Final Report

USAID/Jamaica
Ridges to REEF: Assessment of Strategic Program Options

October 9, 1998

Task Order No. 815
Contract No. PCE-I-00-96-00002-00

Final Report

USAID/Jamaica
Ridges to REEF: Assessment of Strategic Program Options

By
Glen D. Anderson
Kjell A. Christophersen
Peter Espeut

October 9, 1998

For
USAID/Jamaica
Howard Batson, COTR

Environmental Policy and Institutional Strengthening Indefinite Quantity Contract (EPIQ)
Partners: International Resources Group, Winrock International, and Harvard Institute for International Development

Subcontractors: PADCO; Management Systems International; and Development Alternatives, Inc.

Collaborating Institutions: Center for Naval Analysis Corporation; Conservation International; KNB Engineering and Applied Sciences, Inc..; Keller-Bliesner Engineering; Resource Management International, Inc.; Tellus Institute; Urban Institute; and World Resources Institute.

About the Authors

Dr. Glen D. Anderson is an environmental economist and consultant to The Harvard Institute for International Development (HIID). He has 17 years of experience including seven years of long- and short-term international assignments. He served as Senior Policy Advisor to the Ministry of Environment in Poland between 1993 - 1996, and as Team Leader on the Egypt Environment Sector Assessment for the EPIQ consortium. He has consulted in the areas of environmental policy, strategic planning, and environmental finance in Central and Eastern Europe (five countries) and the former Soviet Union (three countries). In addition, he has considerable work experience in Indonesia, Colombia, and Egypt. (Address: 7812 Sutcliffe Dr., Raleigh North Carolina, 27613, phone/fax: 919-845-0063, e-mail: anderson@ral.mindspring. com).

Dr. Kjell A. Christophersen is a Senior Economist and Natural Resource Management Specialist with IRG with over 25 years of international and domestic experience including six years of long-term field experience in West Africa (Senegal, Burkina Faso, and Côte d'Ivoire). He is currently the Senior Manager and Director of IRG's West Coast Office (IRG/West) in Moscow, Idaho, established for the purpose of developing permanent and formal linkages between IRG and Washington State University (WSU) and the University of Idaho (U of I). He also has short-term experience in Africa, Asia and Europe having served as team leader on many assignments: project appraisal, planning, design, and evaluation, feasibility and recurrent cost studies, training needs assessments, and environmental assessments from the economics perspective. (Address: 2368 Arborcrest Road, Moscow ID, 83843, phone: 208-882-4842, fax: 208-882-2467, e-mail: christophersen@turbonet.com).

Mr. Peter Espeut has an academic background in both the natural sciences (Chemistry, Zoology) and the social sciences (Sociology, Development Studies/Rural Development). He is a former Research Fellow at the Institute of Social and Economic Research, University of the West Indies, Mona, Jamaica. He has done consulting work in fisheries, natural resource management, rural development and community empowerment for various agencies and institutions, including USAID, CIDA, IDRC, ICOD,UNDP, UNESCO, FAO, IDB, the PIOJ, the SDC and CARICOM. Currently he is Executive Director of the Caribbean Coastal Area Management (CCAM) Foundation, an environment and development NGO working in the Portland Bight area of Jamaica's south coast with local communities towards the management of the natural resources there along co-management lines. He is the recipient of a Pew Fellowship in Conservation and the Environment (1996), and sits on the UNESCO Experts Group for Coastal Zone Management in Small Islands (CSI). [Address: 7 Lloyd's Close, Kingston 8, JAMAICA, W.I.; Phone: (876) 978-9286; Fax: (876) 978-7641; e-mail: pespeut@infochan.com].

Table of Contents

Preface

The assessment team members are grateful for the excellent and much appreciated logistics, administrative, and professional support provided by USAID/Jamaica, in particular from the SO 2 team (Howard Batson, Greg Booth, Joan Crawford, and Laverne Joseph) and the Program Office (Joanne Feldman-Lawrence), and members of the USAID Activity portfolio (from DEMO, CWIP, and EAST) in the completion of this assessment of strategic program options for the Mission. We would also like to acknowledge the logistical and professional support provided by various Government of Jamaica (GOJ) institutions and individuals during the field trips, particularly Mr. Durval Grapine from the Forestry Department, who led us on a tour of the Negril Watershed. In addition, we would like to thank several environmental NGOs which assisted in organizing meetings and field activities. Finally, we would like to express our appreciation to the many Jamaicans we met along the roads, in fishing beaches, and in the forests and fields who took the time to talk with us.

The team has reviewed a considerable body of reports and documents and talked to over one hundred individuals. As best we could, we have tried to corroborate information we received from these sources and have avoided using information for which we could not obtain verification as to its accuracy or veracity. In addition, the team received valuable comments on the draft report from USAID and participants in a workshop convened by USAID to discuss the report. To the extent possible, we have modified the final report to reflect these comments. The views expressed in this report are those of the assessment team and do not reflect those of USAID or any other persons or institutions. Any remaining errors in the report belong to the authors and not to any of the above-mentioned institutions or individuals.

List of Figures and Tables

List of Acronyms

ARD	Associates in Rural Development
CARDI	Caribbean Agricultural Research Development Institute
CCAM	Caribbean Coastal Area Management Foundation
CIDA	Canadian International Development Agency
COTR	Contract Office Technical Representative
C-WIP	Coastal Water Quality Improvement Project
DEMO	Development of Environmental Management Organizations
EAST	Environmental Audits for Sustainable Tourism
EFJ	Environmental Foundation of Jamaica
ENACT	Environmental Action Program
EU	European Union
GCT	General consumption tax
GDP	Gross Domestic Product
GOJ	Government of Jamaica
GTZ	Gesellschaft für Technische Zusammenarbeit (German aid agency)
HAP	Hillside Agriculture Project (USAID/Jamaica)
IDB	Inter-American Development Bank
IUCN	International Union for the Conservation of Nature
IR	Intermediate Result
ISC	Interagency Steering Committee
JCDT	Jamaica Conservation and Development Trust
JHTA	Jamaica Hotel and Tourism Association
MBMP	Montego Bay Marine Park
MBMPT	Montego Bay Marine Park Trust
NCRPS	Negril Coral Reef Preservation Society
NEAP	National Environmental Action Plan
NEPT	Negril Area Environmental Protection Trust
NEST	National Environmental Societies Trust
NFC	Negril Fishermen Cooperative 1992, Ltd.
NGO	Non-Government Organization
NGIALPA	Negril Green Island Area Local Planning Authority
NIBJ	National Investment Bank of Jamaica
NPV	Net present value
NRCA	Natural Resources Conservation Authority
NRM	Natural resources management
NWC	National Water Commission
OPM	Office of the Prime Minister
OPPD	Office of Program and Project Development
PCJ	Petroleum Corporation of Jamaica
PEPA	Portland Environmental Protection Agency
PIOJ	Planning Institute of Jamaica
RADA	Rural Agriculture and Development Authority

R4	Results, Review, and Resource Request
SDC	Social Development Communication
SO	Strategic Objective
SOAG	Strategic Objective Agreement
SOW	Statement of Work
STEPA	South Trelawny Environmental Protection Association
STAEPA	St. Ann Environmental Protection Association
STEEPA	St. Elizabeth Environmental Protection Association
TA	Technical assistance
UDC	Urban Development Corporation
UNDP	United Nations Development Program
UNEP	United Nations Environmental Program
USAID	United States Agency for International Development
WB	The World Bank

Executive Summary

This report was prepared as a deliverable under the Environmental Policy and Institutional Strengthening IQC Contract to assist USAID/Jamaica and its partners in assessing strategic program options for Strategic Objective no. 2 (SO2): "Improved quality of key natural resources in selected areas that are both environmentally and economically significant." It presents the findings and recommendations for a new *Ridge-to-Reef* activity. It is based on the assessment team's review of documents, interviews with counterparts, stakeholders, donors, and other contractors, and field visits to several watersheds.

Objectives

The objectives of the assessment are to (1) describe the current problems, institutional context, and policy and legal framework in Jamaica, including an analysis of barriers to effective policies and programs; (2) review and assess past, current, and planned donor assistance for environmental activities in Jamaica; and (3) prepare an assessment of strategic program options including recommended activities within the scope of the SO2 results framework.

Problems

The land and water resources in the areas between the highest mountain ridges and the coral reefs offshore are impacted by a variety of human activities that contribute to decreased resource quality and quantity.

- The **ridge** areas of the watersheds in Jamaica are steeply-sloped and characterized by shallow soils. The ridge plays a vital role in collecting and storing water for potable water use and agriculture. Key problems in the ridges include deforestation associated with land clearing and harvesting (both legal and illegal) rates far exceeding replanting efforts, soil erosion, and pesticide and nutrient runoff.

- The **lowland** areas are associated with many of the same environmental problems observed in the ridge area, notably erosion and poorly managed and excessive application of fertilizers and pesticides. In addition, the lowland areas are characterized by larger population centers, industry, and mining, activities that contribute to water pollution and solid wastes. Of particular concern is the lack of sewerage. Only about one-quarter of Jamaican households are served by publicly-provided sewerage with the remainder using soak-away systems, pit latrines or other rudimentary systems.

- In the **coastal** areas, major environmental problems include those associated with human settlements, agriculture, tree cutting, sand mining, and draining of ecologically fragile wetlands. Draining of wetlands diminishes their valuable role in filtering nutrients and pollutants from rivers

while the new activities discharge chemical and/or biological pollutants to the coastal waters. Mangrove swamps are important nurseries for fish and shellfish, but are threatened by charcoal and fuelwood harvesting as well as development activities. The beaches, which along with the coral reefs, are the major tourism amenity in Jamaica are adversely affected by wastewater discharges. Bacterial contamination poses health hazards for swimmers and divers, while nutrients contribute to algae and plant growth that diminish the aesthetic quality of the swimming experience and attract species such as sea urchins. Littering and uncontrolled solid waste disposal is a problem along public beaches and shorelines at the mouths of rivers.

- The coral **reefs** in Jamaica are extremely sensitive to pollution and, by all accounts, are seriously threatened. Nutrients in coastal waters encourage algae which adhere to the coral and smother the coral, depriving it of food. Overfishing, particularly herbivorous species which graze on algae and other plants, exacerbates the algae threat to the coral reefs. Other threats to the coral reefs include damage associated with diving (collection of coral, damage from vessels mooring in reef areas), silt carried by rivers and ocean currents, and the illegal use of dynamite by fishers.

Constraints to Effective Management

The team identified a broad array of constraints to effective management of ridge-to-reef resources. Government management capabilities are impeded because of the disconnect between policy planning and implementation, overlapping jurisdiction, lack of human and financial resources for implementation and enforcement, weak incentives for staff, low penalties and a lack of judicial and political support for enforcement.

The government has devolved management authority to NGOs for environmental protected areas and national and marine parks. However, NGOs face a number of obstacles in their effort to assume these management responsibilities. In particular, there is a lack of a clear legal framework for devolving this authority, the process of declaration of protected areas and parks and subsequent delegation is slow, and NGOs lack core and project financing and are stymied in their efforts to generate user fees.

There are a number of barriers that limit the adoption of environmentally-friendly and sustainable land use practices. In terms of information, many landowners lack awareness of appropriate technologies and access to marketing information. Other barriers include lack of secure land tenure, theft of crops and illegal cutting, lack of incentives and financing for long term investments, and limited availability of key inputs such as tree seedlings.

Finally, there are a number of overarching problems which result in the current patterns of land and water resource allocations. Many ridge-to-reef resources are not valued or undervalued by resource managers including water captured by forests, timber, and biodiversity. Services such as water and wastewater are not priced according to their economic values or even cost of production. Incentive structures to prohibit uncontrolled disposal of wastewater and encourage connections to sewers are also lacking.

Recommendations for a Ridge-to-Reef Assistance Strategy

The assessment team is recommending an assistance strategy which addresses the interrelationships between land and water uses in the watershed. The strategy should promote USAID's Strategic Objective for the environment (SO 2): i*mproved quality of key natural resources in selected areas that are both environmentally and economically significant* and cover a geographical area that is delineated to encompass key ridge-to-reef resources as well as activities that influence the quality and value of the resources. The strategy must overcome the compartmentalization that characterizes management plans for specific resources (e.g., forests, fisheries, watershed, parks, etc.), emphasize promotion of economically viable activities, thereby increasing local acceptance, sustainability, and replicability.

The centerpiece of the recommended ridge-to-reef assistance strategy is the locally-led and implemented management program. It is proposed that two to four management programs could be undertaken, assisted by a USAID contractor. Six geographical areas were considered as candidates for these management programs. Based on criteria such as the value of ridge-to-reef resources, severity of threats, local and national support, institutional capabilities, and the potential for success, the geographical areas were ranked by the team as follows:

1) Montego Bay/Cockpit Country
2) Black River/Cockpit Country
3) Rio Grande watershed
4) St. Ann watershed
5) Negril

All of these areas would be suitable for management programs and USAID is encouraged to revisit the relative rankings after communities indicate their interest in participating in the program by preparing an oral or written presentation.

Two sets of activities are also proposed to complement and improve the effectiveness of the management programs. A series of proposed technical assistance activities would include: a) institutional strengthening and training of NGOs and other implementors to improve their capabilities to raise and sustain funding, facilitate participatory processes, and conduct awareness and education programs; and b) preparation of special studies to demonstrate alternative economic activities, develop estimates of the economic value of ridge-to-reef resources (especially those that are not valued in the marketplace), and evaluate national policies that are critical to the promotion of effective ridge-to-reef management. In addition, the USAID contractor would provide input to legislators, agencies and resource managers based on special studies described in this report.

1. Introduction

1.1 BACKGROUND

The Environmental Policy and Institutional Strengthening Indefinite Quantity Contract (EPIQ) was requested by USAID/Jamaica to field a team to carry out an assessment of strategic program options in support of the Mission's Strategic Objective No. 2: "Increased protection of key natural resources in environmentally and economically significant areas." This report presents the findings and recommendations for a new *Ridge-to-Reef* activity. It is based on the assessment team's review of documents, interviews with counterparts, stakeholders, donors, and other contractors, and field visits to several watersheds.

As stated in the terms of reference, USAID/Jamaica assistance in the area of environmental management focuses on achieving three targeted results: (1) increased adoption of environmentally sound practices; (2) increased effectiveness of environmental organizations to sustainably manage natural resources; and (3) increased compliance with environmental regulations by resource users. The decision to focus on these results is the outcome of a collaborative process between Mission staff and key development partners and stakeholders, including representatives of the Jamaican Government, local NGOs, and the private sector. The extended SO2 team has agreed that a "ridge to reef" approach to resource management should be adopted in recognition of the land-based origins of most water quality problems.

All new efforts to be undertaken in support of SO 2 must complement the current SO 2 portfolio including: the Development of Environmental Management Organizations (DEMO) Project, the Environmental Audits for Sustainable Tourism (EAST) activity, and the Coastal Water Quality Improvement Program (CWIP) which began implementation in January 1998, and account for environmental activities funded by other donors. The new activities may incorporate, as appropriate, elements of projects being phased out, as well as new interventions specifically developed to achieve elements (i.e., planned intermediate results at all levels) of the SO2 framework that are not supported by targeted activities.

1.2 RIDGE-TO-REEF ASSESSMENT

1.2.1 Objectives

To assist USAID/Jamaica in identifying and evaluating options which promote the strategic objectives (intermediate results) enumerated under SO2, the EPIQ team will:

(1) Describe the current problems, institutional context, and policy and legal framework in Jamaica, including an analysis of barriers to effective policies and programs;

(2) Review and assess past, current, and planned donor assistance for environmental activities in Jamaica;

(3) Prepare an assessment of strategic program options including recommended activities within the scope of the SO2 results framework.

1.2.2 Approach

The *ridge to reef* approach to water quality management recognizes the interrelationships within the watershed and the potential for upland activities to adversely impact the water quality on which coastal fisheries and tourism depend to sustain their economic activities. This approach does not absolve coastal resource users of responsibility for protecting the resource base or even imply that upland sources of pollution are more important than those in the coastal area. In fact, overfishing, diving activity, and poorly or untreated wastewater discharges from hotel properties and municipal plants along the coast has contributed to the loss of and continuing threat to Jamaica's coral reefs. Rather, the ridge to reef perspective represents an integrated approach that requires knowledge of the problems, sources of pollution, the relative effectiveness of reducing pollution loadings and the respective costs.

Implicit in a comprehensive approach to water quality management is the commitment required from local stakeholders as well as national institutions. While donors can provide assistance in developing management strategies and recommending technical solutions, local businesses, community leaders, and NGOs must be involved at the earliest design stages and throughout implementation stages if this assistance is to be maximally effective and sustainable. National authorities must be willing to correct distortions in the incentive structures of resource users to encourage improved environmental performance and, if necessary, to enforce laws and regulations. Ultimately, the benefits of improved management of the resource base and environment must be diffused throughout the local communities. Failure to recognize the economic and social welfare of communities will dilute community support.

The EPIQ team understands that USAID financial resources are limited and will strive to identify strategic activities that utilize these resources cost-effectively, identify opportunities for cooperation with other donors, and the potential for leveraging resources with those which can be mobilized from domestic sources including trust funds and profit-seeking businesses. Additional factors considered in the assessment are potential for replication and diffusion, sustainability, and potential for achieving early results (and further enhancing replication). In addition, the team has been encouraged to consider options that could be concentrated in a few geographical areas. The team visited several sites during its field work, consulted with local and national counterparts and stakeholders, and provided recommendations on the relative strengths of specific sites as well as the merits of a geographically-based results package.

1.3 METHODOLOGY

The EPIQ team's activities involved collection and review of documents relevant to the assessment, interviews, and site visits. The review of documents enabled the team to gain an understanding of the environmental issues and institutional and policy context in Jamaica and to characterize assistance programs and activities undertaken by donors. These documents included:

- Laws and regulations related to environmental protection and natural resource utilization
- National and regional strategic planning documents such as the National Environmental Action Program
- USAID Mission documents describing the R4 process and Strategic Objectives
- Project documents describing or evaluating donor-financed assistance projects, particularly those prepared by the World Bank, IDB, the EU, and Canada.
- Other papers and reports prepared by GOJ agencies, NGOs, and research and educational institutions.

A working list of documents that the team reviewed is provided in the References at the end of the report.

The team conducted interviews with USAID and donor staff and project implementers, national and local counterparts and stakeholders such as hotel and attraction operators, fishermen and farmers, and NGOs. The team participated in 35 meetings with over 80 persons. A list of institutions and contacts is provided in Annex C. The team visited field sites in several areas of Jamaica including: Negril, Cockpit Country, Montego Bay, Ocho Rios, Black River, Blue and John Crow Mountain National Park, and Port Antonio. During these field visits, the team toured the watersheds, inspected coastal resources, observed land use activities and problems, discussed agricultural and forest management practices, and met with operators of tourist attractions.

1.4 ORGANIZATION OF THE REPORT

The remainder of the report is divided into three chapters and supporting annexes. Chapter 2 describes the litany of ridge-to-reef problems and their sources. The team had limited access to quantitative data on the relative contribution of the various sources to water quality problems. Thus, the discussion focuses primarily on qualitative assessments gleaned from documents and interviews as well as the team's own observations during field visits. Chapter 3 describes the constraints that must be overcome to improve the environmental performance of resource managers and users if ridge-to-reef resources are to be protected on a sustainable basis. Chapter 4 presents the team's recommendations for a ridge-to-reef strategy, evaluates alternative sites for pilot ridge-to-reef management programs, and describes strategic activities that might be included in the strategy. In addition, the chapter describes linkages between the strategic activities and USAID's Strategic Objective No. 2 and the potential synergy between the proposed activities and other activities in the USAID portfolio and projects undertaken by other donors and lenders.

2. Overview of Ridge-to-Reef Problems and Sources

2.1 INTRODUCTION

The land and water resources in the areas between the highest mountain ridges and the coral reefs offshore are impacted by a variety of human activities that contribute to decreased resource quality and quantity. Although natural factors may alter resource quality (e.g., tropical storms, bleaching of coral due to warmer ocean temperatures), the major focus of the discussion of problems and their sources in this chapter is on human activities.

The enumeration of problems is based on discussions with counterparts, stakeholders, donors, and their contractors as well as the team's personal observations during field visits. The 33 watersheds of Jamaica (World Bank, 1993) are delineated into 26 watershed management units. The team's field work included visits to twelve of the 26 watershed management units: South Negril - Orange River, Martha Brae, Rio Bueno - White River, Pencar - Buff Bay River, Spanish River, Swift River, Rio Grande, Black River, Gut - Alligator Hole, Milk River, Rio Minho, and Rio Cobre. **Figure 2.1** illustrates the range of potential problems for the ridge, lowlands, coastal area, and the reef, which are a result of human activity. Additional discussion of these problems is provided in **Sections 2.2** through **2.5**.

2.2 RIDGE

The *ridge-to-reef* designation encompasses the more common watershed designation, while stressing the linkages between resources rather than focusing on the watershed as an area which collects water. The **ridge** areas of the watersheds in Jamaica are steeply-sloped and characterized by shallow soils. Over half of the land in the upper watersheds has slopes exceeding 20 percent. Most of the watershed area (65 percent) is characterized by shallow limestone soils with soils composed of weathered shale, conglomerates, and tuffs accounting for the remainder (NRCA, 1998). The ridge plays a vital role in collecting and storing water for potable water use and agriculture. If the land resources of the ridge are degraded, poor water retention combined with high intensity rainfall associated with storms can contribute to flooding conditions in the lowlands or coastal areas. Water retention properties of ridges depend on physical slope and soil characteristics, as well as the type of vegetation cover. In addition, climatic factors such as the amount of precipitation, its seasonal distribution, and temperature also determine the potential amount of water that can be produced in watersheds.

Figure 2-1:

Deforestation In the last 100 years, over 60 rivers have dried up in Jamaica, with alteration of vegetation in the ridge most often cited as the primary cause. Jamaica is reported to have one of the highest rates of deforestation in the world, although the estimated rate of 5.3 percent (WRI, 1996) seems unrealistic.[1] Nevertheless, deforestation is occurring at a rate that appears unacceptable and motivates national policy discussions (see, for example, NRCA's draft Watershed Policy and the Forestry Department's Reforestation Program 1998-2000). The rate of deforestation is influenced by both legal and illegal harvesting and clearing of lands. Trees are harvested for lumber, fuelwood, charcoal and yam sticks. In addition, forested land is cleared for agricultural production, particularly for coffee, other crops and for illegal ganja production. Forested lands are also cleared for grazing of livestock. Poorly marked boundaries of the forest reserves plus inadequate staff in the Forestry Department limit the government's ability to reduce or eliminate illegal cutting and land clearing activities. In addition, reforestation efforts, which could reverse (or at least reduce) the rate of deforestation, suffer from limited budgets and resources.

Illegal logging on both public and private lands in the watershed is prevalent everywhere in Jamaica as a manifestation of increasing poverty—more and more people avail themselves of the "free" natural resources in the commons (timber and charcoal) as the only economic livelihood opportunities available once they become unemployed. Although in most cases illegal, the risk of getting caught for timber theft or charcoal production on public land is small, and if caught, the punishments applied are typically light and manageable. Increased charcoal production is of particular concern since charcoal has become a major energy source after kerosene subsidies were eliminated.

Soil Erosion The combination of steep slopes, high levels of precipitation, loss of forested vegetation cover and the resulting cultivation practices result in high levels of soil erosion. NRCA reports that approximately 160,000 hectares in the watershed are subject to severe erosion and average soil losses exceed 30 tons/hectare for some crops and practices (NRCA, 1997). Other estimates of erosion rates are even higher for Jamaica (80 and 72 tons/hectare, respectively).[2] The high erosion rates reduce soil fertility and contribute to higher chemical fertilizer application rates for cash crops planted in deforested areas. In addition, the loss of soil contributes to siltation problems in rivers, reservoirs, irrigation canals, and coastal areas, in some cases necessitating expensive dredging operations to maintain water supplies, shipping channels and port facilities. Pesticide, herbicide and fungicide residuals also leach into ground water and surface waters and contribute to reduced water quality.

Coffee production in the highlands is of particular concern—growers producing for the export market are strongly encouraged to follow the recommended high yield production regimes through the

[1] The estimated loss in forest cover over a 25-year period (early 1960s to mid-1980s) was 240 square kilometers or approximately 0.5 percent per annum (World Bank, 1993). The rate cited in the text is ten times higher. This would suggest that Jamaica would have lost over half of its forests in less than a decade, which seems implausible, given that protected forest reserves account for over half of the area in forests. The planned survey to be conducted by CIDA's Trees For Tomorrow Project should help clarify the current situation and rate of deforestation.

[2] Sources of the estimates are studies by Business Research and Agricultural Consultants (1991) and Danagro (1997). Both estimates were cited in the OPM presentation on the integrated watershed management programme highlights, Michael Chambers, July 14, 1998.

application of chemical fertilizers and pesticides. More often than not, application practices result in up to 80 percent of the chemicals ending up as residuals in the rivers and streams (estimate derived from several field interviews). Worse, least cost bushing techniques are typically applied such as spraying paraquat or other chemicals to remove the vegetation around the coffee plants at minimum costs. Not only does this pose a very serious health hazard to the workers, it is also environmentally disastrous since it kills all living matter in the area except for the coffee plants.

Slash and burn agriculture has worked reasonably well for centuries under conditions of low population, land abundance, and ample fallow periods. Today, however, land is no longer abundant and fallow periods have all but disappeared. Increasing demands for food and housing have been met by continued extensive farming and encroachment onto public lands. Little emphasis is placed on intensifying production on the existing farm land. Crop yields are maintained to some extent through the practice of adding chemical fertilizer and pesticides in response to the declining natural fertility of the soils. The environmental quality of the watershed is, therefore, increasingly compromised over time.

2.3 LOWLANDS

The **lowland** areas are associated with many of the same environmental problems observed in the ridge area, notably erosion and poorly managed and excessive application of fertilizers and pesticides applied to cash crops such as sugar cane, papayas, bananas, and coconut plantations. In addition, the lowland areas are characterized by larger population centers, industry, and mining activity.

The human settlements in the lowland areas are the major contributors to environmental degradation in many of the watersheds, largely because of the inadequate solid waste disposal practices and lack of sewage infrastructure or treatment. The solid waste problem has health, environmental, and aesthetic dimensions. The pattern of urban settlements (informal areas without planned roads and scattered residential development) exacerbates the task of organizing effective collection systems. In addition, many urban areas outside the major cities lack managed sanitary landfills. These unmanaged disposal sites are a nuisance, harbor rodents, and result in noxious odors. They may also result in leaching of various pollutants into rivers, streams, and coastal bays. The ubiquitous litter, burning trash piles, and unmanaged dumps detract from the scenic beauty of the countryside.

Only about one-quarter of Jamaican households are served by publicly-provided sewerage (USAID, 1996) with the remainder using soak-away systems, pit latrines or other rudimentary systems. One concern is the burgeoning population in informal settlements (estimated to be between 0.5 and 1.0 million) that are poorly served with running water, sanitation services, or sanitary landfills. Rural flight, much of it to these informal settlements, is expected to increase the share of urban population to 60 percent by 2000 (USAID, 1996).

Similar to wastewater treatment operations in other countries, facilities in Jamaica lack tertiary treatment to control nutrients and remove biological pathogens. In addition, maintenance of secondary treatment capabilities appears to be difficult because of budget shortfalls, resulting in discharges of partially treated or untreated sewage to rivers and streams. New wastewater treatment plants should

increase treatment capacity in Montego Bay, Negril, and Ocho Rios but are expected to be under-utilized because of high connection costs.[3]

Sewage wastes are a major source of nutrients, deplete oxygen levels in receiving waters and, if untreated, fecal coliform. High nutrient levels increase algae growth in coastal waters and contribute to the loss of coral reefs, while bacterial contamination can make rivers, beaches and coastal waters dangerous for swimming. A recent USAID-funded study monitored water quality at four Jamaican beaches and found that USEPA standards of 200 col/100 ml of water were frequently exceeded at the two Ocho Rios beaches. Coliform counts in the Montego River have been monitored above and below the existing Montego Bay wastewater treatment plant (WWTP). Coliform counts for the Montego River were: 1,900 above the WWTP, 12 million at the plant's outflow, 610,000 downstream, 7,400 at the mouth of the river, but only 2,000 in the bay (MBMPT, personal communication).

Industries such as sugar cane processing, rum distilleries and bauxite mining are major contributors to environmental degradation. The industry-related environmental problem mentioned most frequently in the team's meetings was the discharge of dunder into the rivers and streams. Dunder reduces water quality and can have adverse impacts on fish populations (e.g., freshwater shrimp fishery in the Black River). The mineral industries produce chemical wastes that may be toxic or degrade very slowly. Caustic soda and sodium leaching from red mud lakes associated with bauxite processing pose environmental and health risks. Mining of bauxite requires the removal of the ribbon of topsoil. If improperly reclaimed, mined areas can contribute to erosion and may be unsuitable for productive uses. Illegal sand mining results in increased erosion of waterways and leaves a scarred landscape, with no one accountable for restoring or reclaiming the mined area. Other activities which have an adverse impact on resources include the practice of fishing with lime in rivers and damages to shrimp nets by safari boats. Economically-important attractions such as Dunn's River Falls has been degraded by nutrient loads from upstream activities. Continued plant and algae growth on the rocks in the series of cascades could imperil the participatory appeal of the Falls.

[3] Hook-up costs are too expensive for many, if not most, sewage customers within the reach of the main and lateral network. Although they will be required to pay the monthly fees, they are not required to hook up. It is anticipated, therefore, that many will choose to pay only the monthly fees and not hook up to the system.

2.4 COAST

In the **coastal** areas, major environmental problems include those associated with human settlements, agriculture, tree cutting, sand mining, and draining of ecologically fragile wetlands. Residential and businesses often discharge wastewater directly into coastal water bodies, resulting in conditions which favor algae and plant growth. Wetlands which provide habitat for flora and fauna are most often drained for agricultural purposes or to provide space for residential or business developments. Draining of wetlands diminishes their valuable role in filtering nutrients and pollutants from rivers while the new activities discharge chemical and/or biological pollutants to the coastal waters. Mangrove swamps are important nurseries for fish and shellfish, but are threatened by charcoal and fuelwood harvesting as well as development activities. The team also observed extensive damage to wetland areas in Canoe Valley which appeared to have been deliberately burned to facilitate fishing.

The beaches, which along with the coral reefs, are the major tourism amenity in Jamaica are adversely affected by wastewater discharges. Bacterial contamination poses health hazards for swimmers and divers, while nutrients contribute to algae and plant growth that diminish the aesthetic quality of the swimming experience and attract species such as sea urchins. Littering and uncontrolled solid waste disposal is a problem along public beaches and shorelines at the mouths of rivers.

2.5 REEF

The coral **reefs** in Jamaica are extremely sensitive to pollution and, by all accounts, are seriously threatened. From discussions with stakeholders on the north coast and Negril, most coral reefs near shore are dead and even reefs further offshore, where water quality is higher, are under threat. There are many contributing factors to the demise of the reefs. Coral reefs are sensitive to water temperature changes. Global warming is a worldwide threat to coral reefs and perturbations in weather patterns such as the recent *El Nino* can result in bleaching of the coral. Nutrients in coastal waters encourage algae which adhere to the coral and smother the coral, depriving it of food. Overfishing, particularly herbivorous species which graze on algae and other plants, exacerbates the algae threat to the coral reefs. Other threats to the coral reefs include damage associated with diving (collection of coral, damage from vessels mooring in reef areas), silt carried by rivers and ocean currents, and the illegal use of dynamite by fishers.

3. Constraints to Effective Management of Ridge-to-Reef Resources

3.1 INTRODUCTION

In carrying out this assessment, the team reviewed an extensive body of literature and conducted some 35 interviews with key individuals and institutions, and reviewed USAID's environmental portfolio (see Annex B for a brief summary) and other donor projects for the purposes of identifying barriers to effective management of resources and gleaning major lessons learned from previous donor activities that may be of relevance to the structure and design of the proposed *ridge-to-reef* activity.4 The information obtained clearly indicates that stakeholders in the environmental arena (donors, NGOs, the GOJ and local community groups) are reasonably aware of Jamaica's environmental problems and recognize the existence of barriers to improved management. The remainder of the chapter is organized into four sections. **Section 3.2** describes weaknesses in government management and oversight responsibilities as well as its capacity to cooperate with donors and sustain activities once donor funding has ended. **Section 3.3** examines capabilities of NGOs to assume management authority for parks and protected areas. The last two sections focus on the incentive structures of landowners, farmers, businesses and households as caretakers for Jamaica's resources. **Section 3.4** examines incentives for environmentally-friendly practices in forestry and agriculture while **Section 3.5** focuses on the pricing of natural resources and environmental services. As noted by participants at the team's briefing on July 17, 1998, several of the barriers identified by the team are recognized by GOJ agencies and currently the focus of efforts to reduce or mitigate them. The discussion, where appropriate, acknowledges these ongoing efforts.

3.2 GOVERNMENTAL MANAGEMENT CAPABILITIES

3.2.1 Implementation Problems

Disconnect Between Policy Planning and Implementation A major constraint to effective development in the natural resources and environmental areas is the disconnect between planning and implementation. Policies, plans, strategies, and regulations abound, but the commitment to implementation falls far short in comparison to the time and resources invested in preparation of planning documents and convening of meetings, workshops and seminars to support policy development. Several factors contribute to this disconnect. First, much of the policy development can be termed *top-down*, led by central government officials or provided by donors. One of the criticisms leveled against central government authorities and donors by local stakeholders is that policy development activities and donor-financed projects have tended to be

4 The current chapter focuses on the barriers while **Section 4.2** presents some of the lessons learned from donor assistance that may help to design future USAID activities.

prescriptive with limited input elicited from the local communities. Even when local views have been solicited in surveys, local stakeholders have had limited involvement in the planning or implementation phases. The team's discussions with local stakeholders indicated the importance of local *ownership* to the success of management plans and projects. Second, the government bureaucracy is a formidable constraint—for such a small country there is an overabundance of ministries, departments, laws, rules and regulations that govern what can and cannot be done in the field. Processes such as approval of development plans can take years to move through the system. If the political will is lacking, plans can grind to a halt. For example, the team heard that the squatter problems and solutions in Negril were proposed nearly 20 years ago, but little action was taken and the problems have now multiplied. Several other constraints to implementation are discussed below.

Inadequate Human and Financial Resources A major constraint to the ability of government agencies and departments to achieve their goals is that they are usually inadequately financed and understaffed. The real constraints posed by debt servicing (50-percent or more—see WRI, 1996) and higher unemployment due to expected further cutbacks in the GOJ payroll and the ongoing decline of the sugar cane industry, do not bode well for the prospects for any increased GOJ funding to address the environmental problems and concerns in the near future—other priorities take precedence.

As annual budget cuts take place, usually without staff or management audits, the situation gets worse. Several key departments and agencies have experienced layoffs in recent years, which undermine their capabilities to manage resources or provide effective oversight. Such uncertainty and commitment to staff can hinder the effectiveness of institutional strengthening support from donors; some staff receiving training may be subsequently laid off while others, whose skills have been improved through training, leave government employment for alternative job opportunities.

Another manifestation of limited budgets is the inability of the government to sustain donor activities once funding has ended. In part, the lack of sustainability is a responsibility shared by both the government and the assistance partner. The government fails to make allocation commitments to sustain donor-financed programs, while the assistance partner fails to design projects in a way that creates incentives and is structured around graduation requirements to increase the potential for sustained commitments on the part of the government.

Overlapping Jurisdictions Because of the plethora of environmental laws, there are an abundance of government agencies with responsibility for environmental quality, some with overlapping jurisdictions. There is an overlap between the Forestry Department and the NRCA in their respective roles and responsibilities for watershed management; the Water Resources Division is responsible for allocating water resources captured by the watersheds, and they collect the resource rents. There is also overlap between the Fisheries Division and the NRCA in responsibility for fisheries management. There is an overlap between the Environmental Control Division of the Ministry of Health, the Parish Councils and the NRCA in their respective in the management of ground and marine water quality. Some effort needs to be made to rationalize these overlaps – both in law and institutionally.

Lack of Institutional and Staff Incentives Specific government agencies with responsibilities for management (e.g., the Forestry Department) lack incentives to meet or exceed management or revenue targets. In the latter case, with the exception of NRCA, most revenues go to the government's Consolidated Fund. Thus, excess revenue cannot be targeted for agency budgets. In discussions with the Ministry of Finance, the team learned that there are ongoing discussions to structure budgets increasingly on a "user fee" basis and to require greater accountability by individual resource managers. One example of a department retaining excess revenues was provided by the Ministry of Finance. An incentive program has been established for the Revenue Department to retain 0.5 to 1.0 percent of revenue collections beyond targets for its operations. Where individual government staff members achieve their targets there are currently no provisions for financial rewards. Salaries are the same whether their performance is excellent or fair. There is no incentive (except maybe promotion) for excellence.

Inadequate Data Base Often government departments do not possess the data needed to make informed and responsible management decisions. Often the data they do have is not in a usable format, or is incomplete. Data collection exercises need to be undertaken to fill the data gaps, and the data should be stored in a format where it can best be recalled and analyzed, such as GIS systems. A good example of the data base problem is the challenge of arresting the rate of deforestation. The Forestry Department currently lacks accurate data on forest cover, changes in land use, extent of illegal clearing that has occurred in forest reserves and parks. Without such information, it is difficult to craft a strategy or estimate the resource requirements for implementing a strategy. Through CIDA's Trees for Tomorrow Project, the data base is expected to be improved.

EIA Process Flawed The environmental impact assessment or EIA is a tool that has been introduced in Jamaica. As in many developed and developing countries, the potential role of the EIA has not been realized in Jamaica; the process as practiced, does not engender confidence and has limited value in protecting environmental resources. Because the EIA consultants are contracted by the "developer," their assessments tend to favor approval of the project, shifting the burden of analysis to government agencies and the public to ensure that the data provided in the EIAs is accurate. In effect, such an approach creates a dual EIA process, although NRCA, NGOs, and the public lack the financial resources or the economic incentives to verify the veracity of EIAs. Modifications to the EIA process to require independent EIAs managed by NRCA but financed by developers would improve accountability and provide greater assurances that developments promote the environmental and economic interests of Jamaica.

3.2.2 Enforcement Problems

Lack of Regulations Many of Jamaica's environmental acts and regulations were written many years ago, when natural resource management was not as developed as it is today. Jamaica's Wildlife Protection Act is really a hunting act, and its Fishing Industry Act is geared not to fisheries management but to expanding fisheries exploitation. Many acts (e.g. the Watershed Protection Act) call for regulations to be enacted before they have any teeth, and either no regulations have ever been passed (like for the Watershed Protection Act) or they are inadequate.

The Jamaican government is making attempts to reform its environmental legislation; success in this endeavor is essential if enforcement is to be enhanced and the environment conserved.

Inadequate Human and Financial Resources As noted above, limited budgets and staffs hamper all aspects of implementation, but particularly enforcement. As annual budget cuts take place, usually without staff or management audits, enforcement staff (rangers, wardens) are the first to go. Usually there simply aren't enough rangers and wardens on the ground to cover the area. Field offices are not provided with vehicles or motorcycles to be able to function as enforcers of laws and regulations. The Forestry Department and the NRCA, for example, have the authority and mandate to enforce the laws with respect to timber theft or illegal charcoal burning, or industries illegally discharging industrial waste water into the rivers and streams. Enforcement is virtually non-existent, however, for the simple reasons that field staffs are small and transportation is not available (most agents patrol on foot).

Lack of Staff Incentives Where individual government staff members successfully arrest offenders and win convictions, there are no rewards. Their salaries are the same whether or not they take enforcement actions. In addition, their salaries are usually low, which creates the conditions where staff may be more susceptible to bribes. There is also little incentive to enforce because all fine revenue flow to the Consolidated Fund and neither the local enforcement office or the local community benefits.[5] The absence of any financial incentive to become more vigilant in dealing with serious violations will encourage the violators to continue and even step up their efforts to extract value from the common property resource—the risk of getting caught and prosecuted is minuscule.

Weak Penalties Even when a conviction is obtained, the penalties often are so weak that they do not act as a deterrent to illegal activities. If the costs to the violator are small relative to the benefits derived from the illegal activity, the existence of the penalty will neither discourage prosecuted violators from committing repeat offenses (specific deterrent) or serve notice to others about the negative consequences of detection and prosecution (general deterrent). When the laws and regulations are revised, the penalties for breaches should also be revised and should be set at a level commensurate with the value of the damage to the environment or the opportunity cost of the resource resulting from the illegal activity.

Lack of Judicial and Political Support While judges may support the enforcement action, they often impose penalties at the lower end of the range, either because the offender is poor (and a "sufferer"), or because the judge does not consider breaches of environmental laws to warrant serious penalties. Political support for aggressive enforcement efforts is often lacking, again because offenders are poor and enforcement is viewed as a form of harassment. Some offenders may be politically connected, which may insulate them from arrest. Most politicians appear to be sympathetic to squatters (for dwellings or farming) and appear reluctant to prevent

[5] As noted earlier, the Ministry of Finance does have an incentive system in place to encourage revenue collection. This incentive system is apparently never applied for the Forestry Department, however, because violators are rarely caught and prosecuted, and timber sales through legal channels are the exception rather than the rule.

environmentally damaging activities such as deforestation, coal-burning and overfishing unless economic alternatives are found for the offenders.

3.3 DEVOLVING MANAGEMENT AUTHORITY TO NGOS

3.3.1 General Issues

The Jamaican government has stated its intention to declare fourteen Parks or Protected Areas by the end of the decade and devolve management authority to NGOs. While this management approach has considerable merit and will allow the NRCA to solidify its position of environmental regulator with oversight responsibilities, the process of devolving authority has several weaknesses that will need to be overcome if these areas are to be managed effectively. Foremost among the problems are the limited number of NGOs which have or could develop management capabilities. There seems to be general agreement that only five NGOs at present are seeking management responsibility. It would appear that there is a need for more management NGOs to emerge if the NRCA's policy is to be successfully implemented. Additional weaknesses in this policy are discussed below.

Lack of Clear Legal Framework for NGOs to Manage The implementation of Jamaican government policy to delegate the management of Parks and Protected Areas to NGOs is in its infancy, and a clear legal and institutional framework within which NGOs can operate is yet to be finalized. This is a visible constraint to their operations.

Slow Declaration and Delegation Process Major funding for an NGO seeking to manage will only come after the Park or Protected Area is declared and the delegation is complete. Until now, this process has been slow, which has affected the viability of some NGOs (and their credibility with the local community).

Lack of Core and Project Finance for NGOs to Manage A major weakness in the proposed management approach to parks and protected areas is the lack of financial support from the government. NGOs are expected to raise funds from other sources such as the Environmental Foundation of Jamaica and the National Park Trust Fund, donors, and private sources. One problem NGOs face is that most funding sources are not prepared to provide core funding, even though they require a strong organization before providing any funding at all. This is one factor which explains the small number of NGOs in Jamaica.

Another reason for the lack of NGO financial sustainability is (in addition to the simple fact that it takes money to raise money) that the main catalyst has been absent—the existence of gazetted environmental protection areas and/or marine parks and acceptable management plans. Once the areas are declared, the NGOs will have a much clearer focus on and purpose for their fund raising efforts. The fact that both the Negril and Montego Bay Marine Parks have now been declared should prompt both NEPT and MBMPT into much more aggressive fund raising efforts than has been the case in the past. USAID and other donors are encouraging NGOs to engage in a

variety of fund-raising activities and some attention has been focused on empowering NGOs to collect user fees (e.g., fees for the use of cabins in Blue and John Crow Mountain National Park). Realistically, donor support for NGOs will be needed in the short to medium term while other funding mechanisms are developed.

3.3.2 Weak NGO Management Capability

Existing NGOs often have low management capacity. One element is that it is costly to develop management capabilities until management authority has been delegated. In addition, NGOs cannot secure funds to expand management authority unless they can demonstrate to funding sources that delegation is imminent. Nevertheless, donors have been somewhat successful in strengthening technical and managerial skills of NGOs. Today, some NGOs possess the capacity to conceptualize the problems and formulate the solutions, although they do not yet possess the technical capacity to address the magnitude and complexities of the problems from an implementation perspective, nor are they likely to acquire the requisite skills in the future unless additional funding is made available.

The GOJ and the donors alike must recognize that the technical skills needed to manage protected areas are not readily available in Jamaica— the full intent of USAID's institutional strengthening investments (or any such investments made by other donors) will never be captured unless hiring outside expertise becomes a real option. One NGO today will acquire capacity by hiring away from another, or from the GOJ, with little net increase in the cumulative capacity in the country—a zero sum game. The only realistic option is for all qualified environmental NGOs to compete in the international market for the needed technical skills. Paying internationally competitive salaries, however, is not a likely prospect unless the donors make the provisions, at least for a transition period of two to three years.

3.3.3 Weak Community Participation in Planning and Management

Top-down management by NGOs can be as counter-productive and inefficient as top-down management by government. Often, NGOs strengths' are in technical areas of ecology and environmental science but have little experience in working with and involving the local community in planning and management. Government policy calls for the Parish Councils to become more involved in the management of Parks and Protected Areas, but at present, they lack the conceptual framework to do so, as well as the qualified staff and financial resources.

3.4 BARRIERS TO ENVIRONMENTALLY-FRIENDLY PRACTICES IN AGRICULTURE AND FORESTRY

3.4.1 Barriers to Appropriate Technologies

There are a number of environmentally-friendly practices and technologies which, if implemented in the ridge-to-reef continuum would lead to improved water quality (e.g. composting, integrated pest management); several of these are foreign to Jamaican culture, or known and practiced by only a few – the knowledge base is weak. Where environmentally-friendly technologies do exist in Jamaica, such as a few biogas digesters and composting toilets, they are often inaccessible because few no they exist, they are located in remote areas, or the need for technical skills to replicate them is either unavailable or costs too much. Often the persons or agencies who possess these technologies do not advertise, and so potential users do not know where to go to access them.

3.4.2 Barriers to Reforestation

The greatest barrier to reforestation has been the availability of tree seedlings. Although the Forestry Department advertises that the public may obtain "free" seedlings from them, more often than not, the seedlings are not available for the species sought, largely due to budgetary constraints. This is a disincentive both to those who wish to plant trees, and to those who wish to establish commercial tree nurseries. Moreover, even if the seedlings were available, the geographically disbursed Jamaican farms (small fragmented plots) negates economies of scale in reforestation (as well as the use of environmentally-friendly technologies and methods). Woodlots – where they exist – are usually only a small fraction of farms or watersheds, and may not permit watershed functions to be adequately performed.

3.4.3 Lack of Appropriate Incentives

Secure l**and tenure** is a major prerequisite to success in promoting land improvements. Many Jamaican farmers do not own the land they use, and may not be prepared to invest in environmentally-friendly practices and technologies. Where persons harvest firewood or charcoal from public or private lands not their own, they may not take steps to make their activity sustainable.

There are no **tax or other incentives** to encourage landowners to maintain highly-sloped areas in forest cover rather than ruinate. Indeed, forested slopes might be classified as idle, and may be subject to penalties, so that incentives work in the wrong direction. There are no incentives encouraging biological pest control rather than chemicals, or organic farming, or for farms or industry to treat their own wastewater.

3.4.4 Praedial Larceny

Theft of crops is generally high in Jamaica, and is a disincentive to farming, especially on a small scale. Theft reduces profits which might have been invested in environmentally-friendly technologies. Moreover, it is not uncommon for many farmers to clear land on the steep slopes to grow vegetables rather than farming the bottom lands to minimize the risk of crop theft.

3.4.5 Inadequate Access to Financing

A major impediment to investment in environmentally-friendly technologies is widespread unavailability of credit at affordable rates. One aspect is the difficulty of qualifying for credit, give that many farmers lack credit histories or suitable collateral. In addition, high interest rates and other loan terms tend to discourage investments with slow payback periods and modest rates of return. Thus, credit may not be an option for medium and long-term investments, such as those in agroforestry.

3.4.6 Poor Access to Marketing Information

Even if credit were available, and producers investing in the environmentally-friendly technologies could command premium prices in some markets, there is little to non-existent access to information about such markets.

3.5 PRICING OF NATURAL RESOURCES AND ENVIRONMENTAL SERVICES

3.5.1 Ridge-to-Reef Resources not Fully Valued

Perhaps the most important lesson learned from previous assistance programs is the clear indication of the absence of a consciousness among the major stakeholders of the economic values at risk if environmental protection is not taken seriously. None of the current USAID SO2 activities have an explicit economic orientation, the NRCA is dismally short on economic expertise as are the environmental NGOs. Few of the activities proposed to be undertaken under the auspices of SO2 activities are subjected to rigorous economic and/or financial analysis. The stakeholders in the environmental arena have only fleeting and subjective notions of the economic values at stake and generally state their arguments in environmental, rather than economic terms. The economic values at stake typically weigh much heavier in the political decision-making process than do the environmental values. For example, exploiting the Cockpit Country for bauxite can be easily shown to provide both substantial economic and employment benefits to Jamaica because the relationships between inputs and outputs, benefits and costs can be easily quantified and measured. Protecting a high incidence of flora and fauna endemism in the Cockpit Country is a valid argument indeed, but weak in terms of political clout. It rarely compares to the easily identifiable opportunity costs (or the exploitation value) of the same area. The environmental option—non-exploitation—must also be expressed in economic terms for comparison purposes.

The same argument applies to all field activities undertaken in accordance with management plans for the marine parks and environmental protection areas. These may include

environmental awareness programs in the watershed, development of an ecotourism program, alternative livelihood activities, etc. In addition to increasing awareness among the rural population by pointing out the kinds of behavior that typically accelerate environmental degradation, a much stronger emphasis needs to be placed on knowing the financial and economic attractiveness of the modified behavior proposed. To do this, however, the detailed economic documentation of the activities must be carried out before the awareness programs are launched. The new *ridge-to-reef* activity should be clearly differentiated from the rest of the SO2 portfolio in having a much stronger economic orientation.

3.5.2 Public Timber and Seedlings Underpriced

The prices for seedlings asked for by the Forestry Department are below the prices demanded by the rest of the marketplace, largely because they do not build into the price the cost of labor and other inputs provided by government subvention. This has the effect of depressing actual prices, and hampering the potential profitability of commercial nurseries. Prices for public timber are also far below their market value, resulting in market distortions for local timber compared to imports which saves foreign exchange, and at the same time leads to "legal" deforestation – the sale of trees from forest reserves. The Forestry Department recognizes the pricing dilemma it faces. If it raises timber prices, it will encourage more illegal cutting of trees, since they would be more highly valued by lumber companies. Before timber prices can be raised, the Forestry Department would need to strengthen enforcement efforts to protect against illegal cutting. Given the limited prospects of expanding on field staffs, one key aspect of improved enforcement may be cooperation with sawyers and lumber companies and development of regulations requiring certification of saw logs processed in Jamaica.

3.5.3 Water Capture by Forests not Priced

The price of potable water sold by the NWC does not reflect the cost of the water itself, only the cost of treatment and distribution. As a result, the capture of rainfall by forests and watersheds is not priced and goes unaccounted for in the management activities of landowners (including the government and NWC) in the upper watershed. If the NWC had to buy the water it collects from the watersheds, there would be greater incentives to manage watersheds for their value in collecting water and provide incentives for reducing erosion. It would also encourage the NWC to put more effort into managing the watershed lands they control. The other implication of undervaluing water is that it encourages inefficient use. As long as water is inexpensive, there is less incentive to maintain pipelines and other conduits to avoid transmission losses (estimated to be over 50% for some areas).

3.5.4 Wastewater Pricing not Based on Cost-Recovery

The sewage fees charged by NWC do not reflect the full costs of providing these services (annualized capital costs plus annual operating and maintenance costs). Instead, they are simply a

multiple of the potable water charge, with the multiple a function of the class of customer (100% for commercial customers, 49% for residential customers). In addition, individual treatment plants are not placed on a cost recovery basis, with their budgets determining centrally by NWC. Such a financial management approach creates gross inefficiencies in plant operations, results in poor maintenance of capital equipment and frequent breakdowns because of lack of spare parts, and disincentives to expand hook-ups to capitalize on economies of scale in the treatment facility. Without appropriate pricing and decoupling of sewage treatment costs from potable water prices, business and households may be discouraged from making water conservation investments, altering water management practices, or investing in on-site treatment (in the case of industrial facilities which are tied in to municipal systems).

3.5.5 Lack of Incentives for Connections

Jamaican law requires households or businesses near a sewer main or branch to pay a sewage fee to the NWC, but it does not require the household or business to actually connect so that their sewage may be treated. Thus, if the connection costs, borne by the customer under current NWC policy, far exceed the costs of pit latrines or soak-away systems, the customer's optimal strategy may be to pay the NWC charge without connecting. This may be rational in term of the NWC maximizing its revenue, but is irrational in terms of protecting water quality since most alternatives result in direct wastewater discharges to groundwater or surface water. In addition, such policy contributes to inefficient use of sewage treatment capacity. All of the new North Coast wastewater treatment systems are expected to be underutilized for many years, because connection costs are quite high relative to other alternatives.

4. Recommendations for a Ridge-to-Reef Assistance Strategy

4.1 INTRODUCTION

This chapter provides the team's recommendations for a new ridge-to-reef activity under USAID's Strategic Objective 2 (SO2). The next section provides a brief analysis of the lessons learned in delivering assistance in support of the environment and natural resources of Jamaica. These lessons include both successes and failures and have had an important influence on the recommendations presented in the chapter. **Sections 4.3** and **4.4** discuss the motivation for the proposed ridge-to-reef approach and enumerate criteria the team considered in identifying the proposed activities that might be included. **Sections 4.5** through **4.7** provide an overview and additional details of proposed activities. The major activities recommended by the team are a select number of NGO-facilitated, locally implemented ridge-to-reef management programs (**Section 4.6**). To complement these management programs, a slate of technical assistance, training, and special studies are proposed (**Section 4.7**). **Section 4.8** describes how the proposed activities will promote SO2 and linkages of the proposed activities to USAID's other strategic objectives (SO1 and SO3). The final section (**Section 4.9**) suggests opportunities for cooperation with other donors.

4.2 LESSONS LEARNED FROM USAID ASSISTANCE PROGRAMS

USAID's support for environmental and natural resource activities in Jamaica over the past several years has evolved as a function of lessons learned, not only from activities supported in Jamaica, but also from Agency-wide experiences elsewhere in the world. The assessment team reviewed recent and ongoing USAID projects providing assistance to Jamaica in addressing environmental and natural resource problems. Short descriptions of the three current USAID projects (DEMO, CWIP, and EAST) are provided in **Annex B**. In addition, the recently completed Hillside Agricultural Project was reviewed by the team. The lessons learned are described in three subsections, the first focusing on institutional strengthening, the second on general implementation issues, and the third on the potential for refocusing some activities in the private sector.

4.2.1 Institutional Strengthening

USAID's DEMO project has focused largely on strengthening government agency such as NRCA and environmental NGOs. Many of the lessons on institutional strengthening, both good and bad, have resulted from this project. To DEMO's credit, the project has evolved to address some of its earlier mistakes; these more recent successes as well as some of the earlier difficulties are noted below.

Limitations of Top-Down One of the criticism leveled on DEMO in the first years of the

project related to its cooperation with NRCA in a largely top-down approach to the creation and management of environmental protected areas. The process of creating the Negril environmental protection area in Negril and marine parks in Montego Bay and Negril was the brainchild of NRCA with support from DEMO. They did not adopt or follow a bottom - up process, working with local communities, building consensus along the way. Nor was the creation of NEPT as the NGO delegated the responsibility of implementing the management plan for the EPA an expressed recommendation of the local communities or institutions. In fact, NEPT was created even though Negril already had one of the few strong environmental NGOs in Jamaica. While the assessment team recognizes the reasoning that led to the creation of NEPT and perceives that there is now good coordination between NEPT and NCRPS, the existence of two strong NGOs in one area creates competition for donor support and dilutes the financial support either organization can receive from private companies and individuals. Nevertheless, to NEPT's credit, the NGO has become well established in the community and has built a strong base of local support.

Empowering the Appropriate Institutions Related to the issue of top-down decision-making is the issue of deciding what form of institution is most appropriate to carry out the task at hand. As noted in the previous chapter, NRCA has devolved management for protected areas to NGOs. The devolution of management authority, in itself, is a lesson that has been learned in Jamaica and other countries, with USAID and other donors urging governments to make this change then supplying technical and financial assistance to facilitate implementation. Typically, there have been two options for meeting the institutional requirements of an activity: 1) create a new NGO (the NEPT experience) or 2) empower an existing NGO with these expanded duties. In the case of NEPT, which was created to manage the protected area, financial support through DEMO has been necessary to sustain the NGO. NEPT is only now beginning to engage in aggressive fundraising to sustain its activities. However, an advantage of creating a new institution is that the NGO is organized to carry out the stated objectives, whereas new tasks taken on by an existing NGO can pull resources from other activities. On the other hand, an existing NGO will typically have staff in place, established links to the community and some fundraising capabilities. Thus, the existing NGO has the advantage of starting a new activity more quickly and may be more successful in overcoming some of the usual start-up problems.

Important issues to be considered in making the decision on whether to strengthen an existing institution or create a new one include: understanding the scope of the activities; assessing the positive and negative ramifications of different types of institutions (e.g., NGOs, CBOs, local government, private sector enterprises) taking on the proposed activities; and the likely effectiveness of the institution(s). In Jamaica, the social scene is highly polarized along partisan political lines. In some cases, it may be difficult for partisan-based institutions (government, NGOs, or CBOs) to take the lead role in implementing an activity. Even non-partisan NGOs must recognize their limitations in leading activities that require broad-based community action and support. For example, if a new activity focuses on a program to educate small landowners about environmentally-friendly activities, it may be more useful to empower (and create) a stakeholder group (with assistance from an NGO) than to have the NGO undertake the activity because of previous experience in delivering awareness and education programs, or more simply because the NGO already exists. The collaboration between JCDT and The Nature Conservancy in the Blue and John Crow and Blue Mountain National Park serves as a good

example of partnerships to utilize the skills of institutions in a cost-effective way. However, this partnership relies on the availability of donor financing. As noted earlier in **Section 3.3.2**, NGOs will need to find ways to finance and attract international experts to meet some of their specialized staffing needs.

Rewarding Success One of the tendencies of donor programs which provide technical or financial assistance to NGOs and other institutions is a failure to challenge the recipient organization to set goals for sustaining activities beyond the duration of assistance. During DEMO's initial support for NEPT, the NGO made little progress in developing fundraising capabilities. DEMO is now taking a more aggressive position in setting targets for NEPT in terms of developing fundraising capacity. In addition, DEMO's support of PEPA also includes targets, in this case focused on helping environmentally-friendly microenterprises develop and market outdoor activities such as hiking and tours of historical and cultural sites.

Core vs. Project Support One of the issues that undermines the development of NGOs is the difficulty of raising funds to support staff and overhead costs (**Section 3.3.1**). Typically, NGOs have had more success in fundraising if the money was earmarked for specific projects, whether the support was requested from donors or funding sources such as EFJ. Partly the bias against support for "core" or program funding relates to the difficulty of quantifying the results or benefits of such disbursements and partly a lack of understanding of the value of core funding to the NGO's capacity to identify and plan project activities. DEMO support has been pivotal in closing the financing gap for core funding. In addition, as noted above, DEMO has targeted fundraising as a key institutional strengthening activity to improve NGOs capacity to sustain funding. The other avenues for sustaining NGO financing include: 1) improving awareness among donors and local funding sources of NGOs' funding difficulties and 2) in the case of management of protected areas and parks, development of government policies that enable NGOs to raise money from user fees.

4.2.2 Implementation Issues

Three important lessons learned from donor assistance relate to implementation issues. The first of these relates to the trade-off between short-term success and sustainability while the second relates to ensuring there is implementation to complement various types of studies and analysis.

Short-term Success vs. Sustainable Results A common practice among donors is the provision of goods and services at reduced or subsidized prices. Typically, the practice of buying success is popular with stakeholders and counterparts, and enables the donor to demonstrate that its assistance has achieved results. A case in point is the recently completed USAID-funded Hillside Agricultural Project (HAP). This project was, in many ways, both a success and a failure, yet several lessons were learned that the GOJ could incorporate and modify for future support without any further donor funding. On the success side, HAP's targets set for project performance were substantially exceeded, largely because all inputs were provided to the participating farmers free of charge—in this sense, success was purchased. If such an approach

(attracting participation with free inputs) were favored by the GOJ, budgetary provisions should have been made to cover the subsidies in order to continue with the activities after the project had ended. Sustainability might have been enhanced if assistance in the latter years had been tied to development of alternatives other than free inputs which were more accepted by (and affordable for) government.

The experience of HAP (and numerous other projects in Jamaica and elsewhere) suggests the importance of designing subsidy programs in a way that requires a commitment from counterparts and stakeholders to take on an increasingly larger share of the co-financing so that the subsidy can be reduced and phased-out before the assistance is terminated. If the program cannot ultimately appeal to the self-interest of stakeholders, it is not likely to be sustainable in the long run.

Finishing the Job Studies and various types of economic, environmental, and financial analysis are a mainstay of donor assistance. USAID's CWIP and EAST projects include a variety of such efforts. In the case of EAST, environmental audits of tourism facilities has been the principal focus of their activities. The audits provide the potential for hotels to adopt practices that contribute to improved environmental quality but may be either a net benefit or net cost to the hotel. At the present time there is little incentive for hotels to implement the recommendations in the audits; those which involve low up-front capital costs such as changes in management practices or low cost technologies should readily be implemented. However, if recommended actions involve net costs or high capital costs (where net benefits are expected to result), there is a lower probability that businesses will undertake these options. In designing activities which provide assistance to stakeholders such as the EAST project or involve the preparation of studies, donors need to explore opportunities for strengthening the commitment of stakeholders or counterparts to follow-up implementation. For example, a program to help small landowners identify and assess new practices has a greater chance of success if combined with creation of financing options or expanded availability of agricultural and forest extension services.

4.2.3 Private Sector Initiatives

Donor assistance in the environmental sector has historically been targeted at strengthening counterparts and NGOs, financing nature protection and other environmental activities, and assessment of policy reforms. In addition, donor programs in the natural resources sector has included small entrepreneurs and landowners among their assistance partners. Under DEMO, USAID has also provided assistance to private sector entrepreneurs in the eco-tourism sector and studied alternative livelihoods for fishers in Negril. In addition to creating income possibilities, such endeavors are expected to be beneficial in diverting labor force participants from environmentally-harmful practices, encouraging alternative land uses, and discouraging unsustainable harvesting activities.

In Negril, the private sector is gearing up to convert the Royal Palm Reserve into an eco-tourism attraction. Given the Reserve's location, such low impact land uses could be beneficial to environmental quality in the Negril EPA. In St. Ann, private sector entrepreneurs are marketing and conducting birding excursions for tourists. In the Port Antonio area, PEPA, through support

from DEMO, is assisting in the development and restoration of old plantation ruins as cultural tourism destinations. All in the Port Antonio area, hiking excursion opportunities are being developed by the private sector, that will employ local residents as guides (Valley Hikes). Other budding private sector enterprises beside eco-tourism include charcoal making from bamboo, harvesting essential oils, and agroforestry.

One of the attractions of private sector assistance programs is that they are more likely to succeed since they are based on profitability; often the problem is access to information or lack of training in marketing, financial appraisal, or developing a financial proposal to submit to potential financiers. One of the potential dangers in Jamaica is that good ideas often lead to rapid saturation and choke off demand. This is evident in a number of specialty agricultural markets in Jamaica that were profitable early on but less so later because of oversupply or changes in the nature of the market. While there may be a finite market for eco-tourism enterprises, based on demand and supply of appropriate resources, there appears to be substantial opportunity to expand eco-tourism before such market constraints would come into play.

4.3 MOTIVATION FOR THE RIDGE-TO-REEF APPROACH

All land and water resources found in Jamaica's watersheds are the subject of legislation, regulation, policy, or management, although in most cases, only certain categories of resources fall under the purview of a single law or institution. A cursory review of the various resource management efforts includes the following: forest management, watershed protection policy and management, underground water and surface water management, parks and protected areas management, coastal zone management, and fisheries management. In addition, a number of government departments and agencies have some involvement in oversight or management of these resources.

The ridge-to-reef approach is motivated by a desire to better address the interrelationships between land and water uses in the watershed. Upland and upstream practices may adversely affect water quantity and quality of downstream and coastal waters. Managers of coastal resources such as the Montego Bay Marine Park recognize that a large share of the adverse impacts on the coral reefs stem from land use practices in the watershed. Given the finite assimilative capacity of coastal ecosystems and the reef's extreme sensitivity to water pollution, the Park's lack of influence over land use activities and the difficulty of coordinating with other resource managers can limit the ability of managers to sustain the quality of the Park's resources.

An integrated approach to management of ridge-to-reef resources is needed that recognizes the interrelationships between the various human activities which utilize these resources. Such an approach requires knowledge of the problems and their sources as well as a recognition of the respective economic values (both positive and negative) of the resources and activities which depend on these resources and an understanding of those who benefit or incur costs as a result of decisions upstream. In addition, an understanding of the relative effectiveness (including costs) of options for reducing pollution and mitigating ineffective and unsustainable resource utilization as well has who will bear these costs.

4.4 DESIGN CRITERIA FOR A RIDGE-TO-REEF STRATEGY

In developing recommendations for activities which would contribute to sustained improvement in the environmental condition of ridge-to-reef resources, the team considered several criteria. Foremost, any strategy should promote USAID's Strategic Objective for the environment (SO 2):

> *"Improved quality of key natural resources in selected areas that are both environmentally and economically significant."*

There are several implications of this criterion. First, a strategy must achieve results, rather than focus only on the development of plans and policies. Second, there is a recognition that USAID's assistance resources are limited and support must be targeted, possibly to a small number of geographical areas. Third, "key" resources could include forests, rivers, wetlands, coastal waters, reefs, inland and coastal fisheries, biodiversity, and potable water. Although "key" is not defined, it is suggested that these resources should have both an economic value and environmental importance. Finally, to ensure that USAID's assistance resources are used cost-effectively, the strategy should complement and reinforce other projects in the USAID portfolio. In addition, the strategy should not duplicate efforts of other donors/lenders. Where strategic activities are proposed in areas of ongoing donor/lender projects, synergies and complementarities between the proposed activities and those of other assistance providers should be maximized

The strategy should cover a geographical area that is delineated to encompass key ridge-to-reef resources as well as activities that influence the quality and value of the resources. This suggests that the geographical area could include areas for which a variety of management plans and implementing institutions may already be in place. The strategy must overcome the compartmentalization that characterizes management plans for specific resources (e.g., forests, fisheries, watershed, parks, etc.). The strategy should emphasize promotion of economically viable activities, thereby increasing local acceptance and sustainability, and replicability

Participation of government at all levels, private sector stakeholders, NGOs, and CBOs is vital to the success of the strategy. However, it is unrealistic that all stakeholders and counterparts can be involved in all aspects of strategy development and implementation. National authorities can play an important role in dealing with the problems of overlapping jurisdictions, resolving differences in legal structures and regulation, and helping to mobilize resources that may be needed to ensure effective implementation. Local "ownership" of the strategy is also a key to implementation. The community must buy into the strategy early in the development stages and play a role in implementation. Experience suggests that top down implementation is ineffective in part because managers are not locally accountable for their success or failure.

4.5 OVERVIEW OF GOALS AND PROPOSED ACTIVITIES

The assessment team has identified three interrelated goals for proposed activities. First, activities should be designed to ***demonstrate effective management of ridge-to-reef areas***. The assessment team acknowledges the range of barriers that must be overcome in managing such a diverse set of resources and economic activities that are typically found in Jamaican watersheds. The potential for effective management depends on involvement of key stakeholders and commitment from local communities. Such cooperation can best be obtained if the management area is delineated to include all resources and source of conflict. Initially, USAID should focus on supporting only a few management areas, to ensure adequate resources can be applied to each set of management challenges.

Second, activities should ***strengthen the capabilities of NGOs, CBOs, and government to take on management responsibilities***. It should be recognized that even the best conceived management plan cannot be successfully implemented unless managers have appropriate skills and adequate resources. Thus, USAID must target financial resources to directly support management entities and provide technical assistance and training to improve capabilities. Where technical skills are lacking, cannot realistically be developed during the activity's life, or there is no perceived future need for the specific expertise, external technical assistance should be provided by USAID.

Third, activities should ***address constraints that impede adoption of environmentally-friendly resource use practices and stymie protection of key ridge-to-reef resources.*** It is important to recognize that improved policies, adequately-financed oversight, enforcement and management, and improved incentives for landowners, businesses, and resource managers are all keys to sustained improvement of the environment and protection of Jamaica's diverse resource base.

To achieve the first goal, the proposed activity would involve USAID support for two to four ridge-to-reef management programs. These programs would be led by local committees and would stress participation by a variety of local stakeholders, combined with participation and support from national agencies such as NRCA, Ministry of Agriculture, and the Forestry Department. A USAID contractor would support of the development of these management programs and assist local implementors in developing activities which could be featured in ridge-to-reef management strategies. In **Section 4.6**, the team's suggestions for the design of these management programs and preliminary recommendations for geographical areas are presented.

To support the second goal, a series of technical assistance activities is proposed which would include: (a) institutional strengthening and training of NGOs to improve their capabilities to raise and sustain funding, facilitate participatory processes, conduct awareness and education programs, and undertake various implementation tasks such as environmental monitoring and possibly enforcement; and (b) preparation of special studies to demonstrate alternative economic activities, develop estimates of the economic value of ridge-to-reef resources (especially those that are not valued in the marketplace), and evaluate national policies that are critical to the promotion of effective ridge-to-reef management.

To achieve the third goal, the USAID contractor would provide input to legislators, agencies and resource managers based on the special studies described above. In addition, USAID and its contractors would work closely with the GOJ, NGOs, and donors in the development of more effective approaches to management of resources in the watersheds and coastal areas. Activities to support the second and third goals are outlined in **Section 4.7**.

The activities described above would be combined into a single USAID activity. As with other USAID projects, an implementing mechanism would need to be elaborated. A project agreement would presumably be signed by the Ministry of Finance or PIOJ, with several options available for designating the implementing agency. Based on comments from workshop participants,[6] the implementing agency would not necessarily be NRCA, although they would play a key role. The ridge-to-reef activity would involve a number of governmental bodies such the Ministry of Water, the Water Resources Authority, and the Ministry of Agriculture (Dept. of Forestry). The implementing mechanism might include a combination of a single implementor or small executive committee plus a larger steering committee that would include the bodies listed above as well as other agencies representing tourism and agricultural interests.

4.6 RIDGE-TO-REEF MANAGEMENT PROGRAMS

4.6.1 Overview

The proposed management programs would include a limited number of multi-year, locally developed and implemented programs, with financial support provided by USAID and technical assistance provided by a USAID contractor. As USAID plans to support this new activity over a 5-year period, this flexibility suggests two opportunities for designing the individual management programs.

First, USAID may wish to commit to a small number of management programs in the first year, to concentrate resources and gain experience in supporting these local programs. In addition, the level of funding for special studies and training may be highest in the early years. In subsequent years, additional management programs can be supported. In that respect, this approach is similar to the assistance strategy of USAID's CWIP.

Second, the assessment team strongly encourages the use of a "graduation" process for each management program. Yearly targets should be set for each management program to chart progress in developing and implementing the management plan as well as strengthening management capabilities and sustaining financial support. Targets would be negotiated as part of the workplan process and future funding and TA support decisions should be based on success in meeting the targets.

6 USAID convened a workshop for counterparts, stakeholders, donors, and contractors to review the draft report on September 2, 1998 in Kingston.

Below, a suggested design for the management program, covering the first two years, is provided. While the assessment team endorses this particular design, it recognizes that there may be other designs or approaches that might be as or more attractive to USAID, the GOJ, or NGOs. Nevertheless, the suggested design should provide a useful starting point for further discussions and refinements.

During Year One, the first major activity would involve the **selection of a small number of ridge-to-reef management areas** by USAID and the contractor. This activity would include several discrete tasks. First, USAID and the contractor, with input from the GOJ would need to refine the selection criteria. Suggested selection criteria are provided in **Section 4.6.2**. In addition, follow-up field work to provide data for areas under consideration might be required and carried out by the USAID contractor. Because it is difficult, on the basis of a few meetings, to gauge local commitment and support and the willingness of NGOs or CBOs to take lead roles in developing and facilitating implementation of plans, it is proposed that each community7 make a presentation (or submit a proposal) on its interest, capabilities, and ideas for cooperating with USAID in implementing a management program. The contractor would provide guidelines for these presentations and respond to questions from each community if requested. A small grant could be provided to each organizer to defray costs of holding community meetings and preparing the requested proposal. The proposals would then be evaluated and based on the strength of the proposal and other criteria, a small number of programs would be selected for the first year. For those proposals not selected, the contractor would provide feedback on their strengths and weaknesses and invite the communities to revise and resubmit for Year Two.

As part of the selection process, the community would propose a local co-management committee (LCC) which would be responsible for guiding the implementation of the ridge-to-reef management program. The LCC would also identify implementors for specific activities. In most of the communities under consideration, one of the existing NGOs would be expected to play a prominent role in implementing or facilitating activities. Other groups such as CBOs, private entrepreneurial groups, local government, commodity boards would be expected to participate in the LCC or play a leading or supporting role on specific activities. The **LCC would prepare a workplan to cover Year One activities** to be undertaken by the community. Elements of the workplan would include plans to undertake the following: (1) an assessment of the ridge-to-reef problems and their causes; (2) identification of baseline indicators that would be used over the course of the project to evaluate progress in addressing ridge-to-reef problems as well as a plan for an associated monitoring program; and (3) execution of a participatory process designed to prioritize problems and develop an action plan. The workplan would also include a series of milestones and targets that would need to be met to ensure continued USAID support (graduation provisions). USAID might want to consider developing an evaluation framework similar to the performance indicator program utilized by The Nature Conservancy to evaluate sites in their USAID-funded **Parks in Peril** Project. In addition, the workplan would enumerate the technical assistance, institutional strengthening and training needs, to be fulfilled by the USAID contractor.

7 It is assumed that the communities invited to submit proposals or make presentations would be those in the watersheds visited by the assessment team and evaluated later in the report. Given USAID's limited resources, the "pool" of potential communities may be adequate for the first year. However, the Team would encourage USAID to consider including additional communities in the selection pool in subsequent years.

It is suggested that the LCC would **initiate designation of the** ridge-to-reef area as an **environmental protection area** during the first year. This appears to be the most attractive model for providing protection for the most important resources and exerting some degree of management control over the activities which impact on those resources. The recently designated Negril Environmental Protection Area serves as the best illustration of a ridge-to-reef management area, with its borders delineated to include the ridgelines, extending out to the offshore coral reefs. In addition, the communities would **implement Year One initiatives** that are recommended in the action plan. **Section 4.6.3** describes some of the types of interventions that might be undertaken in support of the action plan.

At the beginning of Year Two, USAID and its contractor would evaluate first year accomplishments and decide which Year One management programs would receive support during Year Two, based on their performance. USAID would then make a determination of the number of graduating and new management programs which could be supported. New programs would undergo the process of workplan development outlined above for Year One, while graduating programs would prepare and implement workplans focused on implementation of the action plan prepared in Year One. Although it is anticipated that both financial and technical assistance would be provided during Year Two for graduating programs, these programs would be expected to achieve greater financial sustainability during Year Two, with appropriate financial targets included in their workplans.

4.6.2 Selection of Ridge-to-Reef Management Areas

The assessment team was tasked with evaluation of alternative locations which might be the focus of ridge-to-reef management programs. USAID proposed that the team consider Negril, Port Antonio, and other North Coast areas including Montego Bay, Ocho Rios, and the Cockpit Country. The team also evaluated Black River, a watershed that has received considerable support through USAID's DEMO project.

To guide the evaluation, the team developed a set of criteria. These are presented below. We have not attached relative weights to these criteria nor developed a rigorous scoring system, in part because we did not feel we had adequate information for each proposed area, based on the set of meetings and scope of field work conducted in each location. As USAID designs the proposed ridge-to-reef activity, they may wish to expand on the initial evaluation provided by the assessment team. In addition, we have also noted the recommendations offered by some of the individuals with particular expertise and familiarity with Jamaica's watersheds and natural resource issues.

Criteria for Selecting Geographical Areas A starting point for the development of criteria was the Watershed Selection Study funded by CIDA as part of preparatory work for the Trees for Tomorrow Project. In that study, all twenty-six watershed management areas were evaluated in terms of ten criteria, with each criterion assigned numerical weights so that a relative ranking of watersheds could be obtained. The criteria used in that study with their numerical

weights are presented in **Table 4.1**. For each criterion, a higher score indicated that the watershed management unit was a better choice for the proposed pilot project. For example, the scores for rainfall were: 3 (very wet); 2 (wet); 1 (intermediate); 0 (dry). By design, given the purpose of the Watershed Selection Study, the criteria are strongly skewed toward attributes of the upper watershed and the production of water. Thus, a watershed with minimal land use conflicts and an absence of community groups or NGOs would score high provided the area has high rainfall and steep forested slopes.

In fact, the rankings for all of Jamaica's watershed management units (WMUs) from the study (**Table 4.2**) indicate that the watersheds in the eastern region, which include ridge areas of the Blue and John Crow Mountain National Park were ranked highest (numerical scores are provided in parentheses). *Italicized* WMUs are those which most closely correspond to the ridge-to-reef areas evaluated by our assessment team. It should be noted that many of the watersheds in italics ranked in the medium or low range in the CIDA study. This is not too surprising given the differences in the management goals and importance attached to resources in the CIDA study, relative to the ridge-to-reef assessment.

Table 4.1 Watershed Criteria

Criterion	Numerical Weight (range)
Water use and production	0 to 2 points
Flooding hazard	0 to 2 points
Rainfall	0 to 3 points
Steep slopes subject to erosion	0 or 2 points
Presence of natural forests	0 or 2 points
Presence of forest plantations	0 or 2 points
Land use conflicts	0 to 2 points
Forest recreation and ecotourism potential	0 to 2 points
Active NGO or community groups	0 or 2 points
Accessibility to Forestry Department offices	0 to 2 points

Source: *Watershed Selection Study*, May 1993

* * * * *

Table 4.2 Rankings of WMUs

Less than 10 points	11-15 points	16-20 points
Milk (5.5)	*Martha Brae (11)*	Spanish River (18)
Oracabessa/Pagee (6)	Morant (11)	*Rio Grande (19)*
Gut/Alligator Pond (6.5)	*Black River (11.5)*	Pencar/Buff Bay (20)
Drivers (7)	*Great River (12)*	
Lucea (7)	Plaintain Garden (12)	
New Savannah (7.5)	Yallahs (12)	
South Negril/Orange (8)	Hope (12)	
Montego River (9)	Cabarita (12)	
Rio Bueno/White (9)	Rio Minho (12.5)	
Rio Nuevo (9)	Wag Water (13)	
Deans Valley (9)	Rio Cobre (13.5)	
	Swift River (15)	

Source: *Watershed Selection Study*, May 1993

For the evaluation of potential ridge-to-reef management areas, the assessment team considered the following criteria: (1) the importance of key natural resources from both an environmental and economic perspective; (2) the severity of current/potential environmental problems; (3) the level of political support; (4) the level of community and stakeholder support to protect key natural resources on a sustainable basis; (5) the potential to mobilize NGOs, CBOs, and other groups as implementors and program facilitators; (6) the potential to achieve sustainable on-the-ground results; and (7) the current level of donor/lender assistance to area.

The first two criteria are designed to reflect attributes similar to those in the CIDA study, although the resources of interest are more broadly defined and the potential for land use conflicts

given greater emphasis. Some participants at the USAID workshop expressed concern that USAID construes the set of key natural resources too narrowly to focus on those resources directly involved in the "production" of tourism and suggested that this criteria consider a broad array of values (e.g., forests, water, biodiversity, fisheries). In addition, participants pointed out the difficulty of ranking geographical areas in three steps (high, medium, low) for the second criterion because it is truly a continuum. Nevertheless, the team acknowledges this flaw but would argue that such concerns could be leveled against other criteria as well. In addition, the team lacks the quantitative or even qualitative data that would be required to develop numerical scores for each criterion.

The third criterion reflects national political support (local political support is subsumed under the fourth criterion) for addressing ridge-to-reef problems. This criterion, recommended by many workshop participants is somewhat similar to the first criterion. In meetings with national counterparts and workshop discussions, there appears to be strong political support for tourism and concern about protecting the resource base of Negril, Montego Bay, and Ocho Rios.

The fourth criterion is included although the level of community and stakeholder support was difficult to assess during the few meetings the team conducted at each site. However, as suggested in the previous section, USAID should be able to better gauge the level of support during the proposal stage.

The fifth criterion is considered essential to the program's success, but also the most troublesome to assess, *ex ante*. NGOs do not develop management capabilities unless there is a requirement for such capabilities, so the strengths of NGOs must be assessed in terms of their effectiveness in carrying out their mission, whatever that mission may be. However, if NGOs do not have this capability, there must be some potential for developing this capability among existing staff or recruiting from outside the NGO, either in Jamaica or overseas. In effect, the potential to recruit is a problem NGOs in all areas would likely face. In addition, NGOs may be one of a few organizations that could play a role in implementing a ridge-to-reef management program.

The sixth criterion acknowledges USAID's mandate to assist partner governments in achieving tangible results. Throughout our meetings and field visits, stakeholders, counterparts, and NGOs were critical of the frequent lack of success associated with donor programs. Many indicated that donor projects had resulted mostly in studies or plans, unless, as noted earlier, success was purchased with free goods or grants. Several concerns about this criterion were raised at the USAID workshop. There was a concern that an area with less severe problems might have an easier time achieving success and vice versa. Thus, the second and sixth criteria would effectively cancel out each other. A second concern related to the appropriate time frame for measuring success and the tendency to focus on short-term successes. The modification of the criterion from the draft report to emphasize sustainable successes emphasizes the longer time frame implied by the criterion. Another issue was the need to elaborate measures of success, such as incomes generated from environmentally-sustainable activities or improved coastal water quality. The team did not have adequate time to make a more rigorous assessment of the potential for success. Ratings of the areas for this criterion considered the types of policies that might be

needed and the likely level of community support and availability of implementing organizations to address the identified problems.

For the first six criteria, more is better than less. For the seventh criterion, the level of donor or lender activity could be viewed either as a plus or minus, depending on whether the type of assistance currently provided would complement (plus) or overlap with or duplicate (minus) the proposed program. As discussed later in **Section 4.9**, the assessment team observed a high level of cooperation among the donors and lenders, combined with open channels of communication. Given donors' limited resources and a perceived desire to leverage those resources, the team believes it is unlikely that donors' projects will duplicate existing efforts. Thus, the seventh criteria focuses on the positive contribution of other donors and lenders.

The assessment team considered six sites for ridge-to-reef activities (Montego Bay, Black River, Cockpit Country, St. Ann Watershed, Port Antonio, and Negril) during its first set of site visits. Although the Cockpit Country was initially viewed as a separate site, it appears that this area is an integral part of several watersheds, including those for Black River and Montego Bay. Consistent with the ridge-to-reef approach, the Cockpit Country would need to be included in the delineated management areas of Black River and Montego Bay, necessitating a greater level of cooperation and coordination between the Maroons and the NGOs and CBOs in the management areas. Nevertheless, the Cockpit Country was evaluated as a separate management area by the team.

For the draft report, the team considered Port Antonio watershed as one of the candidate management areas. Team members and USAID conducted follow-up meetings in Port Antonio on September 3. During these meetings, the team learned that the proposed Port Antonio Marine Park was downstream of six watersheds. The Port Antonio Watershed referred only to the small river entering Port Antonio Harbor. Thus, a ridge-to-reef activity for Port Antonio would require activities over several discreet watersheds, diminishing its value as a manageable demonstration site. As a result of discussions with participants in the meeting in Port Antonio, it was decided to substitute the Rio Grande watershed for Port Antonio.

In **Table 4.3**, the assessment team's preliminary analysis of the six geographical areas in terms of the six criteria enumerated above are provided. A simple system of rating each area as high, medium, or low was utilized. In the table, "na" indicates that a criterion was not applicable. The team has ranked the five sites (Cockpit Country excluded) as follows:

1. Montego Bay/Cockpit Country
2. Black River/Cockpit Country
3. Rio Grande watershed
4. St. Ann watershed
5. Negril Area Environmental Protection Area

It should be noted that the assessment team considers all of these sites suitable for USAID support. The team rates Montego Bay and Black River significantly higher than the remaining three sites. After the team had made its preliminary evaluation, the two highest ranked sites were

endorsed by the top two officials at NRCA. Of the remaining three sites, St Ann and Port Antonio were rated about equal and Negril slightly lower. A brief discussion of each site and the Cockpit Country is provided below.

Table 4.3 Evaluation of Geographical Areas

Areas Visited	Montego Bay			Black River			Cockpit Co.			Rio Grande			St. Ann			Negril		
Criteria	H	M	L	H	M	L	H	M	L	H	M	L	H	M	L	H	M	L
Importance of Nat.Res.																		
Reef	x					x			na	x			x			x		
Coastal	x			x					na	x			x			x		
Lowland			x	x					na		x				x	x		
Ridge		na			na		x				x			x			x	
Problems																		
Reef	x				x				na	x			x			x		
Coastal	x			x					na	x			x				x	
Lowland	x			x					na		x			x			x	
Ridge		na			na		x				x		x				x	
Political Support	x					x		x			x		x			x		
Community Support		x		x					x	x				x		x		
Mobilize Implementors	x				x				x	x				x		x		
Achieve on-ground results	x			x			x				x			x			x	
Level of Donor Assistance	x				x				x	x					x	x		

Montego Bay is the most important tourism site in Jamaica, with an extensive internationally-recognized reef, a large number of beaches, and well-developed tourism infrastructure including an international airport. Much of the tourism industry on the north coast depends on Montego Bay. For example, many of the tourists who raft on the Martha Brae River plan these excursions in conjunction with their stay in Montego Bay. The large population, with a substantial number of unplanned and informal settlements, results in serious water pollution. Although a new wastewater treatment plant has been built and will soon be operational, only a small proportion of residents (estimated to be 10%) and businesses will be connected to the new system. Lack of planning, high costs of extending sewers into the foothills above the city, and inadequate financing for connections are barriers to more effective management of wastewater. As noted in **Chapter 2**, high coliform counts are observed in the Montego River. The river and various gullies also deliver high nutrient loads to Montego Bay.

Because of the importance of Montego Bay as a hub of tourism activities on the north coast and the potential threat to this economic base from pollution, it enjoys strong political support at the national level. The team rated community support as medium in Montego Bay even

though they had very little time during the first field visit to meet with community leaders and a follow-up visit conflicted with market day. The ranking is based on discussions with local NGOs and national counterparts and will need to be reevaluated by USAID as the ridge-to-reef program develops. The Montego Bay Marine Park Trust is one of five environmental NGOs in Jamaica with management capabilities. The Trust has recently hired a communications specialist, which should enable it to expand its ties to the community. Like all NGOs, fund-raising is a high priority for the Trust. The team sees a potential role for the Trust in helping to facilitate a ridge-to-reef management program, but not necessarily as an implementor, given its current management responsibilities for the marine park. Montego Bay has received considerable donor support, including funds to build the new wastewater treatment plant. USAID is supporting the Trust through its DEMO project, and CRDC has implemented a successful program to improve management of residential wastewater in scattered settlements.

The team perceives there is a high potential for implementing a successful management program in Montego Bay because of the primary importance of the wastewater problem, recognized throughout the community as the key factor impacting the economic future of Montego Bay. If USAID selects Montego Bay, there is potential synergy between the new project and CWIP.

Black River does not have the sun and surf tourism base of most of the other areas, but has a growing tourism industry based on the Black River's wildlife. The community is very keen on attracting different kinds of tourists interested in nature excursions (birding and the like) and on culture-oriented tourism. Large all-inclusive hotels are discouraged, while bed-and-breakfast kinds of lodging infrastructure are encouraged. In addition, the wetlands are important to the freshwater shrimp industry and as nursery areas for fish and shellfish. The major threats to the resource base are agricultural run-off and pollution from sugar cane operations. In addition, boat traffic on the Black River has impacts on the shrimp industry, riverbanks, and mangroves.

Black River does not receive the national attention accorded tourist destinations on the north coast. While there appears to be strong community support in Black River, the major NGO, St. Elizabeth Environmental Protection Association, does not currently have a full-time staff, relying on volunteers to carry out their programs. For the Association to play a role in a management program, professional staff would need to be recruited. Black River has less potential for sustained financing for NGO activities, relative to the richer tourism communities on the north coast, and user fees related to tourism activities would appear to be the major option.

USAID's DEMO project has already been active in Black River, working with the Safari boat operations and preparing ecological maps of the watershed. This latter activity serves as a useful starting point for a management program. The potential for success in Black River is rated high, in part because there are a limited number of problems. If the dunder problems can be addressed, significant improvements in water quality are envisioned.

Other than Blue and John Crow Mountain National Park, the **Cockpit Country** is considered one of the most important and fragile ecological areas in Jamaica, with largely undocumented economic values. Its largely undisturbed forests and limestone soils produce a

significant portion of potable water in several watersheds. Because of its vast forests and untapped mineral resources, the potential threats to its environmental values are an important consideration in including the Cockpit Country in Montego Bay and/or Black River management programs.

The commitment at the national level to protection of the Cockpit Country's biodiversity and environmental values is tempered by the potential economic value of bauxite reserves. The Cockpit Country, although one of the major centers of the Maroons, is not perceived to have well-organized community support for sustainable management programs. There is no environmental NGO, although NGOs in Trelawny Parish are active in portions of the area. The Cockpit Country has not received much donor support. The Global Environment Facility has proposed a project, but the major stumbling block is the absence of a local implementing organization.

The **Rio Grande watershed** was one of the top ranked watersheds in the CIDA study, providing two-thirds of potable water for Portland Parish. It is an important area for tourism and agriculture and is also rich in animal and plant biodiversity. The reefs downstream of the river's mouth are among the most important in Jamaica. Poor farming practices, deforestation, high erosion rates, and human and animal waste problems pose threats to the resources of the watershed.

The team ranked Rio Grande as medium in terms of national political support, largely because it does not have the tourism base of other north coast areas. However, there has been considerable concern about the problems of flooding and the contribution that deforestation and poor land use practices have on potential for flooding. Local community support appears to be very strong. In the team's second trip to Port Antonio, more than 30 people, representing a variety of local government and stakeholder interests, participated in two meetings. The team perceived that concern for the watersheds is broad-based and that the community supports efforts to address their problems.

PEPA is one of the most capable environmental NGOs in Jamaica and would be expected to play an important role in the development and implementation of a management program. Port Antonio and Portland Parish have received donor support, mostly focused on the Blue and John Crow National Park and Rio Grande River, with planned activities in the Pencar/Buff Bay Watershed. In addition, USAID's DEMO project is supporting PEPA's activities.

The **St. Ann watershed** is one of the largest management units in Jamaica and includes several river basins which could be managed as ridge-to-reef areas. Its reefs and beaches are of critical importance to the tourism industry in Ocho Rios, Runaway Bay, and St. Ann Bay. Discovery Bay is an important research site for the University of West Indies, and Dunn's River Falls is the leading tourist attraction in Jamaica. There are significant problems throughout the watershed, particularly in the ridge areas (deforestation and agricultural practices) and coastal areas due to human settlements and the absence of adequate wastewater treatment.

Like Montego Bay and Negril, St. Ann, and particularly Ocho Rios, receives strong political support at the national level. In terms of community support, strength of NGOs, and potential for achieving results, the team rated St. Ann as medium. There are two environmental NGOs (St. Ann Environmental Protection Association and Friends of the Sea) which could play a role in facilitating a management program. A comprehensive management program covering the entire Rio Bueno/White River Management Area is perceived to be too large an undertaking. Instead, specific bays or water basins within the larger watershed should be considered for ridge-to-reef management programs. To date, St. Ann has received little donor support with the exception of capital for the new wastewater treatment plant in Ocho Rios. In addition, the team heard that the DEMO project has plans for an activity related to Dunn's River Falls.

Negril has a large tourism-based economy centered on the beaches, offshore reefs, and cliffs to the south of the town. The reefs are critical to the long stretch of sandy beaches but are threatened by nutrients, overfishing, and user impacts. Wastewater discharges from the poorly functioning UDC plant, direct nutrient discharges from hotels and residential areas, and nutrients and chemicals associated with agriculture in the lowlands and ridges contribute to the problems of the reefs.

As noted earlier, as one of Jamaica's top tourist attractions, it receives strong political national support. From the team's observations, community support in Negril is high. The two NGOs (NEPT and NCRPS) have developed management capabilities and appear to have excellent working relationships with local government and CBOs. Negril has developed an environmental management plan and its watershed has been designated as an environmental protection area, with management authority devolved to NEPT. Negril has been the recipient of considerable donor support through USAID (DEMO, CWIP, and EAST) and the EU in particular.

All these factors would seem to lead to a high ranking for Negril as a site for a management program. However, the team's view is that the watershed is plagued by fewer problems than in other areas visited. Also, Negril is already far along in implementing a ridge-to-reef program. As a result, it will be important for NEPT to share its experiences with other programs. It is also recommended that USAID target some interventions in Negril to demonstrate their potential to other programs and focus some of its proposed ridge-to-reef technical assistance and training programs in Negril.

Other Sites The six areas visited by the team are but a small fraction of the sites in Jamaica in need of attention. A common thread of all the six sites is the current or potential importance of tourism based on the area's natural resources. Other areas of Jamaica could be as suitable as these areas for management programs from both an economic and environmental perspective, although the resources of note are more likely potable water, fisheries, forestry and agriculture, rather than tourism. In the assessment team's discussions with watershed experts, other potential sites were suggested. These included:

- Rio Cobre Watershed, suggested by Prof. Franklin McDonald. He noted its importance to the water supply for Spanish Town and Kingston.

- Hope River Watershed, suggested by both Prof. Franklin McDonald and Dr. Edward Farnworth). Like Rio Cobre, the Hope River Watershed's primary importance is its contribution to the Kingston water supply. Along with the Great River, the Hope River has been a centerpiece of discussions about a new watershed project between the Inter-American Development Bank and the GOJ.

- Rio Minho Watershed, suggested by Dr. Ann Sutton. She noted its importance because of its natural forests, mangroves, fisheries, and its potential to provide potable water.

In addition to these three areas, the Rio Grande Watershed in the Portland Parish and east of Port Antonio, has received much attention because of floods last January and has been recommended as a pilot project by the Planning, Environment, Infrastructure and Development Sub-Committee for the Integrated Watershed Management Program.

4.6.3 Supporting Activities

The primary mechanism for achieving improvements in water quality and in protecting natural resources will be the interventions incorporated into action plans prepared for each management area. While these interventions will be developed by the NGOs and communities, the USAID contractor can play a role in helping communities to identify and evaluate options. In Table 4.4, illustrative examples of potential interventions are provided for each of the four ridge-to-reef zones (ridge, lowland, coast, and reef). A more detailed description of these interventions is provided in Annex D.

Table 4.4 A Gallery of Ridge-to-Reef Interventions

Causes	Proposed Activity	Description
RIDGE		
Deforestation - Coffee - Slash & burn - logging: timber and charcoal **Fertilizer and pesticides** - Coffee and other crops	**1. New and Improved Production Techniques**	Introduction of improved methods of production including increased efficiency in charcoal making, improved management of chemicals through organic farming, composting, and integrated pest management, integration of trees into the farm landscape through agroforestry, introduction of improved soil conservation methods
	2. Microenterprise Development	Create improved incentives, develop financing mechanisms to support micrenterprises such as private tree nurseries, legal charcoal making, bee keeping, bat guano mining, perfume and essential oils, and nature tourism
	3. Develop Forestry and Agriculture on Idled Lands	Identify lands in watershed which have been forfeited to the Crown, develop economic plans for these lands which encourage participation of Jamaica's youth
	4. Alternatives to Enforcement	Given the limitations of present enforcement efforts, develop cooperative approaches involving community participation, non-monetary sanctions, and education
LOWLANDS	1 to 4 above	
Agriculture - Fertilizer, pesticides (sugar cane, papaya, bananas, coconuts) - Animal wastes **Industry** - Mining - Effluent (dunder) - Caustic soda **Human settlements** - Squatters - Unplanned settlements (garbage, soakaways)	**5. Animal wastes for fertilizer and energy**	Identify low technology options that can be applied at the small-scale of many Jamaica farms for utilizing animal wastes for fertilizer and energy production
	6. Improved mining restoration	Current practices can be improved to sustain vegetation other than grass, encourage community/mining company cooperation on identifying improved restoration and uses of restored lands which benefits local populations
	7. Treatment of Industrial Effluent and environmental audits	Apply EAST environmental audits to industrial and commercial operations. Action plans should identify pollution sources and prioritize these facilities for audits
	8. Improved Waste and Wastewater Management for Communities	Adapt CRDC low technology sanitation programs, develop financing programs, examine solid waste recycling, reuse, composting options
COASTAL	2 - 5, 7 and 8 above	
Solid waste, draining wetlands, mangrove harvest, wastewater, sand mining	**9. Wetland/mangrove protection**	Evaluate relocation options and land use practices to restore wetlands and mangroves, develop alternative fuelwood and charcoal sources to reduce pressure on mangroves.
REEF	4 - 5, 8 to 9 above	
Over fishing	**10. Fisheries Management** **11. Alternative Fisher Opportunities**	Develop fisheries management plans to limit fishing effort and restore fish stocks Identify and evaluate alternative livelihoods for fishers such as mariculture, Irish moss, aquaculture, ecotourism

4.7 TECHNICAL ASSISTANCE AND SPECIAL STUDIES

A number of discrete activities are proposed that would complement the management programs. These activities have been grouped into three areas: technical assistance, training, and special studies.

4.7.1 Technical Assistance

Economic and financial analysis. Given the several sample activities briefly discussed above, a common TA denominator for the *ridge-to-reef* activity would be to ensure that all interventions proposed make financial and economic sense from the perspectives of individuals and their communities. For example, promoting improved charcoal making should be based on the knowledge that such an activity will increase incomes for the participating charcoal makers. Likewise, promoting investments or participation in tourism ventures such as developing ecotourism tour attractions and packages must be based on analysis of the tourism market and the needed investment. The kinds of analyses carried out on alternative livelihood opportunities for Negril fisher families (Christophersen et al 1997) are envisioned for all of the discrete activities discussed above. The first and highest priority is to determine whether a proposed activity intended to benefit a certain target group is, in fact, a financially interesting proposition from the group's perspective. This depends on the markets for the products, prices and costs, and the opportunity costs of foregone activities or land uses. Once the activity's financial feasibility has been demonstrated, the next step would be to estimate the economic feasibility of the activity in the aggregate, assuming certain target participation rates over time. With proper baseline information, it will also be possible to correlate participation in the proposed schemes with the corresponding reduction in environmental degradation.

Similarly, financial and economic feasibility of different activities can and should be compared to ecologically optimal schemes. The logic is simple, certain target groups of people contribute to environmental degradation through their deforestation activities and/or excessive application of chemical fertilizers and pesticides. Analysis must provide a convincing case that there are alternatives which increase incomes and reduce pollution simultaneously — a win-win situation. An example is improved charcoal making. If the current method is inefficient, more land will be cleared of vegetation in order to produce a certain volume of charcoal than would be needed if improved techniques were introduced. More charcoal could then be produced from the same volume of wood input. The pressure on the land resources will be lower (the environmental benefit) and charcoal makers would increase their incomes (the economic benefit). These are desired outcomes, indeed, although not necessarily ecologically optimal. More often than not, the ecologically-optimal solution is unattainable in practice since the demand for charcoal, chemical fertilizers or pesticides cannot be eliminated, only reduced.

Marketing Closely related to the need for economic and financial analysis of different activities is the need for a strong awareness and knowledge of markets for the products. For example, Jamaica enjoys a strong market for Blue Mountain Coffee but little is known yet about

the potential for so-called “niche” markets, such as coffee guaranteed to be grown organically under extreme care and supervision, aiming for the highest quality possible. This is not unlike the quality reputation built up by many French vineyards who capitalize on the high quality of their wines through price differentiation in premium markets. One coffee producer—Old Tavern Coffee Estate—in the Blue Mountains is doing just that. He managed (with much difficulty) to obtain a license to export coffee separately from the Coffee Board apparatus in order to be free to promote his special brand of Blue Mountain coffee to a select clientele. The result is that he is currently selling all the coffee he can produce for premium prices. Nearly all of his production is organically grown, all bushing is done manually (no paraquat is applied), and pesticides are applied only on individual plants as needed. The result is that his impact on the environment is negligible, or even positive, unlike neighboring coffee producers who follow the practices mandated by the Coffee Board.

Technical assistance in identifying the most promising markets for the different products is key. Producing charcoal from bamboo, for example, should only be done on the basis of firm contacts and contracts established with purchasers in Jamaica and/or importers in the US or elsewhere spelling out volumes and qualities, prices and delivery schedules. The same applies to the production of perfume essence and other essential oils. Investments in infrastructure for new nature tourism attractions should be made only on the basis of having identified the markets—day trips from the all-inclusive hotels, from the cruise ships, or others. The markets for the different products should be identified and negotiations underway before the investments are made.

Farmer visitation to selected sites in Jamaica, elsewhere in the Caribbean, and other countries Technical assistance in identifying destinations, and arranging and planning for visitation by Jamaican participants to sites where success has been achieved merits consideration for the *ridge-to-reef* activity. The most effective selling point for any activities promoted among target groups is for the participants to meet and talk with individuals or groups who have already succeeded with the proposed activities. Visits might be arranged elsewhere in Jamaica, in other Caribbean countries, or in countries outside the Caribbean. Appropriate TA should be available to the participants throughout the project period following the initial visitation to facilitate the availability of credit, establish firm market contacts and contracts, and for other purposes as needed.

NGO revenue-generating modalities Technical assistance should be made available to the participating NGOs and CBOs in revenue-generating techniques, including consideration of revenue-sharing from startup businesses such as bamboo charcoal, tree nurseries, essential oils, and the like. This area is of particular concern to USAID/Jamaica as the environmental NGOs have had limited success in generating revenue from sources other than donors and special purpose funds such as EFJ. None of the NGOs are financially self-sufficient, and none have instituted long-term programs to raise revenues to cover core funding. Revenue generation must be prioritized by both the donor and the NGOs.

4.7.2 Training

The inclusion of a major training component in the *ridge-to-reef* activity would target selected NGO, CBO and GOJ personnel as well as stakeholders in the watershed. To ensure sustainability, any short-term training should be carried out in collaboration with Jamaican training institutions to institutionalize the short courses in a Jamaican context. A tailored short course offered once or twice to a specific audience has limited value—it is always preferable to co-develop and teach short courses with faculty from established training institutions to ensure that similar courses will be available in the future.

It is important, however, for the *ridge-to-reef* activity to carry out a training needs assessment as early as possible including identification of topics, target audiences, and venues. Recommended topics for training are briefly highlighted below. In addition, other areas of training might be considered in the future including: a) training-of-trainers (TOT) in environmental awareness techniques, b) monitoring techniques, c) conflict resolution, and d) technical topics such as nursery techniques, agroforestry systems, and improved charcoal making.

Economic and financial analysis A focus on economic and financial analysis of field activities is very much absent from USAID/Jamaica's SO2 portfolio and from any other donor-funded activities in the natural resource management arena, as well as within GOJ institutions such as NRCA. Intensive short-term training in economics in the context of the activities to be undertaken is essential. The short-term training sessions should focus on introducing rigorous economic reasoning into the decision-making process. The objectives should be to define the conditions under which proposed livelihood opportunities are financially and economically feasible from the perspectives of individual stakeholders and the country as a whole, and to foster an understanding of and appreciation for the importance of economics as an integral part of the decision-making process in NRM.

Business management, marketing, and accounting Success in launching and maintaining any micro-enterprise (see above) is largely a function of acquiring solid skills in business management, marketing, and accounting. The enterprises must be profitable if they are to survive. All training in economic and financial feasibility carried out under the auspices of the *ridge-to-reef* activity, therefore, should be complemented with basic training in marketing, management, and basic accounting tailored to the specific interventions proposed.

4.7.3 Special Studies

The team identified a number of topics for special studies during discussions with counterparts and stakeholders. Some of these are summarized below. All proposed studies should be carried out in the context of supporting improved management of ridge-to-reef resources, reducing barriers to effective programs, and improving incentives for environmentally-friendly practices. For each study, a follow-up activity is envisioned to share the results and promote recommendations stemming from these analyses with policy makers, local management program implementors and donors.

Forest revenue generation, wood and non-wood products Forest revenue generation is a topic of considerable importance because of the current wide gap between actual and potential revenues generated in the forestry sector. Potential revenues relate closely to enforcement—effective implementation of current policies and laws.

- **Wood products**. The study should: a) flesh out the investments needed in the forestry sector to strengthen the ability of the forestry wardens to enforce the laws (i.e., infrastructure, transportation, manpower needs), b) incentives needed for the local Forestry Department offices and/or stakeholder communities to be vigilant in their enforcement work, and c) compare the investments needed with the increased revenues collected to determine the economic feasibility of the needed reforms. If economically feasible, the next step should be to ensure that the recommended reforms are placed on the policy agenda for elaboration and adoption by the GOJ. The study should also include a determination of the economics of wood production since revenue projections must necessarily be based on the commercial flow of forest products in the region, between regions, or exported to foreign markets. This must first be based on production and harvesting regimes in accordance with well elaborated management plans (collaboration with the Canadian-funded Trees for Tomorrow Project will be needed). How to properly balance benefits and costs of producing wood are economic issues that need to be resolved through analysis of different technical management alternatives. The study team should, therefore, document the extent to which management of the plantations and natural forests makes economic sense. The results of the analysis will be the foundation on which future revenue projections can be based.

- **Non-wood products**. One of the possible micro-enterprises discussed above was the extraction of perfume base and other essential oils from flowering trees growing wild in Jamaica's forests. A special study to identify the species and possible essential oils, perfume bases, medicinal plants, etc. and their market potential, is proposed. Jamaica's forests are richly endowed with forest-related products such as floral greens, mushrooms, medicinal plants and other forest-related non-wood products. Lack of market information limits the commercial potential of such products as important potential contributors to the sustainable economic development of the region. Market studies for such products should, therefore, be of high priority to assist in the development of small rural farm enterprises. The study should include an evaluation of the potential contribution to local community/economic development. Specific issues to be addressed will include the potential for job creation and the potential earnings of individuals employed in different aspects of this sector of the local economy. In addition, the potential long-term contribution of the special forest products industry to community development should be assessed.

Economic values of areas in exploited vs. preserved state The economic values of certain environmentally fragile areas, such as the Cockpit Country have not been adequately documented. Should this area be exploited for its bauxite potential and/or other minerals, or should it be preserved to protect the high flora and fauna endemism in the area and the water quality in downstream in the watershed? More often than not, the former option prevails because minerals extraction is associated with identifiable costs and benefits, employment generation can

be estimated, as can foreign exchange earnings. In addition, the negative impacts of mining are not valued, except to the extent that restoration costs are factored into private profits. Preserving the area, however, only provides widely dispersed benefits, not as easily identified or measured and often distributed over long time periods. To better inform policy makers, the value of the Cockpit Country in producing potable water, providing a site for recreation, and contributing unpolluted water to coastal areas, thereby helping to sustain coastal tourism must be estimated and compared to other options.

Economic analysis of privatization of wastewater treatment plants The assessment team learned on many occasions in many interviews that NWC's control over wastewater treatment in Jamaica is both underfunded and ineffective. First, the NWC is primarily focused on water supplies; wastewater treatment was only recently added to their portfolio of responsibilities, albeit with limited funding. This raises question about NWC's ability to maintain and operate the new treatment facilities (now installed in Negril, Montego Bay and Ocho Rios, for example). Second, NWC's operating mode is to relinquish as little control as possible. It is the opinion of some NWC staff interviewed, for example, that the public sector would be able to manage wastewater treatment as efficiently as the private sector if adequate funding were available. The team's view of this opinion is exactly the opposite—the public sector, particularly with the existing centralized approach to management, does not have a profit motive and thus, has little incentive to recover costs and encourage hook-ups to the new sewage treatment systems in order to generate needed revenues. A special study is recommended to identify and assess the conditions under which the NWC might divest management and operations responsibilities for the wastewater treatment facilities, while retaining regulatory oversight powers. This study could be undertaken in collaboration with or solely by CWIP.

Commodity boards: environmental and economic impacts The production of major export earning crops such as coffee, bananas, papayas, and coconut oils is subject to commodity boards—if production is destined for the export market, all producers must abide by the board's rules and regulations. When the dictates of the commodity boards to ensure the highest possible yields through the use of chemical fertilizers and pesticides are inextricably linked to environmental degradation of the watersheds (as has been discussed in greater detail elsewhere in this assessment), it is incumbent upon the GOJ to fully understand the implications. To this end, a special study is recommended to determine the environmental and economic impacts of select commodity boards and to identify alternative models of marketing Jamaica's specialty crops. It was strongly recommended by all individuals interviewed that growers need flexibility to adopt less environmentally degrading growing techniques, some of which could also increase incomes.

Nature tourism The potential for nature tourism in Jamaica has been the subject of much recent discussion at USAID, the NGOs, and elsewhere, but has not benefited from rigorous analysis. This recommended special study will carry out such analysis on two or three example sites in the target areas with emphasis on evaluating: a) the physical and historical tourism attractions of the areas, and b) the economic and financial feasibility of creating and maintaining nature tourism infrastructure as an alternative to commercial (timber, minerals, etc.) exploitation of the areas, and/or as a micro-enterprise. The initial phase of the data collection would focus on the resource base perceived to have nature tourism potential (sites recommended for nature

tourism infrastructure developments and surrounding attractions). The discussion should include physical descriptions of the attractions, tourist activities envisioned, and the estimated tourist carrying capacity per year. This should be followed by a breakdown of the tourist dollar in order to determine how much is likely to be spent at the tourist sites. The total magnitude of these expenditures comprises the upper limit of the pool of money available for recurrent cost funding needed to ensure the sustainable integrity of the tourist attraction. In a broad sense, tourist money that remains in the country and at the site(s) are the direct economic benefits of tourism. The study should also estimate the tourism carrying capacity per site and calibrate the investments accordingly. The study should address the investment requirements in both the public and private sectors. Private entrepreneurs will be expected to invest in revenue-generating infrastructure and activities such as lodges, the provision of local guides, porters, vehicles for the tourists, and training for guides and lodge workers. The public sector will be expected to make appropriate investments in interpretation or education centers, transportation, training of wardens/rangers, training for the local population, and maintain the tourist trails and observation posts, etc. Finally, the study should, based on the analysis, estimate the contribution of nature tourism to the economic welfare of local communities and make judgments with respect to the adequacy of such contributions as incentives to preserve wildlife habitats and the current tourist attractions in the region.

Costs of addressing point and non-point sources of pollution Several of the solutions proposed for support under the *ridge-to-reef* project are linked to income generation activities—those that foster changed behavior with the desirable side effect of generating higher incomes and profits. Energy-saving solutions such as improved charcoal-making and the like are prime examples. Not all solutions for point and non-point sources of pollution result in higher revenues, but involve net costs. These latter options are equally important, provided their adoption yields positive net social benefits and should be identified and documented in detail in a special study.

Alternative economic land uses In response to subsidized beet sugar production in Europe and the US, Jamaica faces a gradual decline in sugar cane production in the future. Over the next several years, prime farm land will, therefore, become increasingly available for other crops. Alternative crops need to be identified in a special study, including a strong focus on how these crops can be grown, effectively marketed to whom, in which volumes, in which qualities, and for which farm gate prices.

4.8 RELATIONSHIP OF PROPOSED ACTIVITIES TO USAID'S STRATEGY FOR JAMAICA

4.8.1 Promotion of SO 2

The proposed management program, suggested interventions, and supporting technical assistance, training, and special studies are all designed to promote USAID's SO 2. The SO 2 Results Framework is structured as a hierarchy of intermediate results which contribute to the achievement of the SO. The intermediate results (IRs) have been developed in recognition of the difficulty of measuring progress in achieving the SO. Generally, it is much easier to identify and evaluate performance indicators for the IRs than for the overall SO. The SO 2 Results Framework is depicted in **Figure 4.1**.

Most of the proposed ridge-to-reef activities have the potential to promote SO 2 and specific IRs. In matching activities to existing IRs, the assessment team identified a group of activities which were not sufficiently matched to IRs. These activities involve new land use practices to replace current practices or the substitution of existing livelihoods with alternatives. In both cases, the goal is to mitigate environmentally-damaging practices, either by substituting an environmentally-friendly practice or by providing an alternative livelihood that discourages harmful activities such as illegal tree cutting. The team proposes a new IR under IR 1:

IR 1.3 *Environmentally destructive practices replaced by alternative economic activities*

The major proposed set of activities is the ridge-to-reef management programs. These programs would directly promote SO 2 and would also promote several IRs. Under SO 2, the performance indicators for the management programs that could be used to evaluate success would be the indicators each program would establish during the initial year. These might include indicators of pollution levels (e.g., fecal coliform counts, nitrate levels), changes in land use (e.g., number of acres replanted), or resource quality (e.g., condition of the coral reefs). Because changes in these indicators might be small in the first year or two, greater emphasis might be placed on achieving intermediate results. For example, the introduction of environmentally sound practices by a few landowners (IR 1) might not result in immediate improvements in water quality, but would represent a step in the right direction.

In **Table 4.5**, the activities described in **Sections 4.5 and 4.6** are matched with SO2 and the IRs (including the proposed IR 1.3). Indicators are not provided for special studies because the result also depends on the outcome of discussions with policy makers.

Figure 4.1

Table 4.5 Results and Indicators for Proposed Activities

ACTIVITY	RESULT(S)	PERFORMANCE INDICATOR(S)
MANAGEMENT PROGRAMS	SO 2	Water quality improvement (coliform counts, nutrient levels), reduced deforestation rates, acreage reforested, condition of reefs
MANAGEMENT PROGRAM INTERVENTIONS		
New and Improved Production Techniques	IR 1	% farmers engaged in agroforestry, % charcoal burners applying improved techniques
Microenterprise Development	IR 1.3	Number of new enterprises, jobs created
Idled Land Development	IR 1, IR 1.3	Acres of lands utilized in environmentally-friendly activities, number of youth employed
Alternatives to Enforcement	IR 2, IR 2.1	Level of illegal activity, number of violators engaged in alternative legal activities
Animal Wastes for Fertilizer and Energy	IR 1, IR 1.3	Amount of inorganic fertilizer saved, amount of energy/income generated
Improved Mining Restoration	SO 2, IR 2	Acres restored, with more productive land uses
Treatment of Industrial Effluents and Environmental Audits	SO 2, IR 2, IR 3	Reduced industrial pollution loadings, amount of water and energy conserved, number of facilities undertaking audits
Improved Waste and Wastewater Management for Communities	SO 2, IR 2, IR 3	Number of households with improved treatment
Wetland/Mangrove Protection	SO 2, IR 1	Acres of mangroves restored
Fisheries Management	SO 2, IR 1	Value of sustained catch
Alternative Fisher Opportunities	IR 1, IR 1.3	Number of fishers pursuing alternative activities
TECHNICAL ASSISTANCE		
Economic and Financial Analysis	IR 1, IR 1.3	Number of businesses, landowners benefiting
Marketing	IR 1, IR 1.3	Number of farmers switching to alternative crops
Agricultural Demonstration Visits	IR 1	Number of farmers participating, number of farmers adopting alternative methods
NGO Revenue-Generating Modalities	IR 1.1	Number of NGOs receiving training, revenue generated through sustainable sources
TRAINING		
Economic and Financial Analysis	IR 1, IR 1.3	Number of businesses, landowners participating
Business Management, Marketing, and Accounting	IR 1, IR 1.1, IR 1.3	Number of businesses, NGOs participating
SPECIAL STUDIES		
Forest Revenue Generation	IR 1	
Economic Valuation of Natural Area	SO 2, IR 2.1.1	
Economic Analysis of WWTP Privatization	IR 3, IR 3.1	
Nature Tourism	IR 1.3	
Costs of Pollution	IR 1, IR 2	
Alternative Economic Land Uses	IR 1	
Environmental and Economic Impacts of Commodity Boards	IR 1	

4.8.2 Linkages to SO 1 and SO 3

The proposed activities are expected to close linkages to USAID's other two strategic objectives: *Increased Participation for Economic Growth* (SO 1); and *Young Jamaicans Better Equipped for the 21st Century* (SO 3).

SO 1 Linkages While the ultimate goal of proposed activities focuses on improved quality of the environment and natural resources, the overall program embodies a distinctly economic orientation. The team acknowledges the importance of economic self-interest of landowners, businesses, and households and has proposed activities to try to capitalize on that self-interest. Thus, management programs and several of the suggested interventions could contribute positively to employment growth and the development of micro-enterprises. To be effective, many of the interventions will necessitate the development of better access of farmers and other disadvantaged groups to capital markets. In addition, more effective marketing of Jamaican produce in export markets could make an important contribution to economic growth and simultaneously enhance environmental quality.

SO 3 Linkages Young Jamaicans are a particularly important group, whose participation in ridge-to-reef programs is considered essential. As a group, the youth are heavily represented in illegal cutting of the forests and spearfishing. In addition, the average age of farmers is over 50 years old. If agricultural activities are to be promoted and sustained, more young will need to be attracted to the sector, most likely by the prospects for income. Job opportunities for the youth may be enhanced through micro-enterprise development, particularly ecotourism. Programs to transfer or lease lands forfeited to the Crown could also target Jamaica's youth. In addition, the management programs could create opportunities for youth in carrying out community activities, participating in monitoring programs and waste clean-ups, building trails, and restoring damaged gullies.

4.8.3 Relationship to Cross-Cutting Themes

USAID/Jamaica has identified three cross-cutting themes: *(1) use of information technology to facilitate Jamaica's transition into the global economy; (2) community-based, customer-driven approaches for sustained development; and (3) creating public-private partnerships to maximize resource investments*. The proposed ridge-to-reef activities most closely support the second and third cross-cutting themes. The proposed management programs are community-based with heavy involvement required of local stakeholders in the design and implementation of actions. The proposed activities also require participation of local government officials and national departments and agencies, at times in partnership with various stakeholders.

4.9 PROSPECTS FOR COOPERATION AND COORDINATION WITH OTHER DONORS

As noted in the discussion of geographical area selection criteria, the involvement of other donors in providing assistance has been a positive factor in providing adequate levels of resources in specific communities. The assessment team participated in one of the donor/lender environmental committee meetings in Kingston and observed a high degree of professionalism and awareness of the various portfolios among the representatives. In the assessment team's review of donor projects, no examples of duplicative or redundant donor/lender efforts were identified. On the contrary, donors seem keen to cooperate in providing complementary programs, thus leveraging their own resources to a greater extent.

With respect to watershed management, several overlaps within the GOJ are apparent in terms of policy development. This is inevitable, given the spatial coverage of watersheds and their economic importance. The GOJ has tabled a National Land Policy and is in the process of preparing a Watershed Policy. In combination with other natural resource policies, there is a plethora of overlapping management approaches. This can be problematic for donors/lenders in trying to develop programs which complement national policy directions. For example, the management approach for CIDA's Trees for Tomorrow watershed management plan for the Pencar/Buff Bay is primarily focused on the upper portion of the watershed, while our team is recommending a broader-based management approach. Management program support for other watersheds has been the topic of discussions between the GOJ and the Inter-American Development Bank. Their cooperation, assuming it continues and results in an IDB loan to the government, would appear to be concentrated on support for discrete economic activities in a couple of watersheds, rather than on a comprehensive management approach.

The key to effective donor/lender cooperation and coordination of programs would appear to be their involvement in discussions with GOJ counterparts on policy directions and the articulation of optional roles that donor/lender programs might play in demonstrating and promoting the government's natural resource policies. The development of the National Integrated Watershed Management Program appears to be an appropriate forum for developing the direction of USAID, responding to Jamaican priorities and cooperating with other donors to leverage their respective resources cost-effectively.

References

ARD, 1998. *CWIP First Annual Work Plan*. Prepared for the Government of Jamaica's NRCA and USAID, USAID Contract No. 532-C-00-98-00777-00.

ARD, 1998. *CWIP Life of Project Plan*. Prepared for the Government of Jamaica's NRCA and USAID, USAID Contract No. 532-C-00-98-00777-00.

ARD, 1998. *CWIP Performance Monitoring Plan*. Prepared for the Government of Jamaica's NRCA and USAID, USAID Contract No. 532-C-00-98-00777-00.

Booth, Greg, June 1998. *SO2 Trip Report*.

Brown, Michael and Barbara Wyckoff-Baird, 1992. *Designing Integrated Conservation and Development Projects*. USAID Biodiversity Support Program, World Wildlife Fund, Nature Conservancy, and World resources Institute.

Budhlall, Penelope, October 1997. *Report on Workshops to Plan the Jampark System*, Prepared for USAID/Jamaica, DEMO/NRCA.

Canadian International Development Agency, 1997. *Trees for Tomorrow Project, Jamaica*.

Christophersen, Kjell, Floyd Homer, Jacqueline Grant, 1997. *Sustainable Interventions for Negril Fisher Families*. DEMO Project, TSS.

Cunningham, Cleveland and Arthur Limbird, May 1993. *Watershed Selection Study*, Trees for Tomorrow Project, Forestry and Soil Conservation Department and CIDA.

Edwards, David T., 1995. *Small Farmers and the Protection of the Watersheds, the Experience of Jamaica Since the 1950*. UWI Centre for Environment and Development, Occasional Paper Series No. 1.

Environmental Foundation of Jamaica, *Annual Report 1996/97.*

Environmental Health Project, July 1997. *Activity Report No. 35: Evaluation of the Jamaica Urban Environmental Program for On-Site Sanitation.* Environmental Health Division, Office of Health and Nutrition, USAID.

Gaudet, John J., September 1997. *DEMO Project Extension Assassment , Background for Strategic Results Planning in the Demo Project.* Prepared for USAID/Jamaica, TSS.

Goreau, T., 1992. *Coral Reef Health in the Negril area: Survey and Recommendation*. In: Protecting Jamaica's Coral Reefs- Final Report of the Negril Coral Reef Mooring Buoy Workshop and Installation Project, 71-82. Reef Relief and NCRPS.

Government of Jamaica, 1994. *Jamaica National Environmental Action Plan*.

Government of Jamaica, 1996. *Towards a National System of Parks and Protected Areas.* Green Paper #1/95.

Hagler Bailly, Inc., Sept. 1997. *EAST Quarterly Progress Report June 1 1997 -September 31, 1997.* Prepared for USAID/Jamaica and Jamaica Hotel and Tourist Association, Environmental Pollution Prevention Project No. 936-5559, Contract no. PCE-5559-C-00-3021-00.

Hagler Bailly, Inc., March 1998. *EAST Quarterly Progress Report January 1 1998 - March 31, 1998.* Prepared for USAID/Jamaica and Jamaica Hotel and Tourist Association, Environmental Pollution Prevention Project No. 936-5559, Contract no. PCE-5559-C-00-3021-00.

Hillside Agriculture Project, 1997. *Final Report*. Submitted to USAID/Jamaica by Tropical Research and Development Inc., Contract no.: LAG-4200-I-00-3056-00.

Hillside Agriculture Project, February 1997. *Final Evaluation.* Submitted to USAID/Jamaica by Tropical Research and Development Inc., Contract no.: LAG-4200-I-00-3056-00.

Hoots, Thomas A., October 1997. *Financial Sustainability Program: User Fees*. Jamaica National Parks and Protected Areas.

International Institute of Tropical Forestry, 1994. *Towards Sustainable Forest Resource Management in the Caribbean*, Proceedings of the 6th Meeting of Caribbean Foresters at Martinique.

International Institute of Tropical Forestry and USDA, 1995. *Economics of Caribbean Forestry*, Proceedings of the 7th Meeting of Caribbean Foresters at Jamaica.

International Institute of Tropical Forestry and USDA, 1995. *Protected Areas Management.* Proceedings of the 8th Meeting of Caribbean Foresters at Grenada.

Jamaica Tourist Board, Corporate Planning and Research Department, 1996. *Jamaica Annual Travel Statistics*.

Jamaica Tourist Board, 1997. *Monthly Statistical Report July 1997*, Vol. VII, No. 7. Tourist Board.

MSI International, December 1997. *USAID/Jamaica, Development of Environmental Management Organizations, Mid-Term Project Evaluation*. Submitted to USAID/Jamaica.

Negril Area Environmental Protection Trust/Negril Green Island Area Local Planning Authority/Natural Resources Conservation Authority, 1995. *Negril and Green Island Area Environmental Protection Plan*. USAID, DEMO, TSS.

Negril Area Environment Protection Trust and Negril Chapter, Jamaica Hotel and Tourist Association, 1997. *Environmental Code of Conduct for Hotels*. Funded by Environmental Foundation of Jamaica.

NRCA, 1995. *Jamaica National Environmental Action Plan*.

NRCA, 1996. *Report on the Coastal Water Quality in Montego Bay and Other Tourist Areas.*

NRCA, November 1997. *Negril Environmental Protection Plan, Update.*

NRCA, June 1997. *Policy for the National System of Protected Areas.*

NRCA, 1997. *Jamaica, State of the Environment, the 1997 Report.*

NRCA, 1997. *Towards a Beach Policy for Jamaica.* Green Paper No. 2/97.

Planning Institute of Jamaica, 1996. *Economic and Social Survey, Jamaica 1996.*

Scott, Grant, D. Robotham, J. Jones, and C. Pomerleau, July, 1994. *Bencar/Buff Bay Watershed, Socio-Economic Study*. Trees for Tomorrow Project, Forestry and Soil Conservation Department and CIDA.

Simons-Tecsult, May 1998. *Project Implementation Plan: Trees for Tomorrow Project*. Canadian International Development Agency.

Simons-Tecsult, May 1998. *Annex to the Project Implementation Plan: Trees for Tomorrow Project*. Canadian International Development Agency.

South Coast Conservation Foundation, 1996. *Draft Provisional Management Plan for the Portland Bight Sustainable Development Area 1997-2000.* NRCA.

The Planning Institute of Jamaica, 1995. *Economic and Social Survey, Jamaica*. Publications Division of the Planning Institute of Jamaica.

The World Bank, 1993. *Jamaica, Economic Issues for Environmental Management*. World Bank Country Study.

The World Bank, August 1994. *Economywide Policies and the Environment: Emerging Lessons From Experience*. Environment Department, Environmentallt Sustainable Development, The World Bank.

UNDP/Government of Jamaica, 1994. *Negril Development Plan*. Town Planning Dept.

USAID/Jamaica, 1997. *R4: Results, Review, Resource, Request*. FY 1998 - 1999.

USAID/Jamaica. *Strategic Objective 2, Outline of Environmental Programs*.

Williams, I. and N. Polunin, 1997. *Reef Condition and Recovery in the Caribbean*. Workshop on Ecological and Social Impacts in Planning Caribbean Marine Reserves, Montego Bay, Jamaica. University of Newcastle.

WRI, January 1996. *Jamaica Country Development Strategy FY 1997-2001, Environment and Natural resources Management*. Report prepared for USAID/Jamaica.

Annex A
Statement of Work

USAID/JAMAICA

STRATEGIC OBJECTIVE TWO:
Improved Quality of Key Natural Resources in Selected Areas that are both Environmentally and Economically Significant

Assessment of Strategic Program Options

I. BACKGROUND

Jamaica's economic and social well being is inextricably linked to the state of its fragile natural resource base, particularly given the importance of tourism, agriculture and mining. As Jamaica's population and economic activity become increasingly concentrated in coastal and urban areas, the natural habitats and resources in these areas are placed under increasing threats, from deforestation and degradation of upland water sheds to pollution of coastal waters and degradation of the island's coral reefs. USAID/Jamaica's second strategic objective is targeted to address these threats through improving the management of the natural resources upon which sustainable long-term development depends. USAID/Jamaica assistance in the area of environmental management focuses on achieving three targeted results—(1) increased adoption of environmentally sound practices; (2) increased effectiveness of environmental organizations to sustainably manage natural resources; and (3) increased compliance with environmental regulations by resource users.

The decision to focus on these particular results is the outcome of a collaborative process which brought together Mission staff with key development partners and stakeholders, including representatives of the Jamaican Government, local NGOs, and the private sector, to refine SO2's strategic results framework. Through this process, the extended SO2 team modified the strategic objective, reflecting a sharpened focus on improvement of environmental quality, rather than protection of natural resources and reached consensus on the set of results which must be achieved to ensure that the SO is met. The attached framework (including performance indicators and targets) represents that set of results and their causal relationships, as well as the basis for managing the Mission's environmental program for results. The extended team also agreed that SO2 should adopt a "ridge to reef" approach to resource management in recognition of the land based origins of most water quality problems.

Supporting the so2 framework's highest level intermediate results (irs), i.e., those results mentioned above, are a series of lower level results. Toward achieving the complete set of results

which comprise the framework, the mission will support the implementation of a set of results packages, each of which will include the activities, resources (human, material and financial), authorities and associated documentation required to achieve a specified result(s) within the framework.

SO2's existing portfolio includes the Development of Environmental Management Organizations (DEMO) Project, the Environmental Audits for Sustainable Tourism activity and the Coastal Water Quality Improvement Program (CWIP) which began implementation in January 1998. The DEMO Project focuses on strengthening the capabilities of local environmental non-governmental organizations (NGOs) and the national agency charged with the protection of Jamaica's environment and natural resources, the Natural Resources Conservation Authority (NRCA); establishing a viable system of parks and protected areas; and implementing packages of strategic interventions to help specific locations that are environmentally and economically important better coordinate community-based efforts to manage their natural resources. The EAST activity conducts environmental audits among tourism-related enterprises as a means of motivating them to adopt environmentally sound, cost-saving management practices which will have a significant positive impact on the quality of the coastal waters on which the tourism industry depends. CWIP was developed as a results package of activities targeted to strengthen the capabilities of tourism-based communities and selected government agencies to address the key factors which contribute to the degradation of Jamaica's coastal waters.

USAID/Jamaica's Hillside Agriculture Project (HAP) was concluded in 1997 after 10 years of implementation. This project worked with over 10,000 small farmers, promoting the planting and rehabilitation of economically viable crop trees on environmentally fragile hillside plots. HAP was, in many ways, considered a great success. It far exceeded its targeted performance indicators. However, evaluations posed questions about the project's sustainability and whether there should have been more of an emphasis on the marketing HAP crops. The HAP experience can provide valuable lessons learned toward the design of any further hillside/watershed activities.

Given SO2's new results framework and that, both, the DEMO Project and EAST will end in FY 1998, the Mission must now design appropriate results package(s)/activities to ensure achievement of the results and the SO embodied in that framework. The new activities may incorporate, as appropriate, elements of projects that are being phased out, as well as new interventions specifically developed to achieve elements (i.e., planned intermediate results at all levels) of the SO2 framework that are not supported by targeted activities.

II. STATEMENT OF WORK (SOW)

USAID/Jamaica requires assistance in identifying strategic options for achieving the set of results embodied in the SO2 results framework. The contractor will (i) prepare an assessment of strategic program options which identifies recommended activities (including policy reforms) within the scope of the SO2 results framework and explains why and how they were selected and (ii) propose performance indicators. The recommendations of this assessment will provide the Mission with guidance for directing/structuring program activities.

The options to be proposed should complement the activities of CWIP. They may also incorporate, as appropriate, elements of DEMO. Proposed interventions should be guided by a ridge to reef approach. This approach focuses on the management of natural resources of a specific geographic area whose parameters are defined by its upland watershed at one end and its coastal zone at the other, and including the land and water resources between them. The concept addresses the inter-relationships between activities, such as hillside farming and human settlement, which take place in upland watershed areas and their impact on the quality of the environment, especially of water, in the lands and coastal zones which are fed by the watershed. It targets the responsible and sustainable use of the natural resources within the specified region, toward a sustainable quality of life for the majority of people within the region. It emphasizes the need for an integrated approach to address both the technical/scientific and socio-economic aspects of natural resource management.

Given the limited financial resources available to the Mission, the extended SO2 team has decided to concentrate the Mission's environmental activities, and 70 percent of its environmental budget, in two "ridge to reef" areas--tentatively Negril and Port Antonio. The remaining 30 percent of the budget will be available to fund discrete activities which support the SO2 IRs in other geographic areas.

Given the physical and socio-economic peculiarities of each area, it is likely that different packages of activities will have to be developed for each area, customized to address challenges/opportunities specific to each area. As such, the contractor will develop and clearly articulate an objective, standardized process and set of criteria for selecting appropriate activities throughout the life of the strategy. Emphasis will be placed on identifying successful interventions being practiced at the resource user level.

In contributing to the Mission's effort to identify strategic program options and possible activities, the contractor shall consider, and respond to where appropriate, such factors as:

- the Mission's three cross-cutting (i.e., across strategic objectives) themes- --- use of information technology to facilitate Jamaica's transition into the global economy;
  --community-based development, i.e., bottom-up, customer-driven approaches for sustained development; and
  --partner collaboration, i.e., creating dynamic public-private partnerships to maximize resource investments;

- potential for linkages to SO1 (broad-based economic growth through employment generation) and SO3 (population and education);

- policy context and impact of national policies on local communities, focusing on underlying policies which constrain sustainable environmental management; the potential for use of incentives in encouraging voluntary compliance;

- the capacity of national and local agencies/organizations to support/implement recommended activities;

- the impact of sewage treatment systems and other land-based activities on coastal water quality and the coral reef ecosystems;
- potential socio-cultural constraints (including gender issues) to implementation of proposed activities; within a specific socio-cultural context how to best facilitate adoption and compliance;

- opportunities for income generation/ enhancement activities, e.g., eco-tourism, eco-enterprise, in the selected communities (especially as they relate to parks and protected areas);

- opportunities for USAID to co-manage/coordinate activities with other donors (e.g., the EU, IDB)

- flexibility of the results package to respond to changing conditions over the life of the activity that may be needed to achieve the objective of the activity.

Proposed activities should support and be consistent with the Mission's strategic framework, making linkages across the other two strategic objectives--SO1 (increased participation for economic growth) and SO3 (Jamaican youth better equipped for the 21st century) where appropriate.

Specific Tasks:

The specific tasks to be completed by the contractor are described in the following section. While every effort has been made to ensure that this list of tasks is thorough, the team is encouraged to identify other issues that should be addressed and incorporated into the assessment's recommendations.

- Review of relevant documents to gain an understanding of environmental issues and institutional capacity within the Jamaican context, USAID's environmental program and other donor activities that address the environment. Documents should include the Mission's current Strategy Plan and Results Review and Resource Request (R4); SO2's strategic results framework (including performance indicators); the Mission's Environmental Strategy; CWIP, DEMO and EAST project papers; evaluations of the DEMO; the Hillside Agriculture projects; the National Environmental Action Plan; and papers by other donors, such as the World Bank, IDB, the EU, and Canada, working in the area of environment.

- Conduct interviews with USAID and counterpart staff involved in the management/implementation/oversight of key environmental activities (including, but no limited to CWIP, DEMO and HAP). Contacts should include the appropriate representatives of the GOJ (including the Ministry of Housing and

Environment, NRCA, etc.), Jamaica Conservation and Development Trust (JCDT), Montego Bay Marine Park Trust (MBMPT), Portland Environmental Protection Agency (PEPA), contractors; members of the donor working groups on the environment and the sub-group in watershed management; other counterparts, partners, stakeholders which are part of the local community addressing environmental issues.

In addition to conducting individual interviews, early in the assessment process the contractor shall organize and facilitate a "participation forum" to ensure that the concerns/issues of the Mission's development partners and stakeholders, including GOJ agencies, local NGOs and other donors, are incorporated into the strategic options.

- Identify approaches/activities which have been successful (in Jamaica and elsewhere) in achieving results similar to those targeted by SO2, i.e., what's working and why.

- Conduct site visits to key watershed areas and protected areas, including those for Port Antonio and Negril (and others as indicated) to meet with community leaders to discuss issues within the parameters of the proposed program options and their interest in participating in potential activities. The team should avoid raising expectations in the areas visited.

- Identify strategic areas of intervention for specific sites. The contractor will prioritize a series of options for interventions at each site and indicate the anticipated results of these interventions. Interventions should be proposed on the basis of their contribution to achieving the SO2 framework results. Discuss sustainability potential. Identify the institutions, organizations or groups that have a role to play, and whose actions can affect the implementation of the SO2 program.

  Distinguish those interventions that should be funded by USAID from those which will not be funded by USAID, but are essential for success. Describe the assumptions that of how these non-funded actions will actually be done. Take into account the following factors in developing specific activities for the selected sites: level of environmental problems and opportunities, impact on present or potential economic activity, numbers of people involved/affected, degree of community interest and willingness to participate, community capacity, opportunities for training activities, probable complexity (in terms of number of institutions involved), and resources available to the community.

- Assess the broad policy and institutional setting in terms of its conducive effect on the success and sustainability of the activity's benefits; identify and assess specific policies which might constrain, or be used to promote, adoption of

environmentally sound practices at the household/ community levels. Where appropriate, recommend economic tools that can address these policies.

- Assess the technical soundness and feasibility of the activity from relevant perspectives that might include economic, financial, political, socio-cultural issues.

- Assess the principal assumptions and risks associated with the activity and decide how best to monitor and manage those concerns during implementation.

Reports

A detailed format for the Assessment will be provided by the Office of Program and Project Development (OPPD) upon the team's arrival. The Assessment report should be a maximum of 35 pages, with a 3-5 page summary. The contractor will provide 5 copies of the draft Assessment to G/ENV and 15 copies to the Mission for review during their fourth week in Jamaica. The same number of final draft reports will be distributed prior to the Team Leader's departure from Jamaica.

The contractor shall provide a final reproducible master copy of the Assessment to USAID/Jamaica. Twenty copies of the Results Package Paper shall be provided while another copy shall be on three and a quarter inch disk(s) IBM formatted and written in Word Perfect 5.1 for DOS or 5.2 for Windows. All appendices, tables, indices, etc. shall be included in both the paper copies and the disk(s).

III. SCHEDULE

The contractor shall provide to USAID/Jamaica, within 3 days of arriving in Jamaica, a work plan to show how it intends to carry out the tasks. The team will work closely with Mission staff throughout its stay in Jamaica, with the Team Leader liaising at least weekly with the designated USAID/Jamaica employee about progress made and directions being pursued.

At the beginning of third week, the contractor will present an interim briefing to inform the Mission of the nature and preliminary details of the activities being proposed and of any issues that need to be addressed.

At the end of the fourth week, or an agreed-upon date, the contractor will provide 20 copies of the complete draft assessment report for Mission/extended team review. Three days later, the Mission will hold a formal review session, with key members of the extended SO2 team present, to discuss the draft report. The USAID/Jamaica team will provide feedback to and agreement on the report to the COP within three calendar days of the briefing.

Minor revisions to the report arising from this presentation should be made by the contractor within three days of receiving feedback. Major revisions to the paper, if needed, will be made by the COP during his/her last and provisional sixth week in-country.

IV. RELATIONSHIPS AND RESPONSIBILITIES

Team Leader of Strategic Objective Team Two will provide technical direction to the contractor team. He will work coordinate with G/ENV and the G/ENV COTR and request assistance as appropriate. The Office of Program and Project Development (OPPD) will provide overall program guidance. To the extent possible an SO2 team member and an OPPD representative will participate actively as team members.

USAID/Jamaica will use the results of this strategic assessment in designing a new activity to support its SO2. The Mission will review the assessment, identify appropriate activities, and develop budgets for them. The Mission will obtain authorization for the new activity and draft a Request for Proposals, if appropriate.

V. PERFORMANCE PERIOD

The work is to begin on/about the first week in June and shall last for a period of five calendar weeks, with a possibility of a sixth week for the COP to revise, if necessary, the assessment.

VI. ASSESSMENT TEAM QUALIFICATIONS

General:

A three person team, working closely with Mission staff, is expected to carry out the requested scope of work.

Key areas of expertise which should be represented in the composite experience of the team include environmental policy analysis and reform, watershed management, financial sustainability of protected areas and/or economic incentives for conservation, social and economic analysis, community development expertise (especially in working with local people living in areas that surround protected areas to achieve conservation and sustainable development goals), strategy/activity development within USAID's reengineered framework.

Previous work experience in Jamaica or other island states, and familiarity with environmental issues, is preferred for all team members. At least one member of the team must be Jamaican. All team members should have professional training at the Masters level and at least 10 years of professional experience in one of the areas of expertise listed above. The team leader must have

demonstrated leadership skills and be available to be in Jamaica for a six week period. The other team members must be available for 5 weeks.

The following is a list of illustrative positions and qualifications:

Activity Development/Environmental Policy Specialist/ (Team Leader)

This individual must be a senior project development specialist with at least 15 years of experience in the design and implementation of international development projects, specifically, with experience in natural resource management projects. He/she also should have experience in farmer-level policy reforms necessary for the promotion of environmentally sustainable practices. He/she should have a good knowledge of USAID regulations and procedures pertaining to activity design/implementation, especially within the context of USAID's reengineered framework, and substantial experience in leading consultant teams. This individual should have a broad understanding of integrated natural resource management issues, including the relevant socio-economic, institutional and policy issues. The team leader must be available to be in Jamaica for five weeks. He/she will have ultimate responsibility for presenting a final paper acceptable to USAID.

Natural Resource/Watershed Management Specialist

This individual should have a relevant graduate degree and at least 10 years of experience in the design and implementation of natural resource management activities in developing countries, especially integrated conservation and development projects (ICDP). He/she should have technical expertise in watershed management and, preferably, in integrated coastal management. He/she should be familiar with small island ecosystems.

Sociologist/Community Development Specialist

This individual should have a graduate degree in anthropology/sociology and at least 10 years of experience in designing/implementing community development-related activities. This specialist should have experience in designing and evaluating watershed management interventions (e.g., agro-forestry) and eco-enterprise activities (e.g., eco-tourism, small enterprise development) in tropical countries. He/she should have experience in participatory project design at the community level and in assessing the social impact of development projects on local communities.

VII. WORK DAYS ORDERED

Position	No. of Work Days
Activity Development Specialist/Team Leader	38
Watershed Management Specialist	32
Sociologist/Community Development Specialist	32

D. Logistic Support

The contractor shall be responsible for all logistical support for the team, including transportation, office or work facilities, word processing equipment, secretarial services, etc.

Annex B
USAID/Jamaica Activity Portfolio

This annex was prepared by USAID/Jamaica SO2 Team

USAID/JAMAICA

STRATEGIC OBJECTIVE TWO

Outline of

ENVIRONMENTAL PROGRAMS

Table of Contents

USAID/JAMAICA
STRATEGIC OBJECTIVE - 2

DEVELOPMENT OF ENVIRONMENTAL MANAGEMENT ORGANIZATIONS (DEMO) PROJECT

THE PURPOSE OF THE DEMO PROJECT IS TO STRENGTHEN THE CAPABILITY OF PUBLIC AND PRIVATE ENVIRONMENTAL ORGANIZATIONS TO MANAGE JAMAICA'S MOST ECONOMICALLY IMPORTANT NATURAL RESOURCES. THE PROJECT WILL REALIZE THIS PURPOSE THROUGH FOUR (4) INTERRELATED SETS OF OUTPUTS WHICH COMPRISE THE PROJECT FRAMEWORK, INCLUDING:

(a) Supporting the Natural Resources Conservation Authority (NRCA) by:
Providing organizational development services to strengthen program direction, human resource development, financial management and physical office operations; and Assisting key functional units to carry out their mandates;
Developing environmental protection policies in the areas of coastal management, protected areas management and pollution control and waste management.

(b) Strengthening the National Environmental Societies Trust (NEST) and other environmental NGOs and public action groups, by:
Providing organizational development services to strengthen NEST's program direction, human resource development, financial management and operations.
Providing training and technical outreach to NGOs and community-based groups.

(c) Conducting SITE (Strategic Interventions in the Environment) activities in targeted geographical areas (Negril, Montego Bay, Port Royal/Palisadoes and Black River) which would protect economically important natural resources and ecological systems, and resolve critical environmental issues by:

- Facilitating GOJ-NGO-private sector collaboration on resource management;

- Protecting economically valuable lands, resources, and ecological systems;

- Establishing data collection and monitoring programs;

- Designing and implementing environmental awareness programs;

- Designing and implementing appropriate development controls, regulations, and voluntary mechanisms for compliance with environmental objectives; and

- Carrying out a grant program to finance priority environmental improvement projects identified by the SITE community.

(d) Supporting the establishment of a sustainable national system of protected areas, by:
Developing/expanding a national protected area trust fund and encouraging revenue generation;
Strengthening protected area system institutions; and
Adding three new units (Black River, Negril, and Port Royal/Palisadoes) to the protected area system.

DEMO activities are being implemented through a long-term contract awarded to Technical Support Services, Inc. in early 1994 to serve as the DEMO Technical Assistance Contractor. This long-term (5-year) contract is being carried out by a team based in Kingston.

This project funding totals US$11.4 million and is to be completed by May, 1999.

USAID/JAMAICA
STRATEGIC OBJECTIVE - 2

COASTAL WATER QUALITY IMPROVEMENT PROJECT (CWIP)

TOURISM IS THE FASTEST GROWING SECTOR OF JAMAICA'S ECONOMY, ECLIPSING AGRICULTURE AND EXTRACTIVE INDUSTRIES. THE VIABILITY OF JAMAICA'S TOURISM SECTOR AND THE SUSTAINABILITY OF THE INCOME FLOW GENERATED BY TOURISM ACTIVITIES DEPENDS IN LARGE MEASURE ON THE QUALITY AND VARIETY OF JAMAICA'S NATURAL ENVIRONMENT, AND PARTICULARLY ON THE ISLAND'S COASTAL AND MARINE RESOURCE BASE.

Accordingly, the USAID/Jamaica CWIP Results Package, initially focusing on Negril, will consist of the following five elements:

(a) **Support to community-based initiatives to identify, prioritize and address environmental concerns** this activity will fund activities that address community environmental priorities that can increase local employment and be financially sustained by the communities themselves. The activity will include the establishment of a grants management program to support Non-Governmental Organization (NGO) and Community-Based Organization (CBO) activities, primarily within low-income communities.

(b) **Establishment of public-private partnerships to improve the operation and maintenance of municipal wastewater management systems** the intent of this objective is to assist the government of Jamaica to manage approximately $100 million in new municipal sewerage system investments in a way that ensures these systems' potential to improve coastal water quality is fully realized.

(c) **Improve the environmental practices of industries and commercial establishments through an environmental audits program** programs will be undertaken to reduce the amount of waste discharged into the marine environment by industry. Initial activity will focus on putting in place environmental audit/certification programs for hotels. Later year activity to be considered will likely include ensuring that the effluent discharges of

package plants can be brought into compliance with NRCA permitting standards and promoting ISO 14000 application to manufacturers and other businesses.

(d) **Develop NGO-Government partnerships to expand and regularize coastal water quality monitoring** Assistance will be provided to NGO and selected private sector entities in support of the core monitoring program of the NRCA. The objective is to ensure that problems be identified, regulations be enforced, and information, which could be a

basis for advocacy efforts, be made available to the public.

(e) **Improve the coordination of coastal zone management activities among Jamaican government agencies, international donors and NGOs** so that the many agencies (e.g. NRCA, NWA, ECD, etc) involved in activities affecting coastal water quality can coordinate programs, and increase public-private collaboration, to solve critical pollution problems.

The CWIP was authorized in September, 1997, and implementation activitites are underway. The length of this project will be six years and the funding level is approximately US$8,900,000.

USAID/JAMAICA
STRATEGIC OBJECTIVE - 2

ENVIRONMENTAL AUDITS FOR SUSTAINABLE TOURISM (EAST) ACTIVITY

The Environmental Audits for Sustainable Tourism (EAST) activity will be a program of environmental audits within a corporate environmental management system aimed at the tourism/hospitality industry. The objectives of the program are:

(1) to develop greater awareness and understanding of the benefits of environmental systems and audits among hoteliers, restaurateurs, and allied tourism businesses;

(2) to upgrade the technical skills of Jamaicans who are expected to conduct the audits and advise on environmental management systems; (3) to assist a select, representative number of tourism-related establishments in carrying out environmental audits; and

(3) to help finance in the tourism industry, on a cost-sharing basis, selected audit recommendations so as to demonstrate the financial benefits of the systematic application of environmentally friendly practices and, thereby, encouraging others in the tourism industry to do likewise.

EAST will focus its tourism activities in Negril because of several factors: first, it has been a community in which USAID has worked successfully over the past several years; second, the NGO and community organizations in Negril (Chamber of Commerce, local Jamaica Hotel and Tourist Association chapter, NEPT, etc.) have been particularly active in and responsive to environmental concerns; third, a number of tourism-related entities have expressed strong interest in participating in this program; and, fourth, Negril is the third most important tourism destination in Jamaica, and changes adopted there are likely to have an important demonstration effect for the tourism industry in the rest of the country.

EAST will be a model for environmental action and self/audits for the tourism sector that can be replicated in other tourism destinations in Jamaica and in the Caribbean through the Caribbean Environmental Network. This activity began July, 1997. This activity might form a component in a larger, follow-on activity in Jamaica, the Coastal Water Quality Improvement Program (CWIP). The length of the initial implementation for this activity is 12 months, at a costs of US$800,000.

Annex C
List of Individuals and Institutions Contacted

Caribbean Agricultural Research Development Institute (CARDI)

Lindsay, Joe, University of West Indies Campus

Department of Forestry

Headley, Marilyn, Director
Evelyn, Owen
Bernard, Claudette, Project Coordinator
Grapine, Durval, Watershed Management Advisor, Negril and Montego Bay
Brown, Nerval, Acting Regional Forestry Officer, Montego Bay
Simpson, Danny, A. Forestry Supervisor, Port Antonio

Donors

Canadian International Development Agency (CIDA)

- Latham, John, Sr. Forestry Advisor, Trees for Tomorrow
- Staniforth, Sue, Public Education, Trees for Tomorrow

European Union (EU)

- Jackson, Thor, Technical Attache
- Baker, Chris, Watershed Advisor
- Collins, Peter, EU liaison with National Water Commission

Inter-American Development Bank (IDB)

- Farnworth, Ed, Sr. Environmental Advisor, Caribbean Region

Environmental Foundation of Jamaica (EFJ)

Daley, Albert Patrick, Director of Projects

Inter-American Institute for Cooperation on Agriculture (IICA)

Dr. Ramkrishna, Farming Systems Specialist

Ministry of Agriculture

Lyons, Paulette, Head Project Cordination and Implementation

Ministry of Finance

Tyndall, Shirley, Financial Secretary

Non-Government Organizations (NGOs)

Conservation Resource Development Centre (CRDC)

- Hodges, Stephen

Friends of the Sea, Ocho Rios
- McKenzie, Ian
- Lankester, Kathy

Jamaica Agricultural Development Foundation (JADF)
- Skeete, Roger

Jamaica Conservation and Development Trust (JCDT)
- Smith, David C., Executive Director
- Glasgow, Shelley-Anne M., Environmental Education Officer
- Peterson Carla, Blue Mountain and J. Crowe National Park Community Liaison Officer

Montego Bay Marine Park Trust (MBMPT)
- Miller, Malden, Park Director
- Williams, Jill, Board Chairman and fund raiser
- Hinlock, Paula, Communications Specialist

National Environmental Societies Trust (NEST)
- Rowe, Maureen

Negril Area Environmental Protection Trust (NEPT)
- Otoukan, Susan, Dir.

Negril Coral Reef Protection Society (NCRPS)
- Thacker, Katy, Exec. Dir.

Portland Environmental Protection Agency (PEPA)
- Ciappara, Simon
- Richards, Mark, Community Leader

St. Elizabeth Environmental Protection Association (SEEPA)
- Francis, Joyce
- Graham, Holly
- Freckleton, Tony, Chairman
- Baker, Eugeni, President

St. Ann Environmental Protection Association (STAEPA)
- Lawrence, Frank, Treasurer
- Glasgow, Joyce, Consultant
- Lee, Wendy, President
- Cusick, Brian, Peace Corps Volunteer
- Bell, Everton

National Water Commission (NWC)

Streete, Don, Manager, Quality Control Assurance and Environment Office
Mitchell, Gillian, Environmental Analyst
Donovan, Beckford, Technical support Office

Natural Resources Conservation Authority (NRCA)

Miller, Learie A., Deputy Executive Director
Jones, Lemore, Chief, Watershed Unit
Brown, David, Chief, UNDP Watershed Project
McDonald, Franklin, Executive Director

Negril Chamber of Commerce

Jackson, Jean, Manager
Lee, Grace, VP
Cummings, Wayne, Sandals Hotel and Chamber board member
Davis, Kenric, Sunshine Village and Chamber board member
Davis, Fritz, Sandals Hotel and Chamber board member

Negril/Green Island Area Local Planning Authority

Evans, Raphael, Manager

Office of the Prime Minister, Tourism

Johnson, Althea, Director
Griffith, Jennifer, Tourism Planner

Office of the Prime Minister, Land

DeCosta, Jackie, Sr. Advisor to PM
Chambers, Michael, Consultant

The Nature Conservancy

Drumm, Andy, Ecotourism Specialist
Campbell, Dan, Director, Jamaica and Belize Country Programs
Leon, Patricia, Director, NGO Enterprises for the Environment Program

Tourism Product Development Company

Bertrand, Claire
Reece, Mary Helen

United States Agency for International Development (USAID)

Jordon, Mosina, Mission Director
Booth, Greg, Environmental Advisor
Lawrence, Feldman JoAnn, OPPD, Project Development Specialist
Batson, Howard, SO 2 Team Leader
Joseph, Laverne, Program Assistant
Attebury, David, outgoing Program Officer
Dickey, Alex, incoming Program Officer
Fort, Vernita, Caribbean Regional
Smith, Steve, Economic Growth
Swallow, John, General Development Officer

USAID/Jamaica SO2 Activity Partners

Coastal Water Quality Improvement Program (CWIP)

- Auman, Jan, COP
- Oak, Indeok, Organizational Strengthening Officer
- Daley, Louis A., Pollution Prevention Policy Specialist

Development of Environmental Management Organizations (DEMO)

- Ornstein, Conrad, COP

Environmental Audits for Sustainable Tourism (EAST)

- Cresser, Hugh

Other

Blackwood, Calvin, Middle Quarters Shrimp River Concern (Black River)
Koenig, Susan, Yale University, Parrot Research Project (Cockpit Country)
Parrent, James M., General Manager Jamaica Heritage Trail, Ltd.
Ramsay, Clyde, Black River constabulary community relations coordinator
Rattner, Robert, independent consultant
Spencer, Ruben, Pres. Black River Chamber of Commerce
Sutton, Ann, Ecologist
Thaxter, Veronica, Valley Hikes Ecotourism Company
Twyman, Alex, Old Tavern Coffee Estate, Blue Mountains

Annex D
Description of Activities in Support of Ridge-to-Reef Management Programs

1. New and Improved Techniques

The challenge is to find ways to produce charcoal, coffee, and other crops more efficiently and economically so that the people involved can increase their incomes in the process. Following are some examples of input substitution schemes whereby the tradeoffs may include lower yields, lower costs, and higher quality.

- Inefficient **charcoal making** using traditional dirt mound kilns (typically associated with 10 to 15 percent efficiency), for example, justifies consideration of improved charcoal making, also based on traditional technology, but raising the efficiency level to more than 30 percent. This means that much more charcoal could be produced from the same volume of wood input, hence reducing the deforestation pressure on the forests8.

- Likewise, overuse or abuse of **chemical fertilizers and pesticides** in the pursuit of the highest possible coffee yields justifies consideration of organic or near organic coffee production and composting.

- **Agroforestry** the integration of trees into the farm landscape is an improved technique used to stabilize the soils and reduce soil erosion as well as restore fertility. Farmers will trade off scarce cultivable space to grow trees if the benefits of the proposed activities clearly outweigh the costs. There are major concerns, of course, such as the possibility of losing the trees in severe hurricanes, or to pests and diseases. And, there is the argument often put forth that the long time period between initial investment and harvest is far too long to generate interest among potential participants. Agroforestry is not an easy sell, despite the obvious environmental advantages. A stronger focus must be placed on the economic advantages than on the environmental ones, however, in order to generate a following. Species that withstand high winds, have a high value, and are harvestable in a reasonable short time period will probably be favored over environmentally optimal species that may not generate attractive economic returns. One approach discussed during the field trips (in particular with PEPA in Port Antonio) is the idea to promote tree planting as a form of social security (retirement planning), or as a means to finance college for children in the absence of any other avenues or government support. Under such a scheme, the trees would be planted and carefully tended during the 15 to 20 years it will

8 An example of improved efficiency in charcoal making is the Casamance kiln developed in the Casamance region of Senegal between 1977 and 1980. The kiln, based on traditional production methods, showed dramatic improvement in both production efficiency and economic returns. See Karch, Ed, M. Boutette and K. Christophersen, 1987, *The Casamance Kiln*, E/DI and the Univ. of Idaho, funded through EIA, USAID/AFR/RA Project No. 698-0424.

take to produce sawlogs (perhaps by the children who will eventually benefit from the proceeds), and then harvested at the right time to generate the needed funds. Added benefits include reduced runoff, improved microclimates on the farm fields and, hence, higher fertility and eventually higher crop yields on the remaining cultivable area. Another excellent possibility meriting consideration is to grow short rotation trees on-farm to have available a steady supply of woody biomass to convert to charcoal and/or to sell directly as fuelwood.

- **Organic (or near organic) farming and composting is another improved production technique of considerable potential in Jamaica** to be considered as an alternative to high cost, high yield cash crop farming based on excessive use (or abuse) of chemical fertilizer and pesticides. Certainly, input substitution between these two production schemes merits detailed investigation as to the economic and environmental benefits and costs. An important prerequisite to organic production of cash crops such as coffee, bananas, papayas, and coconuts is that farmers should be allowed to produce for export without being subjected to the dictates of the commodity boards. The potential benefits derived from product differentiation through organic production may be substantial, if niche marketing were permitted. Guaranteed organically grown coffee or fruits may be associated with higher quality and command higher prices in the export as well as the domestic markets. Under the current system in Jamaica, however, all coffee, bananas, papayas and coconut oils destined for export must abide by the requirements of their respective commodity boards, there is no opportunity for individual producers to break out of the mold. There is currently no incentive for individual producers to differentiate themselves from other producers to increase market shares (much like the wines from different French vineyards are associated with different qualities).

2. Microenterprises

Microenterprises are slightly different from the improved techniques in that they are new activities (not only improvements on old ones) that can be run as separate businesses. Examples abound of which only a few are briefly discussed below:

- **Private tree nurseries** are often economically and financially attractive business opportunities in countries where a high priority is placed on reforesting degraded areas, which is certainly the case in Jamaica (at least it is an expressed priority actual tree planting in the coverage planned remains to be seen). The caveat, however, is that private tree nurseries could not compete effectively with government nurseries if the latter continues the policy of distributing seedlings for free. Such a practice is counterproductive since it virtually kills any incentive for the private sector to produce seedlings for profit, or at least to satisfy the demand for a local community. Moreover, “free” seedlings are far from free so long as individual farmers must travel 50 miles or further to the nearest government nursery to procure the needed seedlings. The prerequisite, therefore, should be for the Department of Forestry (DF) to rethink the policy of distributing free seedlings and to promote the creation of private sector local nurseries in many areas. Private village nurseries will typically produce seedlings for substantially less than is possible in the

government nurseries. Readily available seedlings nearby at reasonable prices coupled with an aggressive promotion of agroforestry and/or woodlot plantation schemes could prove a winner in convincing farmers to integrate more trees into the farm landscape.

- **Charcoal making, bamboo**. Jamaica is inundated with bamboo that has limited commercial use for furniture, fencing, or any other uses so commonplace in many Asian countries. It has some limited value as yamsticks, yet is not preferred since the sticks typically last only one year. It is considered a weed that most people would like to see disappear since it occupies otherwise cultivable space. An alternative (possibly lucrative) use for the bamboo, on the other hand, could be to harvest, chip, and convert the chips into charcoal powder which, when briquetted, would become and excellent quality charcoal destined for the export market. This possible use of the bamboo is being considered by PEPA on behalf of the communities in and around Port Antonio. It is envisioned that the operation would consist of small portable chippers and pyrolysis units that would fit on a truck. Once the bamboo is harvested and chipped, the pyrolysis process would require only a few minutes, unlike the cumbersome and long process of pyrolyzing large wood chunks in traditional dirt mound kilns.

- **Bee keeping**. With proper training, this is potentially attractive to farmers and youth groups most anywhere in Jamaica because of the high quality honey typically produced and the premium price it commands. A possible side benefit may be that a strong bee keepers association in an area will also amass political power over time as its membership grows. Bee keepers may eventually be pitted against neighboring high yield coffee, banana, papaya, and coconut producers who typically over apply fertilizers and pesticides. Since bees are very sensitive to pesticides in particular and cannot coexist in close proximity with large pesticide users, a strong bee keepers association would be in the position to apply the needed pressure to substantially reduce the ways chemical fertilizers and pesticides are applied on the neighboring farms as well as the quantities applied.

- **Bat guano mining**. Bat guano is a highly sought after organic fertilizer for organic farmers everywhere in the world, particularly for those who produce homeopathic medicines and the like. Small 12-oz bags of dried fertilizer may fetch prices as high as $US 15 per bag in the export market or higher. Jamaica has numerous bat caves containing thousands of tons of this fertilizer that could be exploited as an alternative livelihood opportunity. PEPA in Port Antonio is vigorously pursuing this opportunity on behalf of the local communities in that area.

- **Perfume and essential oils**. Jamaica's forests contain a high incidence of trees from which perfume essence and other essential oils could be extracted. Many of these trees are regarded as weeds because they have little commercial value as wood or as sawlogs. Since most of these trees flower continuously the opportunity is present to harvest fragrant flowers and add value by extracting the essential oils and perfume bases. Such commercial activity is much appreciated and pursued in Cuba, for example, and there are few reasons why the same could not succeed as a business venture in Jamaica, even to the point where the most attractive species were grown commercially.

- **Nature and cultural tourism**. Finally, Jamaica blessed with many existing and potential discrete land-based tourism attractions such as water falls, caves, the high flora and fauna endemism in the Cockpit Country, cultural tourism opportunities in many areas (Falmouth and Black River are examples), Blue and John Crowe Mountain National Park, and many other attractions that currently generate revenues far below their potential. Each potential site merits investigation along with identification of potential target markets.

3. Land forfeited to the Crown and other policy ideas

This idea was expressed by both PEPA and the Conservation Resource Development Centre, or CRDC as a means to generate revenues for Jamaica's youth (or other groups) from lands currently idle. The land, having been forfeited to the Crown for failure to pay land taxes or for other reasons, is in a special category. It could be put to use to lessen the deforestation pressure on other public and private land. The youth of Jamaica is a favored target group most have few, if any, opportunities to pursue studies for lack of funding. Many typically earn a living from charcoal burning, spear fishing, timber theft, or ganja growing, all environmentally destructive activities. With appropriate technical assistance to identify the highest and best economic and biologic uses, the land forfeited to the Crown could become income earners for youth or other groups whereby use rights are granted for a limited time period (12 to 15 years) for the purpose of growing crops such as short rotation trees for fuelwood and/or charcoal, or other crops that can generate an income for the time period used, in accordance with approved management plans. The same land would be passed on to new individuals or groups after the lease period.

Another possibility that merits consideration is to offer tax breaks or incentives to private land owners who choose to preserve their land as a forestry environment or bird sanctuary rather than making it appear it is actively utilized. This would be contrary to the current law where any idle private land risks being reclaimed by the state. Because of this law, there is some urgency for the landowners to maintain some activity on the land to make it appear it is being used. A common approach is to invite charcoal makers onto the land to harvest most of the trees and convert them to charcoal. If these landowners instead were rewarded for keeping the property intact through tax incentives to create a forestry environment, deforestation would certainly decrease. Or alternatively, landowners who clear the land could face a tax increase to discourage them from clearing the land.

4. Enforcement

Lack of enforcement of existing laws, particularly in the forestry sector, is an almost universal phenomenon in Jamaica, among the GOJ institutions and the NGOs alike. The Forestry Department does not have the vehicles, the staff, nor the funding to enforce what is already legally enforceable. Likewise, the NRCA cannot enforce the laws to prevent the pollution caused by industrial concerns for the same reasons. The NGOs are in a similar situation. Once having been officially assigned the management responsibilities over an environmental protection area or a marine park, they are obliged to implement detailed management plans and to carry out enforcement functions. Neither can be done for lack of funding, equipment, or manpower. The funds available through the EFJ and/or the National Park Trust Fund are not nearly sufficient to ensure that the mandates of the management plans are actually enforced.

A suggested intervention would involve closer cooperation between enforcement authorities and communities, identification and implementation of non-financial sanctions, and educational programs for violators.

5. Animal wastes for energy and fertilizer

Animal wastes have potential value as a source of energy (biogas generation) and as organic fertilizer as an important ingredient for composting. Jamaica has not developed a composting culture, largely because of the lack of nitrogen. Wherever livestock stabling is commonplace (feedlots, pig farms, etc.), both biogas generation and composting become real possibilities that merit further investigation.

6. Improved mining restoration

Jamaican bauxite is high quality and relatively easy to mine since most of it is found at or near the surface. Once mined, however, the environmental restoration process is very deficient. The requirements stipulate that mined areas be covered with the top soil originally removed and that the area is replanted to grass once the mine has been fully exploited. Neither works well. The layer of top soil returned to the area is typically far too thin to ensure proper restoration of the site. The grass cover does establish on the thin layers, but only as a result of heavy doses of fertilizer applied during the first year. Although the appearance of proper restoration is evident in the beginning, little else (trees or commercial crops) will grow and flourish in these areas in the future once the effects of the fertilizer wears off any future productivity of the area cannot be expected. In this context, it is urgent that the process of mining restoration be revisited, particularly in view of the very real possibility of mining bauxite in the Cockpit Country in the near future. This environmentally fragile area, characterized by high flora and fauna endemism, is very much at risk.

7. Environmental audits, treatment of industrial effluents

USAID/Jamaica's Environmental Audits for Sustainable Tourism (EAST) was given high marks from all individuals and institutions interviewed by the Assessment Team. The concept of

environmental audits has clearly taken root, largely because it is good for business to be environmentally friendly, particularly in the tourist business. Applying the same concept to industrial operations should be a relatively straightforward task, certainly if the investments needed to bring operations up to or exceed the acceptable (NRCA) standards generated cost savings over a reasonably short payback period. Cost savings are indeed probable in the area of energy consumption (which would be covered by the environmental audits). Industries using large volumes of fossil fuels and/or biomass energy can become much more efficient energy consumers with only minor investments, as has been demonstrated in many other countries where similar audit programs have been carried out. Sugar cane processors and/or rum distilleries who are responsible for the pervasive dunder problem in Jamaica's rivers and degradation of the marine environment, on the other hand, pose a different set of problems. Fairly major investments in treatment facilities would be needed to treat the waste water before it is discharged into the rivers. The appeal here could be in the form of ecological labeling of the end products.

8. Improved waste and wastewater management for communities

Many communities in the watersheds are poorly served by wastewater treatment facilities and utilize a variety of sanitation systems which involve ineffective treatment. Communities should be made aware of the type of program implemented in Montego Bay by CRDC. Key requirements will include financing for assessments of alternative sanitation systems and purchase of equipment. Some costs could be reduced through community-based construction. Solid waste is not handled effectively in most smaller communities. As part of management programs, development of more effective waste collection, sorting, recycling, and disposal options. Education programs in schools could be a key component provided the infrastructure and management systems are in place.

9. Wetland/mangrove protection, unplanned human settlements

In the coastal areas, the main foci of concern are on the ecological integrity of the wetlands, the mangroves, and the environmental impacts associated with unplanned human settlements. The ecology of the coastal wetlands is particularly fragile in view of the demands for productive farm land the awareness of the environmental implications of draining the wetlands is very low. The mangroves along the Jamaican coastline and upstream along the river banks are very much at risk as they are regularly harvested for several purposes, notably for conversion to charcoal or for the production of fish pots. Most important, perhaps, are the environmental impacts caused by the unplanned human settlements, particularly in the major tourist areas where population growth is the highest. Unplanned human settlements can include approved subdivisions without any required plan for the disposal of sewage other than using standard soakaway pits, and the squatter communities that settle most anywhere near water sources, typically along the river banks. The degradation of the environment intensifies in more heavily populated areas. The *ridge-to-reef* activity can potentially contribute to solving these problems in the policy arena concerning the wetlands and the mangroves, and by collaborating with CWIP and the NWC in addressing the problems associated with inadequate sewage hook-up policies. One idea that merits considerable attention (discussed elsewhere in this report) is privatization of sewage treatment plants.

10. Fisheries management

There is an overriding and urgent need to substantially limit fishing effort on all fishing beaches in Jamaica. Familiar fishing banks are already heavily overfished which greatly reduces browsing and, hence, the coral reefs. The fisher families are, themselves, very much aware of the status of the fisheries having experienced smaller and smaller catches over the years. They are currently actively seeking marine park declaration for their areas and working with NGOs to institute self policing schemes (voluntary wardens, etc.) to ensure that fishing does not disappear altogether. Urgently needed are legally recognized fish sanctuaries, mangrove protection, mesh size limitations, and paid licences for fishermen.

11. Alternative opportunities for fisher families

Christophersen et al (1997) carried out a small financial feasibility analysis on three alternative livelihood opportunities for Negril fishermen under the auspices of USAID's DEMO project: Irish moss, aquaculture, and ecotourism. These three were prioritized (or objected to the least) by the fisher families in recognition of the need to substantially reduce fishing effort in the area. The same kind of analysis should be carried out for all other identified alternative livelihood options for fishermen in other areas as well.

The activities briefly discussed above are but a few examples where a *ridge-to-reef* project could lend support in the forms of technical assistance (TA), training, and special studies (see below). As stated earlier, the objective is to support activities that foster a greater environmental awareness, increase incomes, and reduce environmental degradation.