO in the Marsa Alam area has been formed by hotel investors and managers, and will seek TDA designation to manage nearby open space buffer zones for public benefit.*

## Practice H-2

# Prepare an Environmental Management Plan and Conduct Environmental Audits

Environmental management practices include development of an environmental management system and implementation of a variety of environmental audits and pollution reduction or resource conservation.

### **(a) Environmental Management System.**

In order to improve and sustain environmental performance in any facility, such as a hotel or resort, a comprehensive and systematic environmental management plan is required. The principal objectives of such a plan are to properly allocate resources in order to reduce risks and liabilities, to improve both environmental performance, and to gain a competitive advantage over other hotels which may lack an effective program. The key elements of an effective environmental management system are discussed below:

Environmental audits and periodic monitoring are essential to achieve and maintain environmentally friendly practices.



1. *Corporate environmental policy statement.* The corporate environmental policy statement is the first step in designing an effective environmental management system. Such a statement should be drafted, discussed, and agreed to by the individual hotel's environment committee, drawing upon experience gained from other corporate or industry-wide sources, and approved by the hotel's resident General Manager. Policy issues to be addressed will include but not necessarily be limited to:
  - Principal environmental issues and themes to be addressed;
  - Targets and objectives to be achieved;
  - Identification of key responsibilities and lines of communication;
  - Time frames to be met;
  - 'Stakeholders' to be involved (e.g., management personnel, environmental engineering and other staff, guests, other hotels, local environmental NGOs, etc.);
  - Affirmation of corporate commitment, as evidenced by the resident General Manager's signature on the original document.

2. *Action plan for achieving the stated policies.* Once a policy statement has been formulated and adopted, detailed action planning should begin, and cover at least the following tasks:

- Designation of resources to be involved, including budgets and staff (in-house and consultants, as needed);
- Detailing of the environmental management program, documents to be prepared, and the in-house environment committee structure;
- Identification in detail of environmental aspects of hotel operations, and their impacts (negative or positive) on the environment;
- Documentation and evaluation of the current status, or 'baseline conditions,' for all identified aspects;
- Development of technically, financially, and legally feasible solutions to identified problem conditions, with particular attention to no-cost and low-cost solutions;
- Staff training and motivation in pollution prevention and minimization (recycling, re-use, reduce) and environmental control;
- Promotion of public awareness for guests and community residents.

3. *Implementation and operation.* The implementation/operation element includes the following essential components:

- Assignment of implementation responsibilities;
- Technical studies, measurements, and evaluations of conditions and processes;
- Preparation of reports and other documents, and review by senior management;
- Training of staff;
- Development of guest awareness and communications;
- Initial implementation of agreed upon preventive and corrective measures.

4. *Checking (auditing) results and taking corrective action.* Once a first round of studies and corrective measures has been completed, the next step in the environmental management system involves initiating a periodic checking and response process:

- Measure, monitor and evaluate environmental performance (at least quarterly, or whenever problems arise);

- Compare actual performance levels with prior conditions, and with anticipated or forecast improvement levels (at least quarterly);
- Take further corrective steps (as warranted);
- Review and evaluate the effectiveness of the environmental management system (annually);
- Reassess the commitment of the environment committee (annually);
- Revise the action plan to assure continual improvement, and to respond to any changes in the environmental policy statement (annually).

5. *Periodic management review of progress, and revision of policy goals, plans and procedures.* The final step in the environmental management system process is an annual management review of system performance and effectiveness. In order to assure the adequacy and sustainability of the system, this should involve the General Manager, the chief Environmental Engineer, his key staff, and other key department heads in the hotel, such as housekeeping, food and beverage, pool and golf course managers, etc. This group should collectively determine any actions needed to maintain and improve the quality of the hotel's environmental policy and implementation action plan.

## **(b) Environmental Audit**

Environmental audits are the core activity in any environmental management system. They provide the hard technical and financial data required in order to make informed decisions. Environmental audits have a dual purpose: first, they are used to identify and characterize environmental problems or conditions which need attention. Second, once a comprehensive environmental management system is in place and appropriate management responses have been initiated, periodic performance audits can be used to monitor and measure progress towards achieving desired end results.

Environmental audits can be broad and comprehensive in scope, or they can be more narrowly focused on a single problem area, such as water or energy consumption, solid waste disposal, wastewater treatment, and the like. In hotels and resorts, environmental audits are usually organized and overseen by the chief environmental engineer. However, outside specialists may be brought in on a case-by-case basis where the nature of the problem requires special expertise on the audit team.

Training for environmental management and auditing is a critical element to assure best environmental performance.



Environmental audits are most effective when they are seen as one part of a comprehensive strategy including development of an overall corporate environmental policy statement; designation of a facility environmental manager having a clearly defined set of responsibilities; provision of sufficient qualified staff or expert consultants; and development of in-house training programs designed to help carry out the recommendations of the audit process.

Environmental audits should be repeated annually (or more frequently, if conditions warrant.) Results of the audit - including both environmental, financial and legal considerations - must be clearly communicated to top management decision makers, so that appropriate responses can be taken.

Often, environmental audits will identify solutions which immediately save money for the hotel, or whose costs can be recovered in a relatively short time. Clear financial analysis may thus be an essential part of an environmental audit, particularly where significant capital investments may be needed. Audits can also identify conditions which are in violation of environmental or safety laws, where the risk of fines or other legal liabilities will mandate prompt compliance. Thus, legal compliance and liability risk analysis is also part of a well-designed audit process.

Audit results must also be incorporated into the hotel or resort's training programs. Ultimately, the staff will be responsible for taking action to address the identified environmental concerns. They must have both an awareness of the importance of the issue, and possess the technical skills that may be required to carry out an appropriate response. Hotel/resort operating units that are significant consumers of water or energy, or generators of wastes include lighting, heating, air conditioning, pools, golf courses, and laundry.

Audits can also provide the data needed to comply with the reporting requirements of Law 4/1994, which regulates environmental matters in Egypt.

Some of the key resources and services of concern in a typical hotel establishment are listed below:

**Resources and Services of Concern in an Environmental Audit**

<i>Water Management</i>	<ul style="list-style-type: none"> <li>• Water supply options</li> <li>• Water quality</li> <li>• Water use efficiency</li> </ul>
<i>Energy Management</i>	<ul style="list-style-type: none"> <li>• Thermal energy supply options</li> <li>• Electricity supply options</li> <li>• Fuel use substitution</li> <li>• Energy conservation and end-use efficiency (thermal and electrical)</li> </ul>
<i>Pollution Management</i>	<ul style="list-style-type: none"> <li>• Air emissions</li> <li>• Noise</li> <li>• Wastewater and other liquid wastes</li> <li>• Solid waste management and disposal</li> <li>• Hazardous waste management and disposal</li> </ul>

Source: *Integrated Energy and Environment Management in the Tourism Sector, Energy Conservation and Environment Project, 1996.*

*The Hilton Hotels Company has formulated a comprehensive environmental management plan for its Egyptian properties, and has conducted detailed audits of its facilities with the assistance of USAID 's Energy Conservation and Environment Project. With the support of USAID 's Environmentally Sustainable Tourism (EST) project, the Hurghada Hotel General Managers' Association has agreed to form an Environmental Engineers' Roundtable which will meet periodically and provide a forum for lectures, seminars and the exchange of practical experience among these key professionals.*



### Practice H-3

## **Monitor Key Environmental Indicators**

Hotels, resorts, dive centers, and other tourism facilities can assist EEAA and other public sector agencies responsible for the collection of environmental data. The previous section (Practice H-2) describes methods for the performance of environmental audits and indicates the reporting requirements of Law 4/1994. Environmental monitoring programs can support environmental audit protection programs by observing and measuring environmental conditions as they change over time.

Monitoring programs require periodic data collection, using consistent methodologies and standardized data collection forms. Visual inspection can be an effective means of environmental monitoring, but is limited by the inherently subjective nature of this approach. Physical sampling and biological and/or chemical testing will yield data of greater consistency, validity, and reliability. Photographic documentation of changing conditions is also an effective way to record changes to the physical environment.

In addition to regular monitoring of their own environmental performance, tourism facility managers can provide invaluable assistance in the provision of "early warnings" of potential environmental and safety emergencies, such as: oil and chemical spills; discharges of untreated sanitary sewage; incidents of large-scale 'die-offs' of fish and other marine life; flash flood events; and the like. The EEAA's Oil Spill Contingency Plan, for instance, relies heavily on the private sector for timely reporting of spills at sea.

However, setting and agreeing on measurable environmental indicators is a pre-requisite for the success of any monitoring process. These indicators must be set by EEAA in consultation with private sector investors. Proper means of implementation must also be secured and sustained. The following table shows the different environmental indicators, and illustrates what these indicators identify and how can they be measured.

Use of a consistent and replicable research methodology is the key to successful monitoring. Underwater surveys are also critical for the evaluation of the health of the marine environment.



<b>Environmental Indicator:</b>	<b>What it Indicates:</b>	<b>How it is Measured:</b>
<ul style="list-style-type: none"> <li>Deterioration of coral reef coverage &amp; health</li> </ul>	<ul style="list-style-type: none"> <li>Excess nutrients</li> <li>Sedimentation</li> <li>Temperature change</li> <li>Physical contact</li> </ul>	<ul style="list-style-type: none"> <li>Rapid ecological assessment (REA), involving quadrates &amp; transects, with photo &amp; and visual data collection</li> </ul>
<ul style="list-style-type: none"> <li>Increased algae growth (marine and freshwater)</li> </ul>	<ul style="list-style-type: none"> <li>Excess nutrients (from sewage, fertilizers, phosphate &amp; detergents, etc.)</li> </ul>	<ul style="list-style-type: none"> <li>Dry weight measured at sampling stations</li> </ul>
<ul style="list-style-type: none"> <li>Presence of coliform bacteria</li> </ul>	<ul style="list-style-type: none"> <li>Presence of raw or poorly treated human sewage waste</li> </ul>	<ul style="list-style-type: none"> <li>Samples collected at sampling stations and laboratory tested</li> </ul>
<ul style="list-style-type: none"> <li>Presence of chemicals in water bodies</li> </ul>	<ul style="list-style-type: none"> <li>Pollution from runoff</li> <li>Point source discharges (pesticides, oil and fuel spills, etc.)</li> </ul>	<ul style="list-style-type: none"> <li>Samples collected at sampling stations and laboratory tested</li> </ul>
<ul style="list-style-type: none"> <li>Increased oily residues at the shoreline</li> </ul>	<ul style="list-style-type: none"> <li>Oil spills at sea (transport and production)</li> <li>Discharges from land</li> </ul>	<ul style="list-style-type: none"> <li>Visual inspection for new traces</li> <li>Samples collected at sampling stations and laboratory tested</li> </ul>
<ul style="list-style-type: none"> <li>Unusual shoreline changes</li> </ul>	<ul style="list-style-type: none"> <li>Abnormal erosion &amp; deposition due to structures placed on land or in the water</li> </ul>	<ul style="list-style-type: none"> <li>On-site measurements</li> <li>Analysis of air and/or ground level photos over time</li> </ul>
<ul style="list-style-type: none"> <li>Lessening of local fish catch</li> </ul>	<ul style="list-style-type: none"> <li>Health of marine ecosystem</li> <li>Over-fishing or improper fishing methods</li> </ul>	<ul style="list-style-type: none"> <li>Fish catch statistics</li> </ul>
<ul style="list-style-type: none"> <li>Mooring buoy use logs</li> </ul>	<ul style="list-style-type: none"> <li>Intensity of dive site usage</li> <li>Indication of sites needing restricted access pending regeneration of coral life</li> </ul>	<ul style="list-style-type: none"> <li>Records of use of buoys from dive boat Captains</li> </ul>
<ul style="list-style-type: none"> <li>Deterioration of mangrove and wetland health</li> </ul>	<ul style="list-style-type: none"> <li>Impact from surrounding development and use</li> <li>Need for larger or more restrictive buffer zones</li> </ul>	<ul style="list-style-type: none"> <li>Species counts</li> <li>Periodic on-site observation of conditions</li> <li>Water quality sampling</li> </ul>
<ul style="list-style-type: none"> <li>Increased incidence or intensity of flooding</li> </ul>	<ul style="list-style-type: none"> <li>Increases in speed and amount of runoff</li> <li>Disruption of drainage patterns</li> </ul>	<ul style="list-style-type: none"> <li>On-site measurements of flood levels and flows</li> <li>Analysis of air and/or ground level photos over time</li> </ul>

Sample of awareness campaign material organized and produced by HEPCA (The Hurghada Environmental Protection and Conservation Association)

BY ORDER OF LAW # 102 OF 1983

For your own safety, please refer to the symbols below. These are signs that you will see during your stay. Please note that the prohibitions listed below are enforced by law.



Do not touch, break or remove any corals or shells.



Do not collect, remove or damage any material, living or dead, from Protected areas (corals, shells, fish, plants, etc.)



Fishing and spearfishing are strictly prohibited in Protected Areas.



Fish feeding upsets the biological balance on the reef, and can be dangerous. It is strictly prohibited (including sharks, morays, napoleon fish, etc.).



It is prohibited to dump any type of rubbish or waste in the sea.



Areas marked with this sign are off limits to the public.



Offenders are subject to prosecution according to the terms of Law # 102 of 1983.

## Practice H-4

### **Promote Awareness by Visitors & Residents**

Environmental protection programs rely, ultimately, on the cooperation and support of the public-at-large. In the case of tourism centers, the "public" consists largely of transient visitors. In many cases, tourists in environmentally sensitive areas have come specifically to enjoy the natural resources which are present, and they are thus already highly aware of the need to deal carefully with these environmental resources. Others, however, may lack this understanding, and will benefit greatly from awareness activities sponsored by hotels, resorts, dive centers, and local environmental NGOs.

One way to promote environmental awareness is to develop visitor centers and to provide other interpretive facilities for use of tourists. Bicycle paths and hiking trails, for example, could include interpretive signage that promotes environmental awareness and protection goals.

Ecolodges are ecotourism facilities that are usually operated with a view towards providing an educational experience rather than simply a leisure experience. Ecolodge managers design their activity programs to maximize opportunities for environmental awareness.

Within individual tourist centers, local residents could be hired as tour guides, boat captains and crews. This will both provide employment opportunities for local residents, as well as providing a vehicle for better acquainting visitors with local customs and practices. Hotels and resorts which have adopted a proactive approach to environmental management often make special efforts to communicate this activity to hotel guests, with a view towards involving the guests as active partners in plan implementation. Communication tools include:

- Stickers inside guest rooms, including messages dealing with resource conservation and management, coral reef protection, and environmental protection generally;

- Copies of the hotel's corporate environmental policy;
- A listing of the hotel's principal environmental Improvement targets;
- A description of programs planned or underway; and
- Closed circuit TV systems to display environmental messages, and to run environmentally related video programs.

On the more broader level, and within local communities, public awareness programs in local schools can be a major vehicle for expanding environmental consciousness and concern. Such programs can be co-sponsored by local tourism center investors and managers, working with local NGOs and school teaching staff. The following table shows some of these awareness program options.

**Environmental Awareness Program Options**

<ul style="list-style-type: none"> <li>• Establish an environmental information center in every tourism village, to sell posters, books, maps, T-shirts, etc., to promote awareness and to raise revenues for environmental projects</li> </ul>
<ul style="list-style-type: none"> <li>• Provide environmental videos at airport waiting lounges, and for viewing on charter flights to Egypt</li> </ul>
<ul style="list-style-type: none"> <li>• Put energy and water conservation tips in hotel rooms and other points of use</li> </ul>
<ul style="list-style-type: none"> <li>• Develop curricula for local school programs</li> </ul>
<ul style="list-style-type: none"> <li>• Develop training programs for guides, tour operators, boat captains, dive guides, etc.</li> </ul>
<ul style="list-style-type: none"> <li>• Publish local newsletters, in concert with local NGOs</li> </ul>
<ul style="list-style-type: none"> <li>• Provide environmental brochures and other information in hotel rooms</li> </ul>
<ul style="list-style-type: none"> <li>• Install signage at environmentally notable sites, to explain its significance, and to guide its use</li> </ul>

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