

COUNTRY ANALYTICAL REPORT ST. VINCENT AND THE GRENADINES

SOLID WASTE REGIONAL / EVALUATION 2002

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1. EXECUTIVE SUMMARY

St. Vincent and the Grenadines form a single independent country located in the southern portion of the Caribbean chain of islands approximately 100 miles west of Barbados. The country is a full member of the Organization of Eastern Caribbean States (OECS). The capital, Kingstown, is located on St. Vincent, the main island of the group. The remainder of the country consists of the northern portion of the Grenadines that extend from St. Vincent south to Grenada. The main islands of the Grenadines that are associated with St. Vincent are Bequia, Canouan and Union Island.

Control of all affairs, both internal and external, is exercised by the Central Government located in Kingstown. The Solid Waste Management Unit (SWMU) falls under the Central Water and Sewerage Authority (CWSA) that, in turn, falls under the general control of the Ministry of Health. SWMU acts as a semi-autonomous body.

The population of St. Vincent is slightly over 100,000 as of 2003. At the same point in time, the Grenadines had a population of just fewer than 10,000.

The economy of St. Vincent is heavily dependent on agriculture with bananas being the main export crop. The problems with the European banana market have affected St. Vincent severely. Tourism in St. Vincent proper is not a major economic factor.

The economy of the Grenadines is heavily tourist dominated with more than 150,000 arrivals per year. Yachting is the main tourist attraction.

The per capita waste generation rate is estimated at 0.79 kg/person/day. The low rate is consistent with a low Gross Domestic Product (GDP) of \$2,900 (US) per capita, the lowest among the OECS countries. However, given the very high tourist population of the Grenadines, it is uncertain whether this generation rate is truly representative of the situation in that area.

The country has 31% of all households rated as being below the poverty line. 84% of these households are considered to be below the indigence line. Both of these figures are the highest among the OECS countries.

Health Care is good with an average life expectancy of 73.1 years at birth.

Illiteracy rates are fairly low at 4% of the population.

Management of solid waste disposal is centralized under the SWMU, a semi-autonomous body reporting administratively to CWSA. The Solid Waste Management Unit was formed as the result of a requirement of the world Bank/Caribbean Development Bank (WB/CDB) solid waste management initiatives dating from 1995.

The WB/CDB project work has been concentrated in St. Vincent with the construction of two new secure landfills and extensive renovations and improvements to the existing Arnos Vale site. Project work in the Grenadines has concentrated on improvements to the collection systems and the development of a solid administrative framework.

Development of new landfill sites on the major islands of the Grenadines has been delayed but is now in the late pre-tendering stage.

Solid waste collection in St. Vincent is a mixture of public and private operations with SWMU controlled household collection and private collection of industrial, commercial and institutional (ICI) wastes.

All waste collection in the Grenadines has been privatized.

St. Vincent has developed an excellent cost recovery system based on universally applied monthly fees for household wastes and an environmental levy on all departing airline passengers. Direct Government funding has been reduced to less than 40% in the 2003/2004 fiscal year.

The main strength of the system lies in the strong cost recovery program combined with a fully staffed and competent administration. The institutional arrangements which permit independent operation are also a major strength.

The main weakness of the system is the lack of an adequate regulatory framework to support the basic controlling legislation. This is aggravated by a lack of clear definition of areas of responsibility and authority in monitoring and enforcement.

Limitations to the system include a lack of depth in the current management staffing level of SWMU.

2. INTRODUCTION

The process of collecting and developing the data required for the production of Evaluation 2002 for St. Vincent and the Grenadines was carried out by a PAHO representative in conjunction with the General Manager of the Solid Waste Management Unit of St. Vincent and the Grenadines. Assistance was also given by the Operations Manager, and the Collection Superintendent of SWMU as well as the Financial Officer of CWSA. Additional information was obtained from the Chief Environmental Health Officer of the Public Health Department.

St. Vincent and the Grenadines form an independent country within the British Commonwealth. The survey covers the main islands of St. Vincent and the northern Grenadines, including the larger islands of Bequia, Canouan and Union Island. St. Vincent and the Grenadines is a full member of the Organization of Eastern Caribbean States (OECS). The Central Government is located in Kingstown, St. Vincent.

The overall management of solid waste is controlled by the Solid Waste Management Unit (SWMU) which is, for administrative purposes, located within the Central Water and Sewerage Authority. The Central Water and Sewerage Authority and the Solid Waste Management Unit form a semi-autonomous entity under the Central Government. This administrative arrangement was developed in response to the requirements of

Component 3 of the World Bank/Caribbean Development Bank Ship-Generated Waste Management and Solid Waste Management Projects.

The overall Solid Waste Management picture in the OECS countries changed radically after the beginning of the WB/CDB waste management initiatives. The St. Vincent and the Grenadines portion of the project included new landfill sites in St. Vincent (the new Diamond site which is in operation and the Wallilabou (Belleisle) site which is currently nearing completion) and improvements to existing sites such as Arnos Vale. Improved collection operations and reception facilities were implemented in both St. Vincent and the Grenadines. Fully staffed local offices have been established in Bequia and Canouan and one is planned for Union Island.

New landfills and/or incinerator/landfills are planned for all major islands in the Grenadines. While these developments originally were considered for the WB/CDB project, the timing was such as to postpone their development beyond the end of the funding period for the initial series of projects. The new disposal facilities are currently in the late stages of tender development.

St. Vincent led all OECS countries in the development of legislation on solid waste management with the passage of the Solid Waste Management Act in 2000. In addition, St. Vincent was the first country to prepare a draft Integrated Solid Waste Management Strategy. This document is currently before the Legislature for passage. Regulations under the Solid Waste Management Act are currently under public review preparatory to submitting them for legislative approval.

The St. Vincent share of the WB/CDB loans totaled US\$7.78 million with funds to be provided by CDB and the European Union (EU). Because of the timing of the work in the Grenadines, the majority of the funds that were spent under the WB/CDB projects were spent in St. Vincent.

Repayment of the WB/CDB loans has been by the Central Government to date, but the loan repayments have not been included directly in the CWSA/SWMU budget structure. This effectively reduces the overall solid waste management costs to a temporarily unrealistic low level.

The solid waste management system in St. Vincent and the Grenadines is extremely highly rated in the Implementation Completion Report (ICR) issued by the World Bank in November 2003. The report makes specific reference to greatly improved collection services both on the main island and the smaller islands as well as a much improved percentage of collected materials which reach the final disposal sites. In addition, St. Vincent has developed a highly successful system of cost recovery that has sharply reduced the need for direct Government funding.

3. BACKGROUND

Physical Characteristics

The main island of St. Vincent has an area of approximately 134 sq. mi. (344 sq. km.) and comprises more than 88% of the total land area of the country. The other larger islands in the northern Grenadines are Bequia, Canouan and Union Island. All are small compared to St. Vincent. The general terrain of the islands is mountainous with some relatively small low lying flat areas along the coasts. 10.3% of the land is classed as arable and 17.9% of the land is in permanent crops. The main crop is bananas which form 39% of total exports.

The western or leeward portion of St. Vincent tends to be rougher with considerably less flat land. The eastern or windward side of the island tends to have more gently sloping land with a greater amount of the land suitable for agriculture and grazing.

The road system is essentially limited to the coastal areas in the eastern, southern and western portions of St. Vincent. There is virtually no road access to the northern portion of the island. The central mountainous portion is generally uninhabited and inaccessible by road. The areas with limited access have a negative effect on collection coverage.

The extremely winding nature of the roads, particularly on the western side of the island, makes access difficult for even moderately long wheel base trucks. The problem is aggravated by the generally poor surface of the roads, particularly on the eastern side of the island. The vehicles purchased under the WB/CDB program were not particularly well suited to the conditions on St. Vincent.

The climate is tropical with the islands lying close to the normal southern limit of the hurricane belt. Hurricanes, while not totally unknown, are certainly less frequent than in the islands to the north of St. Vincent. The rainy season in St. Vincent extends from May to November.

Socio-Economic

The population of St. Vincent and the Grenadines is estimated as 116,812 for 2003. Of these, approximately 92% reside on St. Vincent with the balance in the Grenadines. For the purposes of this report, these population figures place St. Vincent in the high medium range and the Grenadines in the low small range. No valid differentiation is possible between urban and rural populations so far as the report is concerned.

The population of the main island of St. Vincent is concentrated in the general area of the capitol, Kingstown. 50% of the total population lives within three miles of the center of the city.

The rate of population growth between 1991 and 1993 was relatively low at 0.53%. This reflects normal birth and death rates of 17.16 and 6.08 per thousand but a high emigration rate of 7.66 per thousand. The high emigration rate is a probable result of the poor general economic conditions.

The Grenadines form one of the most desirable and spectacular cruising grounds in the Caribbean. This is reflected in the extremely high equivalent population (41.6% of the permanent population) imposed by visitors - generally visiting yachtsmen. Since these visitors are essentially long term tourists, they have a serious effect on solid waste quantities generated in the Grenadines.

At the same time, tourism in St. Vincent itself is of little importance as far as the generation levels of solid waste are concerned. The equivalent population increase is only 1.23%, a figure low enough to be insignificant when compared to the total population.

There is a small offshore banking industry in St. Vincent. This industry has recently come under scrutiny for its secretive practices.

Health

Health care appears to be generally good in St. Vincent and the Grenadines. There are three hospitals in St. Vincent and two in the Grenadines. The main hospital in St. Vincent is located in Kingstown. One of the other two hospitals is very small and may actually be only marginally functional. The two hospitals in the Grenadines are located on Bequia and Canouan. There are nine health districts and 39 local health clinics.

Life expectancy at birth is 71.3 years for males and 74.9 years for females. Average life expectancy for the population is 73.1 years. These figures are relatively high for the Caribbean.

Human Development Indicators

The average per capita Gross Domestic Product (GDP) is the lowest of any of the OECS countries at \$2,900(US). Poverty levels by household total 31% and 84% of those households are considered to be below the indigence line. Both of these figures are the highest in the OECS countries, probably reflecting the extremely low per capita income.

The GINI coefficient of 0.448 ranks fifth among the OECS countries. In comparison with wealthier countries there is still indication of a substantial maldistribution of wealth.

The illiteracy rate for the population is estimated at 4% with little difference between males and females. This estimate dates from 1970. At that time, the rate was fairly average for the Caribbean. No more recent data are available. While access to schools may be difficult in some cases, the predominance of English as the basic language tends to favour low illiteracy rates.

The educational system follows the British model. Education is provided free for the first ten years by the Government. Attendance at the two senior years of secondary school is based on CXC examination. Post secondary education is partially Government financed if it is taken at the University of the West Indies. Study at other post secondary institutions require self financing or scholarships. Advanced studies require self financing or scholarship. Commonwealth scholarships are available from either Great Britain or Canada. These scholarships require a commitment to return to the home country for a fixed period after graduation.

Evolution of the Solid Waste Management System

The WB/CDB Solid Waste Projects have resulted in substantial changes in the solid waste management systems for St. Vincent and the Grenadines. The World Bank Implementation Completion Report consistently rates St. Vincent's performance as "Highly Satisfactory". St. Vincent is unique among the OECS countries in achieving this rating across the board in those areas rated by the ICR.

The development of the SWMU under the CWSA as a controlling body for solid waste is a direct result of the WB/CDB initiatives on solid waste. These initiatives have led to the development of legislation and a draft integrated strategy for the management of both solid waste and ship generated waste. Regulations to implement the legislation are currently under public review preparatory to submitting them for legislative approval. St. Vincent and the Grenadines was the leader among the OECS countries in the area of progress in the development of legislation and regulation in the solid waste area.

Collection generally has improved markedly and the development of new landfills on both St. Vincent has ensured that at least 85% of the total waste generated now reaches an appropriate landfill. The SWMU is responsible for collection on St. Vincent itself while private contractors are responsible for collection and transport in the Grenadines.

The system is not, however, perfect. The difficult terrain on St. Vincent and the isolation of some of the population has led to the continued existence of some illegal dump sites. SWMU is currently attempting to eliminate these sites. The absence of the required regulatory framework is hindering these efforts.

The collection of ICI wastes on St. Vincent is carried out by private contractors who are paid directly by the generators. No tipping fees are charged these contractors when the waste is delivered to the landfill sites.

St. Vincent has been successful in instituting a cost recovery system for solid waste management. This fee structure of EC\$5.00 (US\$1 = EC\$2.67) is applied on a per household basis in

St. Vincent. The fee is levied with monthly water bills. The fees so collected (EC\$1.5 million) have yielded 21% of SWMU operating income since 2002. The yield from an environmental levy of EC\$4.00 per head on tourists leaving by air has been equal to 34% of operating income over the same period. Government subventions have covered 44% of operating cost since 2002. With the exception of Nevis and Grenada, St. Vincent is the only member of the OECS to successfully institute a direct fee structure that pays a substantial portion of the cost of solid waste management.

A similar fee structure of EC\$5.00 per household per month is under consideration for the Grenadines. This fee would be collected with the monthly electricity bill.

Level of Investment

The total investment in the WB/CDB projects amounted to US\$9.01 million. Of this, St. Vincent supplied US\$1.23 million in the form of land, taxes and duty with the balance from CDB and the European Union (EU). As is common in the OECS countries, this represents virtually all the investment over the last five years.

Some investment continues for the completion of the Willilabou (Belleisle) landfill site on St. Vincent.

Future investment will probably be required for the proposed development of the landfills currently planned for the Grenadines. Financing for these projects is not as yet clear.

4. FUNCTIONAL OPERATIONAL STRUCTURE

Institutional Structure

The solid waste management structure in St. Vincent and the Grenadines is the result of progressive development since the beginning of the WB/CDB projects. At present it represents a system that has developed essentially as a legislative model for the other OECS countries. If, within the financial constraints that accompany the low level of GDP, the system can come to terms with the relatively high level of pollution from the cruising yachts, then the system should be a fully stable one that will require little change in the near future.

The high level of maritime pollution is a direct result of the very heavy cruising load in the Grenadines area.

In addition, the specific demands of this type of visitor to the Grenadines lead to the generation of a type of solid waste that is difficult to handle and dispose of. This is an unfortunate side effect of what is an important source of foreign income for the country.

The system appears to be fully functional and, by providing adequate collection and disposal service in the Grenadine area, has apparently solved what might have been a major problem, even if on a relatively small scale. Regardless of the scale, the problem is potentially extremely serious in an area that is highly environmentally sensitive.

The management aspects have been strengthened by the opening of local, fully staffed offices in Bequia and Canouan. A third office is planned for Union Island. This, combined with the contracting out of collection services in this area, has produced a highly workable system.

The institution of a universally applied fee structure in St. Vincent combined with an effective environmental levy has reduced the need for Government financing in the form of subventions. Given the experience of other OECS countries with shortfalls in Government financing, this is unquestionably a significant financial advantage. A universally applied fee system that is applied to water bills, as this one is, does not have the often feared result of illegal dumping of waste by the public. If fees must be paid regardless of where the waste is disposed of, there is little profit in illegal dumping.

Illegal dumping does, however, continue to exist as a problem. In some cases, this is the result of poor access for collection but in other cases, it appears to be the result of poor attitude on a part of the public. The continued absence of a regulatory framework makes control of illegal dumping more difficult. This represents a limitation on the ability of SWMU to fully control solid waste management.

Policies, Legal and Regulatory Framework

St. Vincent and the Grenadines has passed or is considering the passage of the following legislation:

1. Solid Waste Management Act (2000)
2. Ship-Generated Waste Management Act (2002)
3. Integrated Solid Waste Management Strategy (Under consideration)

In addition SWMU/CWSA is in the process of developing the regulatory framework that is required to back up the Solid Waste Management Act. These regulations are currently under review after an initial public review.

This legislative framework and the regulatory framework which will eventually result from it, combined with the universal fee structure and environmental levy, should provide a sound basis for future solid waste management operations.

Monitoring of the solid waste disposal system is currently the responsibility of the Public Health Department. There is, however, some confusion as to the level of their responsibility and authority in this area. This legislative area should be clarified. There may be some incentive for a full transfer of responsibility in this area to CWSA/SWMU.

Centralization of Service

Solid waste management services are centralized under the Central Government. With the exception of street sweeping and drain cleaning, carried out by the Public Health Department, all functions are under the SWMU.

Street Sweeping

Street sweeping and drain cleaning are both carried out by the Public Health Department. A total of 129 persons are employed to provide these services. Coverage is estimated as 50% on an island wide basis. As in other OECS countries this is apparently a carry over from the previous solid waste management setup under the Public Health Department.

Local street sweeping in the villages is under the control of the local town councils. This secondary division of responsibility makes full evaluation of coverage and the number of personnel employed impossible.

Planning

Planning is the responsibility of the SWMU. At the moment the main planning efforts appear to be centered around the development of a viable fee structure for the Grenadines and the possible transfer of sweeping and cleaning operations from the Public Health Department. Some consideration is also being given to privatizing the collection system in St. Vincent.

The delayed development of the Grenadine landfills has resulted in a major project effort to set engineering standards and develop tender documents for those projects. The potential sites on all islands have been identified but must now be confirmed and design engineering started.

5. DELIVERY OF SOLID WASTE MANAGEMENT SERVICES

Quality and Coverage of Services

In St. Vincent, the coverage of collection services is limited to less than 100% by areas of poor road access. The Arnos Vale site has been partially closed and the remainder of the site has been greatly improved. The delay in the commissioning of the Diamond site, located on the south coast, led to a continuation in use of the Arnos Vale site. It will be finally closed and capped off when the two new sites are put into operation.

The Wallilabou (Belleisle) site is only now approaching completion. When it is complete and operational it will serve the west side of the island.

Despite these problems, the collection and disposal services in St. Vincent appear to function reasonably well.

The establishment of local control offices and the privatization of collection services in the Grenadines resulted in essentially complete collection and disposal services. The development of the new landfills will complete the process.

There is some open burning of green waste in both Bequia and Canouan. This should disappear as the composting currently practiced on St. Vincent proper is extended to the Grenadines.

Cost Analysis

Full cost analysis is difficult in St. Vincent and the Grenadines. The calculated unit cost of US\$60.51 per ton is an average figure based on waste generation data developed for St. Vincent only. These per capita figures have been applied to the Grenadines ignoring the fact that per capita waste generation rates are likely to be much higher in a situation where there is a heavy tourist load on the system which is certainly the case in the Grenadines.

The calculated average cost of US\$60.51 per ton is well within the normal range for landfill disposal. The calculated cost includes street sweeping and drain cleaning but does not include the cost of loan repayment to WB/CDB.

Municipal Development

Municipal development in St. Vincent does not appear to be a major factor in solid waste generation. Such waste as is generated is frequently used for the construction of roads at the landfill sites.

Administration

Administration of the solid waste management system is vested in the General Manager of SWMU. The staffing is complete to the limit of the current organization chart and staff members are both young and apparently highly competent. It appears, however, that there may be some lack of depth at current staffing levels.

Street sweeping and drain cleaning are currently controlled by the Public Health Department although there is some incentive to transfer this responsibility to SWMU.

Monitoring of the solid waste disposal system is the responsibility of the Public Health Department. The legislative authority for this function is not completely clear.

There is a moderate amount of friction between SWMU and Public Health. Most of this friction apparently results from a lack of legislative definition of the respective responsibilities of the two entities. The friction appears to be irritating to both sides without significantly affecting the level of service provided.

Shared or Participatory Management

There is no shared or participatory management in the St. Vincent system.

Small Business Involvement

Aside from the private collection contractors, there is no private small business involvement in the solid waste management system.

Micro Enterprises

There are no micro enterprises involved in the solid waste management system in St. Vincent and the Grenadines.

Mustique, however, presents a truly exceptional case. This is a privately owned island is noted as the residence of numerous famous personages. The island has a privately owned and operated solid waste incinerator which is completely outside the SWMU system for the Grenadines.

Sectoral Projects

The completion of the Diamond and Willilabou (Belleisle) landfill sites and the eventual closure of the Arnos Vale site are the remains of the WB/CDB projects. These should be complete in 2004.

The development of waste disposal facilities in the Grenadines was not completed under the WB/CDB project series. These projects are currently in the late tender development stages for consultant selection. The consultant will be required to select between landfill and incineration/landfill as a means of disposal. Subsequent to that decision on basic method, the disposal sites must be selected and definitive engineering completed.

The choice between the two options will probably be forced both by the availability of potential landfill space and the availability of funds to finance and operate the high cost incineration systems.

Completion of these projects is forecast for 2006. This appears to be a highly optimistic date.

Funding

Funding for solid waste management in the 2004 budget is as follows:

1. Direct fee structure: 38.5%
2. Environmental Levy: 24.5%
3. Government Subvention: 36.8%
4. Other: 0.2%

The low level of Government subvention probably provides a substantial safety margin in case of an unexpected downturn in the national economy.

Even if plans to establish a universal fee structure for the Grenadines come to fruition, the yield from the fees would probably be only approximately 3% of the current SWMU annual budget. While this is a significant contribution, it is far from critical.

Of much greater potential significance is the possibility of an environmental levy on those visitors that are currently using the Grenadine waters as a cruising area. The total number of such visitors arriving in the Grenadines that probably use the area for yachting purposes were in excess of 150,000 for 2001. This group adds a heavy load of difficult waste to the Grenadines system. It is also an extremely "High End" group of

tourists that is currently contributing little or nothing to the cost of management of the wastes that they generate. In fact, over 90% appear to be exempt from the environmental levy since they arrive by water and not by air.

If an environmental head tax of EC\$10 were levied against these visitors, and if the proceeds were used to fund solid waste disposal, Government subventions (which currently total approximately EC\$1.6MM) could be reduced to virtually zero. The levy, equal to US\$3.75 per person, would probably be immaterial as far as the actual number of visitors was concerned. Yachtsmen who wish to sail in the Grenadines will do so regardless of a levy of that magnitude.

6. STRENGTHS AND WEAKNESSES OF THE SYSTEM

Strengths

The strengths of the system lie in the institutional arrangements which permit a good degree of freedom of action in solid waste management combined with a cost recovery system that augments this freedom of action. These basic areas of strength have permitted SWMU to improve their public image and acceptance by demonstration of improved landfill operation and high profile waste minimization programs typified by the composting of green waste.

Weaknesses

Weaknesses of the system include a lack of depth in trained personnel at the secondary management level. While the current staff is fully competent, there is a need for one or possibly two extra personnel below the Operations Manager both to reduce the work load on that position and to provide additional depth.

Collection vehicles currently exhibit lower than desired serviceability levels and high maintenance requirements. A part of this problem lies in a design which is not well suited to local conditions. An additional portion is apparently the result of inadequate monitoring and maintenance programs as applied to the vehicles.

There is some consideration being given to the privatization of waste collection in St. Vincent.

The lack of clear definition of responsibility in the monitoring and enforcement areas is a severe weakness since it leads to some degree of dispute and, more importantly, to added effort in areas where responsibilities may overlap due to poor definition.

Limiting Factors

To some degree there is a lack of financial resources needed to improve maintenance standards. At least one administrative position should be added in this area, but this would require additional funding.

Since there is a finite amount of time available, any transfer of monitoring functions to SWMU represents a limitation on the time available to carry out currently mandated SWMU functions.

Both of the above limitations could be eliminated provided that there is sufficient political will to do so.

7. HEALTH, ENVIRONMENT, AND SOCIAL DEVELOPMENT

Health and Environment

There is no evidence that there are any diseases directly linked to the solid waste disposal system in St. Vincent. Since tires are not accepted for disposal at the Arnos Vale site currently in use, even that is eliminated as a potential breeding site for mosquitoes that act as a vector for the disease.

Note that the absence of tires at the landfill site does not eliminate the problem, it simply transfers it from SWMU responsibility. Spent tires remain a serious problem wherever they are disposed of.

Epidemiological Studies

There are no epidemiological studies associated with the operations controlled by SWMU. No such studies are planned since there is no obvious disease linkage.

Occupational Health

There are no occupational health problems linked to the operations associated with solid waste disposal in St. Vincent and the Grenadines.

Economic Value

The economic value of proper solid waste management practices is always felt in the impact on the local tourist industry. In this case, the impact is minimal in St. Vincent proper. This is not the case for the Grenadines with an extremely heavy visitor load and a highly sensitive environmental situation.

As noted, it is suggested that a more aggressive approach in fee collection from visitors might be appropriate.

Equity of Service

Service is provided to all sections of the population other than those areas of St. Vincent that are not accessible by road. Service delivery in the Grenadines appears to be fully equitable.

The question of equity of payment for service received appears to favour the Grenadines heavily. In this case, the level of collection service received is the highest in the country (other than in Kingstown itself) and the level of payment is essentially zero.

8. PARTICIPATORY MANAGEMENT

Community Participation

Community participation is moderate but somewhat irregular.

Non-government Organizations (NGO's)

No Non-Government Organizations are currently involved in the solid waste management system.

Hygiene and Occupational Safety Programs

There are no current programs in these areas that are associated with solid waste management.

Scavenging of Waste

There is no official scavenging of waste at the landfill sites.

Recycling

A composting facility is operated by SWMU at the Diamond landfill. This operation is intended to treat "green" or vegetative waste to reduce the amount of waste reaching the landfill for disposal. The waste is shredded before treatment to reduce bulk and to eliminate air. Approximately 10% of the total waste stream is treated in this manner.

SWMU expects to extend the composting of green waste to the Grenadines to replace the open burning of these wastes.

SWMU is also promoting composting at the household level to further reduce the amount of organic material reaching the landfill site. This project is in its early stages and the overall effect is not as yet clear.

Two local bottling companies (local beer and soft drinks) operate a deposit/return system for bottles. The low level of glass (+/- 8%) in the waste stream indicates a

70-80% recovery rate on bottles for which a deposit has been paid. The deposit is EC\$0.25 per bottle. Imported beers are not covered and this glass uniformly reaches the landfill.

9. FUTURE PROSPECTIVES

Investment and Reorganization

The delayed completion of the Wallilabou (Belleisle) site makes it certain that there will be some continuing investment in 2004. This will probably be relatively small compared to the amount invested since the inception of the WB/CDB projects.

The development of the landfill sites and the incinerator/landfills in the Grenadines will require substantial investment. Whether this work will be covered as an extension of the WB/CDB projects or whether new funding will be required is not clear. It is, however, certain that substantial investment will be required over the next two to five years.

Reorganization of the solid waste management system, if it occurs at all, will probably be limited to a rationalization of the responsibility for street sweeping and drain cleaning.

Considerable consideration is being given to the privatization of the collection services. Much of this consideration is based on the poor maintenance history of the current collection vehicles.

Reform and Modernization

Neither is required. The system functions adequately.

Alternative Management Systems

None are required.

Regulation

The regulatory structure intended to make enforcement of the Acts is currently being reviewed with a view towards legislative action by the end of 2004. The absence of this regulatory framework has made the elimination of illegal dumping more difficult.

Financial Requirements

Financial requirements are apparently being met adequately by the existing system. The implementation of a universal fee system in the Grenadines would produce a marginal increase in revenue. The major possible source of potential revenue is, however, the possible environmental levy on cruising in the Grenadines.

While SWMU is currently adequately staffed, there is some need for additional personnel to provide additional management depth and to reduce the multi function workload at the Operations Manager level. If extra staff is indeed added, extra funding will be required.

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11. ACRONYMS

CDB	Caribbean Development Bank
CWSA	Central Water and Sewerage Authority
EC	Eastern Caribbean (currency)
EU	European Union
GDP	Gross Domestic Product
GETF	Global Environmental Trust Fund
GINI	Coefficient measuring income distribution inequality
IBRD	International Bank for Reconstruction and Development
ICI	Industrial, Commercial and Industrial (waste)
IDA	International Development Association
ICR	Implementation Completion Report
NGO	Non-Government Organization
OECS	Organization of Eastern Caribbean States
PAHO	Pan American Health Organization
SWMU	Solid Waste Management Unit
US	United States (currency)
WB	World Bank

12. WORKING TEAM

O'Reilly Lewis
General Manager
Solid Waste Management Unit

Esther Richards
Operations Manager
Solid Waste Management Unit

Gregg Francois
Collection Superintendent
Solid Waste Management Unit

W.I. Walker
Technical Consultant
Pan American Health Organization