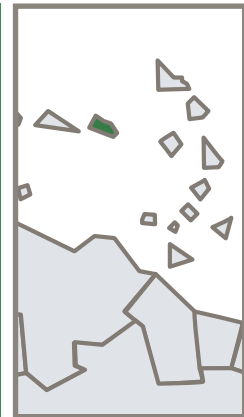


REGIONAL EVALUATION MUNICIPAL SOLID WASTE MANAGEMENT SERVICES



COUNTRY ANALITICAL REPORT BRITISH VIRGIN ISLANDS / EVALUATION 2002

1. Executive Summary	1
2. Introduction	2
3. Background	3
4. Functional/organizational Structure	5
5. Delivery of Solid Waste Management Services	7
6. Strengths and Weaknesses of the System	9
7. Health, Environment, Economic and Social Development	10
8. Participatory Management	12
9. Future Perspectives	13
10. Bibliography	14
11. Acronyms	15
12. Working Team	16

1. EXECUTIVE SUMMARY

The British Virgin Islands is a small country with a fully established solid waste management system. The system provides full coverage to all significant population areas.

Total permanent population is 20,647 on all islands. The long term transient (tourist) population adds a further equivalent population of 8,018 for solid waste generation purposes. Per capita solid waste generation rates are relatively high at 2.59 kg/person/day.

The physical characteristics of the main island, Tortola, are such that there is insufficient relatively level land to permit continued long term use of landfill as the sole means of solid waste without significant volume reduction. Since open burning is not considered acceptable as a means of volume reduction, the decision was taken to install an incinerator. This unit became operational in 1994.

The BVI is a relatively wealthy country with no cases of extreme poverty and only 16% of the population considered to be "poor". The GINI coefficient is low at 0.23.

Illiteracy rates for those over 15 years of age are low at 2.0%. Education is Government financed to the age of 16 in the public school system. A private school system provides an option to the public system.

Health care in the BVI is generally excellent and is heavily subsidized by the Government. There is one main Hospital, located in Road Town, the capital. There are local health clinics on all of the main islands.

The Solid Waste Department has evolved from the Solid waste Division of the Environmental Health Department to full department status under the Ministry of Health and Welfare. Current reporting is directly to the Permanent Secretary.

The BVI allocates approximately 1.5% of the annual budget to solid waste management. Annual investment levels over the last six years have been in the \$630,000 (US) to \$660,000 (US) range. These are not expected to change materially in the near future if consideration of capital projects is excluded. Funding is from general revenues of the Government.

The solid waste management System is fully centralized under the National Government and there is essentially no private participation. Total solid waste management costs range between \$95 (US) and \$100 (US) per ton, including all services provided by the Solid Waste Department.

The well established and highly functional system is considered a major strength. Weaknesses include the lack of legislation and/or regulation, lack of a functional educational component in the public school system and the absence of any recycling programs.

Limiting factors include general public apathy and a lack of interest on the part of Government.

There are no known health factors associated with the solid waste management system.

2. INTRODUCTION

The process of developing the data required to produce Evaluation 2002 was carried out by the Solid Waste Department of the Government of the British Virgin Islands. Cooperation was received from the Development Planning Unit (DPU) and from outside consultants employed on other related projects in the Territory.

Since the BVI is a small country, all participating bodies or agencies are connected directly to the central national government. Although the BVI is a dependent territory under loose control of the UK Government, all internal affairs (including solid waste management) are under local control and are the responsibility of the government. The Government is elected by popular vote. The maximum term is five years although the average period between elections is usually somewhat shorter than that.

Solid waste management is a significant factor in local planning strategy. The physical aspect of the main island, Tortola, is such that there is very little available land which is truly suitable for the operation of a secure sanitary landfill. This factor alone makes volume reduction of solid waste a major requirement in any solid waste management plan. Originally, this reduction was achieved by open burning with some covering of the burned waste.

Open burning, with the accompanying smoke and odour was a major problem in the tourist and residential areas located downwind of the disposal sites.

The combined factors of lack of adequate sites and nuisance led to the decision to install a municipal solid waste incinerator. This unit was completed in 1994 and was, at the time, the first incinerator in the Caribbean area.

The incinerator is located on the largest (and most populated) island, Tortola. The remaining major islands - Virgin Gorda, Anegada and Jost van Dyke - still practice open burning as a means of volume reduction. This is considered adequate for the present when the low population levels are taken into account.

3. BACKGROUND

Physical Characteristics

With the exception of Anegada, the islands that comprise the BVI are all of volcanic origin. They are consequently of a relatively mountainous terrain, only marginally suited to agriculture. There is essentially no surface water and all potable water is either from reverse osmosis desalination or from rainwater collected in cisterns.

Anegada is a low lying coral island of some considerable extent but having a very low population in the order of 200 permanent residents.

Socio-Economic

The population of the BVI can be broadly divided into two classes. These are the natives and "belongers" and the expatriates. The expatriates can be further divided into people originating from other islands in the Caribbean and those originating in North America or Europe.

As of the 1991 census, the native/belonger portion of the population amounted to approximately 49% of the total population. This is possibly the direct result of the high pay levels to be found in the BVI. This factor alone attracts large numbers of workers from the less wealthy islands of the Caribbean.

Expatriate workers form much of the skilled and unskilled labour pool. Such workers are under a work permit system with the permits renewable annually and terminating when the availability of work ends.

Other expatriates who are long term residents are generally under an annual residency system which strictly limits the right to work, either for pay or in an unpaid situation.

The transfer from the work permit or residency system to permanent residency is rather slow with the average waiting period being in excess of ten years from the date of application.

Health

Health care in the BVI is generally excellent. The main hospital is located in Road Town (the capitol) with clinics located on all of the main islands. There are multiple clinics located on Tortola and Virgin Gorda.

A new hospital is currently under construction to supplement the existing hospital. This is a major facility. Completion is expected in 2004.

Health care services generally and hospital services in particular are heavily subsidized by the Government. Some services are provided free to senior citizens regardless of their resident status.

Life expectancy at birth is 75.3 years for men and 80.1 years for women. Infant mortality is highly variable due to the low number of births which distorts the data to the point of little relevance.

Dengue fever is known to be present, but does not appear to be a major factor in the overall health picture.

Human Development Indicators

A recent economic survey for the Ministry of Health and Welfare indicated that there were no cases of households in extreme poverty in the BVI. The survey, carried out by Halcrow Group Ltd. UK, showed that 16% of the 6,700 total households could be considered as "poor" with the remaining 84% considered to be "non-poor".

The GINI coefficient is reported to be relatively low at 0.23.

Illiteracy rates for men and women over fifteen years of age are reported as 2.2% and 1.8% respectively.

Education is provided at Government cost for all belonging and native children. Free education is also available in the public system for other children on the basis of available space. A system of private schools exists as an option for local parents and for expatriate children for whom there is no available space in the public system.

All children, whether local or expatriate, are required to attend school to the age of sixteen. The sole exception is in the case of teen age pregnancy.

No environmental education is provided on a formal basis in the school system.

Evolution of the Solid Waste Management System

The solid waste management system in the BVI has always been under the control of the Ministry of Health. Initially, solid waste disposal operated as a division of the Environmental Health Department. With the completion of the incinerator and the increase in complexity of the operation, the Solid Waste Department was created, altering the chain of responsibility to one reporting directly to the Ministry of Health and Welfare.

In 1987, the Government commissioned a study on incineration and sewage treatment in the BVI. This study was 75% funded by the Canadian International Development Agency (CIDA) under the Canadian Project Preparation Fund (CPPF). The study indicated the need for an incinerator on Tortola. It also surveyed the other main islands, Virgin Gorda and Anegada, but concluded that these islands could not support separate incinerators.

Sewage treatment was also recommended, but rejected by the Government.

The incinerator was erected close to the then existing landfill at Coxheath on the western part of Tortola. It was (and is) a 40 ton/day unit produced by Consumat Ltd. in Mechanicsville, VA. The unit was of adequate size until approximately 1999. Sharp increases in generation rates combined with increasing maintenance requirements have led to capacity problems. A new and larger unit is now in the engineering phase and expected to come on line in early 2005.

Solid waste disposal on the other islands in the group remains essentially unchanged.

Collection services have historically been a mixture of public and contracted service. Essentially, the Government section covers the Road Town area on Tortola. A mixture of contractors cover the other areas in Tortola and on Virgin Gorda, Anegada and Jost van Dyke.

Recycling of selected portions of solid waste has been proposed repeatedly, but has met with little interest from the Government. Of particular interest would be glass recycling since glass makes up approximately 18% of the overall waste stream. Currently, only lead/acid batteries are recycled and those only on an ad hoc basis.

Level of Investment

Currently the Solid Waste Department budget makes up approximately 1.5% of the total national budget. This figure has fallen from 2.1% in 1997, primarily because of the sharp increases in the total national budgets over the same period.

Average annual investment in equipment for the Solid Waste Department has ranged between \$630,000 (US) and \$660,000 (US) over the same period.

4. FUNCTIONAL OPERATIONAL STRUCTURE

Institutional Position

The Solid Waste Department is a free standing group under the Ministry of Health and Welfare of the Government of the British Virgin Islands. The Manager of the Solid Waste Department reports directly to the Permanent Secretary of that Ministry.

Policies, Legal and Regulatory Framework

It is the policy of the Government to provide full solid waste management services to the public at no direct cost. On this basis, the overall cost is paid for from general government revenues. No direct charges are made for collection, tipping fees or treatment and disposal.

There is currently no legal framework governing solid waste management. As a direct consequence, there are no existing regulations in this area.

There is currently some interest in developing overall regulations in the waste management area and this work would eventually include solid waste.

Centralization of Service

The entire solid waste management system in the BVI is centralized under the National Government. Financing of the system is an integral part of the annual national budget.

All other functions such as planning, development of regulations, operations, technology assessment and human resources development are carried out by the Solid Waste Department.

Private Participation

The Government provides collection services in the Road Town area, operating their own compactors. All other areas and islands are served by private contractors who bid competitively for the various contracts. Equipment in such cases is provided by the contractors and a portion of the bid analysis is based on the condition of the private equipment.

Sweeping

The term "sweeping" in this case is accepted as including all miscellaneous services provided by the Solid Waste Department. It includes the clearing of litter from all public road verges, the cutting of vegetation along the road verges, mechanical sweeping of urban (Road Town) streets, erection of signs encouraging the public not to litter and general beautification of the islands.

Many of these functions are not normally classified directly as a solid waste management function, but in most cases, the function is carried out by the Department in the absence of any other interested party. The diffuse nature of this area of responsibility makes it extremely difficult to establish a representative cost for the term "sweeping".

Planning

Solid waste management services in the BVI currently function as expected and to the general satisfaction of both the general public and the Government. At the present time, there is no active planning on areas that would markedly alter the current system.

The inclusion of a viable glass recycling program would be an obvious benefit in most operational aspects of the management system. There is periodic interest in such a step, but, to date, there are no defined plans for such a system. The same is true for all other recycling programs such as steel, aluminum and plastics.

5. DELIVERY OF SOLID WASTE MANAGEMENT SERVICES

Quality and Coverage of Services

Coverage of all services is essentially 100% of the population.

In particular, collection service is provided at local "dumpsters" which can be mechanically tipped into compactors or at localized collection points where refuse is manually loaded into the compactor. Local house to house collection is not available.

While the system functions well, localized collection would make possible a better segregation of waste and would possibly lead to a more practical means of recycling. It would also render the routing of the collection vehicles far more complex. It is questionable whether such a collection scheme would be physically or economically practical in the BVI.

Cost Analysis

Solid waste management costs total between \$95 (US) and \$100 (US) per ton of waste received. These costs are arrived at by dividing the total budget allocated to the department by the total waste received annually. The cost figure, while not abnormally high for an incinerator type treatment system, is somewhat inflated in as much as the cost of all the operations classified under "sweeping" are included in the overall figure. Some of these operations have little to do with solid waste, but the costs cannot be separated.

There are, of course, no rates charged by the Government for these services. It is suspected that, if tipping fees were charged at the incinerator for privately delivered waste, much of such waste would be discarded on the nearest available roadside.

Municipal Development

Municipal development is relatively stable in the BVI at present. Most residential development is in essentially non-urban areas and consists of the building of individual houses or small groups of houses in isolated developments. Such development has little or no significant effect on the current solid waste management system.

Administration

Administrative personnel in the Solid Waste Department include the Manager, Assistant Manager, Education Officer, Financial Officer, Technical Consultant, Collection Supervisor and Secretary. The incinerator supervisory personnel includes the Plant Manager, the General Foreman, the Maintenance Supervisor and the Plant Secretary.

Shared or Participatory Management

There is no management system associated with the solid waste management system other than the one described above.

Small Business Involvement

The contractors that are involved with waste collection are generally classified as small businesses. Their involvement is contractual on the basis of competitive bidding.

There is some contracting out of specialized maintenance services at the incinerator. This contracting out is either to local specialist services such as welding or to equipment manufacturers for specialized equipment servicing.

Micro Enterprises

No local micro enterprises are involved in the solid waste management system.

Sectoral Projects

The installation of the new incinerator, intended to supplement the existing unit is expected to cost \$7.5 MM (US). It constitutes a major project by local standards.

Funding

All funding for solid waste management is drawn from general revenue. Major projects are generally funded by borrowing, either from the local Social Security System or from outside funding agencies.

6. STRENGTHS AND WEAKNESSES OF THE SYSTEM

Strengths

The system's main strength is that it is well established and functions smoothly. As a system that has developed progressively over a considerable period, it benefits from a group of personnel that are well experienced and used to working with each other.

The relative availability of funding for the system is also an added strength.

Weaknesses

The absence of any form of formalized recycling system must be considered a weakness. The seriousness of this weakness must be evaluated on the basis of the relative success (or failure) of this sort of system in other jurisdictions and on the financial and physical effects in the BVI. To date these considerations have not been sufficiently negative to make the decision to recycle attractive.

The absence of legislation and regulation in the solid waste area is also a weakness. Since the system functions well without such regulation, it is difficult to assess excessive importance to this factor. There are, however, instances related to the disposal of toxic and special wastes which would be made easier by appropriate legislation and control.

The lack of a formal educational system on solid waste, particularly in the primary school system, will continue to prevent the development of an environmentally sound attitude in the young. Until this can be accomplished, the current public attitude towards solid waste is unlikely to change.

Limiting Factors

There is a general reluctance to accept regulation present in the BVI. Whether this is applied to traffic lights or solid waste, the lack of public acceptance is always a negative factor in achieving desirable progress. This is at least partially true throughout the Caribbean.

There also appears to be a reluctance on the part of Government to develop and implement the legislation and regulations required to institute recycling programs which would reduce the load on the incinerator and reduce the quantity of waste and ash that must be disposed of in the landfill.

7. HEALTH, ENVIRONMENT, AND SOCIAL DEVELOPMENT

Health and the Environment

There appears to be no obvious effect of solid waste management practices on the general health situation in the BVI. The most common indicator would probably be dengue fever resulting from standing water in waste tyres, but this is eliminated by the burning of tyres in the incinerator.

Prior to the installation of the incinerator, there were complaints of respiratory diseases in those areas that were located downwind of the landfill. Although these were never substantiated, the installation of the incinerator has resulted in at least a cessation of the complaints.

At the time that the incinerator was installed, the Environmental Impact Study indicated that a scrubber was required. Although this unit was installed, it has never functioned properly as a result of problems in obtaining an adequate supply of salt water which must be used as the scrubbing medium. Despite this failure, there is no obvious damage to the environment downwind of the incinerator itself.

Incinerator capacity problems in recent years have resulted in the necessity to resume open burning of some waste. This is generally sporadic in nature and relatively small in volume. It has, never the less, resulted in damage to foliage immediately downwind of the burning site. There are also occasional odour problems associated with this practice.

Until the additional incinerator capacity comes on line, these problems can be expected to continue.

Epidemiological Studies

There is no evidence of any effect of solid waste management practices on public health. No epidemiological studies have been conducted.

Occupational Health

There is no evidence of occupational health problems associated with solid waste management practices in the BVI. If such problems were to occur, one would expect them to be most severe at the incinerator complex. This has not been the case.

Equity of Services

There is no question that the installation of the incinerator complex in 1994 contributed to the removal of a substantial nuisance which had a negative impact on the tourist industry. Although this had a major impact only on Tortola, that island is also the main population center and the location of most of the major portions of the tourist industry.

Beyond the tourist industry, solid waste management practices are applied in a fully equitable manner in the BVI. There is no evidence that current practices have any negative effect on either economic or social development in the BVI. If such a negative effect were present, it would have to be apparent in the tourist industry. As noted above, the incinerator installation solved problems in this specific area.

Economic Value

Although the number of tourists has continued to increase over the last few years, it is impossible to attribute any part of this increase directly to improved solid waste management practices. In fact, the catastrophic results of 9/11 have had a much greater effect on the tourist industry than solid waste ever did.

On a very small scale, the installation and operation of the incinerator created approximately twenty new jobs. This undoubtedly represents some economic benefit. It is hardly likely to be considered significant in the overall employment picture.

There have been no apparent effects in any other economic areas.

8. PARTICIPATORY MANAGEMENT

Community Participation

Community participation in solid waste management is essentially non-existent.

Non-government Organizations (NGO's)

In 1993/1994 there was some activity towards recycling by the BVI Recycling Committee. This voluntary organization was severely hindered in its activities by a general lack of government response and lack of real interest on the part of the general public. The organization ceased to function after 1994.

Education

The Solid Waste Department is responsible for developing educational programs for use in the public school system. To date, such programs have been informal in nature as opposed to a program fully integrated in the curriculum of the public school system.

Hygiene and Occupational Safety Programs

No programs exist in these areas.

Scavenging of Waste

Scavenging of waste on either a formal or informal basis is not carried on in the BVI.

9. FUTURE PROSPECTIVES

Investment and Reorganization

Investment levels are expected to remain relatively constant until the new incinerator complex begins to require increased maintenance. The exception to this will be the need to extensively maintain the existing incinerator once the new incinerator comes into operation. These costs could be anywhere between \$250,000 (US) and \$750,000 (US) in a one year period.

It is estimated from experience that the new incinerator will, if operated properly, not become a major cost factor during the first five to seven years of operation.

There is a feeling that the supervisory system at the incinerator should be strengthened by adding a more technically qualified person as plant manager. How this can be achieved within the current educational and financial situation is not immediately clear.

No other major reorganizations are currently under consideration.

Reform and Modernization

The Solid Waste Management System currently functions in a manner that is fully acceptable to both the Government and the general public. The levels of effectiveness and efficiency are adequate for the needs of the BVI. While it is possible that an incinerator of some form may be required on Virgin Gorda, this need is not a major priority in current planning.

Any changes to the current system are more likely to be in the nature of fine tuning the existing system as opposed to major reorganizations.

Alternatives

The addition of selected recycling programs would be a benefit for all the reasons noted above. This is considered unlikely, at least in the short to medium term.

Regulation

The development of regulations concerning solid waste management would be useful. The absolute need is, however, not urgent and such development is not a Government priority.

Financial Requirements

There is no apparent need for any major increase in either the coverage or quality of the services currently provided. As a direct result of this, there should be virtually no financial requirements for these specific areas over the foreseeable future.

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11. ACRONYMS

BVI	British Virgin Islands
CIDA	Canadian International Development Agency
CPPF	Canadian Project Preparation Fund
DPU	Development Planning Unit
UK	United Kingdom
US	United States

12. WORKING TEAM

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