



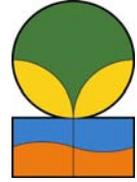
Egyptian Environmental Policy Program

Egyptian Environmental Affairs Agency

Tourism Development Authority

Red Sea Governorate

U.S. Agency for International Development



Red Sea Sustainable Development –

Red Sea Sustainable Tourism Initiative Sub-Component

D E L I V E R A B L E N o . 5

**TDA Solid Waste Management Strategy for the Red
Sea Region**

Prepared for the Egyptian Tourism
Development Authority



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Capacity Building International

September 2004

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1. INTRODUCTION

This document has been prepared by the PA Government Services Inc. under the Red Sea Sustainable Tourism Initiative (RSSTI) for the Egyptian Tourism Development Authority (TDA) as part of a program to upgrade best practices in Red Sea tourism centers. It is related to three other RSSTI reports: *Best Practices: Solid Waste Management*, *Assessment Report of Current Solid Waste Practices in Red Sea Tourism Centers* and *Integrated Solid Waste Management Plan for Shagra Tourism Center*. These reports describe current practices and the steps for implementing and operating improved solid waste management at Red Sea tourism centers – during both construction and operations.

This document offers specific recommendations regarding policies and programs that TDA should implement in order to support the solid waste management activities undertaken by tourism center investors, developers, and resort operators. The recommendations included in this document provide TDA with policy alternatives and strategies to address the solid waste problem in the Tourism Centers in the Red Sea Region.

The current solid waste practices on the Red Sea Coast demonstrates the improper management of waste generated from the construction and operation of tourism centers. Solid waste is randomly disposed along roadways and on vacant lands within the vicinity of all construction sites and operating tourism centers. Solid waste and litter are ever-present eyesore threatening the very foundation of the Red Sea Coast's tourism economy.

Although the cities (Hurghada, Safaga, Qusier, and Marsa Alam) have some level of organized collection and disposal for municipal solid waste, their programs are inadequate for supporting the increasing number of hotels and resorts (and other projects) in TDA tourism centers. The cities do not have the resources (i.e., knowledge, financing, and equipment) to adequately manage waste within their own jurisdiction, let alone provide a solution for the tourism centers being developed and operated on TDA lands.

If solid waste management is not improved, the conditions witnessed in northern (more developed) parts of the Red Sea Coast, especially around Hurghada, will become the reality in the south as development progresses.

The TDA's efforts to address the solid waste problem on the Red Sea Coast must include more than just *best practices*. Social, economic, and technical issues contributing to the solid waste problem include:

- Lack of enforcement of environmental laws;
- Absence of information regarding solid waste generation and composition;
- Absence of information regarding proper practices and technologies;
- Absence of information regarding the true costs of solid waste management;
- Absence of reliable markets for recycled materials;
- Lack of market-based policy instruments;

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These conditions are systemic and cannot be solved by individual tourism centers. The TDA needs to implement policy and programs to address all of these issues and thus support the development of a functioning solid waste management infrastructure for tourism centers on the Red Sea coast.

2. GENERAL POLICY

The TDA should develop and adopt the following general policy recommendations as soon as possible. They will provide the necessary framework for developing and implementing other recommendations.

2.1 SOLID WASTE MANAGEMENT POLICY

A written policy should at a minimum:

- Commit to uphold environmental laws and decrees concerning solid waste management (including provisions of Law #38/1967, Law #31/1976, Law #106/1976, Law #4/1984, and relevant Red Sea Governorate Decrees).
- Commit to the solid waste management hierarchy that states management strategies in descending order of preference: waste prevention, waste diversion (i.e., reuse, recycling and composting), and waste disposal.
- Establish a specific solid waste reduction goal.
- Assign responsibility for development and implementation of the solid waste policy and implementing programs.

2.1.1 Waste Reduction Goal

The TDA should adopt a waste reduction goal as part of its solid waste management policy – for example, 25% waste reduction by 2007.¹ A waste reduction goal demonstrates clear commitment from TDA and provides a target for developers and resort operators. Programs can be evaluated in terms of how successful they are in achieving the goal.

2.1.2 Litter Control and Waste Disposal Policy

The TDA should adopt specific policies to address litter control and waste disposal. The policies should be based on existing national environmental laws regarding solid waste (including provisions of Law #38/1967 and Law #31/1976) and relevant Red Sea Governorate Decrees.

The litter control policy may state, for example, that litter in tourism centers shall be collected at least 4 times annually, and that penalties for littering (such as fines or permit withdrawal) per occurrence may be levied against individuals that litter.

The waste disposal policy may state, for example, that all tourism center waste (from both construction and operation) shall be disposed at designated controlled disposal sites, and penalties may be levied for illegal disposal.

¹ As much as 97% of all waste generated in operating Red Sea resorts can be recovered from the waste stream for recycling or some other use.

2. General Policy...

When adopting either one or both of these policies, the TDA needs to make sure that the means and methods for monitoring and enforcement are also delineated, including defining the responsible party, reporting requirements, approved facilities, acceptable methods, etc.

2.2 CONTRACTING REQUIREMENTS

The TDA has established conditions and technical criteria that developers must meet in their studies and plans regarding planning, water quality, fire protection, sewage treatment, communications, and electricity (see Annex 4 of *Procedures and Stipulations of Contracting with Investors*). The TDA should establish specific conditions and technical criteria regarding solid waste management as well. The conditions and technical criteria should address the following issues:

- Submittal of separate solid waste management plans for construction and operations. Plans must explain the applicant's procedures for collection, handling, and disposal, as well as waste reduction activities.
- Financing of waste management costs.
- Procedures for estimating waste quantities and demonstrating sufficient capacity.
- Minimum procedures for controlling litter and illegal disposal.
- Minimum criteria for disposal of solid waste.
- Procedures for monitoring and record keeping.

3. INTER-AGENCY COORDINATION

Due to the regional and inter-connected nature of solid waste management, the TDA will need to coordinate with other government bodies and stakeholders in order to implement sustainable solid waste solutions. Both of the following recommendations should be implemented in the short-term. A solid waste task force is needed in order to identify and coordinate regional activities, and a clean-up campaign is needed to immediately combat the growing litter and accumulated waste problem.

It is recommended that TDA and the Red Sea Governorate coordinate activities to combat littering, identify proper disposal sites and establish mutually recognized monitoring activities.

3.1 ESTABLISH A SOLID WASTE TASK FORCE

Solid waste problems in the region will not be solved simply by developers and hoteliers because tourism centers account for only a fraction of total waste. The cities of Hurghada, Safaga, Qusier, and Marsa Alam generate far more waste than the tourism centers. Yet, the cities lack the resources (financing, equipment, education, etc.) for proper collection and disposal. The cities and their dumpsites are major sources of litter and accumulated waste. Even if all tourism centers implement solid waste best practices, tourists will still be confronted with litter and accumulated waste – and the environment of the Red Sea Coast will continue to degrade.

Solving the solid waste problem requires an integrated and coordinated approach. Policies and programs implemented by the individual stakeholders must be coordinated. Solutions need to be identified and the best method for implementation determined. Opportunities exist for economic development and job creation in the cities. Opportunities exist for cooperation between cities and tourism centers. Some of the recommendations contained in this document will require input from, and coordination among, stakeholders.

The TDA should take a leadership role to establish a Solid Waste Task Force comprised of representatives from various stakeholder groups. The Task Force should be established as part of an inter-governmental agreement between TDA, the Red Sea Governorate, and the cities of Hurghada, Safaga, Qusier, and Marsa Alam. Given the number of parties to such an agreement, it must be kept simple and clear.

The Task Force will play a central role in efforts to improve solid waste management in Red Sea tourism centers. The following is a suggested mission statement for the Task Force:

“To promote and facilitate the implementation of good solid waste management on the Red Sea Coast.”

Membership in the Task Force should include representatives from the following entities:

- TDA
- Red Sea Governorate
- Municipal Councils (Hurghada, Safaga, Qusier, and Marsa Alam)

3. Inter-Agency Coordination...

- Private Investors
- Resort Operators
- Local Non-governmental organizations (NGOs) and community-based organizations (CBOs)
- Egyptian Environmental Affairs Agency
- Tour Operators

Following are examples of the activities that the Task Force should consider undertaking:

- Coordinate efforts to obtain funding from international donors agencies and Egyptian national government for solid waste program development.
- Evaluate policy initiatives.
- Identify opportunities for regional, multi-stakeholder solutions.
- Coordinate research activities.
- Oversee development and implementation of public education and promotion campaign.
- Serve as a clearinghouse for information, research, documents, funding opportunities, etc.

3.2 LITTER AND ACCUMULATED WASTE CLEAN-UP CAMPAIGN

Litter and accumulated waste are the most pervasive and visible symptoms of the solid waste problem. It is not the fault of any single stakeholder; residents, tourists, cities and tourism centers all generate litter. Littering has many causes: cultural, educational, and technical. To stop littering will take broad-based initiatives of education, provision of solid waste services, and enforcement (much of which is addressed in the following recommendations). At the same time, existing litter and deposits of accumulated waste need to be removed.

The TDA should establish a clean-up campaign in association with the private developers, resort operators, Red Sea Governorate, and the cities. A number of strategies may be coordinated to carry out this activity. Local citizens may be employed for regular collection of litter that accumulates along roadways. Local governments may coordinate collection campaigns as part of environmental education programs for youths. Development contractors may be given financial or other incentives through the concession process to remove and properly dispose of accumulated waste deposits from areas outside of their concession. A roadway sponsorship program may be implemented in which local businesses and hotel operators sponsor regular clean-up efforts along specific segments of roadway and receive free publicity in exchange.

4. RESEARCH

Lack of information is a critical obstacle preventing good solid waste practices. Developers and hoteliers do not have the resources or direct economic incentive to undertake the research needed to properly plan and implement solid waste programs. Yet, they all can benefit from such research. TDA is in the best position to sponsor research that will help developers and hoteliers.

The following research efforts should be undertaken in the near future because they help provide the basis for adopting the *best practices*. Research may be undertaken by third parties working on behalf of TDA.

4.1 CONDUCT CONSTRUCTION WASTE ASSESSMENTS

Currently, there is no quantitative information on the generation rate and composition of construction waste. Resort developers will need such information in order to design and implement construction waste management programs.

The TDA should undertake a comprehensive waste assessment at several different tourism centers that are under-construction. The assessments should utilize a standardized methodology (including waste sorting) to determine waste generation rates and waste composition. Sites should be selected to represent:

- Range of properties and construction styles (e.g., 3-star, 4-star, 5-star resorts, and eco-lodge).
- Types of construction (hotel, dive center, marina, retail areas, etc.).
- Phases of construction (land clearing, foundations, concrete forming, finish carpentry, HVAC, landscape installation, etc.).

4.2 CONDUCT LITTER ASSESSMENTS

Everyone is aware of the litter problem on the Red Sea Coast; the consensus is that plastic bags are the heart of the problem. However, there are many questions. What are the primary sources of plastic bag litter? How much litter comes from cities versus tourism centers? What is the actual composition of litter? Where does litter end up and how far does it travel? Having quantitative answers to these questions will be essential to designing litter clean-up efforts, education and promotion campaigns, developing solid waste collection and disposal operations, and developing policies to reduce plastic bag usage. All of which will be needed to eliminate the litter problem. The TDA should undertake quantitative litter assessments at various locations along the Red Sea Coast in order to provide answers to these questions.

4.3 REGIONALIZATION STUDY

Regional solid waste management systems can take advantage of economies of scale to construct and operate recycling facilities, composting facilities, and disposal sites. Tourism centers and local governments can work together to implement integrated systems that provide coordinated solutions to the solid waste problem. Yet, individual properties and

4. Research...

tourism centers have no knowledge of the benefits that can be gained from regional approaches.

The TDA should undertake a feasibility study to evaluate options for regional solid waste management systems. Options to consider should include:

- Upgrading municipal dumpsites to serve as regional disposal facilities for tourism centers.
- Establishing several regional integrated solid waste sites (sites to include recycling, composting, and disposal) to serve tourism centers only.
- Establishing separate disposal sites for each tourism center.
- Establishing solid waste service franchises for tourism centers.

Financing, ownership, and operational scenarios may include TDA, local government, private contractors, NGOs or some combination of these (e.g., TDA allocated lands for privately franchised solid waste facilities).

4.4 CONDUCT SOLID WASTE MANAGEMENT FULL COST ACCOUNTING STUDY

The current solid waste management system does not properly represent actual costs. Developers and resort operators simply find the least cost solution for them – which may be illegal disposal. However, an individual's least cost solution does not account for the environmental, social, and economic impacts of improper waste management, especially given the lack of proper enforcement of existing national environmental laws. Associated sanctions (e.g., fines, penalties) for violating these laws helps to internalize the cost of improper solid waste management.

Full cost accounting (FCA) is an analysis that includes the full range of measurable costs and benefits (both direct and indirect) plus consideration of non-monetary or non-measurable costs and benefits. FCA provides an excellent foundation for developing sound solid waste policy and programs. Some of its benefits include:

- Eliminate the myth of free waste disposal.
- Quantify the life-cycle cost of programs, facilities, and equipment.
- Quantify the actual costs and revenues for recycling and composting.
- Identify the true cost of proper waste disposal.
- Allow equitable comparison of different scenarios.

The TDA should conduct a FCA study for solid waste management. Such a study should focus on several specific scenarios:

- Current system.
- Integrated waste management systems based on best practices (e.g., systems that include prevention, diversion, and disposal).

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- Regional solid waste systems based on economies of scale.

5. PILOT AND DEMONSTRATION PROJECTS

To help foster solid waste best management practices, the TDA should sponsor several pilot and demonstration projects. The purpose of the projects is to simultaneously test new waste management techniques and promote those that are effective. Pilot projects allow one to test and refine technologies, equipment, and procedures. Demonstration projects prove that waste management techniques work. In addition, they are an excellent place for training so that developers and hotel operators can directly observe best practices. They allow one to accurately measure operational and cost impacts, and thus they provide the basis for developing cost estimates and implementation recommendations.

In order to implement pilot and demonstration projects, the TDA will need to identify partners among the investors, developers, and operators willing to sponsor projects at their property. In exchange, the TDA may offer free or subsidized technical assistance. Partners would also benefit from the good publicity that would be generated.

5.1 CONSTRUCTION SITE WASTE MANAGEMENT

Construction activities account for a large percentage of the solid waste generated on TDA lands. Yet, there are few good examples of proper construction waste management. Construction waste management practices that need to be pilot-tested and demonstrated include:

- Waste prevention methods.
- On-site reuse techniques.
- Equipment and procedures for on-site separation for waste diversion.
- Various types of waste collection bins.
- On-site disposal of inert waste.

5.2 RESORT WASTE MANAGEMENT

RSSTI's work to conduct Environmental Management Audits and promote EMS has helped promote good waste management practices. Existing resorts have implemented some of the programs and strategies identified in the *Best Practices: Solid Waste Management*. Yet, other management practices need to be tested and demonstrated, including:

- Waste prevention and diversion methods.
- Equipment and procedures for on-site processing and storage.
- Various types of waste collection bins.
- Education and promotion programs.

5.3 COMPOSTING ORGANIC WASTE

Composting of organic waste (e.g., food waste, landscaping waste) holds great promise for waste diversion and production of valuable soil amendment. Yet, there are no good examples of composting in place on the Red Sea Coast. Composting methods need to be pilot-tested and demonstrated for both on-site composting at individual resorts and centralized facilities that serve a tourism center or region. Research activities need to address:

- Various composting methods and equipment (e.g., static pile, passively aerated static pile, turned windrow, in-vessel).
- Energy and labor input requirements.
- Different feed stocks and mixing ratios (kitchen waste, landscaping waste, non-recyclable paper, sludge).
- Compost quality (physical, biological, and chemical properties)

Compost utilization also needs to be tested and demonstrated, including: soil amendment, golf course applications, mulching, top dressing, potting mix, and manufactured topsoil. Proper composting requires the right mixture of carbon and nitrogen, as well as moisture and temperature.

An alternative to composting for organic waste is reuse as fish and livestock feed.

5.4 CONTROLLED DISPOSAL SITE

Presently, no dumpsites on the Red Sea Coast demonstrate best practice guidelines. Practices that need to be demonstrated include:

- Proper siting of disposal sites.
- Equipment and procedures for daily operations (controlling incoming loads, managing the active working face, applying daily cover, etc.).
- Design features, equipment, and operating procedures for litter control.
- Practices for recovery and waste diversion.
- Final cover and closure procedures.

The TDA may wish to work jointly with a city to upgrade an existing dumpsite that will serve as a regional disposal facility and demonstration site. Alternately, it may work with a tourism center to construct a controlled disposal site.

5.5 PLASTIC BAG RECYCLING AND ALTERNATIVE PRODUCTS

Plastic bags are one of the most visible solid waste problems on the Red Sea Coast. One of the major barriers to plastic bag recycling is the fact that they are so light. Even for the

5. Pilot and Demonstration Projects...

informal sector, the labor required to separate and clean economically viable quantities of plastic bags is too great.

In addition to efforts to control plastic bag litter, the TDA should implement a pilot study to evaluate plastic bag recycling technologies and alternative products and to development recommendations. Recovery and processing equipment may be installed at centralized processing facilities that can economically recover plastic bags. Small-scale equipment may be utilized to manufacture products from recycled plastic bags. Alternative products may also be substituted for plastic bags. For example, retail shops might use degradable (paper or biopolymer) bags.

6. RECYCLING MARKET DEVELOPMENT

Recycling market development is not just part of waste management, it is an important element in regional economic development. It results in job creation, economic growth, and diversification of the regional economy.

Markets for recycled materials are limited on the Red Sea Coast. Tourism centers have few choices when it comes to finding processors, brokers, and end-users of recycled materials. Currently, most of the recyclables are traded with buyers in Cairo. The lack of adequate markets diminishes the value of recycled materials. Efforts to implement best practices and increase recycling need to be matched by efforts to develop the markets to consume the recycled materials.

Recycling market development activities should not be undertaken by TDA alone, but in coordination with other stakeholders including the Red Sea governorate, NGOs, and CBOs. Funding may be obtained from donor agencies and the national government.

6.1 RECYCLING MARKETS DIRECTORY

There is no reliable or comprehensive list of recycling services available. A Recycling Markets Directory should be developed in the short-term so that information is readily available to tourism centers when they implement the *Best Practices: Solid Waste Management*. The Directory would be like Yellow Pages for recycling and solid waste services including name, contact information, and services provided. It should include solid waste service providers (collection and disposal), recycling equipment suppliers, recycled material processors, and end-users.

6.2 LOCAL SMALL & MEDIUM ENTERPRISE DEVELOPMENT

Developing local markets for recycled materials can benefit the local economy, create jobs, and increase the value of recycled materials. The TDA should consider participating in joint efforts to establish small and medium enterprises (SMEs) that use recycled materials to manufacture finished goods that can be sold as retail products. Some examples of small and medium scale manufacturing include:

- Plastic bottles may be granulated, washed, and molded into a variety of products.
- Glass bottles can be transformed into decorative tiles and blocks for construction.
- Mixed glass can be transformed into sand-blasting media.
- Mixed plastics can be extrusion-molded into plastic lumber, car stops, speed bumps, marine bumpers, etc.
- Paper can be recycled into specialty products such as greeting cards, decorative paper, etc.
- Organic wastes can be composted at centralized facilities and sold for horticultural applications, or given to given to given to local livestock operations.

6. Recycling Market Development...

The resorts can use such products, promote local manufacturing, as well as ensure steady demand for their recycled materials. There are number of ways that TDA may foster SME development:

- Option 1: TDA might offer incentives to developers that include recycled material-based SME development in their tourism center development plans.
- Option 2: TDA may allow and give preference to investors and entrepreneurs who establish SMEs in environmental technologies, services, and manufacturing on TDA lands based on recycled materials.
- Option 3: TDA may coordinate with other stakeholders to implement a technical assistance and loan program aimed at establishing SMEs.
- Option 4: TDA may coordinate with other stakeholders to foster SME development that simultaneously expands the local markets for recycled materials.

6.3 WASTE EXCHANGE

A waste exchange is a network of businesses (in this case, developers and hoteliers) designed to facilitate the exchange of surplus or reusable materials. Participants advertise their excess materials or their material needs. For example, if a developer has excess sheet metal duct work, he can use the waste exchange to make other businesses aware of its availability. Typically, waste exchanges are organized by categories of material (e.g., plastic, metals, fixtures, furniture, paints and coating, wood, solvents, etc.). Some also include equipment and tools.

Individual listings in the waste exchange generally provide a description of the materials, quantity, time frame for availability or need, location, and any special conditions. An exchange can be operated on an anonymous basis until an interested buyer and seller are ready to negotiate directly in private. Alternately, individuals' listings can provide a contact name and number.

For the Red Sea coast, the TDA should participate in developing a waste exchange that serves tourism centers and local businesses. The effort may be undertaken through the Solid Waste Task Force.

7. FINANCING AND ECONOMIC INSTRUMENTS

Current practices do not reflect the true costs of solid waste management. Lack of enforcement of environmental laws means there is little incentive to implement proper practices. The implementation of solid waste best practices will entail investments and expenditures. Consequently, financing mechanisms and economic instruments are needed that will encourage adoption of best practices. The TDA should work to identify sources of funding and establish economic instruments over the short and long term.

7.1 IDENTIFY AND OBTAIN FUNDING FOR SOLID WASTE INITIATIVES

The TDA will need to secure funding for various solid waste initiatives that it undertakes, such as research, demonstration projects, and market development items discussed previously. Potential sources of funding may include:

- National funds.
- International donors.
- Hotel room rate surcharge.
- Development fees.
- Solid waste franchise fees (see below).

The TDA should undertake a feasibility study to (1) determine the financial requirements for initiatives it intends to implement, (2) develop estimates of the funding that may be obtained from various sources, and (3) recommend a strategy for obtaining the necessary funds.

7.2 ESTABLISH SOLID WASTE FINANCING GUIDELINES

The TDA should provide developers and resort operators with guidelines for financing their solid waste management programs. Several different financing strategies may be applicable, including:

- Volume-based fees – Recycling and solid waste service contracts should be based in part on the quantity of material handled. Flat fees do not reflect the actual cost of service. Variable costs incurred by the service provider (such as labor, fuel, and disposal fees) should be reflected in fees based on the quantity of waste handled. Waste reduction efforts are rewarded if waste disposal fees can be reduced commensurate with reductions in waste. Avoided disposal costs can offset the costs of waste reduction.
- Tip fees – Disposal facilities need to establish tip fees for incoming waste that properly reflect the true costs of disposal.² The cost for constructing and operating controlled disposal sites needs to be reflected in charges for incoming waste. Likewise, recycling operations may need to charge fees because revenue from the sale of recycled materials

² Tip fees only work when combined with strict enforcement otherwise haulers will dispose of solid waste in unauthorized areas to avoid paying the fee.

7. Financing and Economic Instruments...

may not always be greater than the costs incurred for processing and transportation. Nevertheless, if net recycling costs are cheaper than disposal costs, recycling still makes economic sense and will reduce the overall cost of solid waste management.

- Link payment to proper practices – When contracting for solid waste services, developers and resort operators should include minimum performance standards as well as penalties to be levied if services are not provided according to the terms of the contract, e.g., not covering open truck beds, disposal in unauthorized areas. Solid waste services fees should only be paid when they are provided according minimum performance standards.

The TDA should conduct a detailed study of solid waste financing options once it has completed a FCA study (see Section 4.4) and provide the results and recommendations to tourism centers.

7.3 ESTABLISH ECONOMIC INSTRUMENTS FOR CONSTRUCTION WASTE MANAGEMENT

The TDA should establish economic instruments to ensure that developers properly handle and dispose of construction waste. Currently, developers can randomly dispose of construction waste with little consequence. Direct economic instruments can be used to establish incentives for proper construction waste management. The TDA should undertake a comprehensive assessment of the following options and implement the one(s) best suited to its needs and capabilities.

- Option 1: Developers pay a solid waste fee as part of their application to TDA during the third stage of contracting (in addition to the payment of 5% of the gross location value). The solid waste fee could be based on the total area of buildings, a percentage of the total construction cost, or the estimated quantity of construction waste. The TDA could utilize solid waste fees to construct and operate (either directly or through a contractor) construction waste recycling and disposal facilities. Fees need to be large enough to cover management costs and can be established based on the results of full cost accounting analysis (see preceding discussion). (Note: TDA already is in the business of providing infrastructure for tourism centers, e.g., construction of access roadways for tourism centers.)
- Option 2: Developers provide the TDA with a waste disposal performance bond as part of the application to TDA during the third stage of contracting. The bond would be held by the TDA. If a developer handles construction waste properly, the bond is returned and canceled when construction is completed. However, if a developer does not properly dispose of its construction waste, the TDA utilizes the bond payment to clean up the waste. The bond must be large enough to provide adequate incentive. If the bond amount is much smaller than the actual cost to properly handle waste, a developer may choose to sacrifice the bond and TDA would have insufficient funds to clean up the waste.

7.4 FRANCHISE SOLID WASTE SERVICE PROVIDERS

Under existing law, solid waste service providers must be licensed through the Local Assembly. The TDA should consider establishing its own licensing process for solid waste contractors that wish to provide service to developers and resort operators by negotiating franchise agreement. Because tourism centers are a lucrative business opportunity for solid waste service providers, there will be an incentive for them to obtain a franchise if required by

7. Financing and Economic Instruments...

TDA. This option would require TDA to include provisions in its contracts with investors that they will utilize TDA-franchised solid waste service providers.

Franchising provides the opportunity to institutionalize good solid waste management and encourage waste diversion.

- The TDA can formalize minimum performance standards (collection procedures, equipment quality, frequency, etc.) and procedures for monitoring and enforcing compliance. The franchise agreement could address performance issues not covered by laws.
- The franchise acts as an economic instrument because it assigns a market value to holding a license. If contractors do not comply with its provisions, their franchise may be revoked and they will lose their business in tourism centers.
- Franchises can require that contractors provide waste recycling and composting services in addition to collection and disposal.
- Alternately, a graduated franchise fee may be used to encourage (but not require) contractors to provide waste diversion services (e.g., a lower fee if recycling services are provided to customers).
- The franchise agreement may establish set minimum fees for solid waste services. Resorts that do not manage their own waste would be required to have a signed contract with a franchised contractor.

Contractors would pay TDA an annual franchise fee. The fee may be used to help fund research, enforcement, and waste diversion initiatives.

7.5 ESTABLISH ECONOMIC INSTRUMENTS FOR WASTE DIVERSION

The TDA should implement economic instruments that encourage developers and resort operators to maximize waste diversion. The TDA should evaluate the feasibility of the following options and implement the ones best suited to its needs and capabilities.

Option 1: Volume-based fees. Volume-based fees provide an economic incentive for waste diversion. The TDA can encourage tourism centers to negotiate volume-based fees with private contractors and provide sample contract language. Alternately, if TDA chooses to franchise solid waste services, it can negotiate volume-based fees as part of the franchise agreement.

Option 2: Diversion incentive payments/credits. Similar to the capital transfer concept, the TDA may establish waste diversion milestones for developers and resort operators. If they meet diversion goals (e.g., 25% of waste generated), then the land payments may be reduced or partially refunded to the property. Alternately, capital transfers received by TDA may be passed along to properties that meet diversion milestones established by TDA.

Option 3: Container & equipment subsidies. The TDA may utilize some of the funds it generates for solid waste initiatives to subsidize the cost of recycling containers and equipment. Tourism centers may enter a competitive grant program and receive container/equipment grants based on the merits of their applications.

7.6 HELP ENFORCE EXISTING LAWS AND DECREES

Existing laws define proper collection containers, collection frequency, transportation, disposal, and other aspects of solid waste management. Although TDA personnel lack the authority to enforce environmental laws, they should work in cooperation with the relevant competent authority(s) to enforce them. For example, when inspecting construction sites, TDA personnel should notify EEAA personnel of potential violations.

8. MONITORING

The TDA should implement simple monitoring procedures that allow it to track solid waste generation, diversion, and disposal activities. Monitoring will help to measure progress towards waste management goals and objectives and to evaluate program effectiveness.

8.1 ESTABLISH SOLID WASTE DATA REPORTING SYSTEM

The TDA should establish a system for collecting and compiling data on solid waste management. First, a system of recording and annual reporting is recommended. For example, developers and resort operators should be required to maintain records on quantities of waste reduction and waste disposal. Contractors and all waste handling facilities should be required to keep records on the amount of recyclables and or waste that they handle. Annual reports would be submitted and the data compiled by TDA staff to calculate the waste diversion rate, calculate total waste disposal, and determine if waste is being properly handled.

Second, the TDA should develop and provide Monitors with specific checklists and forms for evaluating compliance with EIAs and reviewing environmental registers.

8.2 ESTABLISH SOLID WASTE MONITORING TEAM

The TDA should create a small, specialized team of technical staff that will be responsible for monitoring solid waste management practices on TDA lands. They would act not simply as an enforcement unit, but would concentrate their work on outreach, education, and technical assistance. The team would need to coordinate with TDA staff that monitors construction activities as well EEAA rangers that monitor compliance with environmental laws. The solid waste team should receive special training in solid waste management technologies, equipment, and practices. They would be responsible for monitoring contractor compliance with licensing provisions as well as developer and operator compliance with solid waste management procedures. RSSTI has provided a separate document to the TDA that is a checklist for monitoring solid waste during construction.

9. PUBLIC AWARENESS

In order to achieve systematic changes in solid waste management, there must be fundamental changes in personal behavior. Citizens, businesses, contractors, tourists, etc. must all adopt good solid waste handling practices and be made aware of solid waste services that are provided to them.

The TDA must be involved in public awareness, communication, and training activities targeted at the tourism centers. It should also coordinate with local government to ensure consistency and effectiveness of broader public campaigns.

9.1 ANTI-LITTERING CAMPAIGN

The TDA should work in collaboration with local government to develop and implement an anti-littering campaign. Littering is generally a thoughtless activity, and if people are made aware of the negative public impacts of their personal actions, it may be possible to reduce littering.

9.2 MARINE ANTI-LITTERING CAMPAIGN

Marine litter is generated by dive boats, personal yachts, and commercial vessels. It threatens the health of the marine environment and by doing so threatens the tourism industry. The TDA should work in collaboration with other stakeholders to develop and implement a comprehensive anti-littering campaign targeted at boats and marinas. The program should highlight the environmental and economic damage caused by marine litter. It should stress personal responsibility and provide information on how to properly handle marine waste. It should also remind people that littering is a violation of the law that carries consequences (e.g., fines, penalties and other sanctions).

9.3 CONSTRUCTION CONTRACTOR GUIDEBOOK

The TDA should sponsor the development of a solid waste management guidebook for developers and construction contractors. A guidebook could be developed using the *Best Practices: Solid Waste Management* as a starting point. It should provide simple instructions on how to plan and implement solid waste reduction and disposal programs at construction sites, including worksheet that may be used for planning and monitoring solid waste programs. Specific case studies based on the results of pilot and demonstration projects (see preceding discussion) could illustrate success stories. It should also include listings of solid waste service providers, equipment providers, recycling markets, and disposal sites.

9.4 RESORT OPERATOR GUIDEBOOK

The TDA should sponsor the development of a solid waste management guidebook for resort operators. The guidebook can use the *Best Practices: Solid Waste Management* as a starting point. However, the information needs to be more concise and supplemented with the results of research and pilot/demonstration projects recommended. It should include worksheets for planning, implementing, and monitoring solid waste programs. It should also include listings of solid waste service providers, equipment providers, recycling markets, and disposal sites.

9.5 SAMPLE GUEST AWARENESS LITERATURE

The TDA should work with industry associations and NGOs to sponsor the development of guest awareness literature that resorts may use and adapt. Individual resorts need not go through the effort and expense of developing literature from scratch. The program sponsors can provide templates that can be readily adapted and customized by resorts. The literature should incorporate a professionally designed program identity that will ensure that tourists recognize solid waste management efforts regardless of where they visit on the Red Sea Coast. Sample literature, as well as guidelines for preparing guest awareness literature, developed by the TDA will help to ensure that resort provide adequate information and instruction to their guests.

10. CONCLUSIONS

Solid waste management from tourism establishments cannot be simply solved by technology and equipment. All facets of sustainable solid waste management must be addressed: environmental, financial, socio-economic, institutional, legal/policy, as well as technical and operational. All these facets provide the knowledge and framework within which individual tourism centers can make informed and sustainable decisions. To develop a sustainable solid waste management system requires coordinated efforts by many stakeholders. TDA, as the national authority for tourism development, can take a leading role in organizing and implementing programs, including incentives that improve solid waste management practices.

The recommendations presented in this document are an essential counterpart to the *Best Practices: Solid Waste Management*. Without the active engagement of the TDA to undertake the recommendations presented herein, the tourism centers will have only limited success in overcoming the solid waste crisis facing the Red Sea Coast.