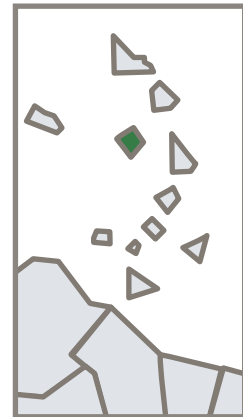


REGIONAL EVALUATION MUNICIPAL SOLID WASTE MANAGEMENT SERVICES



COUNTRY ANALITICAL REPORT ST. KITTS AND NEVIS / EVALUATION 2002

FEBRUARY 2004

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1. EXECUTIVE SUMMARY

St. Kitts and Nevis is an independent federation within the British Commonwealth. While the central government of St. Kitts/Nevis currently exercises at least nominal control over both islands, the process of separation into two independent entities is well advanced.

The total population of St. Kitts/Nevis is slightly over 46,100 with 75% of that population on St. Kitts.

The island's population is fairly stable with a relatively low growth rate. The islands, and in particular Nevis, attract migrant workers from the less wealthy Caribbean islands such as Jamaica, Dominican Republic, Trinidad, Guyana, and Montserrat.

The tourist industry in St. Kitts/Nevis is not of major economic significance, particularly when compared to such tourist dependent island economies as the British Virgin Islands and Antigua.

St. Kitts/Nevis has recently completed the WB/CDB sponsored solid waste disposal projects. These projects have resulted in a much improved landfill system on both islands. In addition, both islands have set up semi autonomous bodies to control their solid waste management systems.

The per capita waste generation rate for St Kitts is 2.08 kg/person/day. For Nevis the per capita rate is 1.52 kg/person/day. Both figures are at the upper end of the expected ranges for the Caribbean. The slightly higher rate in St. Kitts may be due to the greater influence of long term tourism.

A country poverty assessment indicates that 16% of the households in each island can be below the poverty line. In St. Kitts 35% of these households are considered to be in indigence. The Nevis figure for indigence is 53% of the households below the poverty line. The GINI coefficients for St. Kitts and Nevis are 0.445 and 0.370 respectively. The difference in GINI coefficients probably reflects a greater maldistribution of wealth on St. Kitts despite the higher levels of indigence on Nevis.

Health care is apparently good but the average life expectancy is rather low at 69.8 years.

The illiteracy rate for those over 15 years averages 2.5% of the overall population. The figure is among the lowest in the OECS countries. The low figure may be the result of easy access to schools and the predominance of English as the main language on both islands.

The two islands operate virtually identical solid waste management systems under overall Central Government control. Final disposal will be in secure landfills developed under the WB/CDB solid waste project. The new landfills are only now coming into full operation.

Solid waste collection and disposal services cover essentially 100% of the population on both islands. Private collection services account for approximately 75% of Industrial, Commercial and Institutional (ICI) waste collection services on St. Kitts. The remainder is probably handled in the public collection system.

No legal or regulatory framework exists to control solid waste disposal on either island. The draft legislation has been prepared, but has not been passed by either Government.

Solid waste management strategic plans are in preparation on both islands.

The major strength of the system on both islands is the high degree of functionality.

The major weaknesses of the system on St. Kitts are a degree of underfunding and a lack of personnel trained specifically in the solid waste management area. The underfunding apparently results from both a reduction

in Government subventions after 2000 and a lower yield from the environmental levy assessed departing tourists. In addition, there has been a reduction in the SWMC budget as an apparent effort to reduce the national deficit.

The major weaknesses of the system in Nevis are a lack of land to permit expansion of the landfill if required in future and a lack of personnel trained in solid waste management. Finances do not appear to be a current problem.

Continued underfunding in St. Kitts will eventually act as a limiting factor on the development of SWMC.

The lack of land in Nevis for landfill expansion is a possible limiting factor.

2. INTRODUCTION

The process of collecting and developing the data required for the production of Evaluation 2002 for St. Kitts and Nevis was carried out by a PAHO representative in conjunction with the Chief Environmental Health Officer (Ministry of Health and the Environment), the General Manager, St. Kitts and Nevis Solid Waste Management Corporation and the Manager, Nevis Solid Waste Management Authority.

Additional assistance was received from the Planning Section of the St. Kitts Ministry of Finance, the St. Kitts Department of Tourism, the St. Kitts Ministry of Finance, the Nevis Ministry of Finance, the Office of the Permanent Secretary, St. Kitts Ministry of Health and the Environment and the Nevis Public Health Department.

The National Coordinating Committee was a loosely formed group of these parties.

The Federation of St. Kitts and Nevis is an independent country within the British Commonwealth. It comprises the islands of St. Kitts (St. Christopher) and Nevis. The central government on St. Kitts currently exercises overall control over most affairs, but there is a definite degree of separate action and government structure between the two islands. There are separate elected assemblies and civil services on both islands. The pattern of elections follows the British system. The degree of separation will probably become complete after a referendum to be held as a part of the next general election that is due shortly.

The overall management of solid waste in St. Kitts is controlled by the St. Kitts and Nevis Solid Waste Management Corporation (SWMC). The Government established this statutory body some time ago and transferred all responsibility for solid waste collection and disposal to it at the end of 2001. At the time of transfer, it was intended that a single body control both St. Kitts and Nevis but subsequent events have led to the development of a separate body responsible for Nevis alone. This body is the Nevis Solid Waste Management Authority (SWMA). The structure of both bodies is highly similar although the methods of operation differ slightly.

St. Kitts and Nevis tend to act as independent countries - and, in fact, this may become a reality after the next general elections. In the interim, there is some difficulty in separating certain aspects of the questionnaire as it relates to the overall solid waste situation in both St. Kitts and Nevis. Insofar as possible, the difficulties are noted in this Country Analytical Report.

The solid waste disposal situation in the OECS countries has changed radically since 1995 when a consortium of the World Bank, the CDB, the EIB and the EU instituted a combined program to address Solid Waste Management and Ship-Generated Waste Management in the OECS countries. In St. Kitts and Nevis this project resulted in radical changes to both the collection systems and, more importantly, in the landfill systems used for final waste disposal. Effectively, the existing non-secure dumpsites have been replaced with state of the art secure landfills. The only item missing to complete the upgrading of the disposal system is a leachate treatment facility in the case of St. Kitts and a leachate collection and treatment system in the case of Nevis.

The new landfills are only now coming into full operation in both St. Kitts and Nevis. In St. Kitts, flooding of the landfill cell forced the diversion of waste to the old Conaree site while repairs were completed. Operation of the Nevis Low Ground site has been delayed due to construction difficulties affecting both the landfill and the weighbridge.

In particular, the changes to the final disposal system in St. Kitts have resulted in the elimination of the smoke and odour problems that were inherent in the original system. This, in turn, has resulted in the elimination of a variety of respiratory related health problems found downwind of the Conaree landfill site in St. Kitts.

The current solid waste management system in St. Kitts is considered adequate and will probably remain so for the foreseeable future. There are two areas where problems may develop: the training of local supervisory personnel for work in the solid waste area and some degree of underfunding of the current system.

The training of personnel is seen as a problem that arises from a lack of suitable training establishments as much as from the lack of personnel to train. There may be no simple solution to this problem since establishments that provide direct training in solid waste management are relatively rare. It is far more common to train the personnel in an engineering discipline such as Mechanical or Environmental Engineering and then to allow them to gain field experience in the solid waste field. This solution is, however, dependent on suitable candidates being available and, in effect, the solution is basically a medium to long term one. Given a tendency in British based educational systems to favour the arts and humanities over the sciences and technologies, the solution to the training problem may be rather complex.

Underfunding of solid waste management activities is quite possibly a result of the current budget deficit that exists in St. Kitts. This situation is possibly as much associated with the world economy as it is with the local economy. Effectively, SWMC believes that there are adequate funds for current operations, but that the funding is not adequate to provide a surplus to serve predictable future needs of the system. An analysis of the current level of tipping fees indicates that there may be a potential source of additional revenue. However, an overall analysis of the funding structure indicates that revenue from universal direct charges represents a relatively small percentage of current overall expenditures.

The underfunding is also aggravated by a shortfall in revenue from the environmental levy on departing tourists. This is undoubtedly the result of the general decrease in tourism experienced in the Caribbean after 9/11 and probably also due to the poor state of the general US economy. There is some indication that the tourist industry may be recovering to some degree in the 2004 season.

Public education related to solid waste exists both in the school system and in the adult area. These programs should yield long term benefits and should be continued and encouraged. In general, there is a gap of five to ten years before the results of educational programs become fully apparent.

The Nevis system appears to be less constrained financially but there may be future problems if expansion of the current landfill area (12 acres) is required or if leachate collection and/or treatment is required in future. Consideration should be given to acquiring more land as soon as practical.

The better financial situation on Nevis is probably at least partially the result of the EC\$5.00/month (US\$1 = EC\$2.17) direct charge for solid waste management. This charge is applied directly to the monthly electricity billing.

3. BACKGROUND

Physical Characteristics

St. Kitts and Nevis are both moderately large islands (68 and 36 sq. mi. respectively) which have a central massif surrounded by relatively flat land. The land tends to be gently sloped as would be expected, but is generally suitable for the development of landfills. The landfills on both islands are located relatively close to the ocean on land which is flatter than average. The depth of the water table below the landfill cells is probably minimal.

The road system tends to run around the seashore and all of the habitation lies essentially along the shoreline. On Nevis, particularly in the Charlestown area, residential development tends to extend to the base of the central mountain.

The climate is typical of the Caribbean with an average annual rainfall in the order of 40 to 45 inches. The arable areas of St. Kitts are generally in agricultural production with sugar cane being the main crop. The recent problems with the sugar cane markets have led to an increasing emphasis on increasing the production of vegetable crops for both local consumption and export.

Nevis has less land that is apparently suitable for agriculture due to a generally greater slope between the mountains and the ocean.

Socio-Economic

The combined population of the Federation is estimated at 46,111 with 34,930 on St. Kitts and 11,181 on Nevis. The rate of population increase is relatively high at 1.3%. This rate may be slightly optimistic with some sources reporting zero or negative growth.

The tourist industry in St. Kitts, as compared to other islands such as the BVI, Anguilla and Antigua, is relatively small. The combined long term and short term tourists effectively add only 4.1% to the permanent population. This level of transient population is not considered significant from the solid waste generation standpoint, given the inherent degree of inaccuracy in the total waste generation rates as measured to date.

The long term tourist arrivals in St. Kitts probably contribute even less equivalent population to Nevis than to St. Kitts. This is primarily due to the added difficulty in reaching Nevis after landing on St. Kitts. While some air transportation is available directly to Nevis, the main port of entry is still St. Kitts.

St Kitts is attempting to emphasize the higher end tourist trade. A major Marriott hotel (900 rooms) has recently been completed on the north shore of the island. This will represent a net increase of more than 500 in the available hotel rooms on St. Kitts.

Nevis is already well placed in this area with the existence of a major high end Four Seasons hotel and golf complex on the island.

Health

Health care appears to be good on the islands. There is one main hospital located in Basseterre, St. Kitts with two smaller satellite hospitals. There are also eleven local health centers located throughout the island.

Nevis has one main hospital that has recently been expanded. There are also six local health clinics located throughout the island.

Neonatal mortality for St. Kitts averaged 10.36/1000 live births over the period 1999 to 2001. Infant mortality (<5yrs) averaged 13.18 over the same period. Equivalent figures are not available for Nevis but they are expected to be similar.

Overall life expectancy at birth is 67.8 years for males and 71.7 years for females. The overall average for the population is 69.7 years.

As with most other Caribbean islands dengue fever is present on a continuing basis. The Federation has a highly active vector control program in operation and there is no reason to believe that the solid waste system is currently a specific source of the mosquito which acts as a vector. No other diseases can be directly attributed to the current solid waste management system on either island.

As noted, however, there were a substantial number of cases of respiratory problems which could be directly associated with living down wind from the old Conaree landfill on St. Kitts. The incidence of this type of problem has decreased dramatically with the development of the new landfill and with the elimination of the open burning of waste.

Human Development Indicators

The per capita Gross Domestic Product for St. Kitts/Nevis is US\$8,700. This figure ranks second (after Antigua) among the OECS countries.

The high GDP is reflected in the fact that at the present time only 16% of the households on both islands are considered to be below the poverty line. In St. Kitts 42.5% of these households are considered to be in indigence. Nevis is considerably higher at 63.1%.

The combined GINI coefficient is 0.445, the lowest among the OECS countries. This is also reflected in the low percentage of households in St. Kitts and Nevis that are below the poverty line.

The average overall illiteracy rate for the population over 15 years of age is 2.5%. For men alone the rate is 3.0% as compared to women at 2.0%. The illiteracy rate is among the lowest in the OECS countries. The low levels can probably be attributed to the easy access to schools on both islands and to the fact that English is the predominant language.

Education at both the primary and secondary school level is provided free by the Government to age 16. There is one community college on St. Kitts that provides tertiary education. In addition, the University of the West Indies (UWI) has a branch in Basseterre and a smaller one on Nevis. A medical university (UWI) currently exists on Nevis. The education system is based on the British system as opposed to the North American system.

Environmental education is provided at all levels in the public school systems of both islands. While there is no formal curriculum at either the primary or secondary level, the schools maintain programs at a less formal level. There is an adult program which is largely conducted by advertising and radio.

Evolution of the Solid Waste Management System

The solid waste management systems in St. Kitts and Nevis fall under either of two management operations. In St. Kitts the Solid Waste Management Corporation is in total control of the system. It is loosely monitored by the Department of Health and Environment. In Nevis, the equivalent organization is the Solid Waste Management Authority. It is very loosely monitored by the Nevis Public Health Department.

The two management operations developed from a single unit as Nevis became more interested in proceeding with the political separation of the two islands. While cooperation continues, each island operates essentially independently. There is a degree of friction between the two organizations.

There is a minor degree of friction between the Public Health Departments on both islands and the Solid Waste Management Entities (SWME's). The friction, as in other OECS countries, results from a poorly defined division of regulatory responsibility between the regulatory body and the SWME. In St. Kitts and Nevis, the effect is negligible since both SWME's tend to act as self regulating agencies.

Collection services on both islands are provided by the management corporations. In addition, there are small private collection services on St. Kitts which provides collection for businesses on a contract basis. It is estimated that these private services account for the collection of approximately 75% of the ICI wastes generated on St. Kitts.

Considering the apparent level of commercial enterprises on St. Kitts, the actual quantity of waste collected may be fairly small. The balance of ICI wastes probably enters the public collection system.

One of the parishes on Nevis is also contracted out to a private collection contractor.

There is no formal recycling on either St. Kitts or Nevis. There is a very small private operation on St. Kitts, but the amount of waste handled is not significant.

The secure landfill in Nevis had just come into full operation at the time of writing. It is, at this point, impossible to assess its performance. The main problem seems to have been with the weighbridge but there were also construction and completion difficulties.

The St. Kitts landfill has experienced problems with flooding during recent periods of heavy rain. The observed development of the landfill cell in use from the most remote side of the cell to the access point may have contributed to the problem. The new landfill has been out of service for a period of two months pending assessment of the problem. The original landfill has been in service during this period. A return to the new landfill is expected shortly.

Total solid waste management costs for St. Kitts are estimated at US\$43.54 per ton of waste. These costs are exclusive of the repayment costs of the major WB/CDB loan.

The equivalent unit cost in Nevis is US\$67.81 per ton.

The difference in unit cost between the two islands may be the result of the different scale of operations on the two islands.

The unit cost for St. Kitts is well within the range for the other OECS countries although at the lower end of the scale. The reasons for the low figure are not immediately obvious. However, two factors are immediately clear. The drain cleaning component of street sweeping and drain cleaning employs 98 men - essentially the same number as are employed by SWMC for solid waste management - under the control of the Public Health Department. Since it is not under the control of SWMC, the cost is not included in the SWMC budget and therefore not in the unit cost for solid waste disposal. If it were to be included, as it is in Antigua, the unit cost for waste disposal could be expected to rise significantly.

Additionally, the private collection of ICI wastes, particularly in the Basseterre area, may not be included in the SWMC figures - particularly since the contracts are directly between the private contractors and the generators.

Level of Investment

Virtually all the investment in the solid waste management systems in St. Kitts and Nevis has resulted from the WB/CDB solid waste management program loans. These have amounted to US\$8.41 million since the inception of the program in 1995. It is difficult to accurately determine the actual division of the funds between St. Kitts and Nevis. This may lead to problems in separating the repayment costs if the two islands separate - as seems probable.

Future investment in equipment will be through SWMC and SWMA respectively although all expenditures will have to be approved by the respective governments. At the present time, landfill equipment is in good condition and should not require replacement in the near future. Expansion of the landfills themselves should not be required in the near future.

Collection equipment on St. Kitts is apparently in good condition. Older equipment is, of course, somewhat more prone to failure and maintenance. Overall availability is good.

The Nevis compactors are fewer in number and one is currently out of service due to lack of spare parts. With the smaller population, this is possibly not critical, but the loss of another unit would be much harder to accommodate.

Equipment for special services is adequate on both islands.

The St. Kitts Government currently budgets 0.81% of the total annual national budget for solid waste management services. The equivalent Nevis figure is 1.27%. These percentages appear to be fairly stable for the near future.

The 0.81% figure for St. Kitts is the lowest budgeted percentage in any of the OECS countries. In general, budgets that are this low tend to act as a limiting factor on the development of solid waste management services.

While the amount budgeted appears to be adequate for both islands, the reduction in the funds received due to the reduction in Government subventions and the shortfall in the environmental levy has a serious negative effect on actual funding. Dominica is the comparable case with a low initial budget and restricted transfers from the Government Consolidated Fund.

4. FUNCTIONAL OPERATIONAL STRUCTURE

Institutional Structure

The solid waste management systems in both St. Kitts and Nevis operate to the apparent satisfaction of the respective Governments. They are not, therefore, likely to change significantly.

If anything, both systems might benefit from additional outside input from the so called "supervisory" bodies. Such input may, however be limited by lack of practical experience in solid waste matters outside the controlling organizations. Both controlling organizations exhibit a degree of parochialism in their approaches to external bodies.

Policies, Legal and Regulatory Framework

Both islands have some form of fee structure for the disposal of solid waste. The two islands differ in the way that these fees are applied and in the way that they are collected.

St. Kitts does not apply a general solid waste disposal levy to all users of the system. The Government considers that such a fee structure would be politically unacceptable and possibly counter productive. Such a fee structure would also be contrary to historic practices in St. Kitts.

However, the recent financial shortfalls experienced by SWMC may force a reconsideration of a direct fee structure after the approaching general elections are complete.

St. Kitts does apply a tipping fee to items that arrive at the landfill for disposal. These tipping fees cover industrial and commercial waste, construction waste, land clearing waste, asbestos, scrap metal, appliances, batteries, vehicles, tires and used oil. (The latter is of some interest since there is no means of easy disposal available!) The financial yield from these sources is considered to be small.

Nevis applies a general levy on all electricity bills for solid waste disposal. This levy is minimal (EC\$5.00/month). Despite the extremely low figure, there is some resistance to payment. No good method of enforcing the levy has been developed at this point in time.

The Nevis Power Authority levies an impost for administrative costs incurred in collecting the solid waste disposal fees.

In addition, Nevis applies a set of tipping fees very similar to the St. Kitts system for material arriving at the landfill for disposal. The major difference appears to be a differentiated fee system for derelict vehicles depending on the location of the derelict.

Neither island has a formal legislative framework for solid waste management in place at this time. Both are in the process of developing such a framework and the regulations that accompany it. Completion dates range from six months to a year from the present.

Centralization of Service

Fully centralized service provided under the Central Government is common to both islands. This situation is unlikely to change. There appears to be absolutely no intention to privatize any additional services.

Coverage of all services (except street sweeping) appears to be essentially complete.

Private Participation

Outside of the private collection services in St. Kitts and a very small private recycling operation (also in St. Kitts), there is no private participation in the solid waste management system. The absence of any particular incentive to increase the degree of recycling is highly limiting to private participation.

Collection of domestic waste is privatized in one parish (of five) in Nevis.

This situation appears to be unlikely to change.

Street Sweeping, Drain Cleaning

Street sweeping in Nevis is provided by the Public Health Department. The coverage is strictly limited, probably covering 30% or less of the possible area.

Street sweeping in St. Kitts is covered by SWMC using manual sweeping. Approximately 50% of the possible area is covered.

No mechanical sweeping is used or contemplated on either island.

Open drains characterize St. Kitts in both urban and rural areas. Cleaning of these drains is the responsibility of the Environmental Health Department. Some 98 men are employed in this activity. This operation frequently involves the removal of vegetative blockage rural and suburban drains. The cost of drain cleaning adds approximately 30% to the bare cost of solid waste management in St. Kitts.

Planning

At the present time there is very little planning activity for future development in progress. This is fully consistent with the recent completion of the radical changes in the solid waste management systems on both islands.

5. DELIVERY OF SOLID WASTE MANAGEMENT SERVICES

Quality and Coverage of Services

With the exception of sweeping, essentially 100% of the population on both islands is covered by solid waste management services.

Local waste collection is twice per week on both islands with Nevis providing a third pickup in the Charlestown area depending on equipment availability. Pickup is not provided on a household by household basis, but numerous containers which minimize travel distance are provided. The containers are provided by the solid waste management organization.

The system functions adequately on both islands.

Cost Analysis

Solid waste management costs (exclusive of loan debt servicing and drain cleaning) are calculated as US\$43.54 per ton for St. Kitts and US\$67.81 per ton for Nevis. Both of these figures are in the typical range for the type of disposal system used although the St. Kitts figure is on the low end of the scale. The lower St. Kitts figure again reflects a probable efficiency of scale. In addition, St Kitts reports a problem with underfunding of the solid waste management system while Nevis considers that funding is adequate and possibly in excess of real needs.

The fee structure for ICI waste disposal contributes a small but significant amount of income towards the overall system costs. It does not, however, come close to paying the full cost of the overall operation on either island. The majority of the cost of the solid waste management system remains the responsibility of the respective governments. The negative impacts caused by the reduction in Government subventions and delays in transfers from the Consolidated Fund are therefore particularly severe.

Municipal Development

Municipal development is very slow on both St. Kitts and Nevis. There is no obvious effect on solid waste management.

Administration

The administration of the solid waste management systems is vested in the managers of the two solid waste management organizations. Minimal input is received from the two "supervisory" organizations.

Shared or Participatory Management

There is no other management system than that defined above.

Small Business Involvement

The only small business involvement is the private collection operation in St. Kitts and the single parish in Nevis that is contracted out to private interests.

Micro Enterprises

This type of enterprise does not exist on St. Kitts or Nevis.

Sector Projects

There are no current sector projects. This is as expected considering the heavy expenditures in the recent past.

Funding

The majority of the funding for solid waste disposal is from Government. The fee structure applied by both islands probably accounts for ten percent of total cost without debt servicing. When the latter is considered, the fee structure income becomes insignificant.

The heavy reliance on Government funding makes both SWME's vulnerable to delays in transfers from the Consolidated Fund and to shortfalls or reductions in Government subventions. The situation is particularly serious in St. Kitts with the very low budget.

The reported difference between St. Kitts and Nevis in the adequacy of funding probably reflects the effect of the direct charge system in Nevis.

6. STRENGTHS AND WEAKNESSES OF THE SYSTEM

Strengths

The systems main strength lies in the fact that they function well and provide adequate service to the population of both islands.

The educational component, although not totally formal, is an encouraging element for the future.

Apparent public acceptance of the systems on both islands is a factor in the good performance of each system. A reasonable degree of public participation on Nevis is also most encouraging.

Weaknesses

The major weakness in St. Kitts is in the underfunding of the system. While this is undoubtedly the end result of current economic conditions, it has a severe limiting effect on the possible level of planning for the future. In the short term, and considering the recent development of the system, it will probably make little difference. However, in the longer term, a continuation of this policy by the Government could lead to difficulties.

A second weakness in St. Kitts is the lack of trained personnel in the solid waste field. Regardless of the current success of the SWMC, the lack of trained personnel to continue the operation will eventually be damaging. Considering that such training may take up to ten years (assuming that a university degree is involved), there is some urgency to begin to address this potential problem.

In Nevis, the problem of future staffing is equally present. At the present time there are no obvious steps being taken to correct the situation.

In both cases, the lack of legislation and the accompanying regulations constitute potential problems. It must be recognized, however, that the enactment of such legislation and the development of the accompanying regulations is of little use if the enforcement capability (and the resolve to do so) is lacking.

Limiting Factors

In Nevis, the lack of adequate space to increase the size of the landfill or to install leachate collection and/or treatment facilities may eventually constitute a limiting factor. It might be possible to acquire extra land, possibly at a reasonable cost at the present time. Whether this situation will continue or not is open to question.

In St. Kitts, the apparently severe budgetary restraints will probably limit the future development of the solid waste management system.

7. HEALTH, ENVIRONMENT, AND SOCIAL DEVELOPMENT

Health and Environment

There is no direct evidence that the disposal of solid waste is associated with the incidence of any disease. If there were an association, it would very likely be with dengue fever. Areas close to the landfills do not appear to exhibit any greater incidence of this disease than the remainder of the islands.

The radical improvement of the St. Kitts landfill has resulted in a sharp reduction of the incidence of respiratory diseases in areas lying downwind.

Epidemiological Studies

No epidemiological studies have been conducted to verify the association between solid waste disposal and disease. This is consistent with the practices of other Caribbean governments.

Occupational Health

There are no apparent occupational health problems associated with the solid waste management system.

Equity of Service

The solid waste management systems appear to provide fully equitable service to the general populations of both St. Kitts and Nevis.

Economic Value

The solid waste management systems undoubtedly provide economic benefits to the tourist industry of both St. Kitts and Nevis. The relatively clean conditions on St. Kitts and the somewhat better conditions on Nevis are conducive to tourist returns. The actual value of this benefit is, however, difficult to assess. In addition, it is extremely difficult to convince the general population that is not directly associated with the tourist industry that such value is of major economic importance.

8. PARTICIPATORY MANAGEMENT

Community Participation

St. Kitts exhibits very little community participation in the management of solid waste.

Nevis has a greater degree of participation in as much as the various communities show an interest in local cleanups.

Non-government Organizations (NGO's)

No non-government organizations are involved in the solid waste management system on St. Kitts.

In Nevis, a NGO known as "The Environmental Committee" is highly active in organizing annual beach cleanup activities.

Hygiene and Occupational Safety Programs

No programs in these areas exist as a part of the solid waste management systems of

St. Kitts and Nevis.

Scavenging of Waste

Scavenging of waste on either a formal or an informal basis is not carried out in St. Kitts or Nevis. The practice of informal scavenging of the St. Kitts dumpsite ended when the new secure landfill was opened.

9. FUTURE PROSPECTIVES

Investment and Reorganization

Some further investment in the solid waste management system in St. Kitts is possibly required to upgrade the existing equipment and possibly to install leachate treatment at the Conaree site. Considering the recent expansion and its cost as well as the current operating deficit of the St. Kitts Government, any such investment is unlikely in the near future.

Purchase of additional land to allow for expansion of the Low Ground landfill site on Nevis would appear to be desirable. However, with the changing political situation (relative to separation), the provision of any funding for such land acquisition will probably depend on the settlement reached for the portion of the WB/CDB loan repayment.

At the present time neither Government sees the need for any substantial reorganization of the existing solid waste management systems.

Reform and Modernization

Neither is required nor is any contemplated by either St. Kitts or Nevis.

Alternative Management Strategies

Recycling does not appear to be a viable option without source separation. No other options (such as composting) appear to be practical.

If, as a result of the current difficulties in the sugar industry, agriculture develops to the point where the dependence on imported food is reduced, there could be a reduction in packaging materials requiring disposal. This is certainly far from a direct solid waste disposal strategy, but it would have a distinct effect on the amount of waste paper and corrugated requiring disposal.

Regulation

The development of regulations depends on the enactment of solid waste legislation. There appears to be no immediate interest in developing such legislation. This is particularly true in view of the upcoming general election.

Regulation of day-to-day operations by the Public Health Departments on both islands is essentially absent. One of the common problems in the OECS other countries is the inadequate legislative definition of the regulatory responsibilities of either the SWME or the public or Environmental Health Department. In the absence of any legislation at all, it is obvious that this problem will be magnified.

Financial Requirements

The Government of St. Kitts has recently reduced the SWMC budget, apparently in an effort to reduce the national operating deficit. Adequate funding remains for continued operations, at least at current levels. There is, however, no excess funding to build a reserve. This apparently simply made official the reduction in the level of government subvention experienced since 2000.

The 0.81% of the National Budget allotted to SWMC is even lower than the amount in Dominica. At this level, any shortfall in Government subventions or delays in transfer from the Consolidated Fund could have extremely serious effects.

The Government of Nevis is apparently considering a reduction of funding for SWMA. If this is correct, the current relatively loose funding situation may tighten considerably.

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11. ACRONYMS

BVI	British Virgin Islands
CDB	Caribbean Development Bank
EC	Eastern Caribbean (currency)
EIB	European Investment Bank
EU	European Union
ICI	Industrial, Commercial and Institutional (Waste)
MoF	Ministry of Finance
NGO	Non-government Organization
OECS	Organization of Eastern Caribbean States
SWMA	Nevis Solid Waste Management Authority
SWMC	St. Kitts and Nevis Solid waste Management Authority
SWME	Solid Waste Management Entity
WB	World Bank

12. WORKING TEAM

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