

Document of
The World Bank

FOR OFFICIAL USE ONLY

Report No: 27270

IMPLEMENTATION COMPLETION REPORT
(CPL-38790; IDA-27140; IDA-27150; IDA-27160; CPL-38800; SCL-3879A; CPL-38810; CPL-38820;
SCL-3882A; TF-28594; TF-28595; TF-28596; TF-28597; TF-28598; TF-28599; TF-28600; TF-28615)

ON

4 LOANS / 3 CREDITS / 7 GEF GRANTS

IN THE AMOUNT OF US\$24.0 MILLION EQUIVALENT

TO ANTIGUA & BARBUDA, COMMONWEALTH OF DOMINICA
GRENADA, ST. KITTS AND NEVIS, ST. LUCIA AND
ST. VINCENT AND THE GRENADINES

FOR THE
OECS SHIP-GENERATED WASTE MANAGEMENT PROJECT
AND THE
SOLID WASTE MANAGEMENT PROJECT

November 21, 2003

**Caribbean Country Management Unit
Environmentally and Socially Sustainable Development Sector Management Unit
Latin American and the Caribbean Region**

This document has a restricted distribution and may be used by recipients only in the performance of their official duties. Its contents may not otherwise be disclosed without World Bank authorization.

CURRENCY EQUIVALENTS

(Exchange Rate Effective)

Currency Unit = East Caribbean Dollar (EC\$)

US\$ = EC\$ 2.67

FISCAL YEAR

January 1 – December 31

(Antigua and Barbuda, Grenada, St. Kitts and Nevis, St. Vincent and the Grenadines)

April 1 – March 31

(St. Lucia)

July 1 – June 30

(Dominica, Organization of Eastern Caribbean States Secretariat)

ABBREVIATIONS AND ACRONYMS

| | |
|------------|--|
| A&B | Antigua and Barbuda |
| APL | Adaptable Program Loan |
| CAS | Country Assistance Strategy |
| CDB | Caribbean Development Bank |
| DOM | Dominica |
| DSWMC | Dominica Solid Waste Management Corporation |
| EC\$ | Eastern Caribbean Dollar |
| EIB | European Investment Bank |
| EU | European Union |
| 4Rs | Reduction, Recycling, Recovery and Reuse |
| FNPd | Forestry and National Parks Department (Grenada) |
| GEF | Global Environmental Facility |
| GEF-MSP | Global Environmental Facility – Medium Sized Project |
| GSWMA | Grenada Solid Waste Management Authority |
| GRD | Grenada |
| IBRD | International Bank for Reconstruction and Development |
| ICR | Implementation Completion Report |
| IDA | International Development Association |
| IMO | International Maritime Organization |
| MARPOL | International Convention for the Prevention of Pollution from Ships |
| MOU | Memorandum of Understanding |
| MTR | Mid-Term Review |
| MRF | Material Recovery Facility |
| NEAP | National Environmental Management Plan |
| Nevis SWMA | Nevis Solid Waste Management Authority |
| NSWMA | National Solid Waste Management Authority (Antigua and Barbuda) |
| OECS | Organization of Eastern Caribbean States |
| OECS-ESDU | Organization of Eastern Caribbean States, Environment and Sustainable Development Unit |
| OECS-NRMU | Organization of Eastern Caribbean States, Natural Resources Management Unit |
| PA | Public Awareness |
| PIU | Project Implementation Unit |
| PMU | Project Management Unit |

| | |
|-----------|---|
| PR | Public Relations |
| QAG | Quality Assurance Group (World Bank) |
| RCU | Regional Coordinating Unit |
| SAR | Staff Appraisal Report |
| SIDS | Small Island Developing States |
| SKN | St. Kitts and Nevis |
| SLU | St. Lucia |
| SLSWMA | St. Lucia Solid Waste Management Authority |
| SVG | St. Vincent and the Grenadines |
| SWMC | St. Kitts and Nevis Solid Waste Management Corporation |
| SWME | Solid Waste Management Entities |
| SWMU/CWSA | Solid Waste Management Unit of the Central Water and Sewerage Authority, St. Vincent and the Grenadines |
| WCISW | Wider Caribbean Initiative on Ship-Generated Waste Project |

| | |
|--------------------------------|-------------------------|
| Vice President: | David de Ferranti |
| Country Manager/Director: | Caroline Anstey |
| Sector Manager/Director: | Abel Mejia/John Redwood |
| Task Team Leader/Task Manager: | Garry Charlier |

OECS COUNTRIES
Solid Waste Management Project

CONTENTS

| | Page No. |
|--|-----------------|
| 1. Project Data | 1 |
| 2. Principal Performance Ratings | 2 |
| 3. Assessment of Development Objective and Design, and of Quality at Entry | 2-6 |
| 4. Achievement of Objective and Outputs | 6-21 |
| 5. Major Factors Affecting Implementation and Outcome | 21-24 |
| 6. Sustainability | 24-26 |
| 7. Bank and Borrower Performance | 26-29 |
| 8. Lessons Learned | 29-30 |
| 9. Partner Comments | 31-50 |
| 10. Additional Information | 50 |
| Annex 1. Key Performance Indicators/Log Frame Matrix | 51-55 |
| Annex 2. Project Costs and Financing | 56-57 |
| Annex 3. Economic Costs and Benefits | 58 |
| Annex 4. Bank Inputs | 59-60 |
| Annex 5. Ratings for Achievement of Objectives/Outputs of Components | 61 |
| Annex 6. Ratings of Bank and Borrower Performance | 62 |
| Annex 7. List of Supporting Documents | 63-64 |
| Annex 8. Borrower's Contribution | 65-80 |
| Annex 9. Detail of Project Outputs | 81-84 |
| Annex 10. Detail of Project Financing per Country | 85-98 |
| Annex 11. MAP | 99 |

| | |
|---|---|
| <i>Project ID:</i> P006970 | <i>Project Name:</i> Solid Waste Management Project |
| <i>Global Supplemental ID:</i> P006957 (<i>Fully Blended</i>) | <i>Supp. Name:</i> OECS Ship-Generated Waste Management Project |
| <i>Team Leader:</i> Garry Charlier | <i>TL Unit:</i> LCSEN |
| <i>ICR Type:</i> Core ICR | <i>Report Date:</i> November 21, 2003 |

1. Project Data

Name: Solid Waste Management Project

L/C/TF Number: CPL-38790; IDA-27140; IDA-27150; IDA-27160; CPL-38800; SCL-3879A; CPL-38810; CPL-38820; SCL-3882A

Country/Department: OECS COUNTRIES

Region: Latin America and the Caribbean Region

Sector/subsector: Solid waste management (87%); Central government administration (13%)

Theme: Pollution management and environmental health (P); Water resource management (P); Environmental policies and institutions (P); Administrative and civil service reform (P); Regional integration (S)

KEY DATES

PCD: 09/10/1991

Appraisal: 01/16/1994

Approval: 05/04/1995

Original

Effective: 08/09/1995

MTR: 11/10/1998

Closing: 12/31/2000

Revised/Actual

11/11/1996

12/09/1998

06/30/2003

Supplemental Name: OECS Ship-Generated Waste Management Project

L/C/TF Number: TF-28594; TF-28595; TF-28596; TF-28597; TF-28598; TF-28599; TF-28600; TF-28615

Sector/subsector: Solid waste management (54%); Central government administration (44%); Other social services (2%)

Theme: Pollution management and environmental health (P); Water resource management (P); Environmental policies and institutions (P); Administrative and civil service reform (P); Biodiversity (S)

KEY DATES

GEF Council: 09/24/1993

Appraisal: 01/16/1994

Approval: 05/04/1995

Original

Effective: 11/11/1996

MTR: 11/10/1998

Closing: 12/31/2000

Revised/Actual

11/11/1996

12/09/1998

06/30/2003

Borrower/Implementing Agency: OECS MEMBER COUNTRIES/OECS

Other Partners: Caribbean Development Bank (CDB); European Investment Bank (EIB); and the European Union (EU)

STAFF

Vice President:

Country Director:

Sector Manager:

Current

David de Ferranti

Caroline Anstey

Abel Mejia

At Appraisal

Mr. Yoshiaki Abe

Mr. Phillipe Nouvel

Mr. Eugene McCarthy

Team Leader at ICR: Garry Charlier
ICR Primary Author: Jackson Morrill

Usamah S. Dabbagh

2. Principal Performance Ratings

(HS=Highly Satisfactory, S=Satisfactory, U=Unsatisfactory, HL=Highly Likely, L=Likely, UN=Unlikely, HUN=Highly Unlikely, HU=Highly Unsatisfactory, H=High, SU=Substantial, M=Modest, N=Negligible)

| | <u>Rating</u> |
|--|---------------|
| <i>Outcome:</i> | S |
| <i>Sustainability:</i> | L |
| <i>Institutional Development Impact:</i> | SU |
| <i>Bank Performance:</i> | S |
| <i>Borrower Performance:</i> | S |

| | | |
|-------------------------------------|--------------------|-----|
| | QAG (if available) | ICR |
| <i>Quality at Entry:</i> | | S |
| <i>Project at Risk at Any Time:</i> | Yes | |

3. Assessment of Development Objective and Design, and of Quality at Entry

3.1 Original Objective:

The development objective for the Organization of East Caribbean States (OECS) Solid Waste Management Project was to reduce public health risks and protect the environmental integrity of the islands and their coastal and marine systems. This was to be accomplished by improving domestic solid waste management facilities and facilitating compliance with the “Special Area” designation of the Caribbean Sea for MARPOL 73/78 Annex V wastes. The project sought to reduce terrestrial and marine pollution in this area by preventing and discouraging indiscriminate disposal of solid waste both on and off-shore. A further objective was to significantly enhance public health and environmental quality by strengthening the countries’ capacities to manage effectively and dispose of solid waste in an environmentally sustainable manner.

The development objective for the Global Environmental Facility (GEF)-funded Ship-Generated Waste Management Project was to protect the environmental integrity of coastal and marine systems in the Caribbean Sea. This was to be done by facilitating compliance with the special area designation of the Caribbean Sea for MARPOL 73/78 Annex V wastes and thereby, reducing marine pollution. More specifically, the project sought to assist the OECS governments to: (i) reduce the pollution of international and territorial waters caused by ship-generated solid waste by improving the collection, treatment and disposal of such waste; (ii) establish the appropriate legal and institutional framework to enable governments to effectively manage and dispose of such waste; (iii) prepare plans and programs to address the problems of collection, treatment and disposal of liquid waste and to identify regional opportunities for waste recycling.

While the GEF-funded OECS Ship-Generated Waste and the Solid Waste Management Projects have different project appraisal documents supported by 14 individual grant/loan/credit agreements, these projects were considered fully blended during project preparation and supervision. This approach has proved beneficial by easing administrative burdens and creating synergies between the projects. Given the decision to fully blend these projects, this ICR provides a single joint rating for performance and achievement of outcomes and objectives.

3.2 Revised Objective:

No revisions were made to the projects' objectives.

3.3 Original Components:

The difficulty of reconciling an operation that can be viewed from many different angles (e.g. national vs. regional, ship-generated vs. land-based waste) led to inconsistencies between the SAR and the component description in the GEF Project Document. Given these inconsistencies, the ICR team has drawn from both project documents to synthesize the combined project description into four components implemented at national level and two regional components. Total combined cost for these activities was estimated at appraisal at US\$50.5 million. They comprised US\$11.5 million in IBRD/IDA loans and credits; US\$12.5 million in GEF Grants; US\$8.7 million from the Caribbean Development Bank (CDB); US\$6.4 million from the European Investment Bank (EIB); US\$1.9 million from the European Union; and US\$9.5 million in counterpart funding from the six participating OECS countries.

The four national and two regional components are as follows:

National components

Component 1: Investments and improvements in systems for solid waste management storage, collection and disposal: (US\$42.47 million at appraisal). This comprises (i) the procurement of collection, storage, disposal and monitoring equipment; (ii) the development of new sanitary landfills or managed disposal sites; (iii) the closure, redemption and reclamation of unsuitable or inappropriate existing dump sites; (iv) the construction of transfer stations (Grenada and Dominica only); (v) the procurement of equipment for the treatment of bio-medical/hospital waste (Antigua & Barbuda, St. Lucia and St. Kitts and Nevis only); and (vi) the procurement of equipment to promote waste recovery and recycling.

Component 2: Investments in port reception facilities: (US\$2.65 million at appraisal). This component financed the procurement of solid waste collection, storage facilities and transport equipment for large ports, small craft harbors and anchorages.

Component 3: Rationalization of the existing framework for ship and land-based solid waste management: (partial financing provided under the regional component). This component was designed to support: (i) the creation of National Solid Waste Management Entities (SWMEs), based on the regional model; (ii) preparation of Parliament-ready, draft solid waste and ship-generated waste bills; (iii) the SWMEs effort in developing cost recovery mechanisms to ensure positive cash flows; and (iv) national public awareness/outreach and education programs.

Component 4: Grenada Dove conservation: (US\$0.20 at appraisal) Limited to Grenada, this component sought to help protect the endangered Grenada dove by: (i) the preparation and execution of a management plan for the Mt. Hartman National Park and Perseverance Sanctuary; (ii) the construction of a visitor's center at the Mt. Hartman Estate; and (iii) procurement of equipment for monitoring purposes.

Regional components

Component 1: Support activities and technical assistance: (US\$3.18 million at appraisal) This component was designed to finance the following: (i) preparation of model legislation for solid and ship-generated waste; (ii) preparation of a '4Rs' (reduction, recycling, recovery and re-use) strategy; (iii) a regional training program and biannual workshops on key waste management issues; (iv) preparation of ship-generated waste documentation; (v) systems for monitoring and evaluating ship and land-based solid waste; (vi) a model environmental education program; and (vii) systems for project monitoring and evaluation. In addition, technical assistance was to be provided for the preparation of sewerage master plans.

Component 2: Project management support (US\$2.00 million at appraisal) The project would finance project management support to the national implementation units and the new SWMEs, including project operating and administrative costs.

3.4 Revised Components:

N/A

3.5 Quality at Entry:

Appraisal of this project pre-dated the existence of the Quality Assurance Group (QAG). Quality at entry is rated as **Marginally Satisfactory** by the ICR.

The objectives of the OECS Ship-Generated and Solid Waste Management Projects were at the time, and still remain, **highly relevant** to the countries' development priorities and consistent with the Bank's strategies. The latter were outlined in both the April 10, 1995 Country Assistance Strategy (CAS), and the current June 4, 2001 CAS for the sub-region. The preparation of the Solid and Ship-Generated Waste Management Projects coincided with the development of National Environmental Action Plans (NEAPs) in the OECS countries in the years between 1993 and 1995. These NEAPs, supported by Bank technical assistance, identified several key priorities for action. In particular, they highlighted the need to improve solid waste management. Solid waste collection systems varied widely between different countries at the time, with coverage ranging from 85% in Antigua to 50% in Dominica and Grenada. Lack of coverage or infrequent collection led to dumping in uncontrolled sites, such as roadside ditches, and litter was a common concern throughout the region. Poor disposal practices, including indiscriminate burning, led to visual and odor problems. They also constituted serious health risks from air pollution, ground water and surface water pollution, vermin, fly and other pest infestations. Recognizing the severity of these problems, the 1995 CAS committed the Bank to take the "lead role in the two pressing issues of solid waste management and sewerage."

With regards to ship-generated waste in the wider Caribbean region (including the OECS), the Bank had taken the lead in early 1990s with the GEF-funded Wider Caribbean Initiative on Ship-Generated Waste (WCISW) Project. The project's objective was "to provide a regional strategy for the ratification of Annexes I, II and V of MARPOL 73/78ⁱⁱ by the 22 wider Caribbean countries, by providing governments with: (i) information on the legal, technical and institutional measures required; and (ii) a forum for reaching a regional consensus on the actions to be taken." The OECS Ship-Generated Waste Management Project was designed to take the WCISW Project's objective through to the implementation stage in the OECS sub-region, providing for port reception facilities, waste management infrastructure and institutional training programs to facilitate compliance with MARPOL 73/78 Annex V. These were precisely the follow-up activities highlighted as necessary in the ICR for the WCISW Project (June 25, 1999),

demonstrating once again the high relevance of the project to the OECS region.

The management of both ship-generated and land-based solid waste continues to be a priority for the OECS member states. The 2001 CAS notes that, with the increasing reliance on tourism (nearly a quarter of the GDP in some countries), environmental resources must be managed in a more sustainable way. One of the threats to sustainable management is the higher “production of liquid and solid waste brought about by increases in visitors.” The CAS also notes that there is a continuing concern that liquid and solid wastes are still “inadequately managed.”

The Bank was well positioned as a catalyst for this project, helping to bring together the six OECS countries to address jointly one of the most urgent environmental problems facing them, namely the contamination of their terrestrial environment and the pollution of their coastal zones and the Caribbean Sea more generally. Working with the OECS governments, regional agencies and other international agencies and donors to assist the OECS countries in developing a coordinated strategy for solid waste management at the regional and national levels, the Bank was able to facilitate the development of a strong, well-designed land-based solid waste management project. Despite these achievements and the project's high relevance to both the OECS countries' and the Bank's own priorities for development in the region, project design flaws mostly in the ship-generated waste components hindered the full achievement of the project objectives. These included an underestimation of costs as well as implementation sequencing problems. They are the reason for the overall **Marginally Satisfactory** rating for the project's quality at entry. The idea of developing a system for inter-changing “MARPOL” bins -- similar to the now common 40ft. and 20ft. long containers -- was inappropriate. This was because the system was still under development for the cruise-line industry at the time of project preparation.¹²¹ The project design provided funds for the purchase of equipment for the SWMEs to manage ship-to-dock waste collection and transport. This effectively took over an existing and functioning private sector activity, without any consideration of the future role of the private sector. The omission to deal with the cost implications of the implementation of MARPOL 73/78, Annexes I and II -- necessary if Annex V is signed (see Annex A of the GEF Project Document) -- was based on unreasonably optimistic assumptions about the results of the on-going WCISW project. The system for collecting waste and transporting it by barge from shipside to dock was also not adequately designed, with limited attention paid to financial viability and capacity.

The Solid Waste Management Project suffered from overly-optimistic project implementation sequencing: (i) it significantly underestimated the time it would take to satisfy the conditions for effectiveness; (ii) it made contingent the procurement of Bank-funded waste management equipment on the completion of co-financed landfill construction, and because of the delays in landfill construction it resulted in back-loading the Bank/GEF disbursements; (iii) it scheduled the completion of solid waste management studies under the regional component before the SWMEs had the capacity to implement the findings and recommendations; and (iv) it underestimated the complexity and time required to implement an operation involving five donor agencies, six countries and one regional organization. The inclusion of a sewerage and wastewater component was over-ambitious, as the institutional framework was not in place and the costs of completing country-based sewerage master plans proved prohibitive (only Grenada completed one). Finally, the estimated costs developed during the preparation phase for the construction of the landfills were woefully low, resulting in lengthy delays as each country had to renegotiate the necessary extra funding with donor agencies.

Endnotes for section 3.5

¹²¹ The MARPOL 73/78 Convention is the main international convention covering prevention of pollution of the

marine environment by ships. MARPOL 73/78 contains six annexes that define potential marine wastes addressed under the treaty. The annexes relevant to this report include: (i) Annex I – Prevention of Pollution by Oil; (ii) Annex II – Control of Pollution by Noxious Liquid Substances; (iii) Annex V – Prevention of Pollution by Garbage.

^[2] MARPOL bins have never been manufactured, and the system of interchanging bins has never been implemented in the Caribbean region.

4. Achievement of Objective and Outputs

4.1 Outcome/achievement of objective:

Before the inception of the Solid and Ship-Generated Waste Management Projects, many if not all national solid waste management systems were burdened with inadequate institutional arrangements, limited technical capacities, outdated legislation, poorly managed disposal sites, and collection systems that were unable to handle the volumes of waste generated. At the same time, years of inappropriate solid and ship-generated waste management had caused serious health and environmental problems requiring immediate attention. The Solid and Ship-Generated Waste Projects sought to address these concerns over health and the environment by improving the institutional framework for solid waste management. The outcomes are measured by the following four indicators^[3], developed for this ICR in consultation with the borrower/grant recipients:

- (1) The establishment of fully functioning autonomous or semi-autonomous SWMEs in each participating country;
- (2) The increased coverage and improved quality of land-based solid waste management services (collection, transport and disposal) in each participant country;
- (3) Increased public awareness of solid waste management issues with resultant behavioral changes; and
- (4) Improved institutional arrangements with functioning systems that enable each participant country to manage and dispose of ship-generated waste in accordance with MARPOL V 73/78, as well as that of leisure craft (yachts).

The overall outcome of the project is rated **Satisfactory**, as ultimately the project successfully achieved its objectives. Given the regional nature of this project, the analysis requires an evaluation of the project's collective efforts to improve solid waste management in the OECS region. Therefore, while the outcome indicators have been evaluated on a country basis, the following table provides key background information to help justify the overall outcome rating and set the regional context.

OECS Participating Countries – Selected Background Information

| | GDP/Capita (US\$)* | Area (km ²)** | Population** |
|--------|--------------------|---------------------------|--------------|
| 1- A&B | 10,000 | 442 | 67,448 |
| 2- DOM | 3,700 | 754 | 70,158 |
| 3- GRD | 4,750 | 340 | 89,211 |
| 4- SKN | 8,700 | 261 | 38,736 |
| 5- SLU | 4,400 | 620 | 160,145 |
| 6- SVG | 2,900 | 389 | 116,394 |
| Total | N/A | 2,806 | 542,092 |

*The World Factbook: GDP per Capita (Purchasing Power Parity); 2001 Estimates

** The World Factbook: July 2002 Estimates (Population)

Outcome 1: Established and fully functioning autonomous or semi-autonomous SWMEs in each participating country.

This outcome measures the project's impact on institutional development in enhancing participating countries' capacities to make more efficient, equitable and sustainable use of human and financial resources in addressing a priority development issue. The legal framework that created and governed the operation of the SWMEs, established their system of accounts, and outlined their relationship with government was a key condition for effectiveness. It was subsequently complemented by new, comprehensive solid waste management legislation that updated the legal framework. Measures such as the hiring of staff, making the SWMEs operational, implementing cost-recovery mechanisms and securing government subventions were also supported by the project's components. Together, such conditions of effectiveness and project-driven activities greatly helped the development of fully functioning SWMEs with central responsibility for island-wide solid waste management.

The overall rating of this outcome is **Satisfactory**, based largely on the success of the solid waste authorities and/or corporations in strengthening solid waste management in the OECS. Greater operative efficiency^[2] has led to increased and more frequent collection coverage (95% or more in five of the six participant countries, with daily service in urban areas and a weekly service (at least) in semi-urban and rural areas). Disposal practices (proper compaction, elimination of open burning, etc.) have also improved dramatically. However, across-the-board there is some concern that while five of the six SWMEs have kept up positive cash flows, the cost recovery mechanisms have not decreased reliance on government subventions^[3], except in Grenada and St. Vincent and the Grenadines. Looking ahead, service charges (like tipping fees and household service charges) will be essential to ensure the sustainability of the SWMEs and adequate quality of service.

The overall satisfactory rating for Outcome 1 is based on the following analysis for each country:

Summary Table Rating the Achievement of Outcome 1

| Outcome 1 | A&B | DOM | GRD | SKN | SLU | SVG | Overall |
|------------------|----------------|------------|------------|------------|------------|------------|----------------|
| | S | HU | HS | S | S | HS | S |

Antigua & Barbuda (*Satisfactory*):

In Antigua and Barbuda, an Act of Parliament of November 16, 1995 created the fully functioning, semi-autonomous National Solid Waste Management Authority (NSWMA) under the oversight authority of the Ministry of Health. The NSWMA is currently adequately staffed, with 16 employees and has contracts with several private collection operators. The NSWMA Board is functioning very well, with an excellent mix of technical and politically-influential individuals who have ensured sound technical practice whilst raising the profile of the NSWMA at the highest levels of government. In response to Board requests, its core staff has demonstrated a high capacity for planning, maintained tight supervision of activities and submitted monthly financial statements, activity reports and annual budgets. The NSWMA has developed a good cooperative working relationship with the Central Board of Health, the only Health Ministry agency to retain solid waste management responsibility through enforcement of the Litter Act. Areas for further development include the passage of new legislation, the Solid Waste Management Act, and improved support for the Barbuda Local Council which has taken over day-to-day solid waste management operations in Barbuda.

The NSWMA has a positive cash flow, with 40% of its revenue derived from the environmental levy, in place since 1998. The NSWMA has requested the Cabinet to consider either a household levy (tied to the electricity bill) or a 1% charge on specific imported goods at point of entry to generate additional revenue. Now that landfill construction is complete, tipping fees may be instituted by the fourth quarter of 2003 to cover depreciation costs which have not been budgeted. These efforts would help to reduce reliance on Government subventions through the Ministry of Health. These provide 60% of revenues and pay nearly 75% of all staff salaries and those of private contractors.

Dominica (*Highly Unsatisfactory*):

Inadequate staffing and funding have severely limited the Dominica Solid Waste Management Corporation's (DSWMC) ability to fulfill its operational responsibilities under the 1996 Act of Parliament and the January 2002 Solid Waste Management Act. The DSWMC was established as a semi-autonomous entity, but the reality is that it operates merely as an extension of the Ministry of Health. Its leadership has been weak, as has the guidance provided by its Board of Directors. As of the ICR mission in June 2003, many positions were vacant, including such key ones as general manager and operations manager. Resources generated from cost-recovery plans are not transferred directly to the DSWMC, and the transfers of funds from the Treasury (consolidated fund) have either been only partial or subject to long delays. Furthermore, the increasingly difficult macro-economic situation in Dominica has reduced government subventions to wholly inadequate levels. As a result, the DSWMC lacks the funding needed to sustain its operations, raising serious questions about its short-to-medium-term viability.

Grenada (*Highly Satisfactory*)

The Grenada Solid Waste Management Authority (GSWMA), an autonomous entity, has been highly successful. The GSWMA is fully staffed, with its core staff positions filled by technically qualified people, and its collection and street sweeping services all contracted out to private operators. A comprehensive Solid Waste Management Act was passed in 2001, and the GSWMA is currently preparing the complementary regulations as well as an Integrated Solid Waste Management Strategy. Grenada has also put in place one of the region's most successful cost recovery mechanisms (considered a regional model and exemplar of best practice), which has limited Government subventions to below 30%, the lowest in the region. In addition to implementing the environmental levy (provided 12% of the GSWMA's total revenues for 1996-2002), Grenada was the first to implement a household service charge for solid waste collection and disposal services in residential areas, with the charge linked to monthly electricity bills. This has provided an important alternative source of funds (generating 16% of all operational costs). The GSWMA's largest source of revenue comes from the collection of levies on "white goods." Since January 1, 1997, the GSWMA has received EC\$17,000,717 from this levy, or 39% of total operational funds for 1996-2002.

St. Kitts and Nevis (*Satisfactory*)

The two-island Federation of St. Kitts and Nevis has for the last two years maintained separate management authorities. The St. Kitts and Nevis Solid Waste Management Corporation (SWMC), created under Act of Parliament on July 24, 1996, has responsibility for solid waste management on St. Kitts. The Nevis Solid Waste Management Authority (Nevis SWMA) manages day-to-day operations on Nevis. The SWMC is now fully staffed, with 102 employees (includes street sweepers) responsible for managing collection, disposal and the enforcement of local litter laws. The Ministry of Health, previously responsible for solid waste management, has shifted all of its former staff to the SWMC, playing only an oversight role. With an increase in staff, financial sustainability remains a concern for the SWMC, although

operational budgets have risen from EC\$0.9 million in 1999 to EC\$2.4 million in 2003. The SWMC had positive cash flows for 1998-2000, but has since suffered from a reduction in Government subventions and a fall in the yield from the environmental levy (from EC\$0.8 in 2000 to EC\$0.2 million in 2002). Passage of a new Solid Waste Management Act and subsequent regulations remains to be accomplished, as does completion of the Integrated Solid Waste Management Strategy and the development of new sources of revenue. On Nevis (around 9,000 inhabitants or less than 25% of total population for the Federation), the SWMA has been plagued by understaffing and a serious capacity shortfall that requires further training and close supervision. Tapping new revenue streams, like a recently approved household service charge tied to monthly electricity bills, will be essential to help cover the operational costs of solid waste management.

St. Lucia (*Satisfactory*)

The St. Lucia Solid Waste Management Authority (SLSWMA), established at the end of 1996 under the St. Lucia Solid Waste Management Act, has established the regional standard for private sector participation in solid waste management services. The SLSWMA is a fully staffed, semi-autonomous entity with a strong Board of Directors responsible for appointing staff, reviewing budgets and completing periodic reports. Although privatization has reduced the operational costs of the SLSWMA, it remains heavily dependent on direct Government funding, with revenue from a white goods levy going directly to the consolidated fund. Government subventions account for 73% of all revenues, the environmental levy accounting for the remainder. To ensure long term sustainability, the SLSWMA would benefit from the development of new income streams, such as tipping fees or household service charges. Also needed is the future passage of the Solid Waste Management Act and subsequent regulations, as well as completion of the Integrated Solid Waste Management Strategy.

St. Vincent and the Grenadines (*Highly Satisfactory*)

The Solid Waste Management Unit is located administratively within the Central Water and Sewerage Authority (SWMU/CWSA), a semi-autonomous entity, and it has benefited greatly from the service provision experience of its parent organization. The SWMU/CWSA is fully staffed, with all core positions filled, and is providing adequate collection and disposal services. St. Vincent and the Grenadines was the first country to pass a comprehensive Solid Waste Management Act (2000), and the SWMU/CWSA has since completed, with help from the regional component, the first draft Integrated Solid Waste Management Strategy. This will be presented shortly to Parliament for approval. The SWMU/CWSA is now working on the supporting regulations for the Solid Waste Management Act of 2000. Equally noteworthy, the SWMU/CWSA has greatly improved its supervision of solid waste management in the Grenadines by establishing local, properly staffed offices there and improving solid waste collection and disposal services by contracting out to private providers.

St. Vincent and the Grenadines has also been very successful in establishing several cost recovery revenue streams to reduce the need for reliance on Government subventions. The SWMU/CWSA has put in place a household flat service charge of EC\$5, tied to monthly water bills in St. Vincent and to monthly electricity bills in the Grenadines. This generated EC\$1.5 million (between 1996 and 2002), providing 21% of all operating income. With 34% of funds coming from the environmental levy, the Government only had to meet 44% in subventions from 1996-2002.

Outcome 2: Increased coverage and improved quality of land-based solid waste management services (collection, transport and disposal) in each participating country.

This project outcome achieved a **Satisfactory** rating. The project has helped nearly all the countries,

providing new collection and disposal equipment, newly constructed sanitary landfills, closing 17 over-capacity or environmentally harmful dumps, and building technical capacity to support operations. With the exception of Dominica, all have been able to substantially increase collection coverage and institute proper disposal techniques, with significant benefits to public health and the environment. Solid waste management coverage is at, or above, 95% in five of the six countries, and at least 95% of all land-based waste collected is properly disposed of in landfills. This is a dramatic improvement on the baseline as measured in 1995, when coverage varied from an estimated 85% in Antigua to 50% in Dominica and Grenada. Prior to the project, waste disposal was associated with a lack of site capacity, poor sanitary conditions, indiscriminate burning, visual and odor problems, pollution of ground and surface water, poor accessibility and management, indiscriminate on-site dumping, and poor compaction practices. All these deficiencies have been addressed in nearly all participant countries. A project-financed public opinion survey, completed in June 2003, covering a representative sample of approximately 50 persons per country, endorsed these conclusions, finding that: (i) collection systems had vastly improved, with more “reliable” and “professional” sanitation workers who adhere to widely publicized collection schedules; and (ii) construction of sanitary landfills and improved disposal practices have “greatly reduced odors and put an end to the harmful smoke” once prevalent on most sites.

Summary Table Rating the Achievement of Outcome 2

| Outcome 2 | A&B | DOM | GRD | SKN | SLU | SVG | Overall |
|------------------|----------------|------------|------------|------------|------------|------------|----------------|
| | S | U | HS | S | HS | HS | S |

Antigua & Barbuda (*Satisfactory*)

Significant improvements in the quality of solid waste collection and disposal have served to reduce threats to the environment and public health from inadequate solid waste management. Collection coverage in Antigua is now close to 100% (85% in 1995), with private operators handling 60% of the collection zones. The island has been divided into 14 solid waste management zones, with urban areas (St. John) receiving a service that is daily, semi-urban areas once or more often twice-weekly, and rural areas one that is weekly. The NSWMA is currently undergoing an assessment of collection routes to improve efficiency and address concerns of possible excess collection capacity. Disposal practices have also improved on both islands, with nearly 95% of all land-based waste reaching managed disposal sites (with proper compaction and no signs of open burning or pest infestation). Neither of the newly completed sanitary landfills are yet operational because of construction delays and pending arbitration/litigation arising from contract disputes. This has meant continued use of old disposal sites at Cook’s and Plantation. In addition, the SWMA has fought an uphill struggle to counter traditional dumping behavior along streams, roadsides or at illegal dump sites. Improved education and information, as well as an increased enforcement by Health Ministry staff, will help to reduce litter problems. It remains to be seen whether the Barbuda Town Council will prove up to maintaining adequate collection and disposal practices.

Dominica (*Unsatisfactory*)

Because of staffing and financial problems, Dominica has been unable to achieve full collection coverage throughout the island. Although the collection service in Roseau has improved, the entire south-eastern section of the island remains unserved by the DSWMC, giving rise to complaints from a wide section of the community, including tour operators, hotel developers, the diving community and the leaders of a turtle restoration project. Limited collection, plus continued dumping in roadside ditches and at other illegal dump sites, were cited by the Dominican Hotel and Tourism Association as direct cause of Dominica’s

inability to satisfy the solid waste criteria for the Green Globe Award.¹⁴¹ In addition, construction has yet to begin on the new Fond Colet sanitary landfill, resulting in the continued use of the inadequately managed and under-capacity Stock Farm site. Without access to the new landfill site, or the necessary financial and human resources to provide collection services to the entire island, Dominica's citizens and natural resources will continue to suffer from inadequate solid waste management.

Grenada (*Highly Satisfactory*)

Collection coverage and frequency, as well as improved disposal practices, merit a highly satisfactory rating. The GSWMA has successfully reached nearly 100% coverage for the country, a tremendous improvement on the less than 50% collection rate at the time of project preparation in 1995. The GSWMA has fully contracted out all collection services to private operators, who service five collection zones covering the entire country. They collect waste daily in St. Georges and the main suburbs, and twice weekly in all other areas. The GSWMA has maintained responsibility for managing all disposal services, and is receiving 100% of collected wastes at the old Perseverance site and the new Dumfries sanitary landfill in Carriacou. Landfill management has improved dramatically, despite setbacks suffered during the temporary closure of the Perseverance sanitary landfill owing to landslide damage to the active disposal cell in late 2001. Open burning and pest infestation have been eliminated.

St. Kitts and Nevis (*Satisfactory*)

The SWMC has succeeded in reaching over 95% collection coverage, with services provided to Basseterre and surrounding urban areas once or twice daily, semi-urban areas twice weekly, and all other areas at least once a week. A "waste characterization" study carried out with project funds found that St. Kitts relies on the private sector to collect upwards of 75% of its waste, mainly from industrial, institutional, green and ship-generated sources, suggesting the need for the SWMC actively to monitor private operator performance. The SWMC has also greatly improved disposal practices, with nearly 100% of waste collected reaching the landfill. As a result of improved collection, the landfill is now receiving more waste than originally planned, raising the issue of the need for greater public education on waste reduction, segregation and re-use. Overall, landfill practices have improved over the 1995 baseline. Prior to the project, citizens living near the Conaree site suffered serious respiratory illnesses and tourists often complained about unsightly black smoke from the burning of waste. There are no signs of pest infestations or open burning at the Conaree site today. On Nevis, the NSWMA has also improved collection, but disposal remains problematic. The new sanitary landfill is completed but was not yet operational, due to a problem in the weigh bridge. Open burning was still practiced at the old Low Ground dump site at the time of the ICR mission.

St. Lucia (*Highly Satisfactory*)

Collection coverage has reached nearly 100% in St. Lucia, with all collection services provided by private sector operators. Frequency and reliability have improved, with daily collection in urban areas, once or twice-weekly collections in semi-urban areas, and weekly ones in rural areas. There are currently 16 franchise contracts for solid waste collection and 14 enterprises are operating collection services across the island for all waste, excluding industrial and commercial. The improved collection, combined with the beginnings of changes in attitudes on the part of citizens, has led to cleaner streets in Castries, in surrounding areas and throughout the island generally. Disposal practices have also dramatically improved, with the Ciceron managed disposal site now capped and closed and both the new Deglos sanitary landfill site and the managed disposal site at Vieux Fort handling all incoming garbage. Open burning, pest

infestations and offensive smells are things of the past.

St. Vincent and the Grenadines (*Highly Satisfactory*)

Tremendous improvements in collection and disposal practices merit a highly satisfactory rating for the SWMU/CWSA. The SWMU/CWSA has achieved nearly 100% collection coverage on both the main island, as well as in Bequia, Canouan and Union Island in the Grenadines. The SWMU is responsible for collection on St. Vincent, with private operators handling collection in the Grenadines. The SWMU/CWSA provides daily collection services in the capital city, a weekly service to all other areas on St. Vincent, and bi-weekly service on all of the Grenadines. The SWMU/CWSA also has ensured that over 95% of all waste collected reaches the landfills on St. Vincent, as well as on Bequia and Union Island.

Outcome 3: Enhanced public awareness of solid waste management issues resulting in behavioral changes

Prior to this project, OECS governments had no organized public awareness or education campaigns for solid waste management. Information on domestic solid waste management practices was at best sporadic and tended to be short-term responses to public health concerns like mosquito or rat control. As a result, the public, as suggested by a 2000 study conducted in Antigua (*Population Based KAP Survey for the National Solid Waste Management Authority – Report*), had little knowledge of basic waste management practices.

To address these shortcomings in public education and awareness, the project provided funding for campaigns to help increase public information. This was implemented in all the participant countries, with varying degrees of intensity and success. The project-funded 2003 public opinion study found that information dissemination on the part of the SWMEs had led to an increased knowledge among citizens, generating thereby an overall **Satisfactory** rating for this outcome. Information products included: (i) newsletters; (ii) brochures; (iii) posters; (iv) public service announcements (both radio and television); (v) videos; and (vi) news columns. Further activities included school programs for all age groups, community clean-up campaigns, demonstration projects on composting and other techniques, and the promotion of the SWME’s through mascots and promotional activities at Carnival and other public gatherings. Through such activities, the SWMEs may take credit for having popularized concepts such as waste separation, dealing with bulky and household waste, and composting. The public opinion survey, however, suggests the need for more work in this area. The public has responded favorably to improved collection and disposal practices by the SWMEs, and this has resulted in a greater awareness and commitment to changing attitudes towards waste. Areas for future focus include fostering public support for tipping fees and other service charges, encouraging continued waste reuse and reduction, and promoting anti-litter campaigns.

Summary Table Rating the Achievement of Outcome 3

| Outcome 3 | A&B | D | G | SKN | SLU | SVG | Overall |
|------------------|----------------|----------|-----------|------------|------------|------------|----------------|
| | HS | U | HS | HS | HS | HS | S |

The above ratings per country are based on the success of countries in implementing a wide range of public awareness schemes through the project. The following two tables illustrate these in each country.

Table1: Regular Information Products

| Country | N/letter | Brochures | Posters | PSAs | Radio Prog. | Videos | News Columns |
|---------|-----------|-----------|---------|----------|-------------|--------|--------------|
| A&B | Quarterly | PA/PR | PR/PA | Radio/TV | None | PA/PR | Weekly |
| DOM | N/A | PA | PA | Radio/TV | Weekly | N/A | Occasion |
| GRD | Quarterly | PA | PA | Radio/TV | High freq. | PA/PR | Occasion |
| SKN | Quarterly | PA | N/A | Radio/TV | Weekly | N/A | Occasion |
| SLU | Quarterly | PA | PR/PA | Radio/TV | None | PA/PR | Occasion |
| SVG | Quarterly | N/A | N/A | Radio/TV | Weekly | PA/PR | Occasion |

Note: PA (Public Awareness); PR (Public Relations); N/A (Not Applicable)

Table 2: Summary of Educational Activities

| Country | School Presentations | School Books | Activities | Projects |
|---------|----------------------|-------------------|--------------------|------------|
| A&B | Primary/Secondary | Infant/Primary | Clean-up campaigns | Composting |
| DOM | Primary/Secondary | N/A | Clean-up campaigns | N/A |
| GRD | Primary/Secondary | Primary/Secondary | Clean-up campaigns | Composting |
| SKN | Primary/Secondary | N/A | Clean-up campaigns | N/A |
| SLU | Primary/Secondary | Infant/Primary | Clean-up campaigns | N/A |
| SVG | Primary/Secondary | Infant/Primary | Clean-up campaigns | Composting |

Outcome 4: Improved institutional arrangements with functioning systems to help each country manage and dispose effectively of waste generated by ships (in accordance with MARPOL V 73/78) and leisure craft (yachts).

The general objective of the GEF-funded Ship-Generated Waste Management Project was “to facilitate compliance with the special area designation of the Caribbean Sea for MARPOL 73/78 Annex wastes, and thereby, reducing marine pollution in the Caribbean Sea.” This objective has been achieved, although not in the manner originally envisioned in the project design. Instead of using the project’s publicly-operated barge and MARPOL bin system for ship-side waste collection (see national component 2 for more details), shipping agents in five of the six countries have continued to hire private operators and haulers for collecting and transporting ship-waste from cruise ships and other large vessels. In Dominica, the DSWMC places and removes bins for the cruise ships. Ship-generated waste from leisure craft enters the land-based system, where improvements in collection and disposal have ensured that ship-generated waste is properly transported and disposed of at sanitary landfills. In addition, the system of ship-waste documentation (advocated by the project) has been used in several participant countries as a rudimentary system for tracking ship-generated waste, although more work will be required to ensure that the all ship waste is properly monitored from ship to dock to landfill. Additional improvements reached because of the project include: (i) five countries have signed on to MARPOL out of the six (Grenada being the exception); (ii) there is a much higher awareness about solid waste issues among cruise ships and national authorities; and (iii) there is draft legislation in all six countries on this, and an Act has been passed in St. Vincent and the Grenadines.

Summary Table Rating the Achievement of Outcome 4

| Outcome 4 | A&B | D | G | SKN | SLU | SVG | Overall |
|-----------|-----|---|---|-----|-----|-----|---------|
| | U | S | S | S | S | HS | S |

Antigua and Barbuda: *(Unsatisfactory)*

This unsatisfactory outcome largely reflects the failure of the NSWMA to introduce a ship-generated waste bill to Parliament and its inability to reach agreement with the Port Authority to formalize responsibilities for handling ship-generated waste, including the operation of the project-funded barge. Ship-waste collection continues to be problematic, and the Ministry of Tourism has placed a formal complaint with the Port Authority over the current practice of transporting waste onto the docks and through the major tourism area of St. John. Shipping agents hire private haulers to take waste to the landfill sites without either oversight or monitoring on the part of the SWME. Consequently, there is inadequate data to show whether all ship waste actually reaches the landfills. However, Antigua and Barbuda remains dedicated to fulfilling its commitment as a signatory of MARPOL 73/78, Annex V.

Dominica *(Satisfactory)*

The DSWMC has made significant strides in establishing a formal system for managing ship-generated waste. While most cruise vessels do not discharge waste in Dominica, several military vessels have used the DSWMC's system and it has worked well. Shipping agents notify the General Manager 48 hours ahead of arrival, and the DSWMC places containers on the dock in advance. Once the waste has been collected, trucks are waiting to take it to the landfill. The DSWMC has successfully completed a Memorandum of Understanding (MOU) with the Port Authority, but the barge is very under-used. A ship-generated waste management bill is before Parliament with future passage expected shortly. Dominica is a signatory to the MARPOL 73/78, Annex V.

Grenada *(Satisfactory)*

This satisfactory outcome is based largely on the GSWMA's overall highly satisfactory system for collecting and disposal of all waste. Improvements in land-based collection and disposal have had a positive impact on the private operators who still collect most large vessel waste but now transport and dispose of it properly. The GSWMA has also placed bins at all small-craft harbors for the collection of leisure craft waste, which is also now handled properly. Furthermore, the Port Authority and the GSWMA have reached agreement on the use of the barge. Several concerns do remain, however. These include: (i) the failure to move the draft ship-generated waste bill in Parliament, withdrawn after a late objection raised by the Port Authority despite extensive consultation; and (ii) the country's decision not to sign on to MARPOL 73/78, Annex V, due primarily to concern over whether it could comply with Annexes I and II, prerequisites for signing Annex V.

St. Kitts and Nevis *(Satisfactory)*

The SWMC has established an excellent working relationship with the Port Authority, reflected in a signed MOU that spells out procedures for the use of the barge and responsibilities for the handling and disposal of ship-generated waste. The collection system in place for cruise ship waste works well, and while used only once last calendar year, may be viewed as best practice for the sub-region. St. Kitts has a draft bill on ship-generated waste ready for Parliament, and St. Kitts and Nevis have signed on to MARPOL 73/78, Annex 5. On Nevis, the handling of ship-generated waste remains problematic. The NSWMA has been unsuccessful in establishing an MOU with the Port Authority for the collection of ship-generated waste and use of the project-funded barge. High operation costs and low port traffic may explain the Port Authority's unwillingness to take responsibility for the barge. While this is an unsatisfactory outcome for Nevis, St.

Kitts' performance raises the overall rating to satisfactory.

St. Lucia (*Satisfactory*)

The SLSWMA has successfully completed an MOU with the Port Authority, and has prepared a draft bill for Parliament on ship-generated waste management. It has yet to be tabled for review and approval. Private operators collect all cruise ship and other large vessel waste (the SLSWMA has not procured a barge), while leisure craft waste is collected in project-procured bins placed at all small-craft harbors. Improvements in land-based collection and disposal have had a positive impact on the handling of ship-generated waste. Still, improved waste tracking from ship to disposal site would ensure that all ship-generated waste is properly collected and disposed of. St. Lucia has signed and ratified MARPOL 73/78, Annex V, and has finalized a strategy for ship-generated waste management after consultation with all stakeholders.

St. Vincent and the Grenadines (*Highly Satisfactory*)

This outcome is rated highly satisfactory, particularly in light of the successful passage of the 2002 Ship-Generated Waste Management Act, the first of its kind in the region. Private operators continue to collect waste from all cruise ships and large vessels, as no barge was procured by St. Vincent under the project. Bins are in place at all small-craft harbors, and the waste is collected and properly disposed of by the SWMU/CSWA. The SWMU/CSWA has also, following lengthy delays, completed an MOU (signed in 2002) with the Port Authority. St. Vincent and the Grenadines is a signatory to MARPOL 73/78 Annex V.

Endnotes for section 4.1

^[1] It should be noted that it is difficult to measure the health effects and the quality of the environment when solid waste is well managed -- it is much easier to measure the health effects when it is not -- and this makes for problems in coming up with indicators to demonstrate the achievement of objectives. The ICR team developed, in conjunction with the SWMEs from each country, these four outcome indicators to provide some approximate measurements of the project's benefits with regard to health and the environment.

^[2] Operating efficiencies may be assessed by relating operating costs to productivity. Benchmarks were never established under the project for the optimal ratio of productivity to operating costs, and this is something that would be useful for future monitoring of SWME performance. One sound benchmark is the unit cost per ton for collection, disposal and management of solid waste, which in middle-income developing countries ranges from US\$43 to US\$100 per ton. Most of the participant countries where adequate data was available fell within this range (e.g. Antigua – US\$49 per ton in 2002; St. Lucia – US\$70 in 2002).

^[3] Bank experience in other countries has shown that it is difficult to maintain a service charge for the management of solid waste, as opposed to water supply, which may easily be turned off if there is a failure to pay. Few countries have service charges for solid waste management in place, and those that do charge only for collection, with the transport and disposal services paid for by other revenue sources (mainly taxation). In the case of this project, the desired result was simply to reduce dependence on limited government revenues by developing alternative sources of revenue.

^[4] Green Globe 21 is a worldwide benchmarking and certification program developed after the United Nations Rio de Janeiro Earth Summit (1992) and in conjunction with Agenda 21 that facilitates sustainable travel and tourism for consumers, companies and communities.

4.2 Outputs by components:

National component 1: Introducing solid waste management investments to the existing storage,

collection and disposal systems in participant countries.

ICR Rating: Satisfactory

This component sought to address major deficiencies in the management of solid waste in the OECS countries by financing improvements to the existing storage, collection and disposal systems. This was carried out with the purchase of waste collection and other equipment and the development of appropriate disposal facilities. Design flaws, inflation, project delays and lack of capacity all worked against successful completion of this component. At one point it attained “problem project” status due to severe disbursement delays. However, through several project extensions, the countries procured nearly the entire schedule of the equipment and civil works required. Amongst other things, this included eight new sanitary landfills and one upgraded disposal site; 17 closed or restored dumps; over 13,000 bins for land and ship-generated waste; some 51 waste collection trucks; and a number of compactor and other disposal equipment (18 crawler tractors and track loaders, 4 dump trucks, etc.) and other operational equipment. Among the latter were eight weigh bridges, over 60 waste oil containers, three wood chippers, tire balers, tire shredders, etc.). Therefore, despite the noted delays, this component is rated as **Satisfactory**.

Landfill sites: construction and closure

The project provided funding, through parallel financing from the European Investment Bank (EIB), the European Union (EU) and the Caribbean Development Bank (CDB), for the construction of eight new sanitary landfills and one upgraded waste disposal site (out of the 12 in the original project design). Works are underway or should soon start on the three remaining sites (in Dominica and St. Vincent and the Grenadines). In addition, 17 (out of 21) old or illegal dumps have been closed and/or restored under the project. These results are particularly noteworthy in view of the many problems that occurred during project implementation. While several countries suffered setbacks, including landslides (Grenada) and disputes over land ownership (Antigua), the main cause of delay was the large discrepancy between the appraisal estimates and the actual costs of constructing the sanitary landfills. All six countries suffered significant delays in renegotiating loans with the respective donor agencies, as inflation (over five years), erosion of the value of the Euro (for the EIB and EU-funded countries) and/or an initial underestimation of costs all required countries to seek larger amounts to cover construction contracts. These delays threatened to derail the whole project, and ultimately required the Bank to provide several extensions to ensure satisfactory completion. Countries with new sanitary landfills still under construction include Dominica (Fond Colet/EU-financed) and St. Vincent (Wallilabou/CDB-financed) and the Grenadines (Paget Farm/EU-financed). For a more detailed analysis of this sub-component, see Annex 9 Table 1.

Collection and disposal equipment

This sub-component also suffered significant delays, due largely to design flaws that required withholding procurement for most of the equipment until the SWMEs were operational and landfill construction was well underway. While holding to this sequencing was arguably the correct decision, it cost the project, as disbursement delays in the procurement of the IBRD, IDA and GEF-funded equipment led to the project receiving a “problem” status at one point in time. However, as the capacity of the SWMEs increased and the landfill contracts began to move forward, procurement was shifted to the regional level (the Project Management Unit (PMU) and the OECS/Natural Resource Management Unit (NRMU)) to benefit from economies of scale. Project design supported the construction of Materials Recovery Facilities (MRFs) in each country, but only St. Lucia has completed MRFs at both of its new sites. With regards to bio-medical waste equipment procurement, the costs for incinerators and associated equipment proved to be prohibitive for all countries and there was concern that their maintenance would tax both the limited local capacities as well as the budgets of the SWMEs. However, the countries did examine alternative methods of managing

bio-medical waste, and each has incorporated a plan for its future management. St. Lucia has put in place an autoclaving unit that is now operational (Deglos landfill) and this provides for the full treatment of bio-medical waste. Furthermore, the Bank leveraged the experience gained under this project and incorporated the results of various bio-medical waste audits conducted under the project into new HIV/AIDS operations in the OECS. This will help to strengthen the bio-medical waste management system in public health facilities by providing funding for equipment, training, and technical assistance.

National component 2: Investments in port reception facilities for ship-generated waste in participant countries.

ICR Rating: Unsatisfactory

As previously discussed above (in Section 3.5), project design flaws in the Ship-Generated Waste Management components prevented the procurement of the MARPOL bins, which were referred to in project documents but were not in existence at the time of implementation. To compensate, many countries have made available alternative bins procured under the Solid Waste Management Project for both large and small craft harbors. All countries, with the exception of St. Lucia and St. Vincent and the Grenadines, have also procured barges under the project for ship-to-dock handling of waste. However, their costs were well over the appraisal estimate, resulting in delays while necessary adjustments were negotiated. As documented in 4.1, the barges have so far been largely under-utilized for a variety of reasons, including: (i) the lower volume of waste from cruise vessels than originally anticipated; (ii) unwillingness of some Port Authority to sign the MOUs; and (iii) higher than expected operating costs causing shipping agents to opt for private haulers. Because of this under-utilization, the barges are not bringing in enough revenue to cover their operating costs, let alone their maintenance. Some Port Authority representatives (as in Nevis) say they were reluctant to sign MOUs and take over barge operation for fear that they would be stuck with the costs of maintaining the barge without opportunities for recovering them.

National component 3: Rationalization of the existing institutional framework for ship and land based solid waste management in all six countries.

ICR Rating: Satisfactory

While the project provided only very limited funding for this component (through the regional component), it proved to be one of the most successful components. Activities under this component included: (i) the creation of SWMEs, based on a regional model, for all six countries; (ii) the preparation of draft laws for submission to parliament on solid waste management and ship-generated waste management; and (iii) the development of cost recovery mechanisms to ensure that operational costs were covered for SWMEs. All six countries successfully established a Solid Waste Management Authority or Corporation, with nearly all of the SWMEs becoming fully staffed and operational (except Dominica and Nevis). With technical assistance from the regional component (see regional component 1 below), all six countries prepared draft legislation on solid waste management, with three parliaments actually passing legislation (Dominica, Grenada, St. Vincent and the Grenadines). A Ship-Generated Waste Management Act has been passed in St. Vincent and the Grenadines, and legislation has been drafted in the others (except St. Lucia). Cost recovery mechanisms have also helped all but two SWMEs (Dominica and Nevis) to cover operational costs, reducing the level of reliance on Government subventions.

National component 4: Assistance in the establishment of a sanctuary for the threatened Grenada Dove.

ICR Rating: Satisfactory

The concept for this component arose from the discovery of a small population of Grenada Doves during a

site identification for the proposed Perseverance landfill site. The Government as a result proposed the formulation of an additional component to the GEF Ship-Generated Waste project whose primary objective was to provide the endangered Grenada Dove with a protected habitat at the proposed Mt. Hartman National Park and the Perseverance Sanctuary. After completing the gazettelement the National Park's boundaries as a condition for disbursement, the project supported the procurement of: (i) fencing for the Park and Sanctuary boundaries; (ii) signs to clearly demarcate the park; (iii) construction of a Park visitor center; (iv) monitoring equipment; and (v) interpretive materials. To support the management of the Park, the project was to provide technical assistance, as well as support for a management plan and the building of an institutional framework (including cost recovery mechanisms).

The Grenada Dove component has been satisfactorily completed. Construction of the Mt. Hartman Visitors' Center has been completed (despite serious delays due to heavy rains) and turned over to the Forestry and National Parks Department (FNPD) for operations. The boundary fences are in place for both locations, and an additional guardhouse at the Perseverance Sanctuary has been constructed to allay concerns about trespassing. On the management side, the project supported: (i) the preparation of a Cabinet-approved Forestry and National Park Management Plan for both the Park and the Sanctuary; (ii) a Grenada Dove Recovery Plan; (iii) the hiring of two guards for the Perseverance Sanctuary (in line with the findings of the management plan); and (iv) technical assistance to help train Park employees. Still to be completed is the implementation of cost recovery mechanisms to ensure sustainability, including entry fees, merchandise, food services and corporate sponsorships. A follow-up GEF-MSP (Grenada Dry Forest Bio-diversity Conservation Project with the FNPD), now under way, will ensure that the progress so far achieved in this component will be maintained.

Regional component 1: Support activities and technical assistance to all countries.

ICR Rating: Satisfactory

Implementation of this component needs to be evaluated for two phases. The first relates to the period in which the Project Management Unit (PMU) implemented all of the regional activities from 1997 to 2000. Unfortunately, the scheduling of these regional activities did not always go hand-in-hand with SWME development or project sponsored activities at the national level. This limited their overall impact and relevance. During the second phase, from 2001 to 2003, the regional component became more demand-driven, and project management support was provided by the OECS Environment and Sustainable Development Unit (ESDU). The OECS-ESDU provided member states with a list of all of the possible support activities that could be provided by the regional component (in line with project appraisal documents) at a round table meeting held in August 2001. Member states selected and prioritized activities, developing the work plans and procurement plans that became the basis for requests for project extensions. All countries made clear their preference for this approach and praised the OECS-ESDU for its responsiveness.

Over the life of the project, 43 studies and targeted technical assistance activities were undertaken under this component. Some were regional in scope, but the vast majority addressed country specific requests. A list of the completed studies can be found in Annex 9, Table 3.

Model legislation (*Satisfactory*).

Comprehensive and harmonized model legislation for shore and ship-generated waste management was prepared in 1999 under the direction of the PMU. Grenada and St. Vincent and the Grenadines enacted their own draft national legislation in 2000-02 on the basis of this model. The remaining countries requested additional assistance in drafting country-specific legislation, and the OECS-ESDU responded by

providing technical specialists to help prepare draft legislation for Grenada, St. Vincent and the Grenadines, Dominica, Antigua and Barbuda and St. Kitts and Nevis. In addition, assistance was provided to Antigua and Barbuda, Dominica, and St. Kitts and Nevis for the preparation draft legislation for solid waste management. Consequently, all countries, with the exception of St. Lucia, have completed draft legislation for both solid waste and ship-generated waste management by the time of the ICR mission.

Recycling/compost markets (*Satisfactory*).

The project supported the preparation of '4R' reports (reduction, recycling, recovery and re-use) for all participant countries. These reports were undertaken as desk studies, and therefore lacked the on-the-ground information necessary to make country-specific insights. With the operational development of the SWMEs, however, they are being used to identify opportunities for re-use or waste reduction. Additional technical assistance in waste minimization was provided by means of: (i) training SWME staff in master composting and the provision of manuals, posters, brochures, etc; (ii) preparation of a Used Oil Strategy that identified sources of used oil and made recommendations about its management, with suggestions as to the policy and regulatory framework, treatment and disposal methods and public education; and (iii) bio-medical waste audits, bio-medical waste management plans, and training in how best to minimize and manage such waste (five of the six countries received assistance). Several countries have already implemented '4R' activities, including composting programs (all countries), and a promising waste oil recycling initiative (in St. Lucia).

Training and Workshops: (*Satisfactory*).

During early project preparation, project management training was not provided to the SWMEs as had been envisaged in project design. While the PMU did support the preparation of a training needs assessment, most countries have noted that this study came too early in implementation, as at that point they were still establishing the necessary institutional and legislative arrangements. With respect to workshops, the PMU held at least one annual meeting per year to discuss the issues arising from project implementation. After the OECS-NRMU took over the regional component, training became more thematic in its orientation, with workshops held on specific topics (e.g. waste oil management) in lieu of meetings to discuss project progress. Training on solid waste management techniques was provided to 42 participants in 2003. In addition, two round tables were held to discuss the status of implementation. A final symposium was held in June 2003 to discuss the lessons learned from the project and to identify mechanisms and modalities that would ensure the continuity and sustainability of waste management in the sub-region.

Ship-generated waste documentation (*Satisfactory*).

The regional component has been successful in developing ways to ensure oversight for ship-generated waste from port to landfill, as prescribed in the project design. Several countries, most notably St. Kitts, have developed a system for handling waste from ship to landfill, which include the shipping agent giving advance notice, the boarding of the vessel, the recording of the waste, its transfer to the landfill, and the charging for collection and disposal. Over and above what is set down in the project design, the OECS-NRMU has sponsored two studies into the development of a waste tracking system. Such a system proved to be too costly and too difficult to administer. This is because of the state of current capacities in the region and the fact that such a system would have to be established in every Caribbean country, not just the OECS six.

Systems for monitoring and evaluation (*Unsatisfactory*).

No formal system has been put in place to monitor the impacts of the deliverables, and project indicators have never been developed during implementation. However, the PMU and OECS-NRMU did prepare quarterly reports, as well as providing significant oversight in each country. At the country level, a study was prepared under PMU guidance for a system to monitor solid waste management operations. However, this came too early in implementation, as most SWMEs have only now attained the operational capacity to benefit from such recommendations.

Model environmental education program (*Highly Satisfactory*).

It was determined early on in the project implementation that a regional approach to developing an environmental education program would be ineffective. It was decided that each country should develop its own program, grounded on local circumstances. Seed financing (up to EC\$50,000) was provided to five countries to reimburse their costs. Dominica was the only country that did not adequately access available funding to undertake the full array of possible public awareness activities. The work completed by the SWMEs in this component was remarkable, and has been one of the highlights of the project.

Technical assistance in the preparation of sewerage master plans (*Unsatisfactory*).

The PMU completed a pre-feasibility study early on in project implementation, but only Grenada was able to prepare a country-specific master plan based on the regional study. This shortcoming was largely due to: (i) costs of undertaking country-specific master plans, which were seriously underestimated (Grenada's cost over US\$600,000 alone whereas the estimate at the appraisal stage had been US\$400,000); (ii) significant project delays required the Bank and participant countries to refocus efforts on core solid waste activities; (iii) the Bank had not planned to provide further financing in the sector, as other donors were already actively involved in wastewater projects; and (iv) most SWMEs did not have water sanitation as part of their mandate, thus making them less enthusiastic about completing this sub-component.

Regional component 2: Preparation of a workable institutional framework for regional coordination in the project sectors and facilitating overall project management and monitoring.

ICR Rating: Satisfactory

The PMU and the OECS-ESDU provided critical regional leadership by helping to coordinate and move forward both national and regional-level project activities. Project workshops, roundtables and annual meetings all facilitated the development of a common approach to solid waste management through discussion and information sharing amongst the SWMEs. The OECS-NRMU also helped to channel independent knowledge sharing among SWMEs, by putting interested staff from one SWME in touch with staff from another country to share experiences or best practices. Finally, the backstopping regional procurement work taken on by both the PMU and the OECS-ESDU helped countries meet procurement deadlines, which was key to completing critical project activities. As evidence of the success of the regional model, the participating countries at a final symposium agreed to the need for maintaining some regional coordination mechanism to continue information sharing.

4.3 Net Present Value/Economic rate of return:

N/A

4.4 Financial rate of return:

N/A

4.5 Institutional development impact:

Substantial

| Institutional Development | A&B | D | G | SKN | SLU | SVG | Overall |
|---------------------------|-----|---|----|-----|-----|-----|---------|
| | S | U | HS | S | HS | HS | S |

The impact of the project on institutional development was substantial, with Dominica and Nevis¹¹ the most notable exceptions. Well-functioning SWMEs have been established in each country as autonomous or semi-autonomous authorities or corporations. Legislation developed under the project has been introduced into each country, giving the SWMEs sole responsibility for solid waste management. This has removed responsibility from local government bodies and the public health or environmental units of the ministries of health. Because of their multiple responsibilities, these were not always able to give proper attention to solid waste management. A centralized organization has thus been created with specific responsibility for solid waste management and with the required level of autonomy in decision-making. In addition, cost recovery mechanisms have been introduced (environmental levies, household service charges, white goods levies) at various levels in all of the countries and have provided much-needed alternative sources of financing to help make the SWMEs sustainable. All these represent significant institutional advances, and ones that have dramatically modified and improved solid waste management in the sub-region.

Endnotes for section 4.5

¹¹ The original project design did not envisage a separate SWME for Nevis, and arguably it would therefore be difficult to hold the project accountable for inadequate institutional development on Nevis. The NSWMA was only created in 2001, and has not benefited (as have other SWMEs) from the experience of implementation and institutional development gained as a result of the project in previous years.

5. Major Factors Affecting Implementation and Outcome

5.1 Factors outside the control of government or implementing agency:

The project suffered a number of unexpected factors that led to delays in implementation. In order to accommodate these delays and setbacks in the delivery of key products, there were several extensions to the project's original closing date. The main factors were:

- **Delayed passage of legislation through Parliament:** While nearly every SWME produced draft legislation for solid waste and ship-generated waste management, half of the countries' Parliaments have yet to pass Solid Waste Acts, and only one country (St. Vincent and the Grenadines) has passed a Ship-Generated Waste Act. These delays in the passage of legislation have prevented the SWMEs moving forward in the drafting of supporting regulations and in preparing integrated solid waste management plans. The different starting points of the countries with regard to their existing maritime legislation, and the existence of two models for such legislation (International Maritime Organization (IMO) model and one prepared under the project) delayed the preparation of ship-waste legislation.
- **Adverse natural and weather conditions:** Due to heavy rains in December 2001, a major landslide occurred at the Perseverance site in Grenada, causing the GSWMA to revert to the old site and undertake significant remedial action to restore operations at the new landfill. In addition, soil conditions at the new Deglos sanitary landfill in St. Lucia made construction much more difficult than previously expected, causing serious delays.

- **The complexity of the project's financing structure:** The administrative costs from multiple donor procedures, forms, etc., combined with the extensive renegotiations required to secure additional financing from donors for landfill construction (after redesign and revised cost estimates completed), led to significant delays in project implementation.

5.2 *Factors generally subject to government control:*

- **Delays in the submission of solid waste management draft bills to Parliament:** Delays occurred in almost every participant country in moving draft bills through the offices of the Solicitor General or Cabinet for their approval before they reached Parliament for final review and passage.
- **Lack of direct access on the part of SWMEs to cost recovery resources:** While the OECS Governments have successfully put in place cost recovery mechanisms, many have been reluctant to allow the SWMEs to collect directly the resources raised through these mechanisms. This lack of proper governance with cost recovery measures undermines the intended financial autonomy of these entities when payments from the consolidated fund are delayed, arrive only in part or simply never materialize. This puts the overall sustainability of project achievements at risk.
- **Delays in the transfer of human resources and functional responsibilities from ministries to the SWMEs:** The delays in transferring functional responsibilities and human resources from the ministries formerly responsible for solid waste management to the SWMEs affected their rate of development and their ability to perform their mandated functions. Some of these functions, including street sweeping, drain cleaning, and others (i.e. dealing with the enforcement of litter laws), have properly remained within the ministries so as to maintain the distinction between service provider and regulator. Many ministries still retain hiring control, thereby reducing the degree of control that general managers have over staffing for key functions.
- **Strong country ownership:** Project success was the direct result of strong ownership at all levels of government and within the SWMEs. This was evident from the implementation of cost recovery measures in the face of pressures from the cruise ship industry, the transfer of authority for solid waste management from established ministries to new entities, and contributions from the consolidated fund despite instances of macro-economic difficulty.

5.3 *Factors generally subject to implementing agency control:*

- **Conflicts in SWME-PMU relationship:** The relationship between the SWMEs/PIUs and the PMU gradually deteriorated over the course of project implementation. The SWMEs resented what they perceived as a top-down approach. They viewed the PMU as unaccountable and lacking in transparency. The shift to the OECS-NRMU in 2001 was a positive move, and many of the transparency and participatory relationship issues were thereby resolved.
- **Inadequate technical and administrative capacity on the part of the PMU:** Given the scope of the work and the skill mix required in coordinating such a complex project, more resources were needed for the regional coordinating entities to monitor national-level progress, as well as fulfill their regional activities.
- **Staffing delays and limited skills:** Several SWMEs suffered from delays in hiring staff, and two SWMEs (Nevis and Dominica) are still seriously understaffed. Many found it difficult to locate skilled staff, thereby necessitating increased training which was often not included in their budgets. In

addition, some SWMEs suffered a lack of staff qualified in financial management and administration, resulting in an incapacity to handle Bank procurement and disbursement procedures. This also led on occasions to a general inability to appraise the full costs of disposal and collection in day-to-day operations.

- **Misprocurement by the PMU resulting in suspension of disbursement:** The PMU's weak procurement capacity, its perceived general lack of transparency and inappropriate procedures in its selection and evaluation of consultants, all contributed to the Bank's decision ultimately to declare misprocurement on the purchase of office equipment (US\$35,000) and consultant contracts (US\$45,000). This created a great deal of contention amongst the participant countries which were required to pay back the funds. It also was an unfortunate distraction that disrupted project implementation and disbursement for some time.
- **Failure to prepare performance indicators:** The SWMEs and the PMU/OECS-NRMU failed to prepare key performance indicators, as required under the project. This affected their ability to properly monitor progress of key elements of the project.

5.4 Costs and financing:

Total project cost were estimated at appraisal to be US\$50.5 million, with the GEF providing US\$12.5 million, IDA US\$4.7 million, IBRD US\$6.8 million, and the CDB, EIB and EU providing the remaining US\$26.5 million in parallel financing. The United Kingdom's Department for International Development (DFID) provided an additional, unforeseen US\$1.7 million in parallel financing to St. Lucia for technical assistance and consultancies that: (i) assisted the SLSWMA in developing a waste disposal strategy and implementation plan; (ii) supervised the construction of Deglos landfill; and (iii) provided general cross-support for four years to the SLSWMA. At the time of project closure, project costs had reached roughly US\$54.24 million, slightly exceeding original estimates, due largely to the increased costs for landfill construction that required additional donor funding. The project disbursed 90 percent of the initial GEF funding (current value), or US\$10.4 million, and 73% of IBRD/IDA funding (current value), or US\$7.6 million. There are several reasons why the project did not fully disperse available funds. They include: (i) St. Lucia's decision to privatize collection and disposal operations, negating the need for procuring waste collection equipment; (ii) delayed project implementation, which forced a heavy backloading of procurement towards the end of the project, resulting in some potential procurement requests slipping past the deadline; and (iii) Dominica's decision not to draw on any of its IBRD loan. The table below provides a complete analysis of the initial amount of financing provided by the GEF, IBRD and IDA, as well as the amount disbursed and percentage of funds disbursed over the life of the project.

The complex financing structure of the project, and in particular its reliance on multiple donor parallel financing for landfill construction (and other select goods) plus the cost recovery mechanisms for SWME operational costs, added an element of risk that surfaced when the project started to experience delays due to the time required to renegotiate landfill construction contracts. In addition, donors brought their own additional agendas to bear and at times this disrupted project implementation. For example, the landfill construction in Antigua suffered from disbursement delays because of the broader issue of Antigua's arrears to the EIB. In countries with weak cost recovery mechanisms, the project suffered as SWMEs could not carry out project activities without operational funding for staff, training and equipment maintenance.

Table showing amount of GEF, IDA and IBRD funds disbursed under the project

| Country | Source of Funding | Initial Amount (in US\$ million equivalent) | Current Allocation* (in US\$ million equivalent) | Amount Disbursed (in US\$ million equivalent) | Percentage (Amt. Disb./Current)* ** |
|----------|-------------------|---|--|---|-------------------------------------|
| A&B | GEF | 1.30 | 1.27 | 1.23 | 97 |
| DOM | GEF | 0.79 | 0.78 | 0.62 | 80 |
| | IDA/IBRD | 1.20 | 1.24 | 0.47 | 38 |
| GRD | GEF | 1.30 | 1.16 | 1.16 | 100 |
| SKN | GEF | 1.20 | 1.01 | 1.01 | 100 |
| | IBRD | 2.13 | 2.13 | 1.58 | 74 |
| SLU | GEF | 1.10 | 1.03 | 1.02 | 99 |
| | IDA/IBRD | 4.58 | 4.43 | 3.80 | 86 |
| SVG | GEF | 1.10 | 0.99 | 0.99 | 100 |
| | IDA/IBRD | 3.61 | 3.46 | 1.78 | 51 |
| Regional | GEF | 5.70 | 5.30 | 4.38 | 83 |
| Totals | GEF | 12.5 | 11.54 | 10.41 | 90 |
| | IDA/IBRD | 11.5 | 11.26 | 7.63 | 73 |

*"Current Allocation" taken from World Bank's ICS

**"Percentages" taken from World Bank's ICS and ICR calculations

6. Sustainability

6.1 Rationale for sustainability rating:

It is **likely** that the achievements of the project will be maintained because of the project's success in establishing the improved institutional, technical and financial capacity to manage solid waste in nearly every participant country.

Antigua and Barbuda (*Likely*):

The SWMA is now well established in Antigua and Barbuda. It has very skilled technical staff, undertakes solid reporting and record keeping, provides a high quality service, has extensive public awareness programs, benefits from good leadership on the Board, and has solid relations with the Ministry of Health. In addition, the SWMA has operated at positive cash flows, despite an increased reliance on Government subventions (from 40% in 2001 to 60% in 2002). Future revenue streams include a proposed white goods levy that would be transferred directly to the SWMA, contributing necessary additional funding to support operations and to service the EIB loan for landfill construction. Areas of concern include: (i) fragmented institutional roles and responsibilities that are shared with the Ministry of Health; (ii) failure to have in place new legislation or regulations for solid or ship-generated waste management; (iii) the need to develop quantitative output targets and to establish benchmarks for measuring performance; and (iv) the need for continued support to the Barbuda Council for day-to-day solid waste management operations on Barbuda.

Dominica (*Highly Unlikely*):

The Dominica SWMC was facing a crisis at the time of the ICR mission. It is not receiving enough funding from the Government and the environmental levy to maintain adequately its operations. During the fiscal year 2002, the SWMC received only 66% of the total revenue collected from the environmental levy and 33% of budgeted Government subventions. This revenue shortfall is unfortunate as the DSWMC has worked hard despite chronic understaffing to make improvements. Notable achievements include: (i) the successful passage of a new Solid Waste Management Act and preparation of draft legislation with regard to ship-generated waste; (ii) some effective public awareness campaigns in spite of budget shortfalls; and (iii) an excellent record keeping and reporting capacity. If the SWMC does not receive an adequate budget and stronger support and leadership from its Board, the sustainability of these and other future project

benefits may be in jeopardy.

Grenada (*Highly Likely*):

The institutional, technical and financial framework for solid waste management is now well-established in Grenada. Grenada has moved towards privatizing all collection services, and has implemented strong control measures to ensure satisfactory service from contractors. The SWMA maintains a full and technically capable staff, has a strong Board, and is well established in the community. While a Solid Waste Management Act is in place and the SWMA has nearly completed its first draft of an integrated solid waste management plan, the SWMA needs to continue to work on establishing the legal framework for ship-generated waste. Cost recovery mechanisms have helped to lower the SWMA's reliance on Government subventions to 28% (from 1995-2002), making it an example for the rest of the region. With nearly five years of successful operations, project achievements are highly likely to be sustained in Grenada after closure of the project.

St. Kitts and Nevis (*Likely*):

The SWMC has made significant progress in establishing an institutional and technical framework for solid waste management, but there is still room for improvement on Nevis. St. Kitts and Nevis have a Solid Waste Management Act in place, with a Ship-Generated Waste Bill now before Parliament. While the SWMC is now fully staffed, the NSWMA will require additional staff and training, in particular on landfill and financial management. Efforts to increase public awareness have been highly successful, with the public taking an increasing role in helping the SWMC by segregating waste, undertaking public clean-up campaigns, and helping to monitor the problem of litter. The SWMC maintains positive cash flows, but has increasingly relied on Government subventions for funding, with Government contributions moving from EC\$1.20 million in 2002 to EC\$1.80 million in 2003. This has coincided with an overall budget increase from EC\$1.16 million in 2000, to EC\$1.47 million in 2002, and EC\$ 2.39 million in 2003. The NSWMA, however, appears to be in a much more difficult position. Its funding is insufficient to maintain positive cash flows. Despite the noted weaknesses on Nevis, the SWMC's hard work and commitment over the last five years in establishing a high level of service and public awareness ensure the likely sustainability of overall project benefits.

St. Lucia (*Likely*):

The SLSWMA has successfully implemented a totally privatized system for collection and disposal, meaning that it will be able to maintain a much smaller staff and avoid the costs of maintaining equipment and depreciation. The SLSWMA's strong management, its competent staff, its solid public image stemming from a best practice public awareness program, as well as five years of positive cash flows all suggest that the SLSWMA is well-positioned to maintain the achievements of the project. However, the SLSWMA has suffered a rapid reduction in revenues from the environmental levy (from 34% in 2001 to 26% in 2002) which, combined with an increase in its budget from EC\$8.8 million in 2001 to EC\$10 million in 2002, suggest an increasing reliance on Government subventions. The development of additional cost recovery revenue streams and the future passage of a Solid and Ship-Generated Management Acts would help strengthen its institutional foundations.

St. Vincent and the Grenadines (*Highly Likely*):

St. Vincent has established a strong institutional, technical and financial framework for solid waste management. These are based on the well-established CWSA, which increases the likelihood that project achievements will be sustained after closure. St. Vincent is the only country to have passed both a Solid

and a Ship-Generated Waste Management Act, and the SWMU/CWSA is well on its way to completing the region's first set of supporting regulations and an integrated solid waste management plan. The SWMU is fully staffed and has capable leadership. It enjoys excellent public relations, spurred on by its quality service and solid public awareness campaigns. In addition, the SWMU/CWSA has successfully established an enhanced cost recovery system, with Government subventions providing only about 44% of its funding from 1995-2002.

6.2 Transition arrangement to regular operations:

The creation of six solid waste authorities or corporations in the OECS countries has dramatically modified solid waste management in the region. Overall, the entities have been very successful in increasing collection coverage and improving the disposal of solid waste. Resources devoted to solid waste management have been increased in all countries, although it is clear that operating efficiencies, procedures and levels of funding differ greatly from one entity to another. At the time of project closure, SWMEs have been operating for several years, ensuring a seamless transition. This is particularly important, as no follow-up Bank-funded operation is planned.

The management of these institutions recognize the need for sustained regional coordination in the area of solid waste management, and have already embraced the idea of continued experience and knowledge-sharing after the project is over. One option that is being contemplated is the creation of an association of solid waste management authorities/corporations in the region. Examples of such associations exist in Africa in the form of African Water Suppliers Associations and the Water Utilities Partnership. Participation to any association would be voluntary, and the secretariat should be provided by one of the SWMEs on a rotating basis. Operating costs of the secretariat should be financed from annual fees paid by each SWME. Issues to be tackled by such an association could include: (i) the preparation of technical standards; (ii) the definition of technical and financial indicators; (iii) the definition and review of a set of benchmark indicators (efficiency of investment, efficiency of operation and maintenance, financial sustainability, and responsiveness to customers, amongst others); (iv) the promotion of management information systems; (v) the setting up of a performance data base; (vi) the preparation of toolkits (models for contracting the private sector, for example); and (vii) the development of capacity building programs and systems to certify solid waste management operators.

7. Bank and Borrower Performance

Bank

7.1 Lending:

Lending: Marginally Satisfactory

The Bank's leadership in assisting the OECS countries in pulling together a complex project, by promoting a regional approach and attracting other donors to commit funds to supporting national and regional level efforts to improve land-based solid waste management is noteworthy. In addition, the project design for the land-based activities was sound, reducing the impact of the weaknesses of the project's ship-waste aspects. However, the Bank's overall lending performance is marginally satisfactory for the following reasons: (i) its 'top down' approach to developing the ship-generated waste management project; (ii) the over ambitious project design; (iii) serious design defects that resulted in project delays; and (iv) a failure at appraisal to integrate properly the GEF-funded Ship-Generated Waste Project into the Solid Waste Management Project SAR.

Project identification and preparation began in early 1991. The primary focus was on the development of a ship-generated waste management project to take advantage of the progress made by the on-going GEF-funded WCISW project for the wider Caribbean region. However, after high-level country officials

made it clear that ship-generated waste management would work only if land-based waste was itself properly handled, the Bank reacted quickly by working with the countries on preparing additional land-based solid waste management facilities. The Bank provided the leadership required in helping the countries persuade a variety of donors to set aside additional funding to pay for the costly infrastructure works needed to improve land-based solid waste management. This ensured that the countries received a more relevant project that met their needs, eventually generating significant positive results for solid waste management.

However, weaknesses in project preparation and design, including most notably the underestimation of costs for landfill construction, resulted in significant delays while countries renegotiated with donors for additional financing to cover the actual costs. The effectiveness conditions were ambitious, and this resulted in long effectiveness delays. The marine waste component unrealistically sought to establish an innovative marine waste management system with interchanging bins and the use of a barge in countries where small level private sector collection was already in place. An alternative strategy could have been to support the SWMEs in building up the capacity to monitor and regulate private haulers. The project sought to integrate a sewerage component into what was basically a solid waste management project. Finally, the project sought to have all activities completed by a closing date of 2000. As experience has shown, this was an overly optimistic target date given the political realities of: (i) establishing completely new entities and transferring their staff and functions from a pre-existing ministry; (ii) preparing and presenting to Parliament two new laws, along with regulations, while developing solid waste management strategies; and (iii) constructing, closing or upgrading landfills while at the same time procuring a myriad of equipment at the national level with only a very limited capacity to do so.

7.2 Supervision:

Supervision: Satisfactory

With all its complexities, this was a very challenging project to supervise. Despite the difficulties of monitoring progress in several countries, coordinating with other donors, and in spite of those problems emanating from the design stage, the Bank performed adequately. Along with the countries, it should be commended for finally completing a project with a satisfactory outcome. The Bank performed over 20 supervision missions, including one mid-term review mission. For the final three years of supervision, each country received an individualized aide memoire, and these reports were also all circulated to the donors to keep them abreast of project developments. Changes in the Bank's management team over the life of the project, including three different task managers and two country directors, had disruptive effects. However, new management also brought fresh ideas and perspectives that helped to move the project forward. The Bank made the strategic -- and in hindsight appropriate -- decision to hold up the procurement of equipment (IBRD/IDA/GEF financed) until the landfill construction process was well under way. While this ultimately resulted in lengthy disbursement delays (really a design flaw), it helped to advance the difficult landfill negotiations that all countries were undergoing with other donors. After the landfill contracts were on track, the Bank quickly began disbursing funds, and worked diligently with the regional component to achieve as much as possible within the extension period.

However, there were some weaknesses in supervision. In the 1996-2000 period, better supervision could have provided more support to individual countries, including an orientation workshop on Bank procedures and on how to use Bank financial and disbursement officers to help guide procurement. The OECS-ESDU has noted that during the period in which it was involved, Bank procurement and disbursement officers were not always readily available. Greater donor harmonization, such as joint missions, common reporting formats and requirements, and common conditions, while admittedly difficult to coordinate, could have eased the burden on the SWMEs and the regional coordinating agencies. The Bank should have also

focused on the need for early project management support for the SWMEs, working with the PMU to establish performance indicators and provide greater technical assistance.

7.3 Overall Bank performance:

Overall Bank performance: Satisfactory

Despite the weaknesses in project design and preparation, strong project supervision combined with a highly relevant and valued project objective shared by all participating countries led to the successful completion of the project. The Bank demonstrated flexibility in providing for project extensions when needed and properly justified, which shows a commitment to the region and to making an impact on this important issue. Ultimately, these extensions, along with continued strong supervision, contributed to the project's satisfactory outcome.

Borrower

7.4 Preparation:

Preparation: Satisfactory

The Borrowers/Grant Recipients worked proactively with the Bank during the preparation of the project to shift its emphasis from a ship-generated waste project to a comprehensive solid waste management project that would better address the region's development needs. Throughout the preparation of the project, respective government officials showed a commitment to making some of the serious changes proposed, including: (i) implementing cost recovery mechanisms like the environmental levy; (ii) creating new autonomous or semi-autonomous entities and shifting responsibility from existing ministries; and (iii) committing to spend more of limited budgets on purchasing land for new sanitary landfill sites. Generally, country leadership (prime ministers, ministries of finance etc.) recognized the relevance and importance of this project at this stage, giving it their support.

7.5 Government implementation performance:

Satisfactory

The leadership within the OECS countries involved kept up that initial commitment during implementation stage of the project. The implementation of the environmental levy (on visitors) was the consequence of the political support given by the prime ministers of all six participant countries, in the face of strong pressure from the cruise ship industry to prevent it. Ministries formerly responsible for solid waste management agreed to cede all responsibility to the SWMEs in each country. Each country passed laws establishing the SWMEs, and many have successfully passed solid waste management laws under the project. Most governments have also committed significant contributions from their consolidated funds to support the SWMEs, despite severe macro-economic constraints on the budget funds available. However, in the last two years, several of the borrowing countries have demonstrated less willingness to provide the SWMEs with direct access to the funds collected from cost recovery levies and service charges. Continued support from the ministries of finance for enhancing cost recovery systems through the direct transfer of funds to the SWMEs (instead of using the consolidated fund channel) and the introduction of user fees are key conditions for future sustainability.

7.6 Implementing Agency:

Implementing Agency: Satisfactory

Project Management Unit (unsatisfactory): The PMU, located within the OECS Secretariat and responsible for implementing the regional component from 1997 to 2000 successfully executed much of its early work plan, but was often unresponsive to countries' needs, undertaking several studies that would have been better left for later. Limited oversight by the OECS Secretariat, combined with a general failure to act with the due diligence and efficiency that could be expected, led the Bank to suspend disbursements in 2000 and the OECS Secretariat to disband the PMU. The closure of the PMU and subsequent transfer of management responsibility to the OECS-ESDU had a disruptive effect on project implementation.

OECS-NRMU/ESDU (*Satisfactory*): After taking over in late 2000 a seriously delayed and politically sensitive project, the OECS-ESDU moved the project forward quickly and ensured the satisfactory completion of the regional component. After the mixed results achieved during the PMU phase, the OECS Secretariat also took on a more active oversight role that helped to move project activities forward. The OECS-ESDU provided noteworthy support in undertaking the regional procurement of all project-funded equipment, which helped to secure project extensions that ultimately saved the project. In addition, the OECS-ESDU was more responsive to countries because of its more transparent and demand-driven procedures for providing technical assistance to borrowing countries. Several SWMEs noted, though, that the OECS-ESDU could have been more supportive in providing project management support to the SWMEs through flexible funding arrangements like the one used for the public awareness component. The OECS-ESDU also provided noteworthy support to the SWMEs in designing the legislative bills that were prepared in nearly every country.

Solid Waste Management Entities (*Satisfactory*): The effectiveness of the SWMEs in executing project activities has varied between countries, although overall their commitment and effort has been satisfactory. In some instances, countries went beyond the confines of the project by conducting additional public awareness work or implementing innovative cost recovery mechanisms not originally considered. In addition, many of the SWMEs have demonstrated a high level of technical capacity. However, almost all of them suffered serious delays in staffing key positions and in developing the management capacity to execute the project early in the implementation phase. This resulted in delays that threatened project cancellation. After receiving the first extension, many SWMEs corrected these problems, and are now fully staffed with the technical skills required. However, some SWMEs are still struggling to achieve adequate staffing and key positions remain vacant. These require greater support in order to ensure that the project achievements are sustained.

7.7 Overall Borrower performance:

7.2.1. Overall borrower performance: Satisfactory

The borrowing countries demonstrated the commitment and sustained effort required to ensure the successful completion of a complex project that taxed each country's technical and financial capacities. The remaining concern is that the borrowing countries continue to demonstrate this commitment by fully transferring cost recovery funds to the SWMEs.

8. Lessons Learned

- **Regional Approach provides for greater aid effectiveness in small island developing states (SIDS):** The regional approach provides for greater aid effectiveness through economies of scale and increasing synergies in areas where resources, both human and financial, are limited. The regional approach can also help to effectively coordinate the dissemination and replication of lessons learned during implementation of country-specific components. Furthermore, the regional approach fosters a competitive

environment between countries, providing benchmarks that inspire greater performance on a national level. A regional approach may also facilitate regional compliance on international treaty issues, such as MARPOL 73/78 in this project.

- **Project components must have a built in flexibility and realistic time table when dealing with multiple countries with varying development capacities and needs.** Flexibility can be achieved through a demand-driven approach. In this project, the change to a demand-driven approach had a positive impact on implementation, as countries felt they could seek assistance that best fit their needs. Possible demand-driven processes could also have been useful for the procurement of equipment. It should be noted that if faced with a similar situation today, the Bank might consider a regional Adaptable Program Loan (APL), as was done for the multi-country HIV/AIDS Prevention and Control Program. Furthermore, future projects involving multiple donors and countries will require appropriate sequencing for project activities and realistic time tables to account for the inherent complexity of a regional project.
- **The provision for a Regional Coordinating Unit (RCU) is a useful method that facilitates project supervision for multiple country projects.** The RCU in this project was able to provide key regional leadership that ensured regional coordination and consistency in approaches to solid waste management issues. In addition, the RCU provided crucial guidance to countries on Bank procedures and procurement which were important in helping to move implementation forward. It was also essential that the RCU maintained a separate project component with funding tied to it, to provide it with some leverage in dealing with national implementation units.
- **Public awareness and education are essential in building support for major changes.** Public awareness not only may help to ease difficult transitions, such as the move of government salaried employees and functions from the ministries to the SWMEs, but it can also lead to a higher level of achievement of outcome objectives. In this project, the public's efforts to change old habits of disposing of their garbage on the roadside helped to increase the impact of the project. This was only achieved when community groups took it upon themselves to organize clean-up campaigns. Public awareness campaigns are relatively inexpensive methods for inducing significant change in community behavior.
- **Importance of balancing regional standardization and potential efficiency gains with country specific needs to ensure full benefits of joint procurement:** Joint procurement can provide benefits in an operational setting such as the OECS, including economies of scale, harmonization, speed of processing documentation, and efficient use of limited human and financial resources. However, experience in this project suggests that these benefits must be balanced with specific country concerns, situations and capacities.
- **Dealing with sub-national island systems:** Project design and implementation needs to take into account countries that are made up of multiple islands of different size, capacity and development needs. Mechanisms should be put in place to ensure that implementing agencies based on the main islands actively supervise project activities on the smaller ones. In project design, more thought should be given to tailoring equipment and civil works procurement, taking into account the specific technical needs of the smaller islands in multiple island nations.

9. Partner Comments

(a) Borrower/implementing agency:

Antigua and Barbuda



National Solid Waste Management Authority Project Implementation Unit

PO Box 2224, St. John's, Antigua, WI.
Telephone (268) 562-1351 Fax: (268) 562-1352 Email: projectu@ncandw.org

28th October 2003

Garry Charlier
Environmentally and Socially Sustainable Development
Latin America and Caribbean Region
The World Bank,
Washington, D.C. 20433
Fax: (202) 676 0199

Dear Mr. Charlier,
Partner Comments – ICR

We acknowledge receipt of the Implementation Completion Report (GEF-TF028594-600; IBRD-38790-3882; IDA-27140-27160) for the OECS Ship-Generated Waste and Solid Waste Management Project of September 30th 2003. We have reviewed the report.

- 1) We wish to comment specifically on '**Outcome 2: Increased coverage and improved quality of land-based solid waste management services (collection, transport and disposal) in each participating country**' where Antigua and Barbuda received a 'satisfactory' rating. The report noted that the newly completed sanitary landfills are not yet operational because of construction delays and pending arbitration/litigation arising from contract disputes.

The NSWMA and landfill contractors have reached agreement (04th October 2003) on outstanding issues and will avoid either arbitration or litigation. The Taking-Over Certificate has been issued by our consultant engineers. The landfills, already commissioned, will be operational December 01st 2003.

We at the NSWMA and the public are of the opinion that we are 'winning' the uphill struggle to counter littering and illegal dumping/dumpsites.

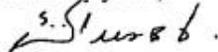
- 2) We note the unsatisfactory rating applied to **Outcome 4: Improved institutional arrangements with functioning systems to help each country manage and dispose effectively of waste generated by ships (in accordance with MARPOL V 73/78) and leisure craft (yachts).**

We understand that the rating does not reflect the efforts of the NSWMA to have these matters resolved. Draft legislation/bills remain in the Attorney General's office despite

entreaties from us for action. The same non-response remains from the Antigua Port Authority.

We share the overall rating of 'Satisfactory' in the project's efforts to improve solid waste management in the OECS region. We are heartened that considerations were given to the regional nature of the project and the attendant difficulties of assessing impact. In Antigua and Barbuda, the organizational commitment of the NSWMA towards the maintenance and improvement of project achievements remains strong.

Sincerely yours,



D. Keith L. Hurst
Chairman,
National Solid Waste Management Authority,
Antigua and Barbuda



MINISTRY OF HEALTH AND SOCIAL SECURITY

Tel: (767) 448-2401 Ext. 3259/3260/3357
Fax: (767) 448-6086
E-mail: minhealth@cwdom.dm

GOVERNMENT HEADQUARTERS
KENNEDY AVENUE
ROSEAU
COMMONWEALTH OF DOMINICA
WEST INDIES

October 31, 2003

Mr. Garry Charlier
Task Manager
The World Bank
1818 #Street NW
Washington DC 20433
United States of America

Dear Mr. Charlier,

We acknowledge receipt of the Completion Report, for the OECS Ship-Generated Waste on Solid Waste Management Project.

The contents of the report have been reviewed, and note taken of status of the various components with particular reference to Dominica.

I have also noted the unsatisfactory performance of Dominica in all but one of the components.

Let me assure you that steps are being taken to resolve some of the inherent problems plaguing the corporation. For a start, a new manager has been recruited and one of the first assignments would include the development of a new strategic plan for the organisation. This plan will address the issue of cost recovery and collaborative initiative with private sector institutions municipals and local government councils.

The recruitment of an Engineer and Operations Manager is also on the agenda. The Solid Waste Act is to be amended to allow for selection of persons from outside of the Public Service to serve on the Board of Directors. The Corporation will no longer be seen as an extension of the Ministry of Health.

I must admit that we are not proud of the unsatisfactory ratings considering that all of our sister OECS countries have been rated highly.

With construction of the new landfill, a new management team, the proposed restructuring of the Board and new strategies for cost recovery, Dominica will eventually overcome the many obstacles, which has confronted the organisation over the years.

As Dominica embarks on its eco-tourism drive, effective management of solid waste is essential, however, it is not possible to achieve positive outcomes without adequate financial resources.

It is my hope that as the economy improves, government subventions and environmental levies will be made available to the Corporation.

In the meantime I wish to thank you sincerely for your support and assistance in the past and look forward to working with you sometime in the future.

Thanks,



.....
JOHN P. BIEN
PERMANENT SECRETARY
MINISTRY OF HEALTH AND SOCIAL SECURITY

Grenada

Grenada Solid Waste Management Authority

P.O. Box 1194

St. George's , GRENADA



TEL:(473) 444-2019/3009 FAX: (473) 444-0330 E-mail gndswma@caribsurf.com

November 5, 2003

Borrower's Comments

The Grenada Solid Waste Management Authority (GSWMA) is in agreement with the evaluation findings stated in the Implementation Completion Report (ICR). Not only has the borrower considered the outcome of the project worthwhile but the benefits to the region and Grenada in particular to be tremendous.

Nevertheless, the project was a complex undertaking. Having to administer a common project among different islands with their individual eccentricity has added to the difficulty of implementation of the project; something that was never anticipated during project design. Further, cross conditionalities placed on disbursement by the project funding agencies did not make the burden any easier. It created delays and in some instances frustration. However, the experience gained will be useful in the design of other regional projects.

With regards to ship-generated waste there is a Memorandum of Understanding between the Ports Authority and Grenada Solid Waste Management Authority (GSWMA). However, the private sector is the major handler of such waste. It is anticipated that Grenada Solid Waste Management Authority (GSWMA) will play a greater role when the construction of the new cruise-ship terminal is completed.

The final project output, the Draft Waste Management Strategy has created the platform to build on the achievements of the project and an avenue for future solid waste management activities. The objective of the Strategy is to ensure sustainability of solid waste management in Grenada. The Grenada Solid Waste Management Authority (GSWMA) is therefore confident that Cabinet will approve the strategy in the first trimester of 2004.

However, Grenada Solid Waste Management Authority (GSWMA) has already begun to implement some of the activities outlined in the strategy.



David Stan Phillip
Chairman

cc. Minister of Health and the Environment
Minister of Finance
Permanent Secretary of the Ministry Finance

St. Kitts and Nevis

30th October, 20

Mr. Gary Charlier,
Environmentally and Socially Sustainable Development,
Latin America and Caribbean Region,
The World Bank,
1818 H Street, N. W.,
Washington D. C. 20433,
U. S. A.

Dear Mr. Charlier,

As per your request, please find below the feedback on the ICR.

IN GENERAL

- 1) The ICR accurately captures the essence of the experience lived out over the life of a very unique project which by its very nature and scope sought to break new ground using a novel, creative approach.
- 2) On reflection, it appears to me that there are many pluses over and beyond the physical infrastructure outcomes, institutional strengthening, public awareness/education gains and behavioural/attitudinal changes. There is, additionally, for example, the positive impact of the project on the deepening of the sub-regional (OECS) integration and functional cooperation process, the gentrifying and professionalizing of the debate about ‘garbage’/waste which, in the process, moves “waste matters” several notches up the totem pole of relevance and importance. Like the West Indies Cricket Team, the OECS Solid and Ship-Generated Waste Management Project is quietly but steadily assuming the status of a regional institution with similar, positive impact on the psyche of the citizenry.
- 3) It is not clear what is the Bank’s (and other Donors’) role in the post-closure period. Perhaps, the Bank (Donors) may care to develop a legacy component to the experience by helping to reduce prospects of reinventing the wheel. How do we do this? By chronicling and documenting the knowledge gained, the attitudes manifested and the practices (especially best practices) conducted over time. A comparative analysis of experiences across cultures/continents will also enhance the legacy of which I speak. I am even more convinced of this need following the exposure to the June 2003 Symposium in Grenada.

B. RATINGS

- 1) Inherent in the dynamics of the rating system is a clear bias (greater weighting) towards SWME ‘s that adopt a dominant private sector approach, particularly in the area of collection and disposal, management of landfill site. This being the case, the approach should have been indicated more explicitly and directly.

On the other hand, there is cause for exercising some balance to such a “weighting” in the assessment given the reservations expressed at the symposium by Grenada with respect to its experiences with its privatization process. Context, culture and circumstance need to feature more visibly in the assessment. Similarly, St. Vincent and the Grenadines was seriously re-examining the pros and cons of assuming responsibility and authority for the collection service after this particular service had been contracted out.

C. SPECIFIC TO ST.KIITS AND NEVIS

I can live with the assessment of the developments and status of the project as indicated in the ICR. There is no

cause for serious objection.

It provides a platform from which to confront the challenges identified. The SWMC, in conjunction with the sister project countries, stands ready to create a post-project coordination agency, which while not sufficient, is indeed necessary, if each of the island nations are to achieve sustainability and maintain the integrity of our marine and terrestrial coastlines.

D. CORRECTIONS

See separate sheet attached which speaks to corrections of text/tables presented in ICR.

A.E. Bridgewater
General Manager/SWMC
St. Kitts and Nevis

Re: Corrections to ICR

Page 55: Table 2 Goods Procured Under The Project

The Table Specific to St. Kitts and Nevis should read as indicated below. Those not mentioned below are correctly stated.

| Items Procured | St. Kitts and Nevis |
|---|---------------------|
| Waste Bins | 1500 |
| Metal Bins (Rear Loader) 3 cubic yards | 30 |
| Refuse Collection Trucks | 6 |
| Skip Bins – 12 cubic yards (Roll-off Containers) | 24 |
| Flat Bed Trucks w/Crane | 02 |
| Hazardous Waste Storage | 02 |

A.E. Bridgewater
General Manager/SWMC



ST. LUCIA SOLID WASTE MANAGEMENT AUTHORITY

P.O. Box 709,
Sans Souci, Castries,
St. Lucia, West Indies

Tel: (758) 453-2208
Fax: (758) 453-6856
Email: sluswma@candw.lc

*Communications on this subject
should be addressed to
THE GENERAL MANAGER*

November 11, 2003

Mr. Garry Charlier,
Task Manager,
The World Bank,
1818 H Street, NW,
Washington, DC 20433,
USA.

Dear Mr. Charlier,

Re: Annex 8 Borrowers Contribution - Comments on Draft Implementation Completion Report

The following are our comments on the ICR as it relates to St. Lucia's component of the project:

4. Achievement of Objectives and Outputs

4.1 Outcome /achievements of objectives

Outcome 1: Established a fully functioning autonomous or semi-autonomous SWME in each participating country.

The rationale provided for the basis of the overall ratings of the SWMEs as satisfactory seems hinged upon mainly/solely on cost recovery mechanisms. However this issue should be taken into consideration under Outcome 6 "Sustainability". The Government of Saint Lucia (GOSL) is adamant that the overall rating for Outcome 1 is "highly satisfactory". The St. Lucia Solid Waste Management Authority (SLSWMA) was established as early as 1996 and immediately sought to establish key positions that by early 1997 a full complement of management staff was instituted. A phased approach to recruitment of staff, was adopted as the SLSWMA assumed more and more responsibility for waste management. Since recruiting its staff, the SLSWMA has undertaken extensive capacity development programs both at the national, regional and international level. It should be noted that two (2) staff members of the SLSWMA were trained at Loughborough University, two (2) in Singapore in waste management and one (1) in Japan in Wastewater Management. Additionally the staff has also been trained in hazardous waste management.

Mr. Garry Charlier, Task Manager
World Bank

Page 2

November 11, 2003

The finance person within the SLSWMA was trained in World Bank procurement procedures. This along with our ability to have worked alongside a World Bank specialist has further increased our ability to ensure that best practices are applied to the procurement of goods and services. Mention should also be made of the fact that this institution has developed model contract documents which received accolades from the World Bank. This has served as a basis for a transparent tender process as well as fully enforceable contracts.

The SLSWMA visibility and level of accountability has also resulted in the willingness of other organizations at the national, regional and international level to provide funding for its various activities especially in the areas of training and capacity development. These include the Japanese Small Grants Projects, UNESCO and OECS/GFF.

St. Lucia has developed a draft Solid Waste Management strategy. Annual budgets and work plans are prepared, quarterly financial statements are submitted to the Board and monthly operational status reports are prepared. The SLSWMA has developed hazardous waste management plans for asbestos, waste oil, used-lead acid batteries (ULABS), spent agricultural chemicals and biomedical waste. Asbestos, waste oil, ULABS and management plans for biomedical waste are currently being implemented. In fact the philosophy of the polluter pays principle and waste reduction and recycling has and will continue to be critical components of the management of these waste streams.

Outcome 2: Increased coverage and improved quality of land-based solid waste management services (collection, transport and disposal) in each participating country.

In the area of collection there have been dramatic improvements in the enforcement of the Litter Act as it pertains to the responsibility of business to make their own provisions for the adequate collection and disposal of their waste. This has resulted in the development of a vibrant private solid waste collection sub-sector. Since the establishment of the SLSWMA several private sector individuals have invested in suitable equipment to provide this service to business houses. With the passage of the much improved draft Solid Waste Management Act it is expected that the level of private sector involvement and investment in waste management will increase further.

Outcome 3: Enhanced public awareness of solid waste management issues resulting in behavioral changes.

The sums originally allocated by the PMU for public education was significantly reduced during the project's life. This impacted negatively on the public awareness program as these funds were earmarked for creole programming since a significant proportion of the population are creole speaking. Another shortfall of this component of the project is the fact that it was clearly stipulated that the funds could not be utilized to procure much needed equipment. Despite these hurdles the level of private sector support and the support of the GOSL to procure equipment which include digital cameras, still cameras, video camera, slide and overhead projectors, TV,

Mr. Garry Chartier, Task Manager
World Bank

Page 3

November 11, 2003

VCR, laptop computer will ensure the continued sustainability of the public education program. It should be noted that at least 90% of the public education program of the SLSWMA since its inception has been funded through assistance from the private sector. SLSWMA has also forged meaningful alliances with several like-minded organizations including the Poverty Reduction Fund and the National Conservation Authority in order to establish the linkage between improved waste management and improved living standards. The future focus of our public education programs will be heavily bent towards waste re-use, social marketing and the polluter pays principle.

Outcome 4: Improved institutional arrangements with functioning systems to help each country manage and dispose effectively of waste generated by ships.

The SLSWMA has prepared a Parliamentary-ready draft Marine Pollution Bill which integrated aspects of the Ship Waste Management Bill and the legislation prepared under the project and the IMO Marine Pollution ACT. With the passage of this bill, St. Lucia would put in place the required legislation which will support the implementation of a wide range of international conventions which we have either acceded to or intend to become a signatory to in the near future. These conventions include BASEL, LBSMP, UNCLOS, Marpol, Cartagena, Liability Convention, and the Fund Convention.

The issue of risk associated with the management of ship generated waste has also been addressed. The autoclave procured has been specifically selected to ensure that it has the capacity to manage quarantined waste.

National Component 1

In spite of significant delays, the investment introduced in solid waste storage collection and disposal systems in Saint Lucia is phenomenal. The SLSWMA currently operates fully engineered sanitary landfills which include facilities for leachate treatment as well as landfill gas and leachate monitoring. Prior to the initiation of the project it is estimated that less than 10 specialized waste collection vehicles existed on the island. Today through public-private partnership the island currently has in excess of 50 vehicles. Additionally, the maintenance regime and capacity of these equipment is much improved.

The existing disposal has also been fully upgraded and both sites are now fully equipped. Equipment includes tire shredders, landfill compactor, loaders, tractors, waste oil storage containers, wood chippers, weighbridges as well as material recovery facilities (MRF). This investment has ensured that the project objectives of improved waste collection and disposal have been achieved.

National Component 2

St. Lucia, recognizing the challenges which would result especially the high cost of operation opted for the non-procurement of the barge. The system which exists whereby licensed waste

Mr. Garry Chartier, Task Manager
World Bank

Page 4

November 11, 2003

haulers are hired to haul ship generated waste was considered satisfactory since waste was adequately contained and hauled to the disposal sites with no delays.

As it relates to ship generated waste the issue which we believed impacted most on the marine environment was the inappropriate management of waste oil. To this end, 60 waste oil store containers were procured and deployed islandwide at all garages, service station anchorages, ports and mariners, hotels and other large generators. This initiative has been embraced by all entities including the private agencies who utilize used oil as supplementary fuel.

MOUs have been developed and signed between the SLSWMA and the agencies entrusted with the waste oil storage containers to ensure that they are properly maintained and managed.

National Component 3

St. Lucia has had parliamentary-ready draft Marine Pollution Act which incorporates both the Waste Management Act drafted under the OECS project and the IMO Model Marine Pollution Bill. Upon passage of this legislation Saint Lucia would have a comprehensive Act to guide ship waste management. This act will not only strengthen the enforcement arm of SLSWMA, but also of the Maritime Administration, the Department of Fisheries and the Ministry of Physical Development, Environment and Housing.

Regional Component

Model Legislation

Saint Lucia has completed a draft Marine Management Act and has undergone extensive consultation with stakeholders prior to finalization of the Act.

Recycling/compost markets

Saint Lucia has attempted several recycling initiatives which included paper and scrap metal, both of which did not live up to expectations because the appropriate enabling environment to support success was non-existent, thus a different strategy has been developed. There also exists a plastic recycling initiative driven by the private sector. This development has also been strangled by the absence of an adequate enabling environment. To date, the GOSL has taken a policy decision to introduce a deposit refund system on returnable containers and a draft act currently exists. However, this act has not been exposed to public consultation. The passage of this act will serve as a catalyst to plastic recycling in Saint Lucia. Two private sector entities are currently involved in a ULAB recycling program. Again its growth is dependant upon the introduction of appropriate economic instruments to encourage the return of spent ULABS.

Model environmental education program

Early in the project a decision was taken to implement country-specific environmental education programs. It was acknowledged that the environmental education programs had to be culturally

Mr. Garry Charlier, Task Manager
World Bank

Page 5-

November 11, 2003

sensitive, especially since countries like Saint Lucia and DOM had a high proportion of a creole-speaking population.

However, the PMU allocated EC\$65,000 to Saint Lucia, later on without prior consultation or reason this amount was reduced to EC\$50,000. Additionally, in light of delays experienced in the disbursement of those funds, the countries were unable to utilize that facility. Instead of providing funding to the countries towards public education, costs were reimbursed for expenditures undertaken. This meant that countries without the necessary resource to undertake the expenditure could not benefit from this initiative.

System for monitoring and evaluation

In general the system for monitoring and evaluation of the regional component is an area which requires significant review if any regional project of this nature is to be instituted.

The PMU commissioned the development of a Project Benefit Monitoring and Evaluation system which has been critical in Saint Lucia's monitoring and evaluation system for the success of its programs. One limitation of this program is that it failed to develop a comprehensive information management system which would have improved its overall effectiveness and applicability.

6. Sustainability

Saint Lucia has as far back as 1998 prepared draft cost recovery plans for consideration by the Ministry of Finance. To date, aspects of these plans have been instituted. However, these revenues are paid directly to the GOSL and remitted to SLSWMA in the form of subventions. The St. Lucia Solid Waste Management Authority, however, will pursue alternative measures that should minimize financial risks in the medium to long-term.

Borrower and Bank Performance

Supervision

The success of Saint Lucia project can be attributed to a level of flexibility displayed by the World Bank Task Manager who functioned during the period February to November 2000. The level of support received when representation was made to revise the procurement component of the project, in light of: (a) changes envisaged with the privatization process was implemented and (b) the procurement of a barge was unnecessary. This was an important turning point for the project and was instrumental in ensuring that the project objectives were achieved without a substantial financial burden on the SLSWMA.

The disbursement unit of the World Bank proved problematic and seemingly lacked an understanding of the peculiarities of the project, as well as the will to work collaboratively with the procurement officer of SLSWMA. This was aggravated by the frequent turnover of staff in

Mr. Garry Charlier, Task Manager
World Bank

Page 4

November 11, 2003

Conclusion

Overall, there is concurrence with the view that the project outcome was satisfactory. The ability of the project to attain a Highly Satisfactory rating was impeded by:

1. delays in the passage of the draft waste management bills – Marine and Shore; and
2. the inadequacy of the cost recovery mechanisms instituted to date.

However, it should be noted that the project was able to achieve objectives far beyond that envisaged when it was initially conceived. This include the development of cost recovery mechanisms currently paid into the consolidated fund, the hazardous waste management plans, the development of a cadre of well trained staff and the development of a highly sustainable public education program. There is however a need to continue developing appropriate mechanics to effectively manage exposure to financial viability, to strengthen the various collaborative institutional mechanisms and to develop the relevant economic instruments in support of more cost-efficient and sustainable waste management practices.

Yours sincerely

ST LUCIA SOLID WASTE MANAGEMENT AUTHORITY


GERALDINE LENDOR
General Manager



CENTRAL WATER & SEWERAGE AUTHORITY

P.O. BOX 363

KINGSTOWN, ST. VINCENT, W.I.

TELEPHONE (784) 456-2946

FAX. (784) 456-2552

E.MAIL CWSA@CARIBSUR.COM

OUR REF

29th October 2003

Mr. Garry Charlier
Task Manager
The World Bank
1818 H Street, NW
Washington, DC 20433
USA

Dear Mr. Charlier,

Re: Comments on Draft ICR for the OECS Solid and Ship-Generated Waste Management Project

This is to acknowledge that we have received and reviewed the Draft ICR for the just completed OECS Solid and Ship-Generated Waste Management Project.

The findings of the report are consistent with our own views on the implementation of this project. In our opinion, the report correctly documents that: 1) there were some design flaws in the original appraisal report, 2) there were some mistakes made during implementation of the project (specifically regarding the operations of the regional Project Management Unit), 3) the major hurdles faced in each country were due to limitations in the existing human resources.

The report also correctly cites the successes of the project: 1) strengthened institutional capacity in the region for solid waste management, 2) improved collection and disposal services, 3) increased public awareness of solid waste management issues, 4) the implementation of cost recovery mechanisms to sustain solid waste management operations in the future.

We do agree that the outcome of the project was satisfactory. Speaking in the case of St. Vincent and the Grenadines, it is frightening to think of where our country would have been today were it not for this project.

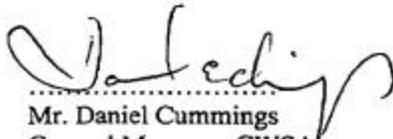
Page 2

October 29, 2003

Mr. Garry Charlier
Task Manager
The World Bank

Thank you for your invaluable support.

Yours Sincerely,



Mr. Daniel Cummings
General Manager, CWSA

c.c. O'Reilly Lewis, Solid Waste Manager
Dr. Vasantha Chase, ESDU
Mr. Samuel Maxwell, Caribbean Development Bank

(b) Cofinanciers:

European Investment Bank (EIB)

Project: OECS - Ship Generated Waste Management Project
Subject: Draft World Bank Project Implementation Report
Reference: Draft report 9/30/2003

The EIB only participated in the financing of the project in Antigua & Barbuda and in Grenada, including a proportional share of the overall project management.

Comments to the Draft

Concerning Antigua & Barbuda and Grenada our experience and conclusions largely concur with the findings of the WB report. Both countries have completed their projects reasonably well but with long time overruns which only partly owed to semi external factors (slow selection of consultants at PMU level, joint preparation of procurement documents, demanding EIAs for landfills, unfavourable exchange rates).

We also agree with the report's comments concerning legislation and the Solid Waste Management Authorities (SWMA) established in both countries. However, despite the current weaknesses observed in Antigua & Barbuda we have no reasons to doubt the longer term sustainability of the established systems in both countries.

Our lessons from the project

In our project monitoring and reviews we have observed to following points which should be taken into account in the preparation/evaluation of future projects:

- The joint procurement was a mixed success. There were initial advantages in the consultant's assistance in defining the needs of the individual countries and the preparation of tender documents. However, the later steps of the procurement have been complicated rather than facilitated by the joint action:
- Given the small size of the countries the number of potential suppliers who could offer local service and maintenance was often limited to a few and most often not the same in the different countries.
- As a consequence and as future maintenance is crucial for the project, the availability of service and spare parts should have been weighted much higher in the evaluation criteria with the result that different suppliers would have been selected for different countries. This would obviously have jeopardized offers, which were made under the assumption of supplying the full lot.
- The GET, CDB and EIB's different eligibility criteria for suppliers made it impossible to invite for tenders only once for the entire lot.
- At the same time, in markets of this size, external price pressure might help to prevent local suppliers asking excessive prices.
- A weak point in project definition and execution has been the closing of old dump sites as it has rather low priority for the local authorities. In the large landfills the surface will be cleaned and collected rubbish disposed of in the new landfills, small dumpsites will just be covered and left to decompose. The solution is not ideal but we have accepted it considering the size of these dumps and the generally domestic nature of the waste combined with the shortage of financing.
- So far no solutions have been found to cope with the more "complicated" wastes for which the islands are too small to have individual systems (collection and processing of recyclable materials (paper, glass, small batteries, car batteries), compaction of derelict cars and white household goods to allow transport, treatment/disposal of waste oils etc.) We hope that the Regional Collaboration concerning solid waste will continue and that over time durable solutions can be found

European Union (EU)

(taken from e-mail to the Task Manager dated 10/20/03)

Dear Garry,

Sorry for keeping you waiting, but I have read the report with interest and have no specific comment on the matter. We have acknowledged the seriousness of the situation in Dominica, where the construction of Fond Colet is about to start and since the tender came out rather favourable, we are now recruiting a professional landfill manager on the balances of the project.

Regards Bonne de Jonge



CARIBBEAN DEVELOPMENT BANK

P.O. Box 408, Wilkey,
St. Michael, Barbados, W.I.
Website: www.caribank.org E-mail: info@caribank.org
Telephone: (246) 431-1600 Telefax: (246) 426-7269 Telex: WB 2287

Our Ref. 45/6/5

November 12, 2003

Mr. Garry Charlier
Senior Operations Officer
Environmentally and Socially Sustainable Development
Latin America and Caribbean Region
The World Bank
1818 H Street, N.W.
Washington, D.C. 20433
UNITED STATES OF AMERICA

Dear Mr. Charlier:

OECS Solid Waste Management Project – Implementation Complete Report

In response to your request for comments on the World Bank's Project Implementation Completion Report on the Organisation of Eastern Caribbean States (OECS) Solid Waste Management Project, I found that generally, the report was well presented and deals with a number of issues in detail, some of which I comment on below.

2. The International Finance Institutions came together to solve a serious problem, with a view to moving the OECS countries forward in up-to-date practice of Solid Waste Management. The project was not without its difficulties and risks, and some of these were evident at the appraisal stage. One very important issue was related to inadequate estimates of costs which led to cost over-runs, occasioned by insufficient knowledge and limited details, associated with the construction of the proposed landfills.
3. We concur with most of the findings in the report, except with those which pertain to Nevis. Sections 3 through 5 do not deal in sufficient detail, with the many problems associated with management of the operations in Nevis. CDB has urged the Authorities on several occasions to select and appoint a Manager, with the appropriate qualifications and experience, but this issue remains unresolved. It is very critical that a solution be found very soon.
4. A footnote should be added to Tables 1 & 2 on page 18 to clarify the unique circumstance of the two separate, but associated, Solid Waste Management Entities (SWME) in St. Kitts and in Nevis. The last sentence in the section dealing with the Federation of St. Christopher and Nevis on page 30 is also ambiguous.
5. Other delays to the completion of the project were occasioned by, and not limited to:
 - (a) timely formation of the SWME's and the amount of effort that this activity required;
 - (b) the inability of the countries to attract suitably qualified and experienced staff to the Project Implementation Units;

CARIBBEAN DEVELOPMENT BANK

Page 2 of 3

Mr. Garry Charlier
Senior Operations Officer
Environmentally and Socially Sustainable Development
Latin America and Caribbean Region
The World Bank
UNITED STATES OF AMERICA

November 12, 2003

- (c) identification of suitable locations and preparation of Environmental Impact Assessments for the development of Transfer Stations (e.g. Dominica) and Landfills;
- (d) unacceptability of some locations by key stakeholders (some quite late in the process), and
- (e) review of submitted landfill designs and modifications of the same (in some cases) prior to the procurement process.

6. The regional office of the OECS Secretariat sought to assist with the procurement of essential equipment. This initiative was based on a premise of 'economies of scale'. The Regional Component did also assist with the provision of Technical Assistance (TA) for Model Policy, Legislation and Regulations, the 4-Rs, Institutional Reform (GSVC) and Training Needs in certain essential areas.

7. The demise of the Project Management Unit (in 2000) severely hampered the procurement process, which was rescued by the Natural Resources Management Unit in 2001. Some later TAs were dealt with on an individual basis while others were on a joint basis, in order to ensure that specified deadlines were met. A mixed success has been recorded on this component.

8. At appraisal, CDB drew on the experience of other agencies and regional projects in other sectors, since it was CDB's first intervention in Solid Waste Management. Many problems and delays were experienced with various design features, with the common cause being the timely availability of relevant expertise at the national and regional offices (including OECS and CDB). Four significant lessons of experience are as follows:

- (a) Where estimates are not sufficiently detailed at appraisal, contingencies should be larger, especially in the case of upgrading dumpsites to landfills.
- (b) Given the significant amount of project activities and stakeholders across a group of countries, a great degree of flexibility is required. Design issues during implementation should be closely supervised by relevant experts.
- (c) Estimates for new types of structures (landfills) should be based on detailed site investigations and designs. In this regard, design consultants should be engaged before appraisal of the project, to inform the process.
- (d) Project management capacity at both local and regional levels was assessed too optimistically. Where weaknesses are likely to occur, additional supporting technical expertise should be provided, in a timely manner.

CARIBBEAN DEVELOPMENT BANK

Page 3 of 3

Mr. Garry Charlier
Senior Operations Officer
Environmentally and Socially Sustainable Development
Latin America and Caribbean Region
The World Bank
UNITED STATES OF AMERICA

November 12, 2003

9. CDB largely concurs with the concerns raised about those factors that relate to the overall sustainability of the project. Some of these are put succinctly in the notes prepared by the European Investment Bank.

Yours sincerely,


for Samuel Maxwell
Operations Officer
Project Supervision Division

SM/NA/va

(c) Other partners (NGOs/private sector):

N/A

10. Additional Information

None.

Annex 1. Key Performance Indicators/Log Frame Matrix

| Project Development Objectives | Outcome Indicators | Actual/latest estimate |
|---|--|--|
| <p><u>Project Objective (SAR):</u> To reduce public health risks and protect the environmental integrity of the islands and their coastal and marine systems, by improving domestic solid waste management facilities and facilitating compliance with the “Special Area” designation of the Caribbean Sea for MARPOL 73/78 Annex V wastes. The project will reduce terrestrial and marine pollution in this area through avoiding and discouraging indiscriminate disposal of solid waste both on and off shore. A further objective is to significantly enhance public health and environmental quality by strengthening the countries’ capacities to effectively manage and dispose of solid waste in an environmentally sustainable manner.</p> <p><u>GEF Objective:</u> To protect the environmental integrity of coastal and marine systems in the Caribbean Sea, by facilitating compliance with the special area designation of the Caribbean Sea for MARPOL 73/78 Annex V wastes and thereby, reducing marine pollution in the Caribbean Sea. More specifically, project objectives are to assist the OECS governments to: (i) reduce pollution of international and territorial waters caused by ship-generated solid wastes by improving the collection, treatment and disposal of ship-generated solid waste; (ii) establish appropriate legal and institutional frameworks to enable them to effectively manage and dispose of ship-generated waste; (iii) prepare plans and programs to address the problems of collection, treatment and disposal of liquid wastes and identify regional opportunities for recycling of waste.</p> | <ul style="list-style-type: none"> • Established and fully functioning in each participating country autonomous or semi-autonomous solid waste management entities (SWMEs) • Increased coverage and improved quality of land-based solid waste management services in each participating country (collection and disposal) • Enhanced public awareness of solid waste management issues resulting in behavioral changes | <ul style="list-style-type: none"> • SWMEs established as statutory bodies with Governing Boards • Six functioning and better equipped SWMEs established • Core staff in place in all countries except Dominica, Nevis, Barbuda that have been adequately trained • Environmental levy on visitors in place in all six countries, with additional innovative sources of revenue introduced, including: (i) household service charge in Grenada, Nevis, St. Vincent and the Grenadines through electricity or water bills; (ii) levies on specific imported goods in St. Lucia, Antigua, Grenada, and Dominica • SWMEs have positive cash flows in all six countries except Dominica • SWM coverage equal or above 95% in all six countries • 95% or more of land-based solid waste properly disposed in sanitary/ managed disposal sites in all six countries • Adequate frequency of collection: (i) once or twice daily in urban areas; (ii) twice weekly in semi-urban areas; (iii) once or twice weekly in rural areas • Elimination of open burning, pest infestation and other health or environmental threats in disposal sites in all six countries, excluding the island of Nevis • Stakeholder survey results demonstrate improved perception on cleanliness of beaches/integrity of the environment • Five of six countries (excluding Dominica) have proactive and effective public |

| | | |
|--|---|---|
| | <ul style="list-style-type: none"> Improved institutional arrangements with functioning systems that enable each participating country to manage and dispose effectively of: (i) ship-generated waste in accordance with MARPOL V 73/78; and (ii) leisure craft (yachts) | <p>education and outreach activities in place with significant public and private sector participation and sponsorship, including: (i) hotline; (ii) newsletter; (iii) school programs; (iv) town hall meetings; (v) national clean-up days (look to attitude survey)</p> <ul style="list-style-type: none"> 100% of ship-generated waste presented is properly handled and disposed |
|--|---|---|

1. B Output Indicators:

| Country Project Components | Output Indicators | Actual Output |
|--|---|--|
| <p>1. Introduction of solid waste management investments and improvements to the existing solid waste storage, collection and disposal systems in each of the six participating countries.</p> | <ul style="list-style-type: none"> Provision of storage facilities (bins, dumpsters or skips) to augment the existing system for collection and storage of domestically generated waste, particularly where curb-side collection systems are operated Procurement of hauling equipment to augment systems for the collection of solid waste and its transportation to the point of ultimate disposal Closure, redemption and reclamation of unsuitable and inappropriate existing dump sites Development of new sanitary landfill sites for the disposal of solid waste or the upgrading of existing dump sites to waste disposal facilities Procurement of compaction and other operational equipment necessary to assist in the efficient management of solid waste at the new sanitary landfill sites, and to increase landfill lifetime and maintain site operation in a satisfactory condition Construction of transfer stations for solid waste (in St. Vincent and the Grenadines and Dominica only), and the procurement of transfer equipment Procurement of equipment to assist in the | <ul style="list-style-type: none"> Procured a total of 13,400 waste bins, 50 refuse containers, 158 skips, and 20 roll-off containers for participating countries, meeting the benchmarks established in project design Procured collection and transportation equipment for participating countries, including (51) waste trucks, etc., meeting the benchmarks established in project design Closed and reclaimed 17 unsuitable and inappropriate existing dump sites 8 new sanitary landfills and upgraded disposal site (out of 12) completed and in operation in each country, with works under way or soon to start in the remaining 3 cases Operational equipment, including 10 track loaders, 6 track-type tractors, 2 crawler tractors, 4 dump trucks, 8 weigh bridges, over 60 waste oil containers, 3 wood chippers, tire balers, etc. procured for participating countries, meeting project benchmarks One transfer station constructed and one under construction in Dominica (out of 3 planned) |

| | | |
|---|---|---|
| | <p>monitoring and operation of the improved solid waste management system</p> <ul style="list-style-type: none"> • Procurement of equipment for the effective treatment of Biomedical/hospital wastes (in Antigua and Barbuda, St. Lucia, and St. Kitts and Nevis only) • Provision of equipment to support efforts at extending opportunities for waste recovery and recycling (including processing of recyclable materials and composting) | <ul style="list-style-type: none"> • Monitoring equipment, including 8 pick-up trucks and numerous items of office equipment procured and in use in all participating countries, meeting benchmarks established in project design • Autoclave and refrigerated containers procured and in operation in St. Lucia to treat hospital wastes • Two materials recovery facilities established in St. Lucia |
| 2. Investments in port reception facilities in all six countries to address the problem of ship-generated waste. | <ul style="list-style-type: none"> • Collection and storage facilities in place at large ports, small craft harbors and anchorages for solid waste from cruise ships, cargo vessels and small craft including yachts • Equipment procured to facilitate transport of this waste to the site of final disposal, or to a point where the waste may be collected for eventual disposal (including barges) | <ul style="list-style-type: none"> • Over 300 ship-waste bins in place at ports in all participating countries • Transportation equipment, including 5 barges, procured and in operation in 4 countries (excluding St. Lucia and St. Vincent and the Grenadines) |
| 3. Rationalization of the existing institutional framework for ship and land based solid waste management in all six countries. | <ul style="list-style-type: none"> • Creation of Solid Waste Management Entities (SWMEs) based on regional model in all six countries • SWM bills placed before Parliament in all countries • Bills to address ship-generated and leisure craft waste before Parliament in all countries • Adequate funding provided to cover full operational costs | <ul style="list-style-type: none"> • SWMEs established in each participating country • SWM laws passed in Dominica, Grenada, St. Vincent and the Grenadines; with Parliamentary ready bills in St. Kitts and Nevis, Antigua; draft bill prepared in St. Lucia • St. Vincent, passed law; Dominica, Grenada, St. Kitts, Antigua Parliamentary ready; St. Lucia draft not completed • Full operational costs covered in all countries (loan serviced in Antigua as well), except Dominica |
| 4. Assistance in the establishment of a sanctuary for the threatened Grenada Dove. | <ul style="list-style-type: none"> • Preparation and execution of management plan for the Park • Construction of a visitors center, guardhouse, and fencing to demarcate the park boundary • Procurement of equipment necessary for monitoring | <ul style="list-style-type: none"> • Management plan completed and approved by Parliament • Visitor's center, guardhouse and demarcation fencing completed (Mount Hartman and Perseverance) • 1 pick-up truck procured for Forestry and National Park Department |
| Regional Project Components | Output Indicators | |
| 1(a). Support activities and technical assistance to all | 1. Model legislation for solid and ship-generated waste developed to provide an | <ul style="list-style-type: none"> • Developed model legislation used by each country to formulate national |

| | | |
|---|---|---|
| <p>countries for project management, training and education, establishment of common legal frameworks, developing recycling opportunities for solid waste, assistance with the enforcement of MARPOL 73/78 Convention, and public awareness programs (GEF Document, pg. 3 § 8);</p> | <p>adequate legislative framework for solid waste operations</p> <ul style="list-style-type: none"> • Local and regional markets for compost and recyclable materials identified and negotiated, and technical assistance provided for waste minimization • Regional training program and biannual workshops on key waste management issues carried out • Ship-generated solid waste documentation preparation and monitoring • System for shore-based solid waste management monitoring and evaluation established • Model environmental education program developed • Systems for project benefit, monitoring and evaluation should be established • Supervision and coordination of technical assistance provided for the preparation of sanitation, sewerage and sewage treatment and disposal proposals | <p>shore-based and ship-generated framework laws</p> <ul style="list-style-type: none"> • Provided technical legal assistance • Provided support on a demand driven basis to countries for the development of a National Waste Management Strategy as required in new legislation in Grenada, St. Kitts, St. Lucia and St. Vincent • Prepared 4Rs (Reduction, Recycling, Recovery and Reuse) strategy with 29 specific action plans for achieving objectives outlined in the strategy; these actions are now incorporated into the Integrated Waste Management Strategies prepared for 4 beneficiary countries (GND,SVG,SLU,SKN). Study for waste oil undertaken. (also possible study for plastics re-cycling was also undertaken). • Prepared training needs assessment, conducted 13 workshops on master composting, biomedical waste management and various aspects of solid waste management, and held two roundtables and one final symposium to discuss project lessons. • Documentation prepared for all six countries; monitoring not implemented because of the lack of resources and capacities to manage tracking system • System now incorporated into draft Integrated Waste Management Strategies by 4 of the beneficiary countries (GRD,SVG,SLU,SKN) • Model program developed but beneficiary countries decided that each country should develop its own program; to this end each country, with the exception of Dominica, was provided a sum of E.C.\$50,000 from the Regional Component • Quarterly reports were prepared, but no formalized system was put in place to monitor the impact of deliverables • Prepared a regional pre-feasibility study, with only Grenada preparing a country-specific master plan |
| <p>1(b). Technical assistance for the preparation of sewerage master plans and of a program of immediate action priority sewerage and sewage</p> | | |

| | | |
|---|--|---|
| <p>treatment projects in all six countries, and the development of detailed project proposals in these sectors in at least three of the countries (SAR 14 § 3.8(a));</p> <p>2. Preparation of a workable institutional framework for regional coordination in the project sectors and to facilitate overall management and monitoring of the Project (SAR 14 § 3.8(b)).</p> | <ul style="list-style-type: none"> • Project management support provided to national implementation units for administration issues | <ul style="list-style-type: none"> • Provided for regional procurement of all SWM equipment for each participating country and additional assistance on a demand driven basis to all participating countries |
|---|--|---|

Annex 2. Project Costs and Financing

Project Costs by Component (in US\$ million equivalent)

| Component | Appraisal Estimate | Actual | Percentage of Appraisal |
|---|--------------------|--------|-------------------------|
| A. Reception facilities | 2.65 | 2.24 | 87 |
| B. Storage and Collection System | 8.01 | 6.80 | 99 |
| C. Waste Treatment and Disposal | 14.86 | 33.23 | 224 |
| D. Medical Waste Treatment and Disposal | 1.82 | 0.63 | 5 |
| E. Project Management and Institutional Support | 0.39 | 0.22 | 85 |
| F. Grenada Dove | 0.20 | 0.23 | 115 |
| G. Regional Component | 5.18 | 4.54 | 88 |
| Land, Taxes and Duties | 9.53 | 6.35 | 66 |
| Contingencies | 7.86 | -- | --- |
| Total Project Costs | 50.50 | 54.24 | 107 |
| Total Financing Required | 40.97 | 47.89 | 117 |

Project Costs by Procurement Arrangements (Appraisal Estimate) (in US\$ million equivalent)

| Expenditure Category | Procurement Method ^{1/} | | | | Total Cost |
|--|----------------------------------|-----|-----------------------|--------|--------------------------|
| | ICB | NCB | Other ^{2/} | N.B.F. | |
| 1. Goods (IDA/IBRD) (GEF) | 18.2 (8.5) (5.3) | 0 | 1.8 (1.0) (0.8) | 7.4 | 27.4 (9.5) (6.1) |
| 2. Consultants (a)Design/ Supervision (IDA/IBRD) (GEF) | 4.9 (0.8) (4.0) | 0 | 2.6 (0.4) (2.2) | 1.8 | 9.3 (1.2) (6.2) |
| 3. Civil Works (IDA/IBRD) (GEF) | 0 | 0 | 1.1 (0.9) (0.2) | 12.6 | 13.7 (0.9) (0.2) |
| Total (IDA/IBRD) (GEF) | 23.1 (9.3) (9.3) | 0 | 5.5 (2.3) (3.2) | 21.8 | 50.4 (11.6) (12.5) |

*Detailed project costing has been included in Annex 10, with a breakdown by country and a separate table for the Regional Component.

Project Costs by Procurement Arrangements (Actual/Latest Estimate) (in US\$ million equivalent)

| Expenditure Category | Procurement Method ^{1/} | | | | Total Cost |
|---|----------------------------------|--------------------------|------------------------------|--------|-------------------------------|
| | ICB | NCB | Other ^{2/} | N.B.F. | |
| 1. Goods (IDA/IBRD) (GEF) | 9.64 (4.58) (5.36) | 0.02 (0.02) | 0.66 (0.33) (0.33) | 3.37 | 13.69 (4.63) (6.04) |
| 2. Consultants (a) Design/ Supervision (IDA/IBRD) (GEF) | 0.35 (0.16) (0.19) | 0.01 (0.01) | 5.01 (0.22) (4.38) | 5.92 | 11.29 (0.29) (5.08) |
| 3. Civil Works (IDA/IBRD) (GEF) | 2.0 (2.0) | 0.04 (0.04) | 0.38 (0.32) (0.06) | 21.09 | 23.51 (2.32) (0.10) |
| Total (IDA/IBRD) (GEF) | 12.29 (6.74) (5.55) | 0.07 (0.03) (0.04) | 5.64 (0.87) (4.77) | 30.38 | 48.38 (7.64) (10.35) |

^{1/} Figures in parenthesis are the amounts financed by the Bank. All costs include contingencies.

^{2/} Includes civil works and goods procured through national shopping, consulting services, services of contracted staff, training, technical assistance services, and incremental operating costs related to managing the project.

Project Financing by Component (in US\$ million equivalent)

| Components | Appraisal Estimate | | | | Actual/Latest Estimate* | | | | Percentage of Appraisal | | | |
|--|--------------------|------|------|------|-------------------------|-------|------|------|-------------------------|-----|-----|-----|
| | WB | GEF | GOV | CoF. | WB | GEF | GOV | CoF | WB | GEF | GOV | CoF |
| A. Reception facilities | 0.00 | 2.45 | 0.00 | 0.00 | 0.21 | 2.03 | 0.00 | 0.00 | 0 | 83 | 0 | 0 |
| B. Storage and Collection System | 5.73 | 0.20 | 0.00 | 2.28 | 3.16 | 0.89 | 0.00 | 2.75 | 55 | 445 | 0 | 121 |
| C. Waste Treatment and Disposal | 3.12 | 3.46 | 0.00 | 6.05 | 3.48 | 2.85 | 0.00 | 26.9 | 112 | 82 | 0 | 417 |
| D. Medical Waste Treatment and Disposal | 1.19 | 0.00 | 0.00 | 0.63 | 0.63 | 0.00 | 0.00 | 0.00 | 53 | 0 | 0 | 0 |
| E. Project Management and Institutional Support | 0.39 | 0.00 | 0.00 | 0.14 | 0.15 | 0.00 | 0.00 | 0.07 | 38 | 0 | 0 | 50 |
| F. Grenada Dove | 0.00 | 0.20 | 0.00 | 0.00 | 0.00 | 0.20 | 0.00 | 0.03 | 0 | 100 | 0 | 0 |
| G. Regional Component | 0.00 | 5.18 | 0.00 | 0.00 | 0.00 | 4.38 | 0.00 | 0.00 | 0 | 85 | 0 | 0 |
| Land, Taxes and Duties | -- | -- | 9.53 | -- | --- | --- | 6.35 | -- | | | 67 | |
| Contingencies | 1.07 | 1.0 | --- | 7.90 | --- | --- | -- | -- | --- | --- | --- | --- |
| Total Project Costs | 11.5 | 12.5 | 9.53 | 17.0 | 7.63 | 10.35 | 6.35 | 29.8 | 66 | 83 | 67 | 175 |

Annex 3. Economic Costs and Benefits

N/A

Annex 4. Bank Inputs

(a) Missions:

| Stage of Project Cycle | No. of Persons and Specialty (e.g. 2 Economists, 1 FMS, etc.) | | Performance Rating | | |
|---|--|--|--------------------|-------------------------|-----------------------|
| | Month/Year | Count | Specialty | Implementation Progress | Development Objective |
| Identification/Preparation | | | | | |
| 1991 | 3 | Unknown | | | |
| 1992 | 8 | Task Manager, others unknown | | | |
| 1993 | 12 | Task Manager, Municipal Engineer, others unknown | | | |
| 1994 | 11 | Task Manager, others unknown | | | |
| 1995 | 2 | Task Manager, other unknown | | | |
| Appraisal/Negotiation | | | | | |
| 1994 | 15 | Task Manager, Environmental Specialist, others unknown | | | |
| 1995 | 13 | Task Manager, 2 Environmental Specialists, Lawyer | | | |
| Supervision | | | | | |
| March 1996 | 1 | Task Manager | S | S | |
| October 1996 | 2 | Task Manager, Consultant | U | S | |
| June 1997 | 1 | Task Manager | S | S | |
| October 1997 | 4 | Task Manager, Long-term Consultant, Consultant, Project Coordinator for PMU | S | S | |
| March 1998 (Grenada only) | 4 | Task Managers (2), Environmental Engineer, Consultant (Grenada Dove specialist) | U | U | |
| June 1998 | 4 | Task Manager, Environment Operations Officer, Consultant, Project Coordinator for PMU | U | U | |
| August 1998 | 1 | Task Manager | U | U | |
| October 1998 (Grenada Dove Project only) | 4 | Task Manager for Grenada Dove Project, Ecologist, Environmental Engineer, Consultant (Grenada Dove specialist) | | | |
| November 1998 | 6 | Sector Leader, Task Manager, Environmental Specialists (2), Task Manager for Grenada Dove, Project Coordinator for PMU | U | U | |
| March 1999 | 4 | Task Manager, Project Coordinator for PMU, Task Manager for Grenada Dove Project, Ecologist, Environmental Engineer | S | S | |
| January/February 2000 | 3 | Task Manager, Senior Project Officer, Consultant | S | S | |

| | | | | | |
|------------|----------------|---|---|---|---|
| | May 2000 | 2 | Task Manager, Consultant | S | S |
| | July 2000 | 3 | Task Manager, Consultants (2) | U | U |
| | November 2000 | 4 | Sector Leader, Task Manager, Procurement Specialist, Financial Management Officer | U | S |
| | February 2001 | 2 | Sr. Procurement Specialist, Sr. Financial Management Specialist | | |
| | March 2001 | 1 | Task Manager | S | S |
| | September 2001 | 2 | Task Manager, Environmental Engineer | S | S |
| | February 2002 | 2 | Task Manager, Environmental Engineer | S | S |
| | May 2002 | 1 | Financial Management Specialist | | |
| | June 2002 | 1 | Task Manager | S | S |
| | January 2003 | 1 | Task Manager | S | S |
| | February 2003 | 1 | Sr. Procurement Officer | | |
| | March 2003 | 2 | Sr. Financial Officer, Consultant | | |
| ICR | | | | | |
| | 09/21/2001 | 4 | Sr. Water and Sanitation Specialist, Port Operations and Maritime Transport Consultant, ICR Consultant, Task Manager | S | S |

(b) Staff:

| Stage of Project Cycle | Actual/Latest Estimate | |
|----------------------------|------------------------|-------------|
| | No. Staff weeks | US\$ ('000) |
| Identification/Preparation | 110.5 | 438.2 |
| Appraisal/Negotiation | 158.4 | 411.9 |
| Supervision | 357.09 | 1,245.7 |
| ICR | 15 | 53.34 |
| Total | 640.99 | 2,149.14 |

Annex 5. Ratings for Achievement of Objectives/Outputs of Components

(H=High, SU=Substantial, M=Modest, N=Negligible, NA=Not Applicable)

| | <u>Rating</u> | | | | |
|--|------------------------------------|-------------------------------------|------------------------------------|-------------------------|--------------------------|
| <input checked="" type="checkbox"/> <i>Macro policies</i> | <input type="radio"/> H | <input type="radio"/> SU | <input checked="" type="radio"/> M | <input type="radio"/> N | <input type="radio"/> NA |
| <input checked="" type="checkbox"/> <i>Sector Policies</i> | <input checked="" type="radio"/> H | <input type="radio"/> SU | <input type="radio"/> M | <input type="radio"/> N | <input type="radio"/> NA |
| <input checked="" type="checkbox"/> <i>Physical</i> | <input checked="" type="radio"/> H | <input type="radio"/> SU | <input type="radio"/> M | <input type="radio"/> N | <input type="radio"/> NA |
| <input checked="" type="checkbox"/> <i>Financial</i> | <input type="radio"/> H | <input type="radio"/> SU | <input checked="" type="radio"/> M | <input type="radio"/> N | <input type="radio"/> NA |
| <input checked="" type="checkbox"/> <i>Institutional Development</i> | <input type="radio"/> H | <input checked="" type="radio"/> SU | <input type="radio"/> M | <input type="radio"/> N | <input type="radio"/> NA |
| <input checked="" type="checkbox"/> <i>Environmental</i> | <input checked="" type="radio"/> H | <input type="radio"/> SU | <input type="radio"/> M | <input type="radio"/> N | <input type="radio"/> NA |

Social

| | | | | | |
|---|-------------------------|--------------------------|------------------------------------|-------------------------|-------------------------------------|
| <input type="checkbox"/> <i>Poverty Reduction</i> | <input type="radio"/> H | <input type="radio"/> SU | <input type="radio"/> M | <input type="radio"/> N | <input checked="" type="radio"/> NA |
| <input type="checkbox"/> <i>Gender</i> | <input type="radio"/> H | <input type="radio"/> SU | <input type="radio"/> M | <input type="radio"/> N | <input checked="" type="radio"/> NA |
| <input type="checkbox"/> <i>Other (Please specify)</i> | <input type="radio"/> H | <input type="radio"/> SU | <input type="radio"/> M | <input type="radio"/> N | <input checked="" type="radio"/> NA |
| <input checked="" type="checkbox"/> <i>Private sector development</i> | <input type="radio"/> H | <input type="radio"/> SU | <input checked="" type="radio"/> M | <input type="radio"/> N | <input type="radio"/> NA |
| <input checked="" type="checkbox"/> <i>Public sector management</i> | <input type="radio"/> H | <input type="radio"/> SU | <input checked="" type="radio"/> M | <input type="radio"/> N | <input type="radio"/> NA |
| <input type="checkbox"/> <i>Other (Please specify)</i> | <input type="radio"/> H | <input type="radio"/> SU | <input type="radio"/> M | <input type="radio"/> N | <input checked="" type="radio"/> NA |

S

Annex 6. Ratings of Bank and Borrower Performance

(HS=Highly Satisfactory, S=Satisfactory, U=Unsatisfactory, HU=Highly Unsatisfactory)

6.1 Bank performance

Rating

- | | | | | |
|---|--------------------------|------------------------------------|-------------------------|--------------------------|
| <input checked="" type="checkbox"/> Lending | <input type="radio"/> HS | <input checked="" type="radio"/> S | <input type="radio"/> U | <input type="radio"/> HU |
| <input checked="" type="checkbox"/> Supervision | <input type="radio"/> HS | <input checked="" type="radio"/> S | <input type="radio"/> U | <input type="radio"/> HU |
| <input checked="" type="checkbox"/> Overall | <input type="radio"/> HS | <input checked="" type="radio"/> S | <input type="radio"/> U | <input type="radio"/> HU |

6.2 Borrower performance

Rating

- | | | | | |
|---|--------------------------|------------------------------------|-------------------------|--------------------------|
| <input checked="" type="checkbox"/> Preparation | <input type="radio"/> HS | <input checked="" type="radio"/> S | <input type="radio"/> U | <input type="radio"/> HU |
| <input checked="" type="checkbox"/> Government implementation performance | <input type="radio"/> HS | <input checked="" type="radio"/> S | <input type="radio"/> U | <input type="radio"/> HU |
| <input checked="" type="checkbox"/> Implementation agency performance | <input type="radio"/> HS | <input checked="" type="radio"/> S | <input type="radio"/> U | <input type="radio"/> HU |
| <input checked="" type="checkbox"/> Overall | <input type="radio"/> HS | <input checked="" type="radio"/> S | <input type="radio"/> U | <input type="radio"/> HU |

Annex 7. List of Supporting Documents

Bank preparation documents

1. *GEF Project Document*, World Bank (1995)
2. *Staff Appraisal Report*, World Bank (1995)
3. *Country Assistance Strategy*, World Bank (1995)
4. *Regional Environmental Project for The Organization of Eastern Caribbean States*, Canadian
5. *Regional Environmental Project for the: Organisation of Eastern Caribbean States: Solid Waste Management Component. Preliminary Report*, The Canadian Marine Waste Management Collaborative (1993).
6. *Regional Environmental Project for the: Organization of Eastern Caribbean States: Solid Waste Management Component. Appendix: St. Kitts and Nevis*, The Canadian Marine Waste Management Collaborative (1993).
7. *Marine Waste Management Collaborative in association with the Novaport/Vaughan International Consultants, Ltd.* (1994)
8. *Application to: Canadian International Development Agency. Organisation of Eastern Caribbean States Ship-Generated Waste Management Project, Sewerage & Sewage Treatment Component*, Maxim Engineering, Inc. (1995).
9. *Report to: Organization of Eastern Caribbean States Solid Waste Management Project, Sewerage & Sewage Treatment Component, Interim Report*, Maxim Engineering, Inc. (1996).

Bank project implementation documents

10. *Project Status Reports (PSRs)*, World Bank (1995-2003).
11. *Aide Memoires of Supervision Missions*, World Bank (1995-2003).

Main documents prepared by the borrower during implementation

12. *Waste Reduction, Recycling, Recovery and Reuse Strategy and Action Program* (including addendum with country-specific information from each participating country), Dillon Consulting (1999)
13. *Model Solid and Ship-Generated Waste Management Legislation Study*, de Romilly and de Romilly, Ltd. (1999).
14. *Waste Characterization Study* (Dominica, St. Kitts and Nevis), Edison Garraway (2002)
15. *Proposals for Strengthening the Regulatory and Monitoring Capacities of the Environmental Health Department of the Ministry of Health of Grenada, St. Kitts and Nevis, St. Lucia and St. Vincent and the Grenadines*, Raymond Reid and Winston Thomas (2002)
16. *Grenada Wastewater Management Study*, Howard Humphreys Ltd. (1999)
17. *Training Needs Assessment and Programme Design*, Edison Garraway (1999)
18. *Biomedical Waste Management Plan (Antigua and Barbuda; St. Lucia; and St. Kitts and Nevis)*, CBCL Ltd. (1999)
19. *National Biomedical Waste Management Plans (one each for Grenada and St. Kitts and Nevis)*, E & ER Group (2002)
20. *Audit of Biomedical Waste Management Practices (Grenada and St. Kitts and Nevis)*, E & ER Group (2002)
21. *Review and Recommendation on a Medical Waste Treatment Technology* (St. Kitts and Nevis and Grenada), E & ER Group (2002)
22. *St. Kitts & Nevis: National Solid Waste Survey Report; Waste Matters*, Carleen Jules (2002).
23. *Training Assessment & Program Design*, Garraway & Associates (1999).

24. *OECS Solid & Ship-Generated Waste Management Project, Project Management Project (PMU) Annual Report* (July 1998 – July 1999)
25. *The Development and Execution of Project Benefit, Monitoring and Evaluation Programmes and Waste Management Systems Monitoring and Evaluation*, Environmental Solutions Limited (2000).
26. *OECS strategy on the Management of Used Oil*, Dr. George K. Sammy (2002).
27. *Composting Organic Wastes. A Practical Guide to Effective Organic Waste Management*, Bio-Logic Environmental Systems (2002).
28. *Antigua and Barbuda Waste Characterization Training and Demonstration Program: Project Report and Procedures Manual – Final*, Dillon Consulting Limited (2002).
29. *Report on Design and Operations Plans Closure of Dumps and Development of New Landfills OECS SWMP* (St. Vincent & the Grenadines), Golder Associates Ltd., MMM Ltd. (1998)
30. *Recommended Biomedical Waste Management Procedures Outline: (Dominica and St. Vincent and The Grenadines)*, Dr. Alan Woodard and Dr. Ira Salkin (2002).
31. *Review and Recommendation on a Biomedical Waste Treatment Technology: Commonwealth of Dominica*, Dr. Ira Salkin (2002).
32. *Emerging Technologies for the Treatment of Medical Waste: Considerations for the Commonwealth of Dominica*, WNWN International, Inc. (2001)
33. *Assessment and Recommendations of Biomedical Waste Management Program: Commonwealth of Dominica October 23-25, 2001*, WNWN International, Inc. (2001).
34. *Proposals for Strengthening the Regulatory and Monitoring Capacities of the EHD of the Ministry of Health – Commonwealth of Dominica with respect to Solid Waste Management*, Raymond Reid, Winston Thomas and Peter Carr (2002).
35. *Emerging Technologies for the Treatment of Medical Waste: Considerations for St. Vincent and The Grenadines*, Dr. Alan Woodard (2002).
36. *Assessment and Recommendations Of St. Vincent and The Grenadines Biomedical Waste Management Program, October 26, 2001*, Dr. Alan Woodard (2002).
37. *Antigua and Barbuda Waste Characterization Training and Demonstration Program: Study Program – Final*, Dillon Consulting (2001).
38. *National Biomedical Waste management Plan: Commonwealth of Dominica* (Final Report), Dr. Ira Salkin (2002).
39. *National Biomedical Waste Management Plan: St. Vincent and The Grenadines- Final Draft*, Dr. Alan Woodard (2002).
40. *OECS Solid & Ship-Generated Waste Management Project, Project Management Unit (PMU) Annual Report* (April 1997-June 1998)
41. *Implementation of a Ship Waste Management Program for the OECS*, Land and Sea Environmental Consultant, Ltd. (2001).
42. *Proposals for Strengthening the Regulatory and Monitoring Capacities of the EHD of the Ministry of Health – Grenada, Carriacou and Petite Martinique with respect to Solid Waste Management*, Raymond Reid, Winston Thomas and Peter Carr (2002)
43. *OECS Solid & Ship-Generated Waste Management Project, Project Management Unit (PMU): Technical Report*, Dr. Gerard S. Dharmaratne, K. Kevin Seale and Sharon C. Layne (2000)
44. *St. Lucia Solid Waste Management Authority Biomedical Waste Management Train the Trainer Program. Proceedings, September, 3-5, 2002, Castries, St. Lucia*, WNWN International, Inc. (2002).
45. *Waste Management Systems Monitoring and Evaluation Study*, Environmental Solutions in association with Witteveen and Bos (2000)
46. *Marine Waste Management Information System Study*, Ms. Judy Daniel (2002)
47. *Evaluation Study of the Public Awareness and Education Component*, Mr. Embert Charles (2003)
48. *Evaluation Study of Cost Recovery Measures*, Mr. Llewelyn Gill (2003)

Additional Annex 8. Borrower's Contribution

OECS Solid and Ship-Generated Waste Management Project

**ORGANISATION OF EASTERN CARIBBEAN STATES
Environment and Sustainable Development Unit**

FINAL EVALUATION REPORT OF THE SOLID AND SHIP-GENERATED WASTE MANAGEMENT PROJECT

July 2003

1.0 Project Data

Report Date: June 2003

Name: OECS Solid and Ship Generated Waste
Management Project

Region: Latin America and
the Caribbean

Country/Department: Antigua and Barbuda,
Commonwealth of Dominica,
Grenada.
St. Kitts and Nevis
St. Lucia,
St. Vincent and the Grenadines,

Sector/Sub sector: Ministries of Health/ Environment (St. Kitts and Nevis,
St. Vincent and the Grenadines)
Ministry of Communications and Works
(Commonwealth of Dominica) Ministry of Physical development,
Environment and Housing (Saint Lucia)

| Key Dates | <u>Original</u> | <u>Revised/Actual</u> |
|-----------------------------|----------------------|------------------------------|
| PCD: June 1991 | Effective: July 1995 | June 1996 |
| Appraisal: February 1994 | | Quarterly Reports (PMU/ESDU) |
| Approval: May 1995 | Closing: June 2000 | June 2003 |

Borrower/Implementing Agency: National Governments/OECS Secretariat and the National Solid Waste Management Entities

Other Partners: Project Management Unit (PMU) (initially) and the
National Resources Management Unit (NRMU)/Environment and Sustainable
Development Unit (ESDU for the regional component
Project Implementation Unit (PIU) in each country that formed part of the SWMEs
CDB, EIB, EU

2.0 Principal Performance Ratings of the Project

| | | | |
|------------------------|----------------|------------------|--------------------------|
| HS-Highly Satisfactory | S-Satisfactory | U-Unsatisfactory | HU-Highly Unsatisfactory |
| HL-Highly Likely | L-Likely | UN-Unlikely | HUN-Highly Unlikely |
| H-High | SU-Substantial | M-Modest | N-Negligible |

| | <u>Ratings</u> |
|---|----------------|
| ➤ <i>Outcome</i> | S |
| ➤ <i>Sustainability</i> | L |
| ➤ <i>Institutional Development Impact</i> | HS |
| ➤ <i>Bank Performance</i> | S |
| ➤ <i>Borrower Performance</i> | S |
| ➤ <i>QAG (if available)</i> | Not available |
| ➤ <i>Quality at Entry:</i> | U |
| ➤ <i>Project at Risk at Any time:</i> | Yes |

3.0 Assessment of Development Objectives and Design and of Quality at Entry

3.1 Original Objectives

The Governments of the participating states of Antigua and Barbuda, St. Vincent and the Grenadines, St. Kitts, Nevis, Commonwealth of Dominica, Saint. Lucia and Grenada had taken an initiative in 1995 to address the deteriorating condition of solid waste management in the respective countries. The overall objective of the Solid and Ship-Generated Waste Management Project (SSGWMP) was to reduce public health risks and protect the environmental integrity of the islands and their coastal and marine systems, by improving domestic solid waste management facilities and facilitating compliance with the “Special Area” designation of the Caribbean Sea for MARPOL 73/78 Annex V wastes. Specifically the project objectives were to assist the OECS governments to (a) improve the coverage and effectiveness of domestic solid waste collection and disposal facilities; (b) reduce pollution of international and territorial waters caused by ship-generated solid wastes; (c) improve the collection, treatment and disposal of ship-generated solid wastes; (d) assist the beneficiary countries in the establishment of appropriate legal and institutional frameworks to enable effective management and disposal of shore and ship-generated waste; (e) assist in the preparation of plans and programs to address the problems of collection, treatment and disposal of liquid wastes; and (f) identify regional opportunities for reduction, recovery and recycling of solid wastes.

These objectives were to be achieved through:

- (a) Institutional strengthening and improved policy, regulatory and incentive frameworks;
- (b) Provision of facilities to receive ship-generated and yacht-generated solid wastes;
- (c) Incremental improvement of domestic solid waste collection and disposal systems to adequately deal with the disposal of ship-generated waste;
- (d) Provision of technical assistance to help in the preparation of sewerage master plans and carry out feasibility studies for sewerage and sewage collection, treatment and disposal improvement programmes;
- (e) The identification of regional opportunities for recycling of waste.

3.2 Revised Objectives

The project objectives were not revised.

3.3 Original Components

The following components were designed to achieve the development objectives of the SSGWMP:

3.3.1 National Components

Specifically the national components included:

- (a) Provision of storage facilities (bins, dumpsters or skips) to augment the existing system for storage of domestic waste, particularly where curb-side collection systems are operated;
- (b) Procurement of collection and transportation equipment to augment the existing systems for the collection of solid waste and its transportation to the point of ultimate disposal;

- (c) Provision of collection and storage facilities for the reception of ship-generated wastes at large ports, small craft harbors and anchorages from cruise ships, cargo vessels and small crafts including yachts; and procurement of equipment to facilitate transport of this waste to the site of final disposal, or to a point where the waste can be collected for eventual disposal (including barges);
- (d) Provision of equipment to support efforts at extending opportunities for waste recovery and recycling (including processing of recyclable materials and composting);
- (e) Construction of transfer stations for solid waste (in two countries only – Grenada and Dominica), and the procurement of transfer equipment;
- (f) Development of new sanitary landfill sites for the disposal of solid waste or the upgrading of existing dump sites to sanitary landfill facilities and the closure, redemption and reclamation of unsuitable and inappropriate existing dump sites;
- (g) Procurement of compaction and other operational equipment necessary to assist in the correct management of solid waste at the new sanitary landfill sites, and to increase landfill lifetime and maintain the operation in a satisfactory condition;
- (h) Procurement of equipment for the effective treatment of hospital wastes (in three countries only – Antigua and Barbuda, Saint. Lucia, St. Kitts and Nevis)
- (i) Procurement of equipment to assist in the monitoring and operation of the improved solid waste management system; and
- (j) Assistance with the establishment of a sanctuary for the threatened Grenada Dove (using GET funds in Grenada only)

3.3.2 *Regional Component*

The regional components were intended to focus on two specific areas to include:

- (a) Technical assistance for the preparation of sewage master plans and also a programme of immediate action priority for sewerage and sewage treatment projects in all six countries, and the development of detailed project proposals in these sectors in at least three of the countries. The technical assistance component will also include training, education and public awareness programs in solid waste management and will help to develop regional approaches to such issues as environmental legislation and to ensure that the full potential benefits of the Project are realized.
- (b) Preparation of a workable institutional framework for regional coordination in the project sectors and to facilitate overall management and monitoring of the Project. Institutional strengthening and training will be focused both at the regional and national levels. The project would finance a number of activities to be coordinated through the OECS Secretariat, including:
 - Fostering cooperation among Member Countries on coordinated environmental policies, strategies and action plans;
 - Provision of a consultation mechanism for the formulation, strengthening and harmonization of environmental legislation and regulations and for their enforcement;
 - Investigation and negotiation of regional markets for compost and recyclable materials;
 - Preparation of documentation for the management and monitoring of ship waste;
 - Organization of annual regional waste management workshops and seminars on relevant topics (e.g. management of hazardous cargoes at ports, recycling etc.);
 - Provision of technical assistance to national agencies during implementation of the project.

3.4 Revised Components

While no significant restructuring was done on the project, the Regional Component relating to technical assistance for the development of plans and programmes and priority arrangements for sewage and sewerage were not pursued or implemented (An extensive design study financed through the regional Component was undertaken for Grenada). St. Vincent and the Grenadines undertook a feasibility study with financing from the British Government. Saint. Lucia was unable to access funds allocated to this component because of the Water and Sewage Authority's performance on another World Bank project.

This component was ill conceived, in that sewage interests and responsibilities laid outside the purview of solid waste management. Be that as it may, this Component was restructured and the balance of the funds incorporated into the Regional Component: No activities were however identified for use of these funds.

3.5 Quality at Entry Assessment

An appraisal report was prepared in February 1994 following a mission visit by the team consisting of representatives of the NRMU, WB, CDB and EIB in addition to specialists in waste management, port management, institutional strengthening, legislation and enforcement. The BCR rates the quality of entry as unsatisfactory.

While the project objectives were well selected and were consistent with the CAS and the various Governments concerns

regarding the national waste management systems and the potential for negative impacts on the tourism industry, the range and duration of national consultations could have been more comprehensive so as to capture the social pulse in an industry that is so people-related. More time could have been spent by the appraisal mission in determining the national needs, required mechanisms and appropriate implementation strategies.

Component identification was intended to speak directly to issues that had elicited Government's stated commitment such as the modification in economic policy to introduce incentives to encourage conservation, introduction of cost recovery mechanisms for environmental protection and the increase in public awareness and public education.

Project components were well designed in that they identified the key issues that would have been catalytic in influencing short-term and long term changes in the national practices in waste management. The design of the components however, was based on a brief assessment of system needs as identified in the appraisal mission. System hardware such as vehicles, plant equipment and infrastructure were addressed as well as soft engineering issues such as institutional arrangements, legislation and training, but the design of the implementation mechanisms relative to the various national peculiarities were not sufficiently assessed. This was particularly evident in the lack of successful implementation of the sewerage and sewer treatment and the marine waste management components.

The design of the cost recovery component underestimated the level of effort required to achieve the desired success. While the intended instruments were clear and did realize some levels of the revenue anticipated, the component was overly optimistic about the SWMEs benefiting directly from these mechanisms that hinged on the Governments' adherence to the terms and conditions of the initiative. Consideration could have been given to making a loan stipulation that the timely and direct delivery of receipts from the mechanisms be realized by the SWMEs. In addition, an assumption was based on consistent arrivals in the cruise ship industry over a projected period. The benefits of this component have not been fully realized by the SWMEs.

The availability of administrative and technical capacity to address the operations of the PIUs in many countries was also inadequate. The project overestimated the project management skills that existed in the various states to effectively address the implementation of the national components. As a result only one of the participating states established an independent PIU that continued to function in parallel with the SWME during the early stages of development. In many of the countries a single professional represented both the Project Manager of the PIU and subsequently became the General Manager of the established SWME.

The design, roles and functions of PMU also resulted in significant challenges in effecting implementation of the activities. The Unit was understaffed relative to the extent of administrative duties encountered for such a broad regional project, involving various States with different administrative systems and practices although it is arguable whether there is much variation in administrative systems and practices; - all Government procedures evolve from British colonial civil service systems). The financing arrangements limited the unit to two (2) budget categories and a replenishment threshold of only US\$50,000.00. The communications expectations between the PMU and the PIUs were not sufficiently articulated, as was the expected level of supervision of the PMU by the OECS Secretariat.

The intentions of the model environmental education programme also may have required further thought regarding the implementation mode. While the project designed the model to be developed on a regional basis, national states preferred to undertake a more localized approach given the variances in social and cultural practices and expectations. However, this approach underestimated the administrative and technical skills required by the countries to achieve the perceived objectives. The appropriate approach might have been to let the PMU assist the countries in the development of both programme and skills, in addition to employing the inputs of the key stakeholders and beneficiaries. This also applies to the development of policies and legislation.

The design of the ship waste management component was also flawed. It provided for so-called MARPOL V bins and the use of barges, and imposed an obligation on the countries to receive and manage Annex I and II wastes, without addressing their capacity to do so. Furthermore, it overestimated the intended role and commitment of the port authorities.

4.0 Achievement of Objectives and Outputs

4.1 Outcome/Achievement of Objectives

The implementation progress is rated as satisfactory. All of the infrastructural development components and the equipment procurement items have been addressed considerably. Five of the participating States have completed the construction of disposal facilities and one is in the process of construction (Dominica had not started during the life of the Project). All of the countries have acquired new waste collection equipment with the accompany bulk containers and skips. SWMEs have been formed as part of the institutional strengthening, and five of the states have developed and/or passed solid waste management

legislation with one country's legal instruments in final draft form. Waste characterization studies have been done in all of these countries within the last two years and these studies have provided the base profiles for future system planning.

On the other hand the Project failed to establish a convincing level of certainty regarding the sustainability of the SWMEs because of basic assumptions made at the appraisal stage. Income from cost recovery mechanisms of total revenue/allocations represented 72% in Grenada, 65% in the case of Nevis, 59% for St. Kitts, 56% in St. Vincent and the Grenadines, and 42% in Dominica. In Saint Lucia, the environmental levy contributes to 23% and Government subventions contribute to 77 % of the Operational Costs. While most of the revenues from the cost recovery mechanisms achieved their targets these funds became part of the national consolidated fund, and the monies were generally not reallocated to the SWMEs as intended.

The project also failed to ensure the commitment and adherence to the establishment of key performance indicators. While limited monitoring indicators were identified as schedules in both the Global Environmental Trust Fund Grant Agreement and Regional Agreement between the participating States and the OECS, the development and processing of data to make even these determinations were not undertaken. As a result the assessment of the performance has had to be primarily qualitative with limited data to assess project performance quantitatively.

4.2 Output of Components

4.2.1 Institutional Development.

SWMEs have been established in each country as authorities or corporations. Legislation has been introduced establishing these institutions with the sole responsibility for solid waste management in the countries. This approach has removed the responsibility from local government bodies and the public/environmental Health Units of the Ministries of Health that had multiple responsibilities. It has also created a centralised organisation specifically targeting solid waste management issues with the required level of autonomy in decision-making. These institutions have been structured with a Board of Directors, appointed by and reporting to the Minister of Health or the Minister of Physical Development, Environment and Housing, in the case of Saint Lucia The Board governs an executive management team who addresses the day-to-day operations of the Entities.

It should be noted that the St. Vincent and Grenadines scenario has resulted in the adoption of a model of co-existence with another institution. This synergistic existence has benefited the sharing of various costs and resources of two fairly related industries. While this may be seen as an alternative for consideration, the level of its success in other countries may be determined by country-specific conditions and arrangements. It remains to be seen whether, in the long term, this unique arrangement will be beneficial.

Some of the issues that need to be addressed as the system is further developed are:

- (a) The commencement of monitoring and regulatory functions by the relevant Ministries.
- (b) Transfer of relevant staff and functions of the Ministries and Public Health Divisions to the SWMEs
- (c) Rationalisation of the reporting responsibility of the street sweepers and drain cleaning crews in some countries.

4.2.2 Legislation

All of the countries have successfully introduced new legislation drafted under the project, or have reached the stage of developing a final draft document awaiting its enactment. Titled the Solid Waste Management Act, the legislation has facilitated the introduction of new institutional arrangements and has detailed clear power of all the stakeholders involved in the industry, including the monitoring and regulatory functions. This mechanism has also consolidated the functions to an identifiable institution, removing the previous concern for the overlap of responsibility. The development and finalisation of regulations are the next set of steps to completion in some of the countries. Also, the issue of enforcement needs to be addressed with the relevant Ministries assuming their legislated responsibility for monitoring and regulatory oversight.

4.2.3 Physical Systems.

(i) Disposal

A disposal site evaluation summary matrix is presented in Table 4.0. The point system was guardedly applied given the recent commissioning of the sites where the testing of systems and infrastructure was still subject to seasonal stress factors and variations.

The WBSAR further identified specific environmental issues associated with domestic and ship waste disposal facilities. Section II, Item B stated:

The main problems facing all countries (OECS) in achieving efficient and environmentally appropriate disposal of

solid waste include:

- (a) *lack of capacity at existing landfill sites;*
- (b) *poor sanitary conditions at landfill sites;*
- (c) *indiscriminate burning of waste at these sites;*
- (d) *visual and odor problems;*
- (e) *pollution of ground and surface waters through leachate migration;*
- (f) *poor accessibility and management of sites;*
- (g) *indiscriminate on-site dumping; and*
- (h) *inadequate and poorly operated and maintained compaction and other landfill equipment.*

If this assessment could be used as a basis for an evaluation done nine years later, it can be comfortably said that the decisions taken and the efforts made have resulted in significant improvements in the solid waste disposal systems in the OECS participating states.

The sanitary landfill has been established as the preferred method of final disposal of solid wastes. All of the countries with the exception of Dominica have already constructed new sanitary landfills. By the end of the second quarter of 2003, Dominica is expected to commence construction of the Fond Colet sanitary landfill and the closure of the Stock Farm disposal site in the Roseau area and the Portsmouth site on the northwestern coast of the island. At the time of preparation of this report Nevis and Antigua had not commenced operations of the newly constructed site and is utilising the existing site adjacent to the constructed facility. Grenada has also resorted to the use of the old Perseverance Site given the structural failure of the newly constructed site in close proximity.

All of the disposal operations are addressed directly by the SWMEs except in the case of St. Lucia where management contracts have been awarded for both the Deglos and the Vieux Fort sites. The standard equipment at all the sites consists of a Track Bulldozer and a Track Loader with Saint Lucia acquiring a landfill compactor as an additional piece of equipment for the Deglos Site.

The application of tipping fees as envisaged by the project has been limited to some commercial clients in some of the countries. This has affected the level of cost recovery anticipated in the design of the system and it is felt that its implementation may face a challenge in the absence of adequate education and information to the site users.

Concerns have also been raised about the potential of the newly constructed sites to realise their design lives in the absence of comprehensive waste diversion programmes. Some countries have already begun to segregate bulky items such as derelict vehicles, white goods and tyres at the sites. While some countries have the option of utilising the older sites in close proximity for the disposal of these items, other countries are forced to create stock piles with the intention to selectively place them in the newly designed cells, where caution is exercised to avoid damage to the liner systems.

Despite some of these challenges of the operations in the initial years of development all of the countries have recognized the benefits of having these upgraded facilities where proper waste disposal procedures could be engineered. The commencement of new site operating practices has modified the traditional public perception of the open dump concept resulting in an enhanced image of the function.

(ii) Collection

All of the collection systems have been enhanced by the introduction of new equipment, and in some cases increased field supervision. Some systems have improved in reliability, at the same time extending coverage to additional areas. Many of the countries have acquired rear-loading compactors in capacities ranging from 5 cubic yards to 10 cubic yards to address the collection of municipal wastes. Crane-equipped vehicles have also been acquired to address bulky wastes. Roll-on roll-off and skip systems have been introduced or enhanced, targeting larger volumes of wastes from commercial and industrial clients, and in some cases government institutions that require the storage capacity. These systems utilize storage container capacities of 6 cubic yards to 10 cubic yards. Plastic bins of 250 litres and 350 litres have also been provided under a grant arrangement.

Waste collection programmes are often the most costly component of a solid waste management system. Many variables affect the efficiency of a collection programme, including frequency of service, type of collection, level of service, crew sizes, recycling and source-separation procedures, size and type of collection vehicles, size and type of containers, and the mapping of collection routes. Given the introduction of new hardware as an output of the SSGWMP, a review of the route management system (i.e. time and motion study, beat balancing, macro and micro-routing) needs to be addressed in each country to determine route productivity and efficiency of the existing systems.

Also, all of the SWMEs have already engaged or have signaled its intention to elicit greater participation of the private sector

in the municipal waste collection function. Grenada and St. Lucia have already implemented the use of private contractors for this function. The indications are that existing companies have demonstrated their ability to fulfill the contract requirements. This approach should in no way reduce the responsibility for the SWMEs to plan and supervise the delivery of solid waste collection services. The secret to maintaining the required level of service is to write specifications that assure continuity in the services needed, at prices that are equitable. At a minimum, plans and licensing should occur, and at a maximum, contracts should be the mechanism for providing collection services. Efficiency, effectiveness, economic pricing and the protection of public health and the environment should form the foundation for the use of private service providers.

It should also be noted that varying national physical conditions of routing systems have dictated structural modifications to newly acquired equipment. These modifications had become necessary where road network designs have limited the manoeuvring of vehicles. Also, collection equipment maintenance facilities have not been adequately constructed and equipped (i.e. wash bay, service ramps or pits, specialized service tools and plant equipment, and parts, service and repair manuals) in countries that have acquired hardware to perform direct collection or to be used as a back-up system.

4.2.4 Marine Waste Management Systems

Generally the proposed collection system as it was perceived, with the accompanying equipment of a barge and bins, has not been successfully implemented. Many of the countries continue to utilize the private contractor approach, engaged in most cases by the shipping agents who provide service on an as-requested basis. There is a theory that the increased levels of waste management technology that now exist on the large naval and cruise vessels have reduced the need for a major waste management role by the host countries. A view is also held that the required planning and consultation did not go into the development of an appropriate system that would have adequately provided an effective ship-generated waste management service.

The issue of the role and responsibility of the Port Authorities for waste management has also been debated. Many Port Authorities have reiterated their specific responsibility for the management of the movement of vessels and cargo in and out of the countries and do not subscribe to the theory of having to play a major role in the waste management function. Nevertheless, both Grenada and St. Kitts have signed Memorandum of Understanding between the Port Authorities and the SWMEs.

Further attention needs to be given to the development of a central national and regional database, accessible to all countries in the Wider Caribbean. Countries also need to revisit the national system for ship-generated waste management, establishing clear national and regional policies and programmes that are guided by IMO specifications and standards, as is being undertaken in Saint Lucia and the Commonwealth of Dominica.

4.2.5 Financial - Cost Recovery Mechanisms

Several mechanisms for cost recovery have been identified to facilitate sustainability of the SWMEs and its systems emerging from the SSGWMP. These mechanisms include:

- An Environmental levy on visitor arrivals applied at both the seaport and the airport averaging US\$1.50 per visitor
- A household service tax or charge (at the proposal stage in some countries and implemented in Grenada, St. Vincent and the Grenadines and Nevis)
- Environmental Protection Levy on items entering the country, such as motor vehicles, refrigerators and freezers, tyres, batteries, goods containers made of plastic, glass, metal or paperboard, empty containers made of plastic, glass, metal or paperboard
- Haulage and disposal fees for ship-generated wastes
- Tipping fees for ship-generated wastes
- Haulage fees for land-based solid wastes
- Scheduled reduction in Government subventions

While these mechanisms, where implemented, have yielded a significant percentage of projected recoveries, the SWMEs have not been receiving all of the funds of the projected revenue on a timely basis. In some of the countries accessing these funds is sometimes problematic, which results in a build up of monthly deficits with a liability profile that threatens the organization's existence as a going concern. Where some countries have access to a greater percentage of the recoveries, concern has been raised as to the possibility of an unexpected change in government policies and attitudes towards solid waste management as a national priority.

Both St. Lucia and Antigua and Barbuda have developed position papers on new initiatives for revenue generation. Some of these initiatives include fees on vehicle licenses, a medical institution levy, and operational fees to private contractors, fees to small commercial enterprises and fees for the disposal of special wastes. The growing concerns to date for the sustainability of the systems may require a revision of the design of these mechanisms.

Annex 3 provides a detailed analysis of the cost recovery mechanisms in 4 of the beneficiary countries

4.2.6 *Strategy for 4Rs*

Strategies were defined, in the very early stages of the Project, in the absence of waste characterisation studies and the required understanding of the economic feasibility on a national basis. The waste types and volumes of waste items would have dictated fairly accurate strategy decisions which would have also impacted on the design considerations for the landfill and collection components. An understanding of the percentage distribution of recoverable items would have also provided sufficient data to inform the possibilities and assumptions that went into identifying the strategies. While the strategy documents have been presented, none has been adopted to date in their entirety. Elements of the strategy documents have been incorporated into the respective Integrated Waste Management Strategy and Action Plan for Grenada, St. Kitts and Nevis, Saint Lucia, and St. Vincent and the Grenadines

4.3 Net Present Value/Economic Rate of Return

No NPV or ERR was undertaken at the appraisal stage of the project.

4.4 Financial Rate of Return

No financial rate of return was done at the time of the appraisal estimation.

4.5 Institutional Development Impact

SWMEs have been established in each country as authorities or corporations. Legislation developed under the project has been introduced establishing these institutions with the sole responsibility for solid waste management in the countries. This approach has removed the responsibility from local government bodies and the public/environmental health units of the Ministries of Health that had multiple responsibilities. It has also created a centralised organisation empowering it with specific responsibility for solid waste management issues with the required level of autonomy in decision-making. These institutions have been structured with a Board of Directors, appointed by and reporting to the Minister of Health or the Ministry of Physical Development, Environment and Housing in the case of St. Lucia. The Board governs an executive management team who addresses the day-to-day operations of the entities. The formation of these entities has set the institutional framework for improvement of management and control of solid wastes and the development of cost recovery mechanisms for services provided.

It should be noted that the St. Vincent scenario has resulted in the adoption of a model of co-existence with another institution. This synergistic existence has benefited the sharing of various costs and resources of two fairly related industries. While this may be seen as an alternative for consideration, the level of its success in other countries may be determined by country-specific conditions and arrangements.

5.0 Major Factors Affecting Implementation and Outcome

5.1 Factors outside the control of the Government or implementing agency

Growth in the OECS continued on a downward path averaging 2.4 percent in 1999-2000 compared to 3.2 percent in the 1990s and 5.5 percent in the 1980s. Further declines are expected in 2003. The WTO ruling against the preferential treatment of Caribbean bananas accelerated this trend, and there was a marked increase in the incidence of catastrophic weather phenomena. More recently, the combined slowdown in the global economy and increasing competition from other Caribbean destinations dampened growth in tourism receipts and budding manufactured exports. The September 11th World Trade Centre bombing incident has worsened the situation. A major drought put further pressure on declining crop production. This national situation in many of the countries has created a competitive environment for generated revenues of which waste management normally occupies fairly low priority. This scenario may have impacted on the levels and timeliness of cost recovery allocation transferred to the SWMEs.

Equipment procurement had also been affected by inflation where the processing period between the decisions to acquire and actual receipt of the hardware was unnecessarily long. This resulted in additional transaction costs to the Countries that were not built-in to initial estimates.

Foreign exchange fluctuations also impacted on financial transaction between the Countries and the Bank regarding the reimbursement of funds. Loan arrangements were negotiated in one currency and had to be converted to another currency at the time of disbursements by which time foreign exchange rates would have made some movement.

5.2 Factors generally subject to government control

While the government demonstrated its commitment to the implementation of the recommended cost recovery mechanisms, that commitment was not extended to the reallocation of the collected funds so as to ensure the sustainability of the SWMEs. The

intended financial independence of these entities continue to be retarded by the poor levels and timeliness of allocations from the State. This dependence on Government subventions is reflected in a range of 28% in the case of Grenada to 58% in the case of Dominica, and 77% in the case of Saint Lucia, over the period 1996 to June 2003. There is concern that receipts from monies generated by the cost recovery mechanisms are reallocated and represented as Government's subvention or support to the entities.

In some countries the delay by Government in the approval for transfer of the human resources that perform relevant functions in solid waste management has affected the rate of development, strengthening and on-going management of the SWMEs and their responsibilities. These functions include the sweeping and drain cleaning functions. As a result management at the SWMEs lack the control over the staff who continues to retain its reporting responsibility to departments or institutions such as the Public Health Departments and the Ministry of Works and Public Transport.

A stronger Governance structure for the project at both the regional and national levels could have paralleled the implementation of the components and the development and operations of the SWMEs. The absence of a PIU in many of the countries resulted in a dual role being played as both Project Manager and General Manager of the newly formed SWMEs with the accompanying challenges of development. While the PIUs and the PMU had a collaborative responsibility at the regional level, at the national level tighter monitoring and evaluation was needed under a defined governance structure. This structure would have defined clear accountability mechanisms, scheduled required reporting benchmarks and delivered prescribed evaluation parameters.

The issue of land acquisition also needs to be addressed effectively as in the case of Dominica where a new site is to be constructed in an area presently occupied by squatters. A total of US\$1.02M was identified to address legal issues surrounding the preparation of new sites for construction. This issue has not been addressed to date resulting in a delay in the construction and development of the Stock Farm Site.

5.3 Factors generally subject to implementing agency control.

Key performance indicators as outlined in the regional agreements were not prepared. This resulted in the inability to effectively monitor the key elements of the project. The varying project management skills between the countries disallowed a comprehensive effort to introduce these indicators as part of a scheduled evaluation process requirement. Limited financial management effectiveness in some cases failed to capture the real costs for disposal and collection of wastes. As a result there has to be a determination as to whether the existing system with new capital investments is really operating cost effectively.

5.4 Costs and Financing

Most of the countries had audited reports prepared on a timely basis receiving unqualified opinions of the auditors. Total project cost at appraisal was US\$50.5 of which US\$41.0M was to be provided by the combined contributions of the World Bank, the EU, the EIB and CDB. The remaining US\$9.5M was to be provided by the participating OECS governments.

6.0 Sustainability

To date, evidence (a detailed study of the cost recovery streams implemented by 4 SWMEs is being submitted under separate cover) has shown that it is hardly likely that the SWMEs would be financially sustainable in the absence of the timely and appropriate allocation of the funds recovered as part of the cost recovery mechanisms. The delays experienced are dictated by the cash flow requirements of the respective Governments. A period of at least two (2) months has been identified as the waiting time for revenues collected. In the case of Grenada that has demonstrated the highest level of success of the mechanisms implemented, 49% (EC\$8.3M) of total collections were outstanding over the period at December 31, 2002 in respect of the levy on white goods including motor vehicles.

The revenues generated by the cost recovery measures implemented by the SWMEs are collected by three main agencies including:

- (a) Customs and Immigration departments of Government
- (b) The Air and Sea Port Authorities, and
- (c) Utility Companies

In addition Contributions are made from the Government through the Treasury. These revenues are paid at source in cash and in theory should be transferable to the Entities without delay. However, in reality this is not so. In addition, where revenues are collected through departments of Government, the revenues are paid directly into the consolidated fund. There is no collection cost related to this measure. In most cases, these funds are accounted for as Government revenue and then paid out as contributions to the solid waste management entities. The delays experienced in receiving these funds are dictated by the cash flow requirements of the respective Governments. Generally the entities have to wait for periods of at least 2 months and more to receive the revenue collected.

There is naturally a build up of arrears with regards to payments of Levy collected. In Grenada, despite the success of the

measures implemented, the receivable in respect of the Levy on white goods including motor vehicles totaled EC\$ 8,364,868 or 49% of total collections over the period at December 31, 2002. In St. Kitts, the situation with regard to the Levy collected from marine visitors was over EC \$ 1,500,000 in arrears at December 31, 2002.

The dependence therefore on collections through the consolidated funds of governments, poses a serious challenge to the Entities as the availability of those funds is a function of the requirements of central government financing.

The collections from statutory Air and Sea Port Authority's generally attract a commission ranging from approximately 1.5% in St. Vincent and the Grenadines to 5% in Grenada. In spite of the commission being paid there is still a delay in the transfer of funds to the Entities for periods of up to 90 days.

The collections by the Utility companies also attract collection fees. In Grenada a flat fee of \$ 10,000 a year is charged by GRENLEC. In St. Vincent and the Grenadines, the commission paid is 20% of 75 cents per water bill paid to designated collecting agencies. These agencies facilitate the payment of water bills on behalf of the Central Water and Sewerage Authority. When the water bill is paid directly to the Authority no fee is charged. In the case of GRENLEC, the total of monthly billings is not remitted to the Authority. Only a percentage, based on the amount paid in relation to the monthly bill of the household is remitted. That is if a bill is paid up, then the full levy is paid. If not the comparative percentage of the payment is remitted. This results in a build up of arrears. In addition, the collections from GRENLEC are paid one month in arrears.

Since the arrangement in St. Vincent and the Grenadines is unique in that the Central Water and Sewerage Authority has responsibility for the Solid Waste Management Unit, the benefit of excellent collections by the Authority, redounds to the benefit of the Solid Waste Management Activities. Government contributions are received between one and two months of the due date for payment. In St. Kitts and Nevis, the contributions for administrative salaries are paid on time.

To encourage the general public to take responsibility for their waste, some additional revenue measures have been implemented by some of the SWMEs. Although not significant in their dollar quantum, they are measures geared towards encouraging a pay for service attitude within the populace.

Some of the measures implemented were:

- (a) Service fee of EC\$ 10 for the first three items and EC\$ 10 per item thereafter, for the collection of white goods in St. Vincent and the Grenadines.
- (b) Fee for disposal of special waste, such as generated by the Medical Schools in St. Kitts.
- (c) Sale of Bins in St. Kitts
- (d) Rental of Equipment in Grenada.
- (e) Return of 75% of Levy's on Returnable Bottles re-exported.

These fees are all paid directly to the SWME's.

The approach taken to cost recovery in the main has been the implementation of the environmental levy on stay over and marine visitors supported by contributions from Government. Ideally, effective cost recovery measures should result in a shift from dependence on one source of revenue, to independence with various sources of revenue linked to the services provided. The environmental levy as a measure by itself is not sustainable as a key revenue source due to the fluctuations in visitor arrivals. This measure has to be complemented by other measures. Measures such as the household levy implemented by Grenada, St. Vincent and Nevis, and the Levy on white goods and motor vehicles effected in Grenada, point the way for ensuring the sustainability of the measures. The sustainability of cost recovery measures also require the support of Governments, the public at large and effective management of the resources of the Entities.

The critical issues that impact on the sustainability of the SWMEs include:

1. Receipt of revenues collected on a timely basis.
2. Development of new revenue measures.
3. Efficient and effective management of Entity operations.
4. Budgets developed and tied in to actions considered under the five year strategic plans of the Authorities currently being developed, and
5. Effective liaison between the Entities, Government and other key Stakeholders.

Currently, budgets prepared are not linked to any specific goals, there are no cost recovery plans in place and the development of strategic plans for the entities is only now being undertaken. With the exception of Grenada, the other SWME' are not yet in a position to make allocations for future capital cost including the replacement of land fills. Allocations over the period have been made by the Grenada Authority. Fixed deposits in excess of EC\$ 2million have been put aside for the purpose of

developing a new landfill and meeting other capital cost.

It is clear that a lot of work remains to be done to ensure the future sustainability of the cost recovery measures and the SWME's. Work needs to be undertaken in:

1. Improving the receipt of revenues from collecting agencies, especially central government;
2. Defining and determination of cost and managing of these costs;
3. Strengthening the management of the Entities so as to be able to develop targeted work plans and budgets; and
4. Implementation of effective data collection and financial systems and timely reporting of information.

6.1 Transition Arrangements to Regular Operation

Firm institutional arrangements have been made by way of the formation of the SWMEs for the future operation of the function. These entities have been established through the appropriate legal instruments and mandate with the required organizational structure. While the sustainability of these entities remains questionable given the reasons discussed earlier, substantial financial, commercial and institutional efforts and provisions have already gone into the implementation process. A benefit of these efforts is that it provides the opportunity for strengthening on the earlier mechanisms and systems that emerged on the project learning curve. Some of these efforts include the facilities for regional dialogue, the achievements of the various public education and awareness initiatives, the development of waste management legislation and strategies and the introduction of new infrastructure and equipment.

The countries need to pursue the completion of national policies, plans, programmes and strategies within an appropriate collaborative structure so that the future of these systems would be governed by sound established principles. Collaborative discussions between the participating countries have commenced regarding the development of a series of subcommittees reporting to a network of SWMEs who in collaboration with relevant financial institutions and technical entities/professionals would propose developed policies, plans, programmes and projects. The network of SWMEs would seek management and coordinating roles from a relevant established regional institution that would also exercise advocacy to the OECS governing bodies regarding these policies, plans, programmes and projects proposed by the network of SWMEs. Annex 4 is a Summary of Conclusions from the meeting of Solid Waste Managers that was held in the ESDU Office on June 25th 2003.

Key performance indicators also need to be agreed upon and established so that the required monitoring and evaluation practices could be adopted. Some of the indicators should include:

- Total cost of waste management system
- Total revenues
- Working Ratio (indicate briefly how this is derived)
- Operating Ratio (indicate briefly how this is derived)
- Cost per tonne for disposal and collection of both shore and marine generated wastes,
- Administrative cost as a percent of annual recurrent cost
- Human Resource cost as a percent of annual recurrent cost.
- Revenues from cost recovery mechanisms as a percent of total revenues
- Government subvention as a percent of total revenues
- Incidence of unregulated dumping
- Incidence of surging waste containers
- Time and motion study data at scheduled intervals per year
- Incidence of disposal of untreated biomedical and hazardous waste

It is critical that the national institutions for regulating and monitoring of these entities be established to ensure effective control and compliance. The Ministries of Health and the Ministry of Physical Development in one case should build their capacity to undertake this function so that the operations of the technical systems of the SWMEs could be regulated within established environmental standards. The SWMEs have also developed some TORs for the Caribbean Environmental Health Institute (CEHI) to establish a regional database of the aforementioned performance indicators. These are attached as Annex 5

Financial institutions may continue to play a role in financial monitoring by way of future impact evaluations of the cost mechanisms relative to the sustainability of the SWMEs. This role should bring an independent view to the evaluation in addition to maintaining a relationship with the operating entities in the various countries. Project identification, appraisal and recommendation as they relate to system improvements could also be easily facilitated.

7.0 Bank and Borrower's Performance

7.1 Bank

7.1.1 Lending

It was felt that more consultation should have been done prior to the development of the project. While the appraisal team interacted with the technocrats at the Ministries and at other Governmental institutions, more public consultation should have preceded the development of some of the components. Issues surrounding public perceptions and concerns could have been appropriately addressed with solutions that were in direct response to such perceptions and concerns. These consultations would also have better facilitated the establishment of priority items that would have led to the outline of a project critical path regarding the implementation.

There is also the feeling that there were insufficient consultations on the 2 reports that became the basis of the SAR. The general consensus is that had the Reports been properly vented, then many of the design flaws in the Project would have been eliminated.

7.1.2 Supervision

Closer and regular supervision by the Bank was evident in that the recommendations of the Supervision Missions have remained consistent with the understanding of the Borrower and have been implemented as agreed. Unfortunately, in the period between 1996 and 2000 the supervision did not appear to have also recognised the various challenges experienced by the countries; this recognition would have provided an opportunity to respond to requests and enquiries from the Borrower in a timely and coordinated manner. Some of these challenges included details on the request for replenishments or reimbursements and the mechanisms or procedures for recovering those deductions. An orientation workshop addressing all the Bank procedures and utilizing the appropriate manuals should have been conducted once the Finance Officers of the SWMEs were recruited. Both the General Managers of the SWMEs and the Finance Officers should have been jointly exposed to the details of the procedures. This would have resulted in a common understanding among the SWMEs on the requirements of the Bank.

Project implementation delays were also evident where the Task Manager was engaged on another mission, and in the absence of other informed procurement and disbursement officers, key project activities that influenced the implementation process were put on hold until his or her return. It must, however, be acknowledged that the Borrower was able to communicate directly with the procurement and disbursement departments.

Co-financiers should have collaborated on definition of conditions precedent, reporting formats and requirements, and should have made greater efforts to undertake joint supervision missions.

7.1.3 Overall Bank Performance

Given the challenges faced by the Borrower, and also the weak assumption by the Bank of the level of understanding of the Bank's procedures by the Borrower, overall performance is rated as satisfactory.

7.2 Borrower

7.2.1 Preparation

The Borrower should have experienced a more substantial process of orientation prior to the implementation process. More attention should have been given to the screening and recruitment of staff for the PIUs so that the required priority and human resource skills would have facilitated a smoother understanding of the project, including project management skills, and how it related to the Bank's expectations.

A development of waste management skills had to be acquired during the process of implementation since the response to the findings of the training needs assessment were effected after many of the project components were already implemented. On the job training facilitated an understanding of what was to be new concepts and practices and provided an opportunity for self-determination of more specific needs by each country.

7.2.2 Government Implementation Performance

Many of the Governments responded very favourably to the project initiation. This was evident by the fact that implementation began taking place within one (1) year of the appraisal mission. This was also evident by steps taken to generally facilitate the implementation of several of the non-engineering components such as legislation for the establishment of the SWMEs and operation of the systems, and the level of implementation of the recommended cost recovery mechanisms.

7.2.3 Implementing Agency

The Project was implemented at the national level and the regional level. At the regional level, Project Implementation can be divided into two phases. During the first phase, a Project Management Unit (PMU) was specifically set up, in the OECS Secretariat, to implement the Project. The Manager of the PMU reported to the Director General, through the Director of Functional Cooperation. There were a number of difficulties with this implementation arrangement:

- Although the PMU was located in the Division of Functional Cooperation and the Manager reported to the Director of

Functional Cooperation, the line of communications were not clearly defined and there were times when the Project manager reported directly to the Director General. There were also no clearly defined lines of communication between the OECS Secretariat and the World Bank.

- The PMU was understaffed and was not equipped to handle the stringent administrative procedures required by the Project; neither were the administrative procedures of the OECS Secretariat sufficiently strengthened to comply with World Bank procedures.
- The skills required of the Project Manager were too broad and extensive to be found in a single individual.

The second phase of the Project was implemented through the OECS' Environment and Sustainability Development Unit (ESDU), which was set up by the OECS Authority in 1986. By the time the Project was handed to ESDU for implementation in 2001, the Unit had been in existence for 16 years and during that time had developed the necessary administrative and financial procedures that were compliant with World Bank requirements. In addition, the Project was also able to benefit from the extensive technical and administrative skills that were resident in the Unit. Furthermore, because the Unit is fully incorporated into the organisational structure of the Secretariat, the appropriate Senior Management of the Secretariat adequately supervises ESDU and all of the Unit's financial and administrative procedures that are regularly checked for compliance with due diligence procedures.

As previously mentioned, national implementation was initially undertaken by Project Implementation Units (PIUs), which became absorbed into the Solid Waste Management Entities. Antigua and Barbuda was the only country in which the PIU remained separate from the Authority and existed until the Project Completion Date. In the case of St. Vincent and the Grenadines, the SWME became a Unit with the Water and Sewage Authority.

7.2.4 Overall Borrower Performance

Given the uniqueness of the industry with its new concepts and practices, and the fairly ambitious targets of the project, substantial efforts and resources had to be committed by the stakeholders of the Borrowing states. The performance should be rated as satisfactory as the capacity to successfully address a project of this magnitude were either limited or non-existent at the time of commencement, on a national and even a regional level.

An evaluation of the OECS Solid and Ship-generated Waste Management Project was undertaken through the conduct of focus group discussions (FGDs) in all of the beneficiary countries. The purpose of this survey was to ascertain public opinion on the project, and its performance, in each of these countries. Participating in the FGDs was a wide range of stakeholders, including representatives of Ministries of Health, Agriculture, Tourism, departments responsible for the environment, local and central government, youth groups, the private sector represented by i.e. the Chamber of Commerce, farmers, private contractors, SWME management as well as urban and rural residents and school children. The opinion of these participants was sought on varying aspects of the project and the activities carried out under the project.

Few respondents knew of the project under which the SWMEs were formed. Neither was much known about the ship-generated waste aspect of the project, the legislation necessitated for the conduct of the SWMEs' activities, nor of the environmental levies. Nevertheless, all knew of the SWMEs and their activities in the management of solid waste, feeling that they were under-resourced, financially, materially and humanly and that the SWMEs should proactively pursue revenue-generating activities including aggressive collection of environmental levies.

Respondents in all of the countries hailed the establishment of the SWMEs. Respondents unanimously approved the efforts of the SWMEs in vastly improving the collection of household waste, and consequently the appearance of the neighbourhoods. They cited the aggressive promotion of householders' responsibility for their waste, i.e. securing it and putting it out in time for collection which was now regular and reliable, the provision of bins and the improved attitude of garbage collectors, as the main factors influencing this change for the better. The SWMEs, with the exception of Dominica whose landfill has not yet been commissioned, received kudos for the operation of the sanitary landfills. Participants reported the absence of stench and flies from the landfills, even claiming that some landfills were attractive to visit. Waste minimisation i.e. recycling, re-using and reduction had not been universally and actively promoted.

In addition to these tributes, participants expressed concern about some areas. There was universal dissatisfaction with the enforcement of health and environmental legislation, although the laws do exist, and in some countries, have been revised and updated. Litter wardens have been appointed and trained, complemented by police officers who are *ex officio* litter wardens. However, few of the appointed wardens appear to be effectual in enforcing the law and the police officers seem unaware that their function includes policing infractions against the environmental laws, including the Litter Act, thus permitting violators to operate at will. Altogether, respondents felt that a combination of vigorous and targeted public education, reinforced by obvious swift and certain punishment of violators, would effect the necessary change in attitudes of all nationals towards a clean environment.

Despite the several clean-up campaigns and beautification programmes initiated by the SWMEs and/or community and civic groups, there was still a need to instill national pride as littering continued, especially by persons throwing cans and other garbage from moving vehicles. This was further exacerbated by the private hauling of construction rubble and other waste in open, uncovered vehicles and the general attitude of the public that the responsibility for managing waste rested solely with the public health or solid waste authorities, and that individuals were absolved of any personal responsibility. Indeed, it was mentioned in several of the OECS countries that some members of the public held the view that if they did not litter, there would be no work for the sanitation workers and further, that by virtue of the payment of any charges for sanitation, they were entitled to litter.

There were also reports of problems with vagrants and drug-addicts rifling bins and garbage bags for bottles, food or other useful items and strewing garbage in their quest. Stray animals, (donkeys, pigs and dogs) continue to be pests at some landfills and occasionally when householders do not secure their garbage before collection.

Altogether, respondents expressed their wish to see more efforts to increase public awareness of the need to protect their environment by taking personal responsibility for the disposal of their waste, by not dumping or littering and even ensuring that others do the same. This, they felt, could be best achieved through closer collaboration and coordination with other agencies involved in aspects of solid waste management.

8.0 Lessons Learned

The findings of the appraisal mission had reinforced what was already identified as a clear need for the improvement of solid waste management in the OECS. While the implementation process had faced several challenges already identified, it resulted in an experience that would inform the development of other similar projects, and the opportunity to structure a model for similar territories. The lessons learnt can be broadly grouped as follows:

8.1 Project Preparation and Appraisal

- Engage all stakeholders in the project conceptualization and preparation including the private sector and NGOs and not just the public sector. A good project should be able to uphold public interest and support by reflecting a direct link between stakeholder needs and the proposed deliverables. Design parameters should provide adequate and appropriate incentives for private sector participation in the system.
- Pre-project design studies and evaluations must be undertaken by persons/firms who are not only competent in the technical content but who are also aware and sensitive to local nuances and local socio-cultural and political realities;
- For a regional component to be successfully demand driven, it has to provide assistance which is tailored to the specific needs of each national component;
- A demand driven regional component must be designed to be flexible and to respond to national components in a timely and efficient manner.

8.2 Project Implementation/Supervision/Dialogue

Project implementation has to be very proactive, engaging both the Bank and the Borrower in continuous dialogue. From these practices the following lessons could be drawn:

- The relationship between the Borrower and the Bank must be cultivated and maintained throughout the life of the project so that the relationship is one of mutual trust and of partnership.
- During the second phase of the Project, ESDU ensured that the regional component was designed to be demand driven and to react to the specific needs of each of the SWMEs. This was a difficult task to achieve in the first phase because the regional component had specific objectives and budget schedules that it had to meet, and which were often not congruent with the objectives and schedules of the national components.
- ESDU ensured that the skills for procurement were resident within the Unit, thereby guaranteeing that procurement was undertaken in a timely manner and in collaboration with the Bank;
- If the regional component is designed to be demand driven then, this component has to ensure that there are regular meetings with the national components and that the national components are involved in all aspects of project design and implementation at the regional level;
- The regional component must function as a facilitator and coordinator and not as a monitor of the national components;
- The Task Manager must be cognisant of, and respect Bank Guidelines and Procedures.
- The Bank must undertake to ensure that the Borrower is fully trained in all aspects of Bank procedures and guidelines, and that the establishment of such procedures and guidelines are conditions precedent to project implementation.
- The Bank must provide regular supervision and must ensure that the recommendations of the Supervision Missions are discussed with the Borrower and that the implementation of these recommendations is monitored.
- There must be regular lines of communications between the Bank and the Borrower;

- The Bank must provide timely responses to requests from the Borrower;
- The Borrower should be able to communicate directly with the procurement and disbursement departments in the Bank;
- The assigned Loans Officer in the Bank must be willing to work closely and be willing to provide assistance to the Borrower in a timely and friendly manner; and
- Deductions to requests for Replenishments or Reimbursements must be communicated clearly to the Borrower who must also be advised as to how those deductions can be recovered.

8.3 Public Awareness

Some of the factors which have been responsible for the initial successes of the public awareness and education component of the programme were as follows:

1. A small but dedicated core of staff which recognised their pioneering role and fully understood the issues and the impact of waste management on other aspects of economic and social development.
2. Excellent formal and informal working relationships between the schools and the public awareness and education officer of the SWMEs.
3. A sympathetic mass media environment particularly the privately owned media. This translated into the extensive free time and space in the media, cooperative reporting of waste management issues.
4. Sustainable partnerships with the private sector, illustrated by the tremendous financial and non-financial support for public awareness activities such as clean-up campaigns, demonstration projects in schools and information products including, posters, brochures and videos.
5. Successful implementation of regular waste collection programmes.

The Specific Lessons Learned :

Clean-Up Campaigns: The SWMEs provided logistic, promotional and in some cases financial support for the clean-up campaigns, which became regular community and national events. Clean-up campaigns increased awareness of the issues of littering and waste disposal. They also facilitated the growth of stewardship for the communities and selected "public spaces". Levels of enthusiasm and participation were much higher than increased awareness of the issues. Successful and sustainable campaigns included information on compliance and law enforcement built into the messages. Waste reduction "demonstrations" must be part of the clean-up campaign activities.

The regularity of waste collection has enhanced the credibility of the SWMEs and provided a platform for intensified public awareness on waste reduction at the household level. The SWME must always be mindful of the public relations gains from all awareness activities by ensuring that the logos and slogans are always used. A small amount of resources were allocated to dissemination of information on waste collection and disposal. In cost benefit terms, the SWMEs must continue to ensure that the communications functions/components of operations and public awareness are highly integrated.

Truck drivers in the awareness and education initiatives. Truck drivers and the staff of the waste haulage companies continue to present potential vehicles for waste reduction. Given proper training and materials, as well as incentives they will enhance overall awareness, education and public relations programme.

The schools programme. The success of the schools programme was based on the presence of three main factors. The first was an extended team of volunteer participating teachers who were highly motivated and well informed. Secondly the development of attractive education materials for students. Thirdly regular programmes which engage students as groups or classes with aspects of creative competition and incentives. This formula should be fully replicated. The materials for students must be produced in large quantities in order to have an impact on the entire school system.

In order for this part of the overall programme to be sustainable, the SWME should consider developing multi-media self-instruction interactive teaching pack of waste reduction for children and teenagers, and also heads of households. The production of these packs must be produced at a regional level, to benefit from economies of scale. Budgetary allocation must be made for distribution.

Mass media usage. The use of mass media, particularly television was based on old patterns of media consumption, where viewing of local television stations was high. Mass media usage by the SWMEs was based on the assumption that the state-owned media would provide extensive free broadcast time for PSAs. In the region there has been a gradual corporatisation of state-owned media, which are at best attempting to arrive at their own best practices and models of public service broadcasting. The cost recovery principle has become an essential aspect of operations.

The rapid penetration of cable television in all communities has changed viewing patterns, where local stations are turned on

mainly for local news, which are "littered" with commercial advertising. PSAs on waste management during this time would be highly priced and out of the reach of the It is recommended that SWMEs continue to produce their media material and make available to all media houses.

8.4 Sustainability of SWMEs

The lessons learned from the issues highlighted in Section 6 above can be summarized as follows:

- Good record keeping is essential to the success of the activities of the Solid Waste Management entities.
- Timely collection of revenues is crucial to the survival of the Solid Waste Management Entities.
- Data on the cost of services provided to the Government is essential to justify the contributions made.
- The Household levy is a good mechanism for getting households to contribute to cost of collection and disposal of waste.
- Good public relations in addition to demonstrated tangible benefits are an effective inducement for implementation of Household Levy.
- New mechanisms for the collection of revenue have to be explored given the difficulties experienced with collections through the Government Coffers.
- Effective management is essential to the success of the Solid Waste Management Entities.
- Proper planning, reflected by effective budgets need to be implemented. These budgets must also include provisions for the replacement of Capital Equipment.
- Government commitment is critical to the sustenance of the Solid Waste Management Activities.
- New revenue streams have to be developed to support the work of the Solid Waste Management Entities. These can only be determined when proper plans are in place for the Entities.

The main activity which can be identified as a best practice for Sustainability of the SWMEs is the privatization of the collection and disposal of household waste as was the case in Grenada. This measure has reduced the need for maintaining a large fleet of vehicles and equipment, thus alleviating the cost of maintenance. Maintenance is still a cost to the entity; it's a question of who is responsible for carrying it out. It has also provided for better management and monitoring. This experience was emulated in St.Lucia and has merit in the future management of solid waste activities.

Additional Annex 9. Detail of Project Outputs

Table 1: List of Civil Works Completed under the Project

| <i>Country</i> | <i>Sanitary Landfills/Managed Disposal Sites Constructed</i> | <i>Closures Completed</i> | <i>Comments</i> |
|----------------|--|--|--|
| A&B | 1. Cook's Sanitary Landfill (Antigua) 2. Plantation Sanitary Landfill (Barbuda) | 1. Old Road 2. Freetown 3. River 4. Parabie | <ul style="list-style-type: none"> ▪ Both landfills completed in early 2003, although not yet commissioned due to unsettled claims from contractors that may require arbitration. ▪ Cause for additional delays included negotiation with EIB for the supplemental loan and settling ownership rights over the old Cook's dump site. ▪ Closure of Cook's and Plantation sites to be completed after new landfills become operational. ▪ Closure of additional sites did not require any project financing. |
| DOM | 1. No sanitary landfills constructed 2. Melville Hall Transfer Station | No closures (Portsmouth and Stock Farm sites still in operation) | <ul style="list-style-type: none"> ▪ After securing additional EU funding in 2002, construction of Fond Colet landfill to start in September 2003 ▪ Still using the Stock Farm site, which is over capacity and not adequately managed. ▪ Melville Hall station completed but not operational, and the two remaining transfer stations remain to be constructed (Portsmouth underway; one additional site to be identified). |
| GRD | 1. Dumfries Sanitary Landfill (Carriacou) 2. Perseverance Sanitary Landfill (Grenada) | 1. Brunswick 2. Telescope 3. Old Perseverance (to be closed) | <ul style="list-style-type: none"> ▪ Both new sanitary landfills completed. ▪ Landslide at the new Perseverance sanitary landfill caused by exceptional rainfalls in December 2000 filled the entire cell, resulting in the suspension of operations. ▪ Old Perseverance site has been reactivated on an emergency basis under controlled management until remediation work completed on new landfill site. |
| SKN | 1. Conaree Sanitary Landfill (St. Kitts) 2. Low Ground Sanitary Landfill (Nevis) | 1. Round Hole 2. Indian Castle | <ul style="list-style-type: none"> ▪ Both new sanitary landfills completed in 2003 with significant delays due to negotiations with CDB over scope of the work and costs for both new sites (agreement reached in early 2002). The final agreement reduced the site acreage by half and the life expectancy from 26 to 16 years. ▪ Low Ground site completed but not in operation, as the Nevis SWMA is waiting until the weighbridge is operational. |
| SLU | 1. New Ciceron Sanitary Landfill 2. Upgraded Vieux Fort to managed disposal site | 1. Micoud 2. Dennery 3. Anse La Raye 4. Choisel 5. Old Ciceron | <ul style="list-style-type: none"> ▪ Best practice example for the region, with all closures completed and both new landfills in operation. ▪ Delays suffered in reaching agreement with CDB due to higher construction costs than originally appraised (poorer soil than anticipated in original design), with additional delays due to both the failure of the contractor to perform on schedule and insufficient monitoring by the supervision firm. |
| SVG | 1. Diamond Sanitary Landfill 2. Wallilabou Sanitary Landfill (under construction) 3. New managed disposal sites upgraded in Canouan, Bequia and Union Island | 1. Arnos Vale 2. Chili 3. Old Wallilabou | <ul style="list-style-type: none"> ▪ Diamond Sanitary Landfill completed and commissioned in September 2002. ▪ Wallilabou Sanitary Landfill began construction in June 2003 after delays in negotiating for additional funding from the CDB. ▪ Arnos Vale was upgraded to a managed disposal site and has been in operation since late 2000. It will remain in operation until construction of Wallilabou landfill completed. |

Table 2: Goods Procured Under the Project

| Items Procured | Antigua and Barbuda | Dominica | Grenada | St. Kitts and Nevis | St. Lucia | St. Vincent and the Grenadines |
|--------------------------|---------------------|------------------|----------------|---------------------|------------------|--------------------------------|
| Waste Bins | 2,000 | 1,000 (on order) | 3,000 | 1,500 | 1,400 | 4,000 |
| Metal Bins | 70 | 30 | -- | 30 | -- | 120 |
| Barge | 1 | 1 | 1 | 2 | -- | -- |
| Compactor Vehicles | -- | -- | 1 | -- | -- | 2 (5 yd ³) |
| Roll-on/off truck | -- | -- | -- | 2 | -- | -- |
| Refuse container bins | 50 | -- | -- | -- | -- | -- |
| Refuse Collection Trucks | 10 | 3 | 2 | 6 | -- | 6 |
| Pick-up trucks | 3 | 1 | -- | 2 | 1 | 2 |
| Side loaders | 1 | 2 | -- | -- | -- | -- |
| Skip Bins | -- | 70 | 20 | 24 | 8 (w/ bin slabs) | 30 |
| Skip hoist trucks | -- | 2 | 1 | -- | -- | 2 |
| Hoist trucks | -- | 3 | -- | -- | -- | -- |
| Flatbed truck | 1 | -- | -- | 2 | -- | 1 (w/ crane) |
| Tipper truck | -- | 1 | 2 (1 w/ crane) | -- | -- | -- |
| Roll-off containers | -- | 20 (ordered) | -- | -- | -- | -- |
| Track-type tractor | -- | 1 | 1 | 1 | 1 | 2 |
| Track loaders | 2 | -- | 2 | 2 | 2 | 2 |
| Dump trucks | 2 | 1 | -- | -- | -- | 1 |
| Crawler tractor | 1 | -- | -- | -- | 1 | -- |
| Car crushers | -- | -- | -- | -- | -- | -- |
| Bin washer/wells | 2 | -- | -- | -- | -- | -- |
| Tire slicers | 1 tire baler | 1 | -- | -- | 2 | -- |
| Weigh bridges | 1 | 1 | Landfill CW | 2 | 2 | -- |
| Quick release forks | -- | -- | -- | -- | -- | -- |
| Hazardous waste storage | 1 | -- | Landfill CW | 2 | -- | -- |
| Glass crushers | -- | -- | -- | -- | -- | -- |
| Cover applicators | -- | -- | -- | -- | -- | -- |
| Waste-oil storage | -- | 1 | Landfill CW | 2 | 60 drums | -- |
| Wood chippers | -- | 1 | -- | -- | 2 | 2 |
| Refrigerated room | -- | -- | -- | -- | 1 | -- |
| Compactor | -- | -- | -- | -- | 1 | -- |
| Office equipment | X | X | -- | X | X | X |
| Other | -- | 1 forklift | -- | -- | 1 autoclave | 1 wheeled mini loader |

Table 3: List of Consultancies Undertaken through the Regional Component of the Project

| A. Activities Undertaken through the PMU (April 1997-August 2000) | Date |
|---|------------------------------|
| Regional Waste Reduction, Recycling, Recovery and Reuse | March 1999 |
| Model Policy, Legislation and Regulations | June 1999 |
| Training Needs Assessment and Programme Design | October 1999 |
| Technical Assistance on the Joint Procurement of Equipment | |
| Grenada Wastewater Management Project | November 1999 |
| Cost Effectiveness for Waste Collection and Disposal in Grenada | |
| Institutional Arrangements for St. Vincent and the Grenadines | |
| Development of Biomedical Waste Management Plans for Antigua and Barbuda, St. Kitts and Nevis, and St. Lucia | |
| Development and Execution of Project Benefit Monitoring and Evaluation Programmes and Waste Management Systems Monitoring and Evaluation | January 2000 |
| Review and Analysis of the PET and Glass Bottle Recycling Industry in Barbados and the Scope for Implementation of Similar Recycling Initiatives in the OECS | March 2000 |
| | |
| B. Activities Undertaken through the OECS-NRMU and OECS-ESDU (July 2001-June 2003) | Date |
| Short-term consultancy to provide assistance in the implementation of the project | July 2001-August 2001 |
| Services of a procurement consultant | July 2001-January 2002 |
| Preparation of Solid Waste Management Legislation for St. Kitts and Nevis | August 2001-October 2001 |
| Audits of Regional Component of the Project | August 2001-September 2002 |
| Waste Characterization Training and Demonstration – Antigua and Barbuda | September 2001-December 2001 |
| Assistance in Regional Roundtable and Development of Waste Diversion Action Plans | September 2001 |
| Programme Officer – OECS SSGWMP | September 2001-February 2002 |
| Preparation of Legislation for St. Vincent and the Grenadines; Antigua and Barbuda | September 2001-April 2002 |
| Preparation of legislation for the Commonwealth of Dominica | October 2001-January 2002 |
| Preparation of Specifications for Biomedical Waste Management Equipment for St. Lucia | October 2001-January 2002 |
| Development of a Biomedical Waste Management Plan for St. Vincent and the Grenadines | October 2001-December 2001 |
| Solid Waste Management Consultant to OECS | November 2001-February 2002 |
| Development and Delivery of a Master Composter Training Course for the OECS | December 2001-February 2002 |
| Development of Preventative Maintenance Programs for Solid Waste Management Equipment for Grenada; St. Vincent and the Grenadines | December 2001-February 2002 |
| Development of Preventative Maintenance Programs for Solid Waste Management Equipment for Antigua and Barbuda; the Commonwealth of Dominica; St. Kitts and Nevis; St. Lucia | December 2001-February 2002 |
| Development of a Biomedical Waste Management Plan for St. Vincent and the Grenadines | January 2002-March 2002 |
| Development of a Biomedical Waste Management Plan for St. Kitts and Nevis; Grenada | |
| Consultant Program Officer – Solid Waste Management, OECS-ESDU | December 2001-June 2003 |
| Train the Trainer Workshop on Biomedical Waste Management for the OECS | June 2002-July 2002 |
| The conduct of Waste Characterization Studies for the Commonwealth of Dominica; St. Kitts and Nevis | July 2002-September 2002 |
| Team Leader and Health Planning and Management Specialist on the assignment to Formulate Proposals for the Strengthening of the Regulatory and Monitoring Capacities of the Environmental Health Departments of all six OECS countries, excluding Antigua and Barbuda | July 2002-October 2002 |
| Solid Waste Management Specialist on assignment for the above activity | July 2002-October 2002 |
| Environmental Health Specialist on assignment for the above activity | July 2002-October 2002 |
| Development of an OECS Strategy on the Management of Used Oil | August 2002-October 2002 |
| Development of a Marine Waste Management Information System | August 2002-October 2002 |
| Preparation of National Solid Waste Inventory for Grenada, and National Solid Waste Management | December 2002-June 2003 |

| | |
|--|-------------------------|
| Strategies for Grenada; St. Kitts and Nevis; St. Lucia; and St. Vincent and the Grenadines | |
| Design and Delivery of a Solid Waste Management Training Program for the OECS | January 2002-April 2003 |
| Short –term consultant (ICR Coordinator) | February 2003-June 2003 |
| Technical Assistance to OECS-ESDU and OECS SWMEs in the Preparation of Project Closing Reports and the Evaluation of Solid Waste Management Collection and Disposal Activities under the Project | March 2003-June 2003 |
| Team leader and Solid Waste Management Specialist on the Conduct of Public Opinion Research on the Effectiveness of the Solid Waste Management Systems of the OECS countries | March 2002-June 2003 |
| Survey Design and Data Management Specialist for the above activity | March 2003-June 2003 |
| Evaluation of the Public Awareness and Education Component of the Project | March 2003-June 2003 |
| Evaluation of Cost Recovery Measures implemented by Selected Beneficiary Countries under the Project | April 2002-June 2003 |

Additional Annex 10. Detail of Project Financing per Country

I. Antigua and Barbuda

Project Costs by Component (in US\$ million equivalent)

| Component | Appraisal Estimate | Actual/Estimate | Percentage of Appraisal |
|---|--------------------|-----------------|-------------------------|
| A. Reception facilities | 0.62 | 0.50 | 81 |
| B. Storage and Collection System | 1.02 | 1.35 | 132 |
| C. Waste Treatment and Disposal | 2.10 | 4.71 | 224 |
| D. Disposal of Medical Waste | 0.63 | 0.00 | 0 |
| E. Project Management and Institutional Support | 0.07 | 0.12 | 171 |
| Land, Taxes and Duties | 1.47 | 2.10 | 143 |
| Contingencies | 1.15 | 0.00 | 0 |
| Total Project Costs | 7.06 | 8.78 | 124 |
| Total Financing Required | 5.59 | 6.68 | 119 |

Project Costs by Procurement Arrangements (Appraisal Estimate) (in US\$ million equivalent)

| Expenditure Category | Procurement Method ^{1/} | | | | Total Cost |
|----------------------------|----------------------------------|----------------|---------------------|--------|--------------------|
| | ICB | NCB | Other ^{2/} | N.B.F. | |
| 1. Goods | 1.3 (0.09 GEF) | 0.00 (0.00) | 0.1 (GEF) | 3.0 | 4.4 (1.0 GEF) |
| 2. Consultants | 0.1 | 0.00 (0.00) | 0.00 (0.00) | 0.3 | 0.4 |
| (a) Design/ Supervision | 0.1 (GEF) | | | | 0.1 (GEF) |
| 3. Civil Works | 0.00 (0.00) | 0.00 (0.00) | 0.02 (GEF) | 2.0 | 2.22 (0.02 GEF) |
| Total | 1.4 (1.0 GEF) | 0.00 (0.00) | 0.3 (GEF) | 5.2 | 7.0 (1.3 GEF) |

Project Costs by Procurement Arrangements (Actual/Latest Estimate) (in US\$ million equivalent)

| Expenditure Category | Procurement Method ^{1/} | | | | Total Cost |
|--|----------------------------------|------|---------------------|--------|------------------|
| | ICB | NCB | Other ^{2/} | N.B.F. | |
| 1. Goods (GEF) | 1.22 (1.22) | 0.00 | 0.00 | 1.54 | 2.76 (1.22) |
| 2. Consultants | | | | | |
| (a) Consultant services and studies (GEF) | 0.01 (0.01) | 0.00 | 0.00 | 0.00 | 0.01 (0.01) |
| (b) Design/Supervision | 0.00 | 0.00 | 0.00 | 3.49 | 3.49 |
| 4. Civil Works (GEF) | 0.003 (0.003) | 0.00 | 0.00 | 0.42 | 0.423 (0.003) |
| Total (GEF) | 1.23 (1.23) | 0.00 | 0.00 | 5.45 | 6.68 (1.23) |

1/ Figures in parenthesis are the amounts financed by the Bank. All costs include contingencies.

2/ Includes civil works and goods procured through national shopping, consulting services, services of contracted staff, training, technical assistance services, and incremental operating costs related to managing the project.

Project Financing by Component (in US\$ million equivalent)

| Project Financing by Component (in US\$ million equivalent) | | | | | | | | | |
|---|--------------------|------|------|-------------------------|------|------|-------------------------|-----|-----|
| Components | Appraisal Estimate | | | Actual/Latest Estimate* | | | Percentage of Appraisal | | |
| | GEF | GAB | CoF. | GEF | GAB | CoF | GEF | GAB | CoF |
| A. Reception facilities | 0.42 | 0.00 | 0.00 | 0.50 | 0.00 | 0.00 | 120 | 0 | 0 |
| B. Storage and Collection System | 0.20 | 0.00 | 1.02 | 0.18 | 0.00 | 1.17 | 90 | 0 | 115 |
| C. Waste Treatment and Disposal | 0.60 | 0.00 | 1.50 | 0.50 | 0.00 | 4.21 | 83 | 0 | 253 |
| D. Disposal of Medical Waste | 0.00 | 0.00 | 0.63 | 0.00 | 0.00 | 0.00 | 0 | 0 | 0 |
| E. Project Management and Institutional Support | 0.07 | 0.00 | 0.07 | 0.05 | 0.00 | 0.07 | 109 | 0 | 100 |
| Land | 0.05 | 0.24 | 0.00 | 0.00 | 0.80 | 0.00 | 0 | 333 | 0 |
| Design and supervision | 0.05 | 0.00 | 0.32 | 0.003 | 0.00 | 0.00 | 6 | 0 | 131 |
| Taxes and Duties | 0.00 | 1.35 | 0.00 | 0.00 | 1.30 | 0.00 | 0 | 96 | 0 |
| Contingencies | 0.02 | 0.00 | 0.52 | 0.00 | 0.00 | 0.00 | 0 | 0 | 0 |
| Total Project Costs | 1.41 | 1.59 | 4.06 | 1.23 | 2.10 | 5.45 | 87 | 132 | 134 |

II. Dominica

Project Costs by Component (in US\$ million equivalent)

| Component | Appraisal Estimate | Actual | Percentage of Appraisal |
|---|--------------------|--------|-------------------------|
| A. Reception facilities | 0.45 | 0.39 | 87 |
| B. Storage and Collection System | 1.17 | 1.20 | 99 |
| C. Waste Treatment and Disposal | 2.13 | 3.54 | 158 |
| E. Project Management and Institutional Support | 0.04 | 0.06 | 150 |
| Land, Taxes and Duties | 1.02 | 0.00 | --- |
| Contingencies | 1.34 | 0.00 | --- |
| Total Project Costs | 6.15 | 5.19 | 84 |
| Total Financing Required | 5.13 | 5.19 | 101 |

Project Costs by Procurement Arrangements (Appraisal Estimate) (in US\$ million equivalent)

| Expenditure Category | Procurement Method ^{1/} | | | | Total Cost |
|---|----------------------------------|------|-----------------------|--------|-----------------------|
| | ICB | NCB | Other ^{2/} | N.B.F. | |
| 1. Goods (IDA/IBRD) (GEF) | 1.8 (0.3) (0.6) | 0.00 | 0.4 (0.3) (0.1) | 1.2 | 3.4 (0.6) (0.7) |
| 2. Consultants | 0.2 | 0.00 | 0.1 | 0.3 | 0.06 |
| (a) Design/ Supervision (IDA/IBRD) (GEF) | (0.1) (0.1) | | (0.1) | | (0.2) (0.1) |
| 3. Civil Works (IBRD/IDA) | 0.00 | 0.00 | 0.04 (0.04) | 1.7 | 2.1 (0.04) |
| Total (IDA/IBRD) (GEF) | 2.0 (0.4) (0.7) | 0.00 | 0.9 (0.8) (0.1) | 3.2 | 6.1 (1.2) (0.8) |

Project Costs by Procurement Arrangements (Actual/Latest Estimate) (in US\$ million equivalent)

| Expenditure Category | Procurement Method ^{1/} | | | | Total Cost |
|---|----------------------------------|----------------|---------------------|--------|--------------------------|
| | ICB | NCB | Other ^{2/} | N.B.F. | |
| 1. Goods (IDA/IBRD) (GEF) | 0.61 (0.61) | 0.00 | 0.24 (0.24) | 1.08 | 2.08 (0.39) (0.61) |
| 2. Consultants | 0.02 | 0.01 | | 0.18 | 0.21 |
| (a) Design/ Supervision (IDA/IBRD) (GEF) | (0.01) (0.01) | (0.01) | 0.00 | 0.00 | (0.01) (0.02) |
| 3. Civil Works (GEF) (IDA/IBRD) | 0.00 | 0.00 (0.00) | 0.22 (0.22) | 2.83 | 2.93 (0.07) |
| Total (IDA/IBRD) (GEF) | 0.63 (0.01) (0.62) | 0.01 (0.01) | 0.46 (0.46) | 4.09 | 5.19 (0.48) (0.62) |

1/ Figures in parenthesis are the amounts financed by the Bank. All costs include contingencies.

2/ Includes civil works and goods procured through national shopping, consulting services, services of contracted staff, training, technical assistance services, and incremental operating costs related to managing the project.

Project Financing by Component (in US\$ million equivalent)

| Components | Appraisal Estimate | | | | Actual/Latest Estimate* | | | | Percentage of Appraisal | | | |
|---|--------------------|------|------|------|-------------------------|------|------|------|-------------------------|-----|-----|-----|
| | WB and CDB | GEF | GD | CoF. | WB and CDB | GEF | GD | CoF | WB and CDB | GEF | GD | CoF |
| A. Reception facilities | 0.00 | 0.45 | 0.00 | 0.00 | 0.00 | 0.39 | 0.00 | 0.00 | 0 | 87 | 0 | 0 |
| B. Storage and Collection System | 1.17 | 0.00 | 0.00 | 0.00 | 0.12 | 0.00 | 0.00 | 0.00 | 100 | 0 | 0 | 0 |
| C. Waste Treatment and Disposal | 0.64 | 0.25 | 0.00 | 1.24 | 0.29 | 0.23 | 0.00 | 2.61 | 75 | 88 | 0 | 134 |
| E. Project Management and Institutional Support | 0.04 | RC | 0.00 | 0.00 | 0.06 | RC | 0.00 | 0.00 | 75 | -- | 0 | 0 |
| Land, Taxes and Duties | 0.00 | 0.00 | 1.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | ---- | | --- | --- |
| Contingencies | 0.51 | 0.15 | 0.00 | 0.68 | 0.00 | 0.00 | 0.00 | 0.00 | ---- | | --- | --- |
| Total Project Costs | 2.36 | 0.85 | 1.02 | 1.92 | 1.96 | 0.62 | 0.00 | 2.61 | 83 | 73 | --- | 136 |

III. Grenada

Project Costs by Component (in US\$ million equivalent)

| Component | Appraisal Estimate | Actual | Percentage of Appraisal |
|--|--------------------|--------|-------------------------|
| A. Reception facilities | 0.44 | 0.45 | 102 |
| B. Storage and Collection System | 1.26 | 0.55 | 44 |
| C. Waste Treatment and Disposal | 2.22 | 4.89 | 220 |
| E. Project Management and Institutional Support ** | 0.07 | 0.00 | 00 |
| F. Grenada Dove | 0.20 | 0.23 | 115 |
| Land, Taxes and Duties | 1.75 | 1.94 | 111 |
| Contingencies | 1.05 | 0.82 | 78 |
| Total Project Cost | 6.99 | 8.85 | 127 |
| Base Cost | 5.24 | 6.12 | 117 |

Project Costs by Procurement Arrangements (Appraisal Estimate) (in US\$ million equivalent)

| Expenditure Category | Procurement Method ^{1/} | | | | Total Cost |
|---|----------------------------------|----------------|---------------------|--------|--------------|
| | ICB | NCB | Other ^{2/} | N.B.F. | |
| 1. Goods (GEF) | 1.2 (0.9) | 0.00 (0.00) | 0.2 (0.2) | 2.5 | 3.9 (1.1) |
| 2. Consultants (a) Design/ (GEF) Supervision | 0.1 (0.1) | 0.00 | 0.00 | 0.4 | 0.5 (0.1) |
| 3. Civil Works | 0.00 | 0.00 | 0.00 | 2.4 | 2.4 |
| Total (GEF) | 1.3 (1.0) | 0.00 | 0.2 (0.2) | 5.3 | 6.8 (1.2) |

Project Costs by Procurement Arrangements (Actual/Latest Estimate) (in US\$ million equivalent)

| Expenditure Category | Procurement Method ^{1/} | | | | Total Cost |
|--|----------------------------------|------|---------------------|--------|--------------------|
| | ICB | NCB | Other ^{2/} | N.B.F. | |
| 1. Goods (GEF) | 0.98 (0.98) | 0.00 | 0.13 (0.13) | 0.75 | 1.86 (1.11) |
| 2. Consultants (a)Design/ (GEF) Supervision | 0.00 | 0.00 | 0.50 (0.50) | 0.00 | 0.50 (0.50) |
| 3. Civil Works (GEF) | 0.00 | 0.00 | 0.07 (0.07) | 3.69 | 3.76 (0.07) |
| Total (GEF) | 0.97 (0.97) | 0.00 | 0.69 (0.19) | 4.44 | 6.12 (1.18) |

1/ Figures in parenthesis are the amounts financed by the Bank. All costs include contingencies.

2/ Includes civil works and goods procured through national shopping, consulting services, services of contracted staff, training, technical assistance services, and incremental operating costs related to managing the project.

Project Financing by Component (in US\$ million equivalent)

| Components | Appraisal Estimate | | | | Actual/Latest Estimate* | | | | Percentage of Appraisal | | | |
|---|--------------------|------|------|------|-------------------------|-------------------|-----------------|------|-------------------------|-----|------|-----|
| | GEF | CDB | GG | EIB | GEF | CDB | GG ^y | EIB | GEF | CDB | GG | EIB |
| A. Reception facilities | 0.44 | 0.00 | 0.00 | 0.00 | 0.38 | 0.00 | 0.26 | 0.00 | 86 | 0 | 0 | 0 |
| B. Storage and Collection System | 0.00 | 0.00 | 0.00 | 1.26 | 0.00 | 0.00 | 0.41 | 0.55 | 0 | 0 | 0 | 44 |
| C. Waste Treatment and Disposal | 0.57 | 1.37 | 0.00 | 0.28 | 0.62 | 4.25 | 0.84 | 0.00 | 109 | 310 | 0 | 0 |
| E. Project Management and Institutional Support | RC | 0.00 | 0.00 | 0.07 | RC | 0.00 | 0.00 | 0.00 | --- | 0 | 0 | 0 |
| F. Grenada Dove | 0.20 | 0.00 | 0.00 | 0.00 | 0.20 | 0.03 ^x | 0.43 | 0.00 | 100 | 0 | 0 | 0 |
| Land, Taxes and Duties | 0.00 | 0.00 | 1.75 | 0.00 | --- | --- | --- | --- | --- | --- | 1.75 | --- |
| Contingencies | 0.18 | 0.33 | 0.00 | 0.54 | --- | --- | --- | --- | --- | --- | --- | --- |
| Total Project Costs | 1.39 | 1.7 | 1.75 | 2.15 | 1.20 | 4.28 | 1.94 | 0.55 | 86 | 252 | 100 | 26 |

IV. St. Kitts and Nevis

Project Costs by Component (in US\$ million equivalent)

| Component | Appraisal Estimate | Actual | Percentage of Appraisal |
|---|--------------------|--------|-------------------------|
| A. Reception facilities | 0.48 | 0.63 | 131 |
| B. Storage and Collection System | 0.98 | 1.35 | 137 |
| C. Waste Treatment and Disposal | 2.10 | 6.33 | 302 |
| D. Medical Waste Treatment and Disposal | 0.59 | 0.03 | 5 |
| E. Project Management and Institutional Support | 0.07 | 0.07 | 100 |
| Land, Taxes and Duties | 1.58 | --- | --- |
| Contingencies | 1.08 | 0.00 | 0 |
| Total Project Costs | 6.88 | 8.41 | 122 |
| Total Financing Required | 5.30 | 8.41 | 159 |

Project Costs by Procurement Arrangements (Appraisal Estimate) (in US\$ million equivalent)

| Expenditure Category | Procurement Method ^{1/} | | | | Total Cost |
|-------------------------|----------------------------------|----------------|---------------------|--------|----------------|
| | ICB | NCB | Other ^{2/} | N.B.F. | |
| 1. Civil Works | 0.00 (0.00) | 0.00 (0.00) | 0.2 (0.2) | 1.7 | 1.9 (0.2) |
| 2. Consultants | 0.2 | 0.00 (0.00) | 0.1 | 0.2 | 0.5 |
| (a) Design/ Supervision | (0.1) (0.1) | | (0.1) | | (0.2) (0.1) |
| (IBRD) | | | | | |
| (IDA) | | | | | |
| 3. Equipment | 3.3 | 0.00 | 0.4 | 0.7 | 4.4 |
| (IBRD) | (1.4) | (0.00) | (0.3) | | (1.7) |
| (IDA) | (1.0) | | (0.1) | | (1.1) |
| Total | 3.5 | 0.00 | 0.7 | 2.6 | 6.8 |
| (IBRD) | (1.5) | | (0.6) | | (2.1) |
| (IDA) | (1.1) | | (0.1) | | (1.2) |

Project Costs by Procurement Arrangements (Actual/Latest Estimate) (in US\$ million equivalent)

| Expenditure Category | Procurement Method ^{1/} | | | | Total Cost |
|--|----------------------------------|------|--------------------------|--------|--------------------------|
| | ICB | NCB | Other ^{2/} | N.B.F. | |
| 1. Civil Works (IBRD) (GEF) | 0.00 | 0.00 | 0.00 | 5.82 | 5.82 |
| 2. Consultants | 0.00 | 0.00 | 0.04 | 0.00 | 0.04 |
| (a) Design/ Supervision (IBRD) (IDA) | | | (0.03) (0.01) | | (0.03) (0.01) |
| 3. Goods (IBRD) (IDA) | 2.55 (1.55) (1.00) | 0.00 | 0.00 | 0.00 | 2.55 (1.55) (1.00) |
| Total (IBRD) (IDA) | 2.55 (1.55) (1.00) | 0.00 | 0.04 (0.03) (0.01) | 5.82 | 8.41 (1.58) (1.01) |

1/ Figures in parenthesis are the amounts financed by the Bank. All costs include contingencies.

2/ Includes civil works and goods procured through national shopping, consulting services, services of contracted staff, training, technical assistance services, and incremental operating costs related to managing the project.

Project Financing by Component (in US\$ million equivalent)

| Components | Appraisal Estimate | | | | Actual/Latest Estimate* | | | | Percentage of Appraisal | | | |
|---|--------------------|------|------|------|-------------------------|------|------|------|-------------------------|-----|------|-----|
| | WB | GEF | GAB | CoF. | WB | GEF | GDR | CoF | WB | GEF | GDR | CoF |
| A. Reception facilities | 0.00 | 0.48 | 0.00 | 0.00 | 0.12 | 0.51 | 0.00 | 0.00 | -- | 106 | 0 | 0 |
| B. Storage and Collection System | 0.98 | 0.00 | 0.00 | 0.00 | 1.35 | 0.00 | 0.00 | 0.00 | 139 | 0 | 0 | 0 |
| C. Waste Treatment and Disposal | 0.00 | 0.57 | 0.00 | 1.53 | 0.01 | 0.50 | 0.00 | 5.82 | 0 | 88 | 0 | 380 |
| D. Medical Waste Treatment and Disposal | 0.59 | 0.00 | 0.00 | 0.00 | 0.03 | 0.00 | 0.00 | 0.00 | 5 | 0 | 0 | 0 |
| E. Project Management and Institutional Support | 0.07 | RC | 0.00 | 0.00 | 0.07 | RC | 0.00 | 0.00 | 100 | -- | 0 | 0 |
| Land, Taxes and Duties | 0.00 | 0.00 | 1.58 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | --- | --- | 0.00 | --- |
| Contingencies | 0.49 | 0.87 | 0.00 | 0.38 | --- | --- | 0.00 | --- | --- | --- | -- | --- |
| Total Project Costs | 2.13 | 1.92 | 1.58 | 1.91 | 1.58 | 1.01 | 0.00 | 5.82 | 74 | 53 | 0.00 | 380 |

V. St. Lucia

Project Costs by Component (in US\$ million equivalent)

| Component | Appraisal Estimate | Actual | Percentage of Appraisal |
|---|--------------------|--------|-------------------------|
| A. Reception facilities | 0.20 | 0.16 | 80 |
| B. Storage and Collection System | 1.83 | 0.04 | 2 |
| C. Waste Treatment and Disposal | 3.00 | 8.34 | 278 |
| D. Disposal of Medical Waste | 0.60 | 0.60 | 100 |
| E. Project Management and Institutional Support | 0.07 | 0.02 | 29 |
| Land, Taxes and Duties | 1.73 | 0.26 | 15 |
| Contingencies | 1.98 | 0.00 | --- |
| Total Project Costs | 9.41 | 9.42 | 100 |
| Total Financing Required | 7.68 | 9.16 | 119 |

Project Costs by Procurement Arrangements (Appraisal Estimate) (in US\$ million equivalent)

| Expenditure Category | Procurement Method ^{1/} | | | | Total Cost |
|---|----------------------------------|------|-----------------------|--------|-----------------------|
| | ICB | NCB | Other ^{2/} | N.B.F. | |
| 1. Goods (IDA/IBRD) (GEF) | 5.7 (3.8) (1.0) | 0.00 | 0.3 (0.2) (0.1) | 0.00 | 6.0 (4.0) (1.1) |
| 2. Services | 0.4 | 0.00 | 0.1 | 0.3 | 0.8 |
| (a) Design/ Supervision (IDA/IBRD) (GEF) | (0.3) (0.1) | | (0.1) | | (0.4) (0.1) |
| 3. Civil Works (IDA/IBRD) | 0.00 | 0.00 | 0.2 (0.2) | 2.3 | 2.5 |
| Total | 6.1 | 0.00 | 0.6 | 2.6 | 9.3 |

Project Costs by Procurement Arrangements (Actual/Latest Estimate) (in US\$ million equivalent)

| Expenditure Category | Procurement Method ^{1/} | | | | Total Cost |
|---|----------------------------------|--------------------------|--------------------------|--------|--------------------------|
| | ICB | NCB | Other ^{2/} | N.B.F. | |
| 1. Goods (IDA/IBRD) (GEF) | 2.31 (1.47) (0.84) | 0.02 (0.02) | 0.09 (0.02) (0.07) | 0.00 | 2.42 (1.51) (0.91) |
| 2. Consultants | 0.28 | 0.00 | 0.09 | 0.00 | 0.37 |
| (a) Design/ Supervision (IDA/IBRD) (GEF) | (0.21) (0.07) | | (0.09) | | (0.30) (0.07) |
| 3. Civil Works (IDA/IBRD) (GEF) | 1.99 (1.99) | 0.04 (0.04) | 0.00 | 4.34 | 6.17 (1.99) (0.04) |
| Total (IDA/IBRD) (GEF) | 4.54 (3.67) (0.91) | 0.06 (0.02) (0.04) | 0.16 (0.11) (0.07) | 4.34 | 9.16 (3.8) (1.02) |

1/ Figures in parenthesis are the amounts financed by the Bank. All costs include contingencies.

2/ Includes civil works and goods procured through national shopping, consulting services, services of contracted staff, training, technical assistance services, and incremental operating costs related to managing the project.

Project Financing by Component (in US\$ million equivalent)

| Components | Appraisal Estimate | | | | Actual/Latest Estimate* | | | | Percentage of Appraisal | | | |
|--|--------------------|------|------|------|-------------------------|------|------|------|-------------------------|-----|-----|-----|
| | WB | GEF | GD | CoF | WB | GEF | GD | CoF | WB | GEF | GD | CoF |
| A. Reception facilities | 0.00 | 0.20 | 0.00 | 0.00 | 0.00 | 0.16 | 0.00 | 0.00 | 0 | 80 | 0 | 0 |
| B. Storage and Collection System | 1.83 | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 | 0.00 | 0.00 | 0 | 0 | 0 | 0 |
| C. Waste Treatment and Disposal | 1.16 | 0.46 | 0.00 | 1.50 | 3.18 | 0.82 | 0.00 | 4.34 | 274 | 178 | 0 | 289 |
| D. Disposal of Medical Waste | 0.60 | 0.00 | 0.00 | 0.00 | 0.60 | 0.00 | 0.00 | 0.00 | 100 | -- | 0 | 0 |
| E. Project Management and Institutional Support | 0.07 | RC | 0.00 | 0.00 | 0.02 | RC | 0.00 | 0.00 | 29 | 0 | 0 | 0 |
| Land, Taxes and Duties | -- | -- | 1.73 | -- | --- | --- | 0.26 | --- | --- | --- | --- | --- |
| Contingencies | 0.9 | 0.50 | -- | 0.46 | --- | --- | --- | --- | --- | --- | 15 | --- |
| Total Project Costs | 4.56 | 1.16 | 1.73 | 1.96 | 3.80 | 1.02 | 0.26 | 4.34 | 83 | 88 | 15 | 221 |

VI. St. Vincent and the Grenadines

Project Costs by Component (in US\$ million equivalent)

| Component | Appraisal Estimate | Actual | Percentage of Appraisal |
|---|--------------------|--------|-------------------------|
| A. Reception facilities | 0.46 | 0.18 | 39 |
| B. Storage and Collection System | 1.75 | 3.40 | 194 |
| C. Waste Treatment and Disposal | 3.31 | 4.14 | 125 |
| E. Project Management and Institutional Support | 0.07 | 0.06 | 86 |
| Land, Taxes and Duties, and Contingencies | 1.98 | 1.23 | 68 |
| Total Project Costs | 7.57 | 9.01 | 119 |
| Total Financing Required | 7.57 | 7.78 | 103 |

Project Costs by Procurement Arrangements (Appraisal Estimate) (in US\$ million equivalent)

| Expenditure Category | Procurement Method ^{1/} | | | | Total Cost |
|---|----------------------------------|------|-----------------------|--------|---------------------------|
| | ICB | NCB | Other ^{2/} | N.B.F. | |
| 1. Goods (IDA/IBRD) GET | 4.9 (3.0) (0.9) | 0.00 | 0.3 (0.2) (0.1) | 0.00 | 5.2 (3.2) (1.0) |
| 2. Consultants - Design/ Supervision (IDA/IBRD) (GEF) | 0.4 (0.3) (0.1) | 0.00 | 0.1 (0.1) | 0.3 | 0.8 (0.4) (0.1) |
| 2. Civil Works (IDA/IBRD) | 0.00 | 0.00 | 0.1 (0.1) | 2.5 | 2.6 (0.1) |
| Total (IDA/IBRD) (GEF) | 5.3 (3.3) (1.0) | 0.00 | 0.5 (0.4) (0.1) | 2.8 | 8.6 (3.7) (1.1) |

Project Costs by Procurement Arrangements (Actual/Latest Estimate) (in US\$ million equivalent)

| Expenditure Category | Procurement Method ^{1/} | | | | Total Cost |
|---|----------------------------------|----------------|--------------------------|--------|--------------------------|
| | ICB | NCB | Other ^{2/} | N.B.F. | |
| 1. Goods (IDA/IBRD) (GET) | 2.22 (1.26) (0.96) | 0.42 (0.42) | 0.00 (0.00) | 0.00 | 2.64 (1.68) (0.96) |
| 2. Consultants - Design/ Supervision (IDA/IBRD) (GEF) | 0.04 (0.04) (0.00) | 0.00 (0.00) | 0.00 (0.00) | 2.25 | 2.29 |
| 3. Civil Works (IDA/IBRD) | 0.00 (0.00) | 0.00 (0.00) | 0.09 (0.05) (0.04) | 3.99 | 4.08 |
| Total (IDA/IBRD) (GEF) | 2.26 (1.30) (0.96) | 0.42 (0.42) | 0.09 (0.05) (0.04) | 6.24 | 9.01 (1.77) (1.0) |

^{1/} Figures in parenthesis are the amounts financed by the Bank. All costs include contingencies.

^{2/} Includes civil works and goods procured through national shopping, consulting services, services of contracted staff, training, technical assistance services, and incremental operating costs related to managing the project.

Project Financing by Component (in US\$ million equivalent)

| Components | Appraisal Estimate | | | | Actual/Latest Estimate* | | | | Percentage of Appraisal | | | |
|---|--------------------|------|------|------|-------------------------|------|------|------|-------------------------|------|------|------|
| | WB | GEF | CDB | GVG | WB | GEF | CDB | GVG | WB | GEF | CDB | GVG |
| A. Reception facilities | 0.00 | 0.46 | 0.00 | 0.00 | 0.09 | 0.09 | 0.00 | 0.00 | 0 | 1.95 | 0 | 0 |
| B. Storage and Collection System | 1.75 | 0.00 | 0.00 | 0.00 | 1.69 | 0.67 | 0.00 | 1.04 | .92 | 0 | 0 | 0 |
| C. Waste Treatment and Disposal | 1.32 | 0.41 | 1.34 | 0.00 | 0.00 | 0.18 | 3.5 | 0.47 | 0 | .44 | 2.61 | 0 |
| E. Project Management and Institutional Support | 0.07 | | 0.00 | 0.00 | 0.00 | 0.06 | 0.00 | 0.00 | 0 | 0 | 0 | 0 |
| Land, Taxes and Duties, and Contingencies | 0.49 | 0.34 | 0.55 | 1.98 | 0 | 0 | 0 | 1.23 | 0 | 0 | 0 | 0.62 |
| Total Project Costs | 3.63 | 1.21 | 1.89 | 1.98 | 1.78 | 1.00 | 3.5 | 2.74 | 0.0 | .82 | 1.85 | 1.41 |
| | | | | | | | | | | | | |

VII. Regional Component

Project Costs by Component (in US\$ million equivalent)

| Component | Appraisal Estimate | Actual | Percentage of Appraisal |
|----------------------------------|--------------------|--------|-------------------------|
| A. Model Legislation | 0.3 | 0.33 | 110 |
| B. Recycling/Compost | 0.45 | 0.51 | 113 |
| C. Training | 0.2 | 0.09 | 45 |
| D. Marine Waste Documentation | 0.05 | 0.03 | 60 |
| E. Workshops | 0.15 | 0.07 | 47 |
| F. Model Environmental Education | 0.25 | 0.23 | 92 |
| G. Evaluation and Monitoring | 0.28 | 0.24 | 86 |
| H. Project Management Unit | 1.51 | 2.06 | 136 |
| I. Sewerage and Water | 2.00 | 0.98 | 49 |
| Total Project Costs | 5.18 | 4.54 | 88 |
| Total Financing Required | 5.18 | 4.54 | 88 |

Project Costs by Procurement Arrangements (Appraisal Estimate) (in US\$ million equivalent)

| Expenditure Category | Procurement Method ^{1/} | | | | Total Cost |
|----------------------|----------------------------------|------|---------------------|--------|----------------|
| | ICB | NCB | Other ^{2/} | N.B.F. | |
| 1. Consultants (GEF) | 0.00 | 0.00 | 5.18 (5.18) | 0.00 | 5.18 (5.18) |

Project Costs by Procurement Arrangements (Actual/Latest Estimate) (in US\$ million equivalent)

| Expenditure Category | Procurement Method ^{1/} | | | | Total Cost |
|----------------------|----------------------------------|-----|---------------------|--------|----------------|
| | ICB | NCB | Other ^{2/} | N.B.F. | |
| 2. Consultants (GEF) | | | 4.38 (4.38) | | 4.38 (4.38) |

1/ Figures in parenthesis are the amounts financed by the Bank. All costs include contingencies.

2/ Includes civil works and goods procured through national shopping, consulting services, services of contracted staff, training, technical assistance services, and incremental operating costs related to managing the project.

Project Financing by Component (in US\$ million equivalent)

| Components | Appraisal Estimate | Actual/Latest Estimate* | Percentage of Appraisal |
|----------------------------------|--------------------|-------------------------|-------------------------|
| Activity | GEF | GEF | GEF |
| A. Model Legislation | 0.3 | 0.33 | 110 |
| B. Recycling/Compost | 0.45 | 0.51 | 113 |
| C. Training | 0.2 | 0.09 | 45 |
| D. Marine Waste Documentation | 0.05 | 0.03 | 60 |
| E. Workshops | 0.15 | 0.07 | 47 |
| F. Model Environmental Education | 0.25 | 0.23 | 92 |
| G. Evaluation and Monitoring | 0.28 | 0.24 | 86 |
| H. Project Management Unit | 1.51 | 2.06 | 136 |
| I. Sewerage and Water | 2.00 | 0.98 | 49 |
| Total Project Costs | 5.18 | 4.54 | 88 |

Additional Annex 11. MAP

IBRD 32733



