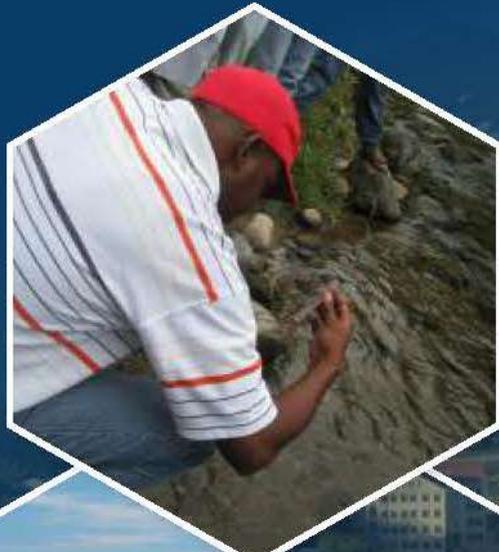


ASSESSMENT REPORT FOR SELECT COUNTRIES IN RESPECT OF THE PROTOCOL CONCERNING POLLUTION FROM LAND-BASED SOURCES AND ACTIVITIES (LBS PROTOCOL)



Final Report

Assessment Report for Select Countries in Respect of
The Protocol Concerning Pollution from Land-based Sources
and Activities (LBS Protocol)



Caribbean Water and Sewerage Association Inc.



FINAL REPORT

**ASSESSMENT REPORT FOR SELECT COUNTRIES IN
RESPECT OF THE PROTOCOL CONCERNING POLLUTION FROM
LAND-BASED SOURCES AND ACTIVITIES
(LBS PROTOCOL)**

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January 2013

ACKNOWLEDGMENTS

Legislative Drafting, Planning and Environmental Consultants is grateful to the LBS Protocol Focal Points and their designates in Antigua and Barbuda, Barbados, Guyana, Saint Lucia, Suriname, St. Vincent and the Grenadines and Trinidad and Tobago for providing valuable information to guide the preparation of this report.



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LIST OF ACRONYMS

BOD	Biochemical Oxygen Demand
CEC	Certificate of Environmental Clearance
CEHI	Caribbean Environmental Health Institute
CBH	Central Board of Health
CRew	Caribbean Regional Fund for Wastewater Management
CZMU	Coastal Zone Management Unit
EIA	Environmental Impact Assessment
EIMAS	Environmental Information Management Advisory System
EM	Environmental Management
EMA	Environmental Management Authority (Trinidad and Tobago)
EPA	Environmental Protection Agency (Guyana)
EPD	Environmental Protection Department (Barbados)
GEF	Global Environment Facility
GGMC	Guyana Geology and Mines Commission
GWI	Guyana Water Incorporated
GWRf	Guyana Water Revolving Fund
IDB	Inter-American Development Bank
IWCAM	Integrating Watershed and Coastal Areas Management
LBS Protocol	Protocol Concerning Pollution from Land-Based Sources and Activities
MEA	Multilateral Environmental Agreement
NEAB	National Environmental Advisory Board (St. Vincent and the Grenadines)
NBSAP	National Biodiversity Strategy and Action Plan
NEMS	National Environmental Management Strategy
NGO	Non-Governmental Organization
NPA	National Programme of Action
NPS	Non-Point Source
OECS	Organisation of Eastern Caribbean States
PUA	Public Utilities Authority (Antigua and Barbuda)
SDE	Sustainable Development and Environment
SIDS	Small Island Developing States
SIRM	Sustainable Island Resource Management
SIRMM	Sustainable Island Resource Management Mechanism
STP	Sewage Treatment Plant
UNEP	United Nations Environment Programme
USEPA	United States Environmental Protection Agency
WASA	Water and Sewerage Authority
WCR	Wider Caribbean Region
WPR	Water Pollution Rules

EXECUTIVE SUMMARY

This report provides an assessment of the status of seven countries in respect of the Protocol concerning pollution from land-based sources and activities (LBS Protocol). The report was commissioned by the Caribbean Water and Sewerage Association Inc. (CAWASA). Four of these countries have either ratified or acceded to the Protocol, namely, Antigua and Barbuda, Guyana, Saint Lucia and Trinidad and Tobago. The remaining three countries, that is, Barbados, St. Vincent and the Grenadines and Suriname have to date not acceded to the Protocol. Suriname has also not yet acceded to the Cartagena Convention.

Information for the report was gathered primarily through a desktop review and analysis of various studies and documents. It was supplemented by responses from the Protocol Focal Points (or their designates) in each of the countries to an interview schedule that was prepared to guide telephone discussions between the consultant and the focal points on issues pertinent to the assignment. However, the majority of the focal points opted to provide written submissions to the questions

posed as opposed to engaging in oral communication. Two interview schedules were prepared, one for the countries that have already ratified or acceded to the Protocol and the other, for those that have not acceded. These schedules are contained in Annexes I and II.

The findings indicate that there is a great disparity between the countries in respect of their status in relation to the Protocol. While all of the countries have made some level of effort to prevent, reduce and control pollution of rivers and the marine environment from land-based sources and activities, some have made much greater strides than others. Even those countries that have not acceded to the Protocol are undertaking activities that fall within the ambit of the Protocol. All of the countries face similar challenges in addressing Protocol-related issues, albeit to varying extents. Domestic, industrial and commercial wastewater as well as deforestation and agricultural runoff and leaching are the primary sources of pollution of rivers and the marine environment.

Lack of adequate financing is a major constraint to the effective

and efficient management of wastewater in all of the countries. Countries have generally failed or have been unable to make adequate budgetary provisions to facilitate large-scale investment in the sector. The enormity of the situation emerges when it is considered that a large percentage of the infrastructure for sewage treatment and disposal is antiquated and obsolete and in need of urgent rehabilitation. Some countries have made some inroads into upgrading their systems, but by and large, major injections of capital are required to not only overhaul the existing infrastructure, but to construct new systems.

In general, there is an insufficient number of sewage treatment plants in the countries and the problem is compounded by the fact that some of the existing ones malfunction. Even where the plants appear to be functioning satisfactorily, the effluent may be of poor quality. The situation is virtually similar in respect of sewage package plants, as many of them do not function optimally. These issues are indicative of poor designs and operating systems as well as a lack of adequate maintenance. There is in general, little reuse of domestic wastewater. Reuse tends to occur

in hotel developments where the effluent from sewage package plants is used for irrigation purposes.

A lack of financial resources does not only negatively impact the countries' ability to meet the infrastructural demands of the sector, but it transcends the institutional, legislative and policy frameworks. Most countries cited a lack of financial resources as posing a challenge to implementing Protocol-related activities or even to acceding to the Protocol. It is important, therefore, that emphasis be placed on cost recovery measures in relation to wastewater management services. Some countries do not charge a tariff and those that do, impose a tariff that is too low as regards to the cost of providing the service. Also, collection rates are generally poor. Introduction of tariffs where they do not exist and increasing the tariffs where they do exist, coupled with efficient collection, can potentially provide additional financing for the sector.

The wastewater management sector is plagued by the use of old technologies. Unfortunately, the enabling environment for the adoption of new and more appropriate technologies is generally weak. Only a few of the

countries offer some level of incentives to encourage the use of more sustainable and appropriate technologies. This is an area that should be further explored. There also appears to be insufficient information and knowledge among the various stakeholders in respect of technological advances that have been made in the sector, including low-cost treatment alternatives.

In general, the policy framework for addressing the prevention, reduction and control of pollution from land-based sources and activities is weak. While issues relating to pollution are indicated in broad policy documents such as national environmental policies and strategies, countries have not adopted a single policy that is specifically concerned with wastewater management and the control of pollution. There are, however, a few countries that appear to have adequate policies but these policies are fragmented and sectoral in nature, which together with inadequate implementation, render them significantly diluted in their ability to address Protocol-related issues in an integrated manner.

The findings also demonstrate that the legislative frameworks for wastewater management and

pollution control are inadequate for a number of reasons. Some of the principal pieces of legislation are both old and sectoral in nature, which implies that enforcement is spread among a wide range of entities. Only one country has regulations in force that specifically prohibit pollution of the marine environment. Enforcement of the legislative instruments is generally poor, primarily as a result of a lack of human and financial resources. Only a few of the countries have enforceable national effluent standards and where they exist, they are consistent with those specified in Annex III of the Protocol. Only two countries have classified their waters in compliance with the requirements of Annex III. In some instances, compliance is voluntary which severely erodes the spirit and intent of such standards. All of the countries have provisions requiring the conduct of Environmental Impact Assessments. In the majority of the countries, this requirement forms part of the physical planning legislation for which such assessments are required in respect of specified proposed developments.

It has been revealed that incompatibility of laws as well as duplication of roles and responsibilities among relevant

entities are constraints to the successful implementation of Protocol-related issues. It is evident that most of the countries have not fully incorporated their obligations or proposed obligations under the Protocol into their domestic legal regimes.

The institutional frameworks in the countries do not generally provide an enabling environment for the implementation of the activities relating to the Protocol. Insufficient human, financial and technical resources are major constraints to the ability of the entities to discharge their roles and responsibilities efficiently and effectively. As noted, responsibilities in relation to wastewater and coastal zone management as well as pollution control are fragmented across several entities, with little coordination among them, giving rise to a piece-meal approach to environmental management. A few jurisdictions have, however, designated or established one entity to coordinate these functions among line agencies and in these cases, there appears to be greater cohesion and a move towards an integrated approach to addressing Protocol-related issues. The findings reveal that there is a general lack of technical expertise in the relevant entities in respect of

the operation and maintenance of sewage treatment plants and other related facilities.

While all of the countries undertake some level of surveillance and water quality monitoring, the majority do not have sustained and comprehensive programmes. Existing programmes either tend to focus on recreational waters only or are undertaken as part of externally funded projects. The reasons cited for the low level of monitoring are a lack of in-country laboratories to carry out the testing of the water samples, the high cost of procuring and maintaining the requisite equipment as well as a lack of expertise to undertake the monitoring activity. In a few countries, however, monitoring is carried out on a sustained basis. There is a paucity of scientific data to inform assessments of the water quality of rivers and the marine environment.

In two of the countries that have not acceded to the Protocol, lack of political will was cited as the principal reason accession has not taken place. This may be indicative of a lack of knowledge and awareness by the decision and policy makers as to the importance of effective wastewater management and the prevention,

reduction and control of pollution of the marine environment. In all of the countries, however, it is evident that there is a need for enhanced public awareness and environmental education in respect of the Protocol and the pollution of rivers and the marine environment.

The assessment concludes that all of the countries whether or not they have acceded to the Protocol, face some challenges in respect of addressing Protocol-related activities. It is important to note, however, that the countries can access financial and technical

support under the Caribbean Regional Fund for Wastewater Management (CReW) in overcoming most of these hurdles. Notwithstanding, it will be left to the countries themselves to commit to the implementation of Protocol-related activities and to integrate them into the national agenda on environmental management and the work programmes of implementing agencies.



PART I

BACKGROUND AND GENERAL INFORMATION



Assessment Report for Select Countries in Respect of the Protocol Concerning Pollution from Land-Based Sources and Activities (LBS Protocol)



1.0 Background

The Caribbean Water and Sewerage Association Inc. (hereinafter referred to as “the client”) engaged the services of *Legislative Drafting, Planning and Environmental Consultants* (hereinafter referred to as “the consultant”) to conduct an assessment of the status of the Protocol Concerning Pollution from Land-Based Sources and Activities (the LBS Protocol, hereinafter referred to as “the Protocol”) in selected Caribbean countries. These countries are Antigua and Barbuda, Barbados, Guyana, Saint Lucia, St. Vincent and the Grenadines, Suriname and Trinidad and Tobago (hereinafter referred to as “the countries”).

Terms of Reference

The objective of the assignment is to conduct an assessment of the status of the Protocol in the countries aimed at providing a baseline for the design and implementation of future capacity building interventions. The activities to be undertaken are as follows:

- (a) Provide general information including:

- A brief background to Small Island Developing States (SIDS)
 - An overview of the Cartagena Convention and the Protocol including the benefits of ratification and accession
 - The obligations to be met by each country that is party to the Cartagena Convention
 - A list of the legal implications associated with ratification or accession to the Protocol
- (b) Provide the following information in respect of those countries that have not acceded to the Protocol:
- An assessment of the status of river and coastal water quality
 - Areas relating to the Protocol that are of greatest concern to the countries
 - The main stumbling blocks to accession
 - A list of areas where the Caribbean Regional Fund for Wastewater Management (CReW) Project can assist the countries to move the accession process forward
 - Recommended steps to be taken by each country to accede to the Protocol
- (c) Provide the following information in respect of those countries that have ratified or acceded to the Protocol:
- An assessment of the status of river and coastal water quality
 - The status of implementation of Protocol-related activities
 - Areas relating to the Protocol that are of greatest concern to the countries

Approach and Methodology

The consultant was required to undertake a desk study of available information and data to inform the compilation of the country assessments. Notwithstanding, the consultant also consulted with the national focal points for the Protocol or their appointed designates in each country to verify information and data as well as to gain a greater understanding of the status of implementation of Protocol-related activities (where the Protocol has already been ratified or acceded to), challenges to accession (where the country is not a signatory to the Protocol), river and coastal water quality, as well as other relevant issues. The consultant prepared an interview schedule to guide discussions with the in-country focal points and this was submitted in advance of the planned telephone meetings. However, in the majority of cases, the consultees indicated a preference for submitting written answers to the questions. The interview schedules are at Annexes I and II to this report.

2.0 Small Island Developing States

The countries that are included in this report are all designated as Small Island Developing States (SIDS). While SIDS share similar challenges to development as other developing countries generally, they possess inherent vulnerabilities and characteristics, which make their path to sustainable development more difficult and challenging. The special circumstances of SIDS were first given international recognition during the United Nations Conference on Environment and Development in 1992 and these issues were expressly addressed in Agenda 21 —the Programme of Action emanating from the Conference.

Since then special attention has been given to addressing the special needs of this group of developing countries.¹ Chapter 17 of Agenda 21 addresses issues relating to the protection of the oceans, all kinds of seas, coastal areas and the “protection, rational use and development of their living resources”. Programme Area “G” of that Chapter is devoted specifically to the sustainable development of small islands and the following excerpts² from that programme area provide an insight into the peculiarities and vulnerabilities of SIDS:

Paragraph 17:124:

“Small island developing States, and islands supporting small communities are a special case both for environment and development. They are ecologically fragile and vulnerable. Their small size, limited resources, geographic dispersion and isolation from markets, place them at a disadvantage economically and prevent economies of scale. For small island developing States the ocean and coastal environment is of strategic importance and constitutes a valuable development resource.”

Paragraph 17:126:

“Small island developing states have all the environmental problems and challenges of the coastal zone concentrated in a limited land area. They are considered extremely vulnerable to global warming and sea level rise, with certain small low-lying islands facing the increasing threat of the loss of their entire national territories. Most tropical islands are also now experiencing the

¹ See for example, the Barbados Plan of Action, which was adopted in 1994; The Mauritius Strategy of Implementation (MSI), adopted in 2005 and the MSI+5 Document following the high level review of the MSI in 2010.

² United Nations Department of Economic and Social Affairs, 1992, *Agenda 21*, United Nations: <http://www.un.org/esa/dsd/agenda2>

more immediate impacts of increasing frequency of cyclones, storms and hurricanes associated with climate change. These are causing major set-backs to their socio-economic development.”

Paragraph 17:127:

“Because small island development options are limited, there are special challenges to planning for and implementing sustainable development...”.

It is evident therefore, that SIDS have numerous hurdles to overcome as they seek to pursue economic development while at the same time maintaining the integrity of the environment. As noted, their coastal zones are of major importance to their economic development, yet these resources are among the most vulnerable. Increased construction in the coastal zone, unsustainable agricultural practices, improper disposal of solid, liquid and hazardous wastes as well as deforestation are all major contributors to marine pollution.³ Pollution from land-based sources and activities consequently plays a significant role in the degradation of the marine environment as well as a threat to public health. The Protocol is therefore an excellent instrument for assisting SIDS and other countries to better manage and protect the integrity of their coastal and marine resources.

3.0 The Cartagena Convention and the LBS Protocol

The Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region (the Cartagena Convention, hereinafter referred to as the “Convention”) was adopted on 24 March 1983 in Cartagena, in the Republic of Colombia. The Convention came into force on 11 October 1986. Three protocols to the Convention have to date been adopted and entered into force, one of which is the LBS Protocol,⁴ which was adopted on 6 October 1999 and entered into force on 13 August 2010. Table 1 presents a status of the countries included in this report in respect of the Convention and the Protocol.

From Table 1, it is evident that Suriname is the only country that has not acceded to the Convention, while Barbados and St. Vincent and the Grenadines have not ratified or acceded to the Protocol. The other countries, that is, Antigua and Barbuda, Guyana, Saint Lucia and Trinidad and Tobago have ratified or acceded to the Convention and the Protocol.

³ Organisation of Eastern Caribbean States, 2002, *Towards an OECS Development Strategy*, Saint Lucia: OECS Secretariat.

⁴ The other two protocols are: the Oil Spills Protocol which was adopted in 1983 and entered into force on 11 October 1986 and Protocol Concerning Specially Protected Areas and Wildlife (SPA) in the Wider Caribbean Region which was adopted in 1990 and entered into force on 18 June 2000.

TABLE 1: STATUS OF COUNTRIES IN RELATION TO THE CARTAGENA CONVENTION AND LBS PROTOCOL

Country	Date of Signature – Convention	Date of Ratification or Accession to the Convention	Date of Ratification or Accession to the Protocol
Antigua and Barbuda		11 September 1986	13 July 2010
Barbados	5 March 1984	28 May 1985	
Guyana		14 July 2010	14 July 2010
Saint Lucia	24 March 1983	30 November 1984	30 January 2008
St. Vincent and the Grenadines		11 July 1990	
Suriname			
Trinidad and Tobago		24 January 1986	28 March 2003

Source: United Nations Environment Programme – Caribbean Environment Programme (UNEP-CEP)⁵

Overview of the Cartagena Convention

The Convention is an important comprehensive multilateral environmental agreement (MEA) aimed at protecting and developing the marine environment. It places an obligation on Contracting Parties to, *inter alia*, adopt national, sub-regional and regional measures aimed at reducing, controlling and preventing pollution of the Convention Area⁶ from the following sources:

- Discharges from ships
- Dumping of wastes and other matter by ships, aircraft and man-made structures
- Land-based sources which include coastal disposal or discharges emanating from rivers, estuaries, coastal establishments, outfall structures or any other sources on the territories
- Sea-bed activities
- The air

⁵ United Nations Environment Programme – Caribbean Environment Programme (UNEP-CEP), *Status of the Cartagena Convention and Protocols*, available at:

<http://www.cep.unep.org/cartagena-convention/about-the-cartagena-convention#status>

⁶ Article 2 of the Convention, defines the Convention Area as “... the marine environment of the Gulf of Mexico, the Caribbean Sea and the areas of the Atlantic Ocean adjacent thereto, south of 30 deg north latitude and within 200 nautical miles of the Atlantic coasts of the States referred to in article 25 of the Convention”.

The Convention also promotes the establishment of protected areas in Contracting States as well as the development of technical and other guidelines to assess the environmental impact of planned developments on the marine environment. Contracting Parties are also required to cooperate in cases of pollution emergencies, in scientific research, monitoring and exchange of data and other scientific information as well as in the adoption of rules and procedures relating to liability and compensation arising from pollution of the Convention Area.

Overview of the LBS Protocol

The Protocol, which comprises nineteen (19) Articles and four (4) Annexes, places an obligation on Contracting Parties to prevent, reduce and control pollution of the marine environment of the Wider Caribbean Region (WCR) from land-based sources and activities⁷ through, for example, the adoption of national, sub-regional and regional plans, programmes and other measures while utilizing the most appropriate technology and management regimes. The Protocol also requires Contracting Parties to institute monitoring programmes and adopt guidelines for the conduct of environmental impact assessments of planned activities.

Contracting Parties undertake individually and collectively to develop information systems as well as to conduct education and public awareness programmes. Each party is required to designate both a focal point to liaise with the United Nations Environment Programme (UNEP) in respect of the technical components of the Protocol as well as a representative to sit on the Scientific, Technical and Advisory Committee. Importantly, Contracting Parties agree to mobilize financial resources to support implementation of the Protocol in their jurisdictions.

The technical annexes to the Protocol are of special importance as they set out specific requirements and standards that Contracting Parties must adhere to in order to prevent, reduce and control pollution of the Convention Area. Annex I lays out the priority source categories and activities (primary polluting industries and activities including domestic sewage) that affect the Convention Area as well as the associated pollutants of concern. It also provides a list of characteristics and other factors that Contracting Parties should have regard to when evaluating additional pollutants of concern which are not specifically listed in the Annex.

⁷ “Land-based sources and activities” as defined in Article I of the Protocol “means those sources and activities causing pollution of the Convention areas from coastal disposal or from discharges that emanate from rivers, estuaries, coastal establishments, outfall structures, or other sources on the territory of the Contracting Party, including atmospheric deposition originating from sources located on its territory”.

Annex II provides a comprehensive list of factors to be used when making a determination on effluent and emission source controls as well as management options. These include the:

- Characteristics and composition of the waste.
- Characteristics of the activity or source category.
- Characteristics of the discharge site and receiving marine environment.

In relation to management options, Contracting Parties should have regard to alternative production, waste treatment technologies and management practices.

Annex III addresses the management of domestic wastewater⁸ as a means of preventing, reducing and controlling pollution of the Convention Area. This is of significant importance to the countries of the WCR. It is widely documented that sewage pollution is the main contaminator of the marine environment in the region.⁹

It is estimated that about 86 per cent of wastewater that is discharged into the Caribbean Sea is untreated.¹⁰ Over half of the households (about 51.5 per cent) in the Caribbean Region do not have sewer connections and less than one-fifth (about 17 per cent) have connections to adequate collection and treatment systems.¹¹ It is further estimated that within the Caribbean SIDS, over 98 per cent of urban sewage is not treated before disposal and this figure is even higher in respect of rural areas.¹²

Annex III deals specifically with the discharge of domestic wastewater into the Convention Area and effluent limitations. In respect of the latter, different limitations apply depending

⁸ "Domestic Wastewater" as defined in Annex III of the Protocol is "all discharges from households, commercial facilities, hotels, septage and any other entity whose discharge includes the following:

- (a) Toilet flushing (black water);
- (b) Discharges from showers, wash basins, kitchens and laundries (grey water); or
- (c) Discharges from small industries, provided their composition and quantity are compatible with treatment in a domestic wastewater system.

Small quantities of industrial waste or processed wastewater may also be found in domestic wastewater."

⁹ See for example:

- (a) CARSEA, 2007, Caribbean Sea Ecosystem Assessment (CARSEA) in Agard, J; Cropper, A., Garcia, K. (eds.), *Caribbean Marine Studies, Special Edition*, available at:

www.cbd.int/doc/meetings/mar/.../rwebsa-wcar-01-crfm-03-en.pdf.

- (b) UNEP/GPA, 2006, *The State of the Marine Environment: Trends and Processes*, The Hague.

¹⁰ Refer to fn. 9(b).

¹¹ Emanuel, E., 2012, *Wastewater Management in the Wider Caribbean Region: Knowledge, Attitudes and Practice (KAP) Study*, UNEP-CEP.

¹² Refer to fn. 9(b).

on whether the discharge is made into Class I¹³ or Class II¹⁴ waters. Tables 2 and 3 below present the limits that Contracting Parties are required to comply with in respect of domestic wastewater discharges into Class I and Class II waters respectively.

TABLE 2: EFFLUENT LIMITS FOR CLASS I WATERS

Parameter	Effluent Limit
Total Suspended Solids	30 mg/l *
Biochemical Oxygen Demand (BOD ₅)	30 mg/l
pH	5-10 pH units
Fats, Oil and Grease	15 mg/l
Faecal Coliform Parties may meet effluent limitations either for faecal coliform or for E. coli (freshwater) and enterococci (saline water).	Faecal Coliform: 200 mpn/100 ml; or a. E. coli: 126 organisms/100ml; b. enterococci: 35 organisms/100 ml
Floatables	Not visible
* Does not include algae from treatment ponds	

¹³ “Class I Waters” as defined in Annex III of the Protocol are “waters in the Convention area that, due to inherent or unique environmental characteristics or fragile biological or ecological characteristics or human use, are particularly sensitive to the impacts of domestic wastewater. Class I waters include, but are not limited to:

- (a) waters containing coral reefs, seagrass beds, or mangroves;
- (b) critical breeding, nursery or forage areas for aquatic and terrestrial life;
- (c) areas that provide habitat for species protected under the Protocol Concerning Specially Protected Areas and Wildlife to the Convention (the SPAW Protocol);
- (d) protected areas listed in the SPAW Protocol; and
- (e) waters used for recreation.

¹⁴ “Class II Waters” as defined in Annex III of the LBS Protocol are “waters in the Convention area, other than Class I waters, that due to oceanographic, hydrologic, climatic or other factors are less sensitive to the impacts of domestic wastewater and where humans or living resources that are likely to be adversely affected by the discharges are not exposed to such discharges”.

TABLE 3: EFFLUENT LIMITS FOR CLASS II WATERS

Parameter	Effluent Limit
Total Suspended Solids	150 mg/l *
Biochemical Oxygen Demand (BOD ₅)	150 mg/l
pH	5-10 pH units
Fats, Oil and Grease	50 mg/l
Floatables	Not visible
* Does not include algae from treatment ponds	

Additionally, this Annex mandates Contracting Parties to take appropriate measures to control or reduce the amount of nitrogen and phosphorus and their compounds as well as chlorine that is discharged into the Convention Area. Contracting Parties also have obligations in respect of the pre-treatment of industrial wastewater, ensuring that household systems do not contaminate ground and surface waters and that existing domestic wastewater systems are properly managed, operated and maintained. Target timelines are also stipulated in the Annex for the achievement of the effluent limits set out in Tables 2 and 3 as well as those relating to nitrogen, phosphorus and chlorine.

Annex IV provides for the prevention, reduction and control of agricultural non-point sources of pollution,¹⁵ which are well recognized as a major contributor to pollution of the Convention Area. Contracting Parties are obligated in this regard to, *inter alia*, formulate policies, develop plans and legal mechanisms as well as to implement related education, training and awareness programmes. In addition, parties should provide economic and non-economic incentives to encourage the adoption of best management practices.¹⁶

¹⁵ “Agricultural Non-Point Sources of Pollution” as defined in Annex IV of the Protocol is “non-point sources of pollution originating from the cultivation of crops and rearing of domesticated animals, excluding intensive animal rearing operations that would otherwise be defined as point sources”.

¹⁶ “Best Management Practices” as defined in Annex IV of the Protocol is “economical and achievable structural or non-structural measures designed to prevent, reduce or control the run-off of pollutants into the Convention Area”.

4.0 Obligations of, and Benefits to Contracting Parties

The major obligations of Contracting Parties in respect of the Protocol are discussed in section 3.2 above. Notwithstanding, it is important to understand the legal implications of acceding to the Protocol. In respect of the English-speaking countries of the Caribbean, acceding to the Protocol does not mean that it automatically becomes a part of the domestic law of that country. Consequently, unless it is expressly transformed into the national legislative regime, the Protocol is subject to the existing laws of the Contracting Party and does not impose any additional liability on the Contracting Party than what currently exists. However, domestic law will as far as practicable be interpreted to give effect to the provisions of the Protocol.¹⁷ There are no penalties or sanctions for non-compliance by Contracting Parties with their obligations under the Protocol.

There are several national and regional benefits that can potentially be derived by countries as a result of acceding to the Protocol. The marine environment plays a very important role in the economic (especially in respect of tourism and fisheries) and social development of the WCR and the negative impacts of pollution on the quality of coastal waters is a major source of concern. Any instrument such as the Protocol, aimed at preventing, reducing or controlling pollution of the marine environment will consequently in itself prove beneficial to the Contracting Parties. The Protocol requires Contracting Parties to cooperate at the sub-regional and regional levels in the implementation process. This cooperation will provide leverage for the countries to obtain greater access to and sharing of financing and technical assistance in support of an integrated approach to the management of the marine and coastal waters of the WCR. By undertaking activities on a joint basis, the available financial and technical resources will be utilized more optimally.

Implementation of Protocol-related activities will also facilitate the sharing of data and information among Contracting Parties thus presenting a sound basis for the development and maintenance of sub-regional and regional monitoring systems as well as shared responses to transboundary pollution. It is envisaged that the implementation process will also result in greater environmental awareness.

Benefits will also be derived at the national level, as implementation of activities will facilitate and reinforce the need to adopt an integrated approach to development planning

¹⁷ Prudent-Phillip, P., 2007, *Bridging the Policy and Legislative Divide Towards Reducing Land-Based Sources of Marine Pollution: the Case of Saint Lucia*, Masters of Law Thesis, University of the West Indies, Barbados: unpublished.

as the inextricable link between terrestrial, coastal and marine resources becomes more apparent. It is anticipated that this will result in improved management of the marine environment. Economic and social spin-offs will also accrue from an enhanced quality of coastal and marine waters.

It is further envisaged that there will be increased capacity building within relevant ministries and other entities, resulting from the transfer of knowledge and information from technical assistance available to Contracting Parties as well as through cooperation with other countries which are parties to the Protocol. Improved environmental monitoring programmes and access to relevant scientific and other data will also be a positive consequence. It is also expected that improved sewage treatment systems as well as the adoption of more sustainable agricultural practices will be realized. It is evident therefore that there are significant regional and national level benefits to be derived by countries that accede to the Protocol.

5.0 Caribbean Regional Fund for Wastewater Management

The Caribbean Regional Fund for Wastewater Management (CReW) is a Global Environment Facility (GEF)-funded four-year project, which will support countries in the Wider Caribbean Region in satisfying their obligations under the Convention and the Protocol. The objective of the CReW is:

“... to pilot revolving financial mechanisms and related wastewater management policy reforms that can subsequently be established as feasible instruments to provide sustainable financing for the implementation of environmentally sound and cost-effective wastewater management measures.”¹⁸

The Project is being managed and implemented by the Inter-American Development Bank (IDB) and the United National Environment Programme (UNEP) and comprises the following four (4) components:¹⁹

- (1) “A flexible and innovative investment and financing mechanism, including: (i) a project implementation facility to finance wastewater projects; (ii) a project development facility (PDF) window that would provide technical assistance to project sponsors to help bring projects to “bankable” status; and (iii) a monitoring and evaluation subcomponent that would generate and analyze the information necessary to measure the performance of the CReW towards achieving its global objectives.
- (2) A policy reform component in support of improved wastewater management that is consistent with the GPA²⁰ Strategic Action Plan Guidelines on Municipal Waste Water Management, including institutional and legal strengthening and capacity building to ensure technology transfer, targeting specifically innovative and low cost wastewater management technologies that provide communities with effective and locally manageable wastewater treatment and disposal at an affordable cost. This component would also promote public awareness and information exchange for improved wastewater management.

¹⁸ GEF, 2008, *CReW - Project Identification Form – IV Version*, available at: <http://www.cep.unep.org/gef-crew-caribbean-regional-fund-for-wastewater-management-unesp-iadb-gef-partnership-project/crew-pif-iv-version-11-september-2008-with-endost-letter.doc/view>

¹⁹ Refer to fn. 18

²⁰ UNEP’s Global Plan of Action

- (3) A component that would permit regional dialogue, linkages, coordination, communication and liaison between CReW staff, counterpart agencies, implementing partners, related programs (e.g., in integrated water resources management), and relevant Caribbean stakeholders including the private sector.
- (4) A project management component, under which a governance structure would be established as the primary coordination mechanism for launching and implementing the CReW.”

PART II

ASSESSMENTS OF COUNTRIES THAT HAVE ACCEDDED TO THE PROTOCOL



6.0 Introduction to Country Assessments

This part of the report presents assessments in respect of those countries that have already acceded to the Protocol, namely Antigua and Barbuda, Guyana, Saint Lucia and Trinidad and Tobago. The assessment for each country includes the following:

- (a) The status of river and coastal water quality
- (b) Status of implementation of Protocol-related activities
- (c) Areas relating to the Protocol that are of greatest concern to the countries
- (d) The challenges faced in the implementation of the Protocol
- (e) Areas where the CREW can assist in addressing the challenges faced

Antigua and Barbuda



Assessment of the Status of River and Coastal Water Quality

There are a number of land-based activities that are contributing to pollution of rivers and the marine environment in Antigua and Barbuda. The main factors impacting water quality are wastewater from domestic, industrial and commercial sources, sedimentation arising from land degradation and animal rearing as well as agricultural run-off. There is no central sewer system in the country, with septic tanks being the predominant method of sewage disposal in both the residential and commercial sectors. Other methods of disposal include pit latrines, pitless latrines,²¹ “bucket systems” and sewage packaging plants. There are

²¹ United Nations Environment Programme, 2010, *National Environmental Summary (NES)* – Antigua and Barbuda, available at www.unep.org

inadequate sewage holding facilities and domestic handling in the capital city of St. John's as well as a general lack of treatment of sewage before discharge and inappropriate disposal of septic tank sludge.²² The situation in the St. John's urban area is very acute as the land available for construction is limited, which has resulted in inadequately sized septic tanks being constructed with insufficient capacity to accommodate the load. This is exacerbated by the non-permeability of the soil, which causes effluent flows between buildings. This has been addressed in part, by redirecting the effluent into street drainage channels that drain into the sea. This area has been adopted as a hotspot within the Caribbean region under the UNEP/GEF Global International Waters Assessment Based Hotspot Selection Mechanism.²³

The Central Board of Health (CBH) of the Ministry of Health undertakes collection of night soil (bucket system) and disposes of it in trenches of approximately two (2) feet in depth at the dumpsite. Failures in this system occur which result in raw sewage being discharged into open drains and coastal waters.²⁴ Packaging sewage plants are used in most of the hotels in the country and indications are that eighty-eight (88) per cent operate outside the national guidelines for Biochemical Oxygen Demand (BOD) and Suspended Solids. The effluent is generally discharged into street drains, the marine environment and salt water lagoons.²⁵ There is no adequate enforcement programme in respect of wastewater discharge.

Agricultural activities also contribute to riverine and coastal water pollution through pesticide run-off, use of chemicals in watershed areas, land degradation and faecal contamination by livestock and poultry. Land degradation as a result of overgrazing by animals as well as the indiscriminate clearing of land for various uses, increases the potential for surface run-off and ultimate sedimentation of surface and coastal waters. Wastewater from commercial and industrial entities including garages and factories is disposed of in open sewers. Inadequate disposal of solid waste is another source of pollution that needs to be addressed. Inappropriate attitudes coupled with low levels of awareness of wastewater management issues as well as poor practices have been cited as contributing to the pollution of rivers and the marine environment in Antigua and Barbuda.²⁶

In the absence of comprehensive and sustained monitoring, a proper assessment of the

²² UNEP-CEP, 2012, *Profiles of Wastewater Management in the Wider Caribbean Region Countries*, Technical Report No. 54, available at: <http://www.cep.unep.org/publications-and-resources/technical-reports/technical-reports>

²³ Refer to fn. 22. This designation identifies the St. John's Harbour as a primary pollution area, with the major concerns being related to microbiological pollution and eutrophication as a result of inadequate sewage treatment.

²⁴ Emanuel, E., 2012, *Situational Analysis – Regional Sectoral Overview of Wastewater Management in the Wider Caribbean Region*, UNEP-CEP Technical Report 66.

²⁵ Refer to fn. 22

²⁶ Refer to fn.11

water quality in the country is difficult to make. Observed practices and health indicators, however, suggest that land-based activities are impacting the water quality of rivers and coastal areas. Some monitoring of bathing waters has been conducted over the last six years but testing is only carried out in respect of Enterococci based on the applicable United States Environmental Protection Agency (USEPA) standard. While compliance with the standard is stated to be generally high, there are concerns in respect of the north-west, north-east and south-east coastal waters.²⁷

The north-west is the principal tourism area in the country and it has been determined to be an environmental hotspot on account of the high levels of “...liquid and waste contaminants (nutrients, microbiological and chemical pollution); suspended solids; solid wastes”²⁸ and the fact that it is located within the Cedar Grove Watershed. There is no doubt that enhanced sewage disposal and treatment needs to be instituted through the construction of a sewage treatment plant, among other methods.

Status of Implementation of the Protocol

Domestic Wastewater – Discharge and Effluent Standards

There is no classification of waters in Antigua and Barbuda and no adopted domestic wastewater effluent standards. The CBH has, however, proposed that the standards established for Class I Waters in Annex III of the Protocol be used for all wastewater entering the aquatic environment. It is further proposed that these be formally adopted by way of legislation during the course of the implementation of the Global Environment Facility (GEF) funded Sustainable Island Resource Management Mechanism Full-Sized Project (SIRMM Project).²⁹

Policies, Programmes, Plans and other Relevant Interventions

Antigua and Barbuda does not have a specific policy in respect of wastewater management, and this shortcoming is well recognized as revealed in both the National Biodiversity Strategy and Action Plan (NBSAP, 2001) and the National Environmental Management Strategy (NEMS). Both of these documents identify liquid waste disposal as an issue that requires priority attention and sewage as a primary pollutant. There are other existing and

²⁷ The Environment Division of the Ministry of Agriculture, Lands, Housing and the Environment – the LBS Focal Point (response to the interview schedule in Annex I).

²⁸ Government of Antigua and Barbuda, 2008, *Promoting Best Practices in Wastewater Disposal, Water Conservation and Re-Use in the North West Tourism Zone – Antigua*, available at: <http://gefantigua.org>

²⁹ This is a US\$3m GEF funded 4 year environmental project, which commenced in 2008.

draft policies, strategies and plans that are of some relevance to Protocol-related issues. These include:

- Capacity Building for Environmental Management in Antigua and Barbuda: Strategy and Action Plan: 2007-2012
- National Action Plan, 2005
- Draft Agricultural Policy (awaiting the approval of the Cabinet of Ministers)
- Draft National Food Production Plan

The NEMS is a comprehensive document which presents the national framework for environmental management in the country and elaborates the approach that the Government will adopt in the implementation of multilateral environmental agreements to which Antigua and Barbuda is signatory. The National Action Plan outlines planned interventions in respect of various thematic areas including watershed and coastal zone management, land use – including pasture management, environmental education and public awareness, capacity building and data management. The National Food Production Plan promotes the use of environmentally sound practices and technologies in the agricultural sector.

The Government of Antigua and Barbuda has committed to the preparation of a National Integrated Water Resources Management Plan, which will provide for all water quantity and quality issues.³⁰ Notwithstanding the above-mentioned policies, strategies and plans, the existing framework is inadequate to enable the country to fulfill its obligations under the Protocol. This inadequacy is compounded by the fact that a programme of action has not yet been developed to guide the implementation of Protocol-related activities.

A recreational water quality monitoring programme has been ongoing from 2006 to the present, although it diminished significantly in 2012. It is conducted by the CBH in collaboration with the Ministry of Agriculture, which is responsible for providing the laboratory services for testing of water samples. As mentioned earlier, testing is only carried out in relation to Enterococci as per the applicable USEPA standard. Since 2008, water quality monitoring at McKinnon's Pond and adjacent beaches on the north-west coast are being carried out under the GEF-funded Integrating Watershed and Coastal Areas Management (GEF-IWCAM) Project. This Project seeks, *inter alia*, to address coastal pollution and wastewater discharges from the capital city of St. John's. Under the SIRMM Project³¹ additional monitoring of coastal waters along the north-west coast was to commence in

³⁰ Refer to fn. 24

³¹ Refer to fn. 29

November 2012.

There is limited reuse of domestic wastewater as only some of the hotels reuse treated effluent for irrigation purposes. There is also no pre-treating of industrial discharges. With respect to preventing, reducing and controlling agricultural non-point sources of pollution, the Ministry of Agriculture has been training farmers on the use of good agricultural practices. There are no incentives aimed at encouraging the use of environmentally sound technologies and practices by stakeholders. There is a low level of knowledge and skills among wastewater operators in respect of proper management and operations techniques.³²

The Government has embarked on a major project, the outcomes of which will contribute significantly to addressing Protocol-related issues. The SIRMM Project promotes the development and adoption of an integrated (sustainable island resource management) approach to planning and management of the country's natural resources. The Project has the following four (4) outcomes:³³

- (1) Easy and reliable access to information for environmental management by all stakeholders. This outcome includes the establishment of a centralized Environmental Information Management Advisory System (EIMAS), which will provide a basis for planning and decision making. Comprehensive and sustained long-term monitoring programmes will also be established and importantly, this includes the monitoring of ground and coastal water quality as well as water resources generally. The monitoring information will be stored in EIMAS.
- (2) Sustainable Island Resource Management (SIRM) and zoning plans will be developed together with a strategic plan (to accompany the zoning plan).
- (3) Policy and institutional reforms will be undertaken in support of implementation of the SIRM Plan. Of particular importance to the Protocol is the formulation of policies and policy proposals for wetlands and coastal development, livestock management and grazing practices as well as the reduction of pollution, especially in respect of untreated effluent. The issue of

³² Refer to fn. 11

³³ UNDP, SIRMM Project Document 3 - *Demonstrating the Development and Implementation of a Sustainable Island Resources Management Mechanism in a Small Island Developing State*, available at: <http://gerantigua.org>

incentives in support of environmental stewardship will also be addressed under this outcome.

- (4) Four (4) demonstration projects (Demo-Projects) are being supported, of which Demonstration Project 4, that is, “Promoting Best Practices in Wastewater Disposal, Water Conservation and Re-Use in the North West Tourism Zone” is of significant importance to addressing issues under the Protocol. It focuses on domestic wastewater disposal, reuse and incentives, especially in respect of the tourism sector.³⁴

Legislative and Regulatory Framework

While there is a plethora of laws that can potentially assist in preventing, reducing or controlling pollution of the coastal and marine waters of Antigua and Barbuda, there is no legislation specifically geared towards integrated wastewater management or which addresses the obligations under the Protocol. The existing legal and regulatory framework does not provide an enabling environment for the country to fulfill its obligations under the Protocol. The framework is inadequate in terms of comprehensiveness, currency and the generally low level of prescribed penalties. This is further compounded by a general lack of enforcement, regulations and other statutory instruments. The Public Health Act, Cap. 353, for example, was enacted in 1955 and serves as the principal legislative instrument for regulating disposal and treatment of liquid waste. It seeks to regulate by way of the abatement of nuisances, which is defined in section 2 of the Act as:

“...anything which is capable of being abated either by the person or persons concerned or by the Board”.

Provision is made for the abatement of nuisances summarily. Section 20, paragraphs (b) and (k) provide examples of the types of nuisances that may be abated under the Act:

Section 20(b): “any street, ditch, sink, cistern, pool, borrow pit, watercourse drain, gutter, privy, dustbin or manure pit so foul or in such a state or so situated as to be a nuisance or injurious to health to the public”;

Section 20 (k): “the drainage, refuse or washing of any town, village or building falling into any harbour, river, watercourse, ravine, pond, ditch or on any foreshore so as to be a nuisance or injurious to health”.

³⁴ See <http://gefantigua.org> for further details on the project including the demonstration projects.

The Public Utilities Act, Cap. 359 establishes the Public Utilities Authority (PUA), which has been vested with the power to, *inter alia*, “establish, operate and maintain a sewage system in Antigua and Barbuda”³⁵ as well as “to control, manage, maintain, operate and supervise all watercourses, and waterworks in Antigua and Barbuda...”.³⁶

Section 32 of the Act prohibits a person from throwing any refuse, foul, offensive or obnoxious matter, whether solid or liquid, into a watercourse. It also prohibits a person from causing the water from any sink, privy, sewer, drain, engine or boiler or any foul or filthy water to flow into any watercourse or from committing any act, which will cause pollution of a watercourse. A person who contravenes section 32 is liable on summary conviction, to a fine not exceeding fifteen hundred dollars or to imprisonment for a term not exceeding six months. The Minister is empowered to make regulations for among others, the cleaning, maintenance, protection and prevention of obstruction of watercourses and watersheds.

The Pesticides and Toxic Chemicals Act, 2008 seeks to regulate the importation, storage, manufacture, sale, transportation, use and disposal of pesticides and toxic chemicals.³⁷ The legislation mandates the establishment and maintenance of a register of licenses as well as registers of pesticides and toxic chemicals. Schedule II of the Act provides a list of controlled substances, which must first be registered before they can be imported, sold, manufactured, transported or stored (in marketable quantities). Schedule III contains a list of prohibited products. The Minister is empowered under Section 15 (1b) to make regulations for among others, “controlling the use or application of pesticides in agriculture generally, or in particular crops or pests, or on produce during its storage, transportation or disposal, and for controlling the use of toxic chemicals in agriculture...”. The Regulations are at an advanced stage of development but do not yet have the force of law.

The Physical Planning Act, 2003 regulates the development of land as well as provides for the conduct of Environmental Impact Assessments (EIAs) in respect of specified types of development. The Development Control Authority is empowered to stop any development that is being carried out without its approval or contrary to any condition of approval. The National Solid Waste Management Authority Act, 1995 (and its amendment of 2005) provides for the storage, collection, treatment and disposal of solid waste including ship-generated wastes. The Forestry Act, Cap. 178 prohibits the clearing of a forest reserve without a permit issued by the Chief Forestry Officer and provides for the declaration of

³⁵ Paragraph (m) of section 8 (2)

³⁶ Paragraph (n) of section 8 (2)

³⁷ Long Title of the Pesticides and Toxic Chemicals Act, 2008

forest reserves and areas, which are to be the subject of reforestation schemes. Under the Beach Control Act, Cap. 45, the Minister may grant licenses for the use of the foreshore for any public purpose, trade, business or commercial activity on such conditions that he thinks fit.

It is clear that the legislation is sectoral in nature with responsibilities being shared among a multitude of entities. The Government of Antigua and Barbuda has taken some steps to provide umbrella environmental legislation as a means of addressing the piece-meal approach to environmental management and the antiquity of some of the legislation. An Environmental Health Bill (2005) was drafted to replace the Public Health Act. In addition, an Environmental Management Bill has also been drafted but neither of these instruments has been enacted. This is primarily due to the fact that there appears to be a conflict in the provisions of the Bills in respect of the control of pollution.³⁸ Under the draft Environmental Health Act pollution control lies with the CBH³⁹ while the Environmental Management Bill vests such responsibility in the Department of the Environment, which will be created under the Act. There is a lack of consensus among relevant agencies as to which entity should have responsibility for the control of pollution and enactment of the Bills has therefore stalled.

The Environmental Management Bill provides for, *inter alia*:⁴⁰

- The conduct of EIAs.
- The establishment of an Environment Trust Fund.
- The management of wastes, coastal resources and biodiversity including national parks.
- Water quality and pollution.
- Waste management and protection of the marine environment.
- Sustainable forestry.
- The appointment of environmental inspectors.

The Bill needs to be revised to incorporate more fully, the obligations under the Protocol.⁴¹

Institutional Framework

As noted earlier, there are several entities that have some level of institutional responsibility for water resources, wastewater management and regulation of pollution. The CBH, PUA and the Environment Division, however, have the greatest responsibilities in this regard. The

³⁸ Refer to fn. 22

³⁹ The body established under the Public Health Act to regulate public health in the country.

⁴⁰ Refer to fn. 21

⁴¹ Refer to fn. 22

CBH carries out some level of water quality monitoring of recreational waters in conjunction with the Ministry of Agriculture. The CBH is principally charged with advising the Governor General on health-related matters, implementing measures to protect public health as well as abating nuisances, including those that may affect rivers and coastal waters. The PUA has control over all water resources and is mandated to carry out water quality testing. However, its responsibilities do not extend to watershed management. The Environment Division is primarily concerned with environmental protection, the implementation of MEAs and coordinating implementation of the NEMS.

A National Coordinating Mechanism on Environmental Conventions has been established, with responsibility for coordinating the implementation of MEAs. This body reports to the Minister with responsibility for foreign affairs and indications are that it is currently not fully functional. Other entities that have a role to play in regulating pollution from land-based sources and activities include:

- (a) The Development Control Authority, which is responsible for ensuring that the development of land is carried out in an environmentally sound manner.
- (b) The Pesticides and Toxic Chemicals Board, which is charged with regulating the importation, storage, manufacture, sale, transportation, use and disposal of pesticides and toxic chemicals through a system of licenses, permits and registration.
- (c) The National Solid Waste Management Authority, which is the body responsible for the administration of the National Solid Waste Management Act.

The existing institutional framework is inadequate to facilitate proper implementation of activities relating to the Protocol because, *inter alia*, there is a lack of coordination among the several agencies that have a role to play in both coastal zone and wastewater management. These agencies are generally not adequately staffed and do not have the full complement of equipment to facilitate the efficient and effective discharge of their duties. The Environmental Management Bill provides for the establishment of a Department of the Environment that will be the principal agency charged with coordinating the environmental management agenda of the country. In addition, the Bill provides for the establishment of a National Council for Sustainable Development, which will facilitate coordination at the decision-making and policy formulation levels.

Education, Training and Public Awareness Programmes

The Environment Division has an environmental education programme, which covers a broad range of thematic areas. While there is no programme specifically dedicated to the Protocol issues, it is envisaged that the public awareness component of the SIRMM Demonstration 4 Project will address this shortcoming.

Areas of the Protocol that are of Greatest Concern

The Environment Division has indicated that the area of greatest concern with regards to the Protocol is the lack of an established time frame for implementation of activities and by extension, the absence of a national programme of action to guide implementation.

Challenges Faced in Implementing the Protocol

The main challenges faced in implementing the Protocol as identified by the Environment Division are:

- Inadequate legislative and institutional frameworks to support implementation of the Protocol.
- Lack of capacity to conduct the requisite water quality monitoring.

Potential Assistance under the CReW to Overcome the Challenges to Implementation

The Environment Division has listed the following as potential areas of support under the CReW:

- Provision of funding for the development of laboratory capacity in support of the monitoring programmes
- Support for the formulation and implementation of relevant policies
- Assistance in enhancing institutional capacity
- Assistance in the review of the legislative and regulatory framework and drafting of legislation to address the weaknesses and gaps identified in the review exercise

Guyana

Assessment of the Status of River and Coastal Water Quality

It is estimated that approximately thirteen (13) per cent of the population of Guyana has access to a sewerage system, with Central Georgetown being the only city serviced by a communal sewerage system.⁴² The system discharges untreated sewage into the Demerara River through two short outfalls, one of which extends approximately 100 m into the River and the other only about 40 m.⁴³ It is estimated that approximately 3.9 million gallons of untreated sewage are discharged daily into the mouth of the Demerara River.⁴⁴ Discharge of untreated sewage from old and mal-functioning septic tanks into drainage and storm channels also occurs.⁴⁵ The 2002 census revealed that fifty-six (56) per cent of the population used pit latrines and two (2) per cent had no access to sanitation facilities.⁴⁶

It is therefore, not surprising that untreated or poorly treated sewage is determined to be one of the major wastewater management issues confronting the country.⁴⁷ The focal point agency⁴⁸ that was consulted during the preparation of this report identified the current system of sewage disposal, mining activities, inadequate solid waste disposal, industrial discharges and agricultural run-off as major contributors to the pollution of rivers and the marine environment. It is interesting to note that these factors were also highlighted as being principal sources of water pollution in the National Development Strategy prepared in 2000⁴⁹.

There are no river and coastal water quality monitoring programmes currently being undertaken and there is consequently a dearth of scientific data to inform an assessment of the water quality in the country. It is well documented,⁵⁰ however, that river and coastal waters are being negatively impacted by poor sewage disposal practices and systems, mining activities, agricultural run-off and untreated industrial effluent being discharged into canals and rivers. While there is no monitoring of these impacts to inform an assessment of

⁴² Refer to fn.22

⁴³ Refer to fn. 22

⁴⁴ United Nations Environment Programme, 2010, *National Environmental Summary (NES)* – Guyana, available at www.unep.org

⁴⁵ Refer to fn. 24

⁴⁶ Refer to fn. 22

⁴⁷ Emanuel, E., 2010, *Gap Analysis and Regional Best Practices in Wastewater Management*, UNEP-CEP Technical Report 64.

⁴⁸ The Environmental Protection Agency is the focal point entity in Guyana for the LBS Protocol.

⁴⁹ Government of Guyana, 2000, *Guyana National Development Strategy 2001-2010*, National Development Strategy Secretariat. Available at: <http://www.ndsguyana.org>

⁵⁰ Refer to for example, fn. 11, fn. 22 and fn. 24.

the state of the water quality, human health indicators suggest that they are responsible for serious national environmental and public health problems.⁵¹

Status of Implementation of the Protocol

The Environmental Protection Agency (EPA) has assessed the status of implementation of the Protocol in Guyana to which it acceded approximately two years ago, as limited.

Domestic Wastewater – Discharge and Effluent Standards

There is no classification of receiving waters (Class I and Class II) as required under Annex III of the Protocol. Regulation 9(1) of the Environmental Protection (Water Quality) Regulations, 2000⁵² (hereinafter referred to as “the Regulations”) empowers the EPA to “establish parameter limits of effluent which may be discharged into any inland or coastal waters or land of Guyana with respect to any or all of the substances specified in the Second Schedule.”⁵³ The provision is, however, limited by Regulation 5(2), which provides that the Regulations do not apply to discharges specified in Schedule 1 (of the Regulations) which includes “... discharges from households except where such households contain industrial or commercial facilities; or any housing or commercial development or both of less than 30 units...”. Consequently, there are no established wastewater effluent limits with respect to households.

In accordance with Regulation 9, the EPA in collaboration with the Guyana National Bureau of Standards developed *Interim Guidelines for Industrial Wastewater Discharges into the Environment*, which specify parameter limits for different types of industries. However, the Guidelines are limited in that they do not apply to mining and forestry operations, agricultural infiltration, seepage and run-off, which are some of the primary contributors to pollution. The Guidelines are currently being reviewed.

It is noteworthy that Regulation 5(3) places a prohibition on the discharge of the following wastes (includes waste from households) unless such discharge is specifically permitted in a compliance schedule:⁵⁴

⁵¹ Refer to fn. 11

⁵² These Regulations are made under the Environmental Protection Act, No. 11 of 1996.

⁵³ The substances specified in the Second Schedule are: Ammoniacal Nitrogen; Sulphate; Chloride; Cobalt; Colour Detergents; Anionic Fluoride (as F); Molybdenum Phosphate 9 (as P); Polychlorinated Biphenyls; Selenium; Silver; Beryllium; Vanadium; Radioactive Material; Nitrate Nitrogen; Temperature; Pesticides; Fungicides; Herbicides; Insecticides; Rodenticides; Fumigants or any other Biocides or any other Chlorinated Hydrocarbons; a substance that either by itself or in combination with other waste or refuse may give rise to any gas, fume or odour or substance which causes or is likely to cause pollution.

⁵⁴ Regulation 2(f) defines a Compliance Schedule as a schedule of measures including a sequence of interim requirements that lead to compliance with the Regulations. A compliance schedule will include the date and the

- “(a) discharge of any effluent in toxic amounts including substances that may accumulate to toxic amounts during the expected life of the organisms in receiving waters;
- (b) any discharge of radiological or chemical wastes from research and medical facilities;
- (c) any discharge which would substantially impair anchorage and navigation;
- (d) any discharge of sewage from vessels while moored, berthed or underway in the inland or coastal waters of Guyana except through a properly functioning discharge device approved by the Agency; and
- (e) any other discharge which the Agency identifies as having a negative impact on human health and the environment.”

The Regulations also mandate the EPA to establish and maintain a Register of Water Effluents, which shall contain among others, information on the “... quantity, conditions or concentrations relevant to the identification of each effluent”.⁵⁵ The EPA is also required to ensure the currency of the register and to publish it periodically in one or more daily newspapers in the country.

It is evident that Guyana has made some headway in defining effluent standards. However, these are restricted to certain types of industrial activities, with some of the key causes of river and marine pollution, that is, mining operations and agricultural run-off, being expressly excluded from the scope of the Guidelines. In addition, discharges from households are excluded from the ambit of the Regulations. It is timely that the Guidelines are being reviewed as it provides an opportunity for the inclusion of domestic wastewater standards (with the consequent amendments to the legislation), which will enable Guyana to become more compliant with its obligations under Annex III of the Protocol. Additionally, while there is at present no national water quality monitoring management programme, the launching of the National Water Council in 2008 could potentially provide a platform for the establishment of such a system.⁵⁶

manner in which every existing facility shall comply with the parameter limits established under the Regulations.

⁵⁵ Regulation 21 of the Environmental Protection (Water Quality) Regulations, 2000

⁵⁶ Refer to fn. 44

Policies, Programmes, Plans and other Relevant Interventions

There are several relevant existing policies and plans that can potentially assist in addressing Protocol-related issues. These include for example:

- Environmental Policy
- National Development Strategy, 2000
- National Environmental Action Plan
- National Biodiversity Action Plan II, 2007-2011
- Climate Change Action Plan, 2001
- Solid Waste Policy
- National Forest Policy
- National Forest Plan and Code of Practice
- Integrated Coastal Zone Management Plan
- Low Carbon Development Strategy⁵⁷

It has been suggested that Guyana has adequate policies and plans to address its environmental problems, including pollution of rivers and the marine environment, but that implementation and continuity are generally inadequate.⁵⁸ This is primarily a result of technical and financial constraints.

There are, however, several important gaps existing in the implementation of the activities relating to the Protocol. As stated earlier, there is no current river or coastal water quality monitoring programme. A Water Quality Monitoring Programme was developed in 2005 under the Environmental Management Project (Phase II) funded by the Inter-American Development Bank (IDB). Unfortunately, this programme was not implemented because of limited financial resources and technical capacity. Notwithstanding, industrial entities, which are granted environmental authorization by the EPA, are mandated to conduct water quality assessments in respect of their operations in accordance with the national standards for the discharge of industrial effluent into the environment.⁵⁹ However enforcement of this requirement is limited, which results in only a small amount of data being generated from the mandatory testing of water quality.

One of the main gaps identified by the EPA between the Protocol requirements and the current environmental framework is that discharges from households are not regulated or

⁵⁷ This is an indicative list only of the types of policies and plans that are of relevance to Protocol-related matters and should in no way be construed as being exhaustive.

⁵⁸ Refer to fn. 44

⁵⁹ Guyana National Bureau of Standards, 2002, *Interim Guidelines for Industrial Effluent Discharge into the Environment*, Guyana: Guyana National Bureau of Standards.

addressed in any current policies or programmes. The reuse of domestic wastewater is not being practiced in Guyana, neither is it provided for in existing policies or programmes.

The Government of Guyana has entered into an agreement under the CReW to obtain assistance from GEF and the IDB to improve its wastewater management. The Government has also established a four-year Guyana Water Revolving Fund (GWRF), which is aimed at testing various financing mechanisms towards the development of sustainable financing to support cost-effective and environmentally sound wastewater management.

There are no industrial pre-treatment programmes currently being pursued in the country. While this could potentially be considered under the GWRF, the EPA has indicated that the current focus is primarily on rehabilitating existing wastewater treatment facilities and establishing new facilities aimed at compliance with the Guidelines. The Government has no current or planned interventions geared towards the prevention, reduction or control of agricultural non-point sources of pollution.

Environmental Management Systems have been developed for medium- and small-scale miners, and complementary training has been provided for that target group.⁶⁰ There is a general absence of incentives aimed at encouraging the private sector to exercise environmental responsibility and to adopt more technologically appropriate options in the conduct of their operations

Legislative and Regulatory Framework

There are a number of legislative instruments that are of relevance to the prevention, reduction and control of pollution, whether directly or indirectly. These include legislation relating to forestry, fisheries, rivers and coastal areas, marine environment, land use, mining, pesticides and toxic chemicals control, water and sewerage, public health as well as biodiversity. However, the Environmental Protection Act, No. 11 of 1996 is the principal legislative instrument governing environmental management in Guyana. The objectives of the Act provide for, *inter alia*, the prevention or control of pollution as well as for the assessment of the environmental impact of development. Part IV of the Act makes provision for the conduct of EIAs, while Part V speaks specifically to the prevention and control of environmental pollution. Section 19 (1) (b) of the Act provides that:

“A person shall not discharge or cause or permit the entry into the environment of any contaminant in any amount, concentration or level in

⁶⁰ Refer to fn. 44

excess of that prescribed by the regulations, or stipulated by any environmental authorisation”.

Of critical importance to the implementation of the Protocol are the Environmental Protection (Water Quality) Regulations 2000, which have already been discussed in section 6.2.2. As noted, while the EPA has utilized its powers under the Regulations to establish effluent limitations in respect of select industrial operations, it has been constrained by the scope of the Regulations in establishing domestic wastewater effluent standards. This is a major shortcoming in the legislation, which effectively limits the EPA from complying with Annex III of the Protocol. This is an area that requires urgent attention. The Regulations should be amended to incorporate domestic wastewater in its scope of application, thus empowering the EPA to establish and enforce Annex III compliant standards for that category of wastewater.

The EPA has not been effectively enforcing the effluent standards due to its human, technological and financial limitations.⁶¹ The enactment of the Environmental Protection Act pre-dates Guyana’s accession to the Protocol and the contemplated revision of the Act will provide an opportunity for Guyana’s obligations under the Convention and the Protocol to be, as far as is practicable, incorporated into the amended Act. It is evident that the obligations under the Protocol are not fully reflected in the domestic legal regime.

Institutional Framework

The EPA and the Guyana Geology and Mines Commission (GGMC) are the main entities involved in regulating pollution of rivers and the marine environment. The EPA was established by virtue of the Environmental Protection Act and is mandated in the performance of its duties to observe the “polluter pays” principle, the “precautionary” principle, “strict liability”, “state of technology” principle as well as the “avoidance” principle. The EPA has very comprehensive functions⁶² including the prevention or control of pollution, establishing, monitoring, and enforcing regulations as well as formulating standards and codes of practice in respect of limits on the release of contaminants into the environment.

Importantly, the EPA is required to play a coordinating role in both the preparation and implementation of cross-sectoral programmes related to the environment. This suggests that the EPA is empowered to prepare a national implementing strategy in collaboration with relevant stakeholders to guide the implementation of the Protocol-related activities.

⁶¹ Refer to fn. 44

⁶² Refer to section 4 of the Environmental Protection Act, No. 11 of 1996.

This has not yet been undertaken, and at present, these activities are incorporated into the general work programme of the Environmental Management Division of the EPA. The Legal Unit of the EPA has been defunct for over five years and serious consideration should be given to its reactivation.

The GGMC is responsible for regulating all activities in the mining sector. Of particular relevance is the fact that it is empowered to enforce the conditions on mining licenses, permits and concessions, prospecting licenses and permits as well as quarry licenses. Guyana Water Inc. (GWI) is responsible for water supply and the operation and maintenance of the Georgetown sewerage system under the Water and Sewerage Act 2002 and is assisted in the discharge of its duties by Regional Democratic Councils and Local Government Authorities. The operations of GWI are hampered by budgetary constraints and a review of charges for its services should be undertaken to determine the potential for cost recovery.

The Ministry of Health, in particular, the Environmental Health Unit and the Regional Environmental Health Services also have roles to play in the prevention and control of pollution of rivers and coastal waters under the public health legislation.⁶³ The control of land use falls within the ambit of the Central Housing and Planning Authority. The Pesticides and Toxic Chemicals Act Board, which is established under the Pesticides and Toxic Chemicals Act 2000, undertakes the regulation of pesticides and toxic chemicals.

Education, Training and Public Awareness Programmes

The EPA is mandated as part of its functions to undertake environmental education and public awareness programmes. While there are no such programmes dedicated specifically to the Protocol, there are existing opportunities available to the EPA to carry out some level of public awareness, most notably, under the Integrated Coastal Zone Management Project, the Guyana Mangrove Restoration Project and the CReW Project.

Areas of the Protocol that are of Greatest Concern

The EPA has identified the following as areas of the Protocol that are of greatest concern to the country:

- Aligning the legal framework and country policies and strategies to address domestic wastewater
- Public awareness
- Monitoring of water quality

⁶³ Refer to fn. 22

Challenges Faced in Implementing the Protocol

The following have been highlighted by the EPA as the critical challenges faced in implementing the Protocol:

- Inadequate human and technical resources dedicated to the implementation of activities under the Protocol
- Lack of technical capacity to implement a water quality monitoring programme
- Inadequate financial resources to fulfill the obligations under the Protocol as well as for capital works required for improving and developing adequate municipal infrastructure for the treatment and disposal of wastewater

Other challenges identified⁶⁴ include:

- Lack of access to appropriate technology
- Lack of coordination of activities among stakeholder entities
- Inadequate enforcement of legislation
- Lack of public awareness and education on the Protocol and pollution

Potential Assistance under the CReW to Overcome the Challenges to Implementation

The EPA has identified the following support under the CReW to assist in overcoming the stated challenges to implementation of the Protocol:

- Providing assistance for the development of a National Implementation Strategy to establish the framework and timelines to guide the implementation process and report on the progress made
- Assisting in the implementation of a monitoring system and the conduct of an assessment of the current state of water quality in Guyana
- Assisting in the review of the legislative and regulatory framework
- Assisting in the revision of the current legislation to ensure compliance with the requirements of the Protocol
-

It is submitted that assistance under the CReW should also include the following:

⁶⁴ UNEP-CEP, 2006, Proceedings of the Workshop on the *Promotion of the Protocol Concerning Pollution from Land-Based Sources and Activities (LBS Protocol) in the English Speaking Caribbean Countries*, 24th-26th July, 2006, Saint Lucia. Available at <http://www.cep.unep.org>

- Designing and implementing public awareness and environmental education programmes
- Enhancing institutional capacity through training and the provision of technical and other assistance
- Providing assistance in accessing and adopting more appropriate technology
- Establishing data management systems both for national analytical purposes and for facilitating the exchange of information at the sub-regional and regional levels

Saint Lucia



Assessment of the Status of River and Coastal Water Quality

The principal factors impacting river and coastal water quality are inadequate sewage treatment and disposal, pollution from grey water as well as sedimentation from deforestation and other poor land use practices.⁶⁵ Pollution of rivers and coastal waters as a result of erosion is most evident after periods of heavy rainfall. With some shift away from banana cultivation, many farmers are now engaging in livestock rearing, in particular pig husbandry, which is giving rise to an increasingly important issue of faecal contamination of rivers.⁶⁶

Wastewater management is absent in most of the communities, with the exception of the sewage system in the capital city of Castries. This system, however, only serves as a collection facility, thus providing no treatment and resulting in raw sewage being discharged directly into the Castries Harbour by way of a short outfall.⁶⁷ Discharge of raw sewage into the marine environment occurs in many coastal communities and this is evidenced by the

⁶⁵ Sustainable Development and Environment Division of the Ministry of Sustainable Development, Energy, Science and Technology, which is the focal point for the Protocol - response to the interview schedule in Annex I.

⁶⁶ United Nations Environment Programme, 2010, *National Environmental Summary (NES)* – Saint Lucia, available at www.unep.org

⁶⁷ Caribbean Environmental Health Institute, 2006, *Vieux Fort Sewage Needs Assessment Project*, Saint Lucia.

presence of high bacterial levels in adjacent coastal waters. Industrial wastewater is sometimes partially treated and other times, not treated at all before being discharged into open drains and water courses.

The only wastewater treatment facility in Saint Lucia is located in Gros-Islet (the northernmost town in the country) and it serves 13.2 per cent of the population. Assessments of the system carried out by the Caribbean Environmental Health Institute (CEHI) revealed that the effluent quality is good, but the system capacity is under-utilized.⁶⁸ A sewage system servicing the south of the island (Vieux-Fort) is non-functional. The package plants used generally in the hotel sector appear to be operating well according to CEHI.⁶⁹

A Sewage Needs Assessment Study was conducted in Vieux-Fort in 2006 as part of UNEP-CEP's assistance to countries to meet their obligations under the Convention. It was conducted as a pilot project not only for Saint Lucia but also for the Caribbean region, generally. One component of the Study involved extracting end-of-pipe effluent samples as well as samples from freshwater sources and receiving coastal waters. The analysis revealed that the levels of inorganic nutrients in the coastal waters were above the defined limits for sensitive ecological systems.⁷⁰ In addition, the end-of-pipe effluent quality was also above the threshold specified in Annex III of the Protocol in respect of Class I waters.

The Study concluded that the receiving waters in the south-western part of the country have very good assimilative capacity and microbiological counts are relatively low. Notwithstanding, it revealed further that grey water was generally being discharged untreated into sewer systems or in open drains, while only 15 per cent of the relevant entities conducted treatment of the black water by way of sewage treatment plants (STPs). The effluent from the STPs is disposed of in the marine environment. Management of grey water was indicated as an issue that needed to be addressed in an effort to reduce the high levels of nitrates and phosphorus in the nearshore marine environment.

The Study also highlighted that nearly half of the sewage disposal systems were sited within one hundred (100) metres of a natural water course, while twenty-three (23) per cent were located within one hundred (100) metres of the high water mark, thus exacerbating the potential for pollution of the marine environment. Twenty-three (23) per cent of the systems

⁶⁸ Refer to fn. 22

⁶⁹ Refer to fn. 22

⁷⁰ Refer to fn. 66. The limits referred to are the standards adopted by Barbados in respect of Class I Waters as elaborated in section 7.1 of this report.

had in fact overflowed and eight (8) per cent of the STPs malfunctioned on a regular basis, resulting in raw sewage being discharged into the marine environment.

Status of Implementation of the Protocol

The Sustainable Development and Environment (SDE) Division of the Ministry of Sustainable Development, Energy, Science and Technology indicates that the status of implementation of Protocol-related activities in Saint Lucia is good.

Domestic Wastewater – Discharge and Effluent Standards

While there is no classification of receiving waters as envisaged under Annex III, the Sewage Needs Assessment Study made recommendations regarding such classification in respect of the project study area (south-western coast). The inshore marine waters up to a distance of 2 km in some cases are proposed as Class I waters, and beyond that distance, Class II waters. This recommendation has not yet been adopted. In 2009 Guidelines for Recreational Water Quality were developed, which establish parameters and limits for riverine and coastal waters. In 2010, the Guidelines were adopted as a national standard.⁷¹ The effluent limits are consistent with those specified for Class I waters in Annex III, with the exception of BOD, which is a stricter limit.⁷² However, compliance with the national standard is voluntary.

Policies, Programmes, Plans and other Relevant Interventions

Saint Lucia has a good framework of policies, strategies and plans to guide implementation of the Protocol. Some of these that are of significant relevance include:

- National Environment Policy
- National Environmental Management Strategy
- National Environmental Action Plan
- National Coastal Zone Management Policy
- Coastal Zone Management Strategy and Action Plan
- National Water Policy
- Draft National Agricultural Policy
- Draft Land Policy
- National Biodiversity Strategy and Action Plan
- Agrochemical (Pesticide) Hazardous Wastes Management Plan

⁷¹ National standard – SLNS 83:2010

⁷² The specified limit for Class I Waters in Annex III is 30mg/l and in the National Standard for Saint Lucia it is 20mg/l.

However, implementation of the policies, strategies and plans is generally weak as a result of limited human, institutional and financial constraints.⁷³ In addition, the policies and strategies tend to be sector-specific and offer a piecemeal approach to the management of resources. Many policies are still in draft form and require formal adoption.⁷⁴ The National Water Policy provides for an integrated approach to water and wastewater management including sewage treatment and disposal, thus addressing issues relating to both potable water and wastewater. Saint Lucia has committed to the preparation of an integrated water resources management plan that will address both qualitative and quantitative aspects of water from all sources.⁷⁵ The Coastal Zone Management Policy promotes the sustainable use of resources in an effort to maintain integrity of the coastal zone. The Coastal Zone Strategy and Action Plan elaborate measures for preventing, controlling and reducing pollution of the marine environment.

The Ministry of Health and the Department of Fisheries have since 2002 been carrying out a joint coastal water quality monitoring programme in select areas along the north, west and south-west coasts of the country. The programme essentially monitors bacterial parameters. However, the results of the monitoring are generally not available and hence there is a dearth of scientific data to inform policy formulation and decision making. An additional coastal water quality monitoring programme has recently been introduced which will cover an area extending from the north of the country (Cap Estate) to Canaries, which is located mid-way along the west coast. The area, which will be the subject of the monitoring programme, encompasses thirteen (13) beaches and fifteen (15) sampling points. Monitoring will focus on microbial and chemical characteristics.⁷⁶ Saint Lucia, in collaboration with CEHI, is also currently implementing Phase II of the North West Coast Water Quality Demonstration Project,⁷⁷ which commenced in 2010. Phase I of the project has been completed and it focused on two components, namely:

- (a) Characterizing land-based hotspots of pollution sources that can impact the coastal environment
- (b) Establishing guidelines for recreational water quality standards

Phase II of the project is aimed at promoting implementation of Saint Lucia's National Environmental Action Plan and Protocol-related activities. This phase will focus on developing pollution strategies aimed at prevention, remediation and control as well as on

⁷³ Refer to fn. 66

⁷⁴ Refer to fn. 66

⁷⁵ Refer to fn. 22

⁷⁶ SDE Division's response to the interview schedule in Annex I.

⁷⁷ The project is entitled "*Mainstreaming of Saint Lucia's National Plan of Action through a North West Coast Water Quality Demonstration Project*".

promoting public awareness and sensitization on recreational water quality. Some level of water quality assessment will be carried out. The project will also support a review of existing legislation relevant to land-based sources of pollution and identify the potential for strengthening these legislative instruments.

Some hotels conduct water quality monitoring but this is generally in relation to recreational water (swimming pools) and treated wastewater, and rarely does the monitoring extend to coastal waters.⁷⁸ Saint Lucia has taken steps to improve sewage disposal in the city of Castries and its environs. A study⁷⁹ was undertaken to assess the status of the discharge of raw sewage into the Castries Harbour by way of a short outfall. While various recommendations and options were presented to address the issue, the Government has not been able to implement any of them due to lack of funding.

There is some level of reuse of domestic wastewater mainly for irrigation purposes in those hotels that use packaged plants. Saint Lucia has recently completed a project in the Fond'Or Watershed, which focused on sustainable land management. This project formed part of the regional GEF-IWCAM project, which aimed at implementing an integrated approach to the management of watersheds and coastal areas. There are currently no incentives being offered by the Government to promote technology innovation.

Legislative and Regulatory Framework

There is a plethora of legislative instruments that have the potential either directly or indirectly, to assist in preventing, controlling or reducing pollution of rivers and the marine environment. These are sectoral in nature and include the following:

- Public Health Act, No. 8 of 1975
- Physical Planning and Development Act, No. 29 of 2002
- Saint Lucia Solid Waste Management Authority Act, Cap. 6.10
- Forests, Soil and Water Conservation Act, No. 6 of 1945
- Pesticides and Toxic Chemical Control Act, Cap. 11.15
- Water and Sewerage Authority Act, No. 14 of 2005
- Litter Act, No. 24 of 1983
- Beach Protection Act, No. 2 of 1967
- Marine Areas Act, No. 6 of 1984
- National Conservation Authority Act, No. 16 of 1999
- Land Conservation and Improvement Act, No. 10 of 1992

⁷⁸ Refer to fn. 24

⁷⁹ The Smith Warner International Study

Of particular relevance is the Public Health Act, 1975 and Regulations made under the Act. Under Section 9 of the Act, the Minister may make Regulations for, amongst others:

- The prevention, treatment, limitation and suppression of disease.
- Regulating sewers and sewage disposal works.
- The collection, removal and sanitary disposal of rubbish, night soil and other offensive matter.
- The inspection and sanitary conditions of beaches and swimming pools in the interest of public health.
- The maintenance of the proper sanitary condition of premises.
- The prevention, abatement or removal of nuisances and insanitary conditions on premises.

Section 3 (xvi) of the Public Health Regulations: Nuisances (S.I 10/1978) provides that nuisance includes:

“Any discharge, save in accordance with a valid permit granted by the Public Health Board, into any river, stream, water course, of any other industrial, other noxious matter, whether or not a prescriptive right has been acquired to any such pollution”.

A public health inspector may, where a nuisance is being carried out, serve an abatement notice on the person causing the nuisance or on the owner or occupier of the premises. If the person fails to comply, the Public Health Board may take whatever action it deems necessary to stop the nuisance and recover its costs from the person causing the nuisance or the owner or occupier of the premises.

Section 3 of the Public Health Regulations: Water Quality Control (S.I 14/1978) prohibits a person from, *inter alia*:

- Carrying out any act that may impair the quality of water in any river, stream, spring, well, pond, reservoir or any other place.
- Discharging any sewage, industrial or trade waste or any other matter (likely to be injurious to health) into rivers, streams, water courses or the sea or to contaminate underground water.

The Public Health Regulations: Disposal of Offensive Matter (S.I 21/1978) regulates the disposal of “night soil”⁸⁰ on or about any beach and in the sea. It also restricts the discharge of effluent into the sea from public and private sewerage systems or septic tanks. The Public Health Regulations: Sewage and Disposal of Sewage and Liquid Industrial Waste

⁸⁰ Night Soil means human excreta.

Works (S.I 22/1978) prohibit the discharge of sewage and industrial and other liquid wastes into water course and coastal areas without the prior permission of the Public Health Board.

The Board may permit the discharge of such effluent if it is satisfied that the quantity is so small that dilution prevents nuisances or that the waste is treated to the satisfaction of the Board. The Regulations also empower the Board to grant permission in respect of the "... quality allowable of biological oxygen demand, suspended solids and other chemicals in any effluent to any stream, river, water courses etc...". The Regulations provide specifications with respect to the construction and siting of sewage treatment facilities. The penalties for non-compliance with the provisions of the Public Health Act and its Regulations are very limited and do not act as a deterrent to those persons who breach the legislative provisions.

The Water and Sewerage Act, No. 14 of 2005 is another legislative instrument of particular importance to the prevention, control and reduction of pollution of rivers and the marine environment. It is primarily concerned with the management and conservation of water resources as well as the regulation of the delivery of water supply and sewerage services. Section 2 defines "water" to include surface water, water in a river, spring, lake, ground and coastal waters. Section 7 of the Act empowers the Minister with responsibility for agriculture, where he is satisfied that any water resource⁸¹ is threatened, to take whatever measures are required to:

- Prevent any matter from entering the water.
- Remove or dispose of any matter from the water.
- Remedy or mitigate any pollution arising from matter in the water.

Where the Minister is satisfied that the discharge of waste⁸² on any land or into any sewer, drain, bore or water makes it necessary to regulate this discharge so as to protect that water resource, he is required under section 24 by Order, to declare the threatened resource a Waste Control Area. The Act prohibits the discharge of waste into a Waste Control Area or the use of water in a Water Control Area without a permit granted by the Minister. Contravention of this provision is a punishable offence.

⁸¹ Water Resources as defined in Section 2 of the Act includes any surface of any land upon which water is situated or is flowing; and any watercourse. Watercourse includes all rivers, streams, ditches, gullies, culverts, dykes and passages through which water flows, whether on the surface or underground, except water mains and sewers.

⁸² Waste as defined in section 2 of the Act includes any solid, liquid or gaseous material including but not limited to logs, bottles, tins, sawdust, derelict vehicles, cartons, plastic, paper, glass, food, animal remains, garbage, refuse, debris, gravel, stone, sand, dirt or sewage or other material which may cause pollution.

The Physical Planning and Development Act, No. 29 of 2002 empowers the Development Control Authority to regulate land use and development in the country. It also makes provision for the conduct of EIAs in respect of specified proposed developments. There is however a need for better monitoring of developments during the construction and operation phases to ensure that the mitigation measures prescribed by the EIA are incorporated into the development. The Pesticides and Toxic Chemicals Control Act, Cap. 11:15 regulates the use and handling of pesticides and toxic chemicals, but it is weak in that it does not provide any safeguards to prevent excess use of these substances or to protect rivers and the marine environment from the resulting impacts of excessive use.⁸³

It is evident that there is a multiplicity of laws that can potentially address Protocol-related issues. However, there is an absence of mandatory effluent limits, thus making prosecution under these legislative instruments more challenging. Compliance with the national standard for recreational water quality as stated earlier is voluntary. Enforcement of legislative provisions is fragmented among various agencies and is limited primarily as a result of human and financial constraints. It is apparent that the obligations of the Protocol are not sufficiently incorporated into the national legislative framework. A review of the legislative framework to harmonize provisions and identify gaps as relates to the Protocol would be beneficial. It should be noted that the Government has prepared an Environmental Management Bill of which Part III deals specifically with the issue of pollution. All efforts should be made to ensure prior to enactment, that the Bill is reflective of Saint Lucia's obligations under the Protocol, as far as is practicable.

Institutional Framework

The Department of Environmental Health is the principal entity responsible for regulating pollution of rivers and the marine environment in Saint Lucia through its governing legislation. Protocol-related responsibilities are spread across a range of agencies. The Water and Sewerage Company as well as various Government ministries have a supporting role to play in the prevention, control and reduction of pollution. The Ministry of Health is charged with the responsibility of reviewing and granting permission for proposed technology options in respect of sewage disposal. The Physical Planning Department ensures that proposed developments are compliant with the Building Code and other planning standards and regulations. As noted earlier, the Department of Environmental Health and the Ministry of Agriculture both conduct coastal water quality monitoring.

Importantly, Saint Lucia has established a Coastal Zone Management Unit (CZMU), which forms part of the SDE Division of the Ministry of Sustainable Development, Energy, Science

⁸³ Refer to fn. 66

and Technology. The CZMU is supported by a Coastal Zone Management Advisory Committee, which provides guidance and advice on integrated coastal zone management. The CZMU has a coordinating function and integrates the work programmes of the principal agencies involved in environmental management, including those responsible for physical planning, fisheries management, environmental health, agriculture, environment and forestry. This has resulted in these line agencies paying greater attention to coastal and marine considerations in the implementation of their work plans.

The CZMU has been successful in its efforts to mainstream coastal and marine protection considerations into the national development agenda and processes by establishing inter-sectoral committees that further coordinate and integrate the work programmes along sector lines. The SDE Division is the focal point for the Protocol in Saint Lucia and is therefore well placed to ensure that the requirements of the Protocol are integrated into the work plans of relevant agencies. The SDE Division is represented on the Board of the Development Control Authority (the entity charged with regulating land use) and reviews EIAs that are prepared in respect of proposed developments. Institutional strengthening through an injection of sustained human and financial resources would facilitate greater effectiveness of the efforts of the SDE Division and in particular, the CZMU and the line agencies in discharging their duties in relation to the Protocol.

Education, Training and Public Awareness Programmes

The North West Coast Water Quality Demonstration Project has a public awareness component geared specifically to recreational water quality. A draft environmental education policy and an accompanying strategy and work programme have been developed and are awaiting the approval of the Cabinet of Ministers. These potentially serve as platforms for the conduct of educational and public awareness interventions in respect of the Protocol and related issues. Training in sustainable land management has been conducted for various target groups including engineers, the construction sector and public servants.

Areas of the Protocol that are of Greatest Concern

The SDE Division has identified nutrient and wastewater management as the areas that are of greatest concern with regards to the Protocol.

Challenges Faced in Implementing the Protocol

The following have been highlighted by the SDE Division as the critical challenges faced in implementing the Protocol:

- Inadequate capacity of the implementing and supporting agencies to incorporate the requirements of the Protocol into their portfolios

- Insufficient water quality monitoring programmes
- Overlapping responsibilities of some agencies as regards the Protocol, which poses a challenge in determining which agency should be charged with the implementation of specific activities

Potential Assistance under the CReW to Overcome the Challenges to Implementation

The following are potential areas of assistance that may be provided under the CReW:

- Valuation of the economic impacts of pollution resulting from nutrients and wastewater
- Review of the legislative framework and drafting of amendments and new legislation as required, to rationalize the law, clarify roles and responsibilities of agencies as well as to ensure compliance with the Protocol
- Institutional strengthening of relevant agencies

It is submitted that assistance also be provided in respect of establishing a sustained and comprehensive water quality monitoring programme, including analysis of data collected to inform decision making and policy formulation. Also of benefit would be the provision of assistance in respect of public awareness and environmental education for various target groups.

Trinidad and Tobago



Assessment of the Status of River and Coastal Water Quality

Domestic, industrial, agricultural and commercial activities are the primary factors impacting the water quality of rivers and the marine environment in Trinidad and Tobago. The National Environmental Policy states that land-based activities have contributed to “...the impairment and loss of inland and coastal resources and ecosystems”.⁸⁴

The discharge of untreated and inadequately treated sewage effluent mainly from domestic sources, directly or indirectly into rivers or coastal waters, is a major source of pollution. This results from seepage from septic tanks and pit latrines as well as from non-functioning or ill-functioning treatment plants. Water sampling from rivers in built-up areas of Trinidad as well as those in the south-western part of Tobago usually show the presence of sewage. The results of a 2004 – 2005 research project on river quality revealed that all the rivers monitored exhibited bacteria levels “exceeding environmental limits for domestic, agricultural and recreational purposes”.⁸⁵ There is also evidence of sewage in the coastal waters in several areas of both Trinidad and Tobago.

The majority of package treatment plants are privately owned and these service residential, institutional, industrial and commercial developments.⁸⁶ These plants are for the most part, especially those servicing residential developments, non-functioning, ill-maintained or in an advanced state of disrepair and they discharge effluent into onshore coastal waters and

⁸⁴ Government of Trinidad and Tobago, 2005, *National Environmental Policy*, p.6; available at: <http://www.ema.co.tt>

⁸⁵ Refer to fn. 22, pg. 44

⁸⁶ The Water and Sewerage Authority (WASA) and the Ministry of Housing together operate approximately 36 sewerage systems while over 150 are operated by private sector entities.

even on to roads.⁸⁷ The public sector treatment plants, though generally better maintained than their private sector counterparts, are still not functioning optimally. The sewerage system in the country is characterized by aging infrastructure with replacement, upgrading and the adoption of new technologies not keeping pace with what is required to ensure a fully functioning and efficient system. Sewerage tariffs are too low to support the required injection of capital to modernize the public sewerage systems. In fact, the rates charges for sewerage services, is approximately half of the amount charged for water services.⁸⁸ Revision of the tariff is necessary to make the charges more reflective of the cost of providing the service.

There is an increasing level of industrial activity in the country with a commensurate increase in the level of pollution of rivers and coastal waters, resulting from the direct discharge of industrial waste into these receiving waters. This is most evident in the rivers that flow along the East to West Corridor and those that drain the western portion of Trinidad and the Steele River in Tobago.⁸⁹ Increasing levels of thermal pollution are also being realized. There is a general lack of environmental responsibility being exercised by the industrial entities. Oil exploration and production activities are also major contributors to pollution of riverine and coastal waters, especially in the south of Trinidad. An increasing use of chemicals and pesticides in agricultural production as well as the direct and indirect discharges of wastes from farms into rivers, especially during the dry season, are causing increasing levels of pollution of the receiving waters.

Clearing of hillsides for development and indiscriminate deforestation is resulting in increased run-off, especially during episodes of heavy rainfall, thus contributing to high levels of sedimentation of rivers and coastal waters. Seepage from the Beetham Dump is a potential source of pollution of coastal waters due to its location close to the coast. The absence of a toxic waste disposal site presents the potential for pollution of coastal waters from the indiscriminate dumping of such wastes.⁹⁰

Status of Implementation of the Protocol

Domestic Wastewater – Discharge and Effluent Standards

Trinidad and Tobago's receiving waters are divided into four (4) categories in accordance with Schedule II of the Water Pollution Rules (WPR), 2001. The categories are as follows:

⁸⁷ Refer to fn. 22

⁸⁸ Refer to fn. 24

⁸⁹ Environmental Management Authority, 2005, *Water Pollution Management Programme*, available at: <http://www.ema.co.tt>

⁹⁰ Refer to fn. 22

- (a) Environmentally Sensitive Areas and/or Groundwater
- (b) Inland Surface Waters
- (c) Coastal Nearshore Waters
- (d) Marine Offshore Waters

The Environmentally Sensitive Areas and/or Groundwater category is synonymous with Class I waters under Annex III of the Protocol, while categories (b) – (d) represent sub-categories of Class II waters. Tables 4 and 5 present a comparative analysis of the permissible levels under the WPR in relation to the requirements of Annex III, in respect of Class I and Class II waters, respectively.

TABLE 4: CLASS I WATERS - REQUIREMENTS UNDER ANNEX III AND PERMISSIBLE LEVELS UNDER THE WPR FOR ENVIRONMENTALLY SENSITIVE AREAS

Parameter	Effluent Limit Under Annex Iii	Permissible Levels For Environmentally Sensitive Areas Under the WPR
Total Suspended Solids	30 mg/l	15 mg/l
Biochemical Oxygen Demand (BOD ₅)	30 mg/l	10 mg/l
pH	5-10 pH units	6-9 pH units
Fats, Oil and Grease	15 mg/l	No Release
Faecal Coliform (Parties may meet effluent limitations either for faecal coliform or for E. coli (freshwater) and enterococci (saline water).)	Faecal Coliform: 200 mpn/100 ml	Faecal Coliform: 100 mpn/100 ml
Floatables	Not Visible	No Solid Debris

TABLE 5: CLASS II WATERS - REQUIREMENTS UNDER ANNEX III AND PERMISSIBLE LEVELS UNDER THE WPR FOR THE VARIOUS CATEGORIES OF CLASS II WATERS

Parameter	Effluent Limit Under Annex III	Permissible Levels For Inland Surface Water Under the WPR	Permissible Levels For Coastal Nearshore Water Under the WPR	Permissible Levels For Marine Offshore Water Under the WPR
Total Suspended Solids	150 mg/l	50 mg/l	150 mg/l	200 mg/l
Biochemical Oxygen Demand (BOD ₅)	150 mg/l	30 mg/l	50 mg/l	100 mg/l
pH	5-10 pH units	6-9 pH units	6-9 pH units	6-9 pH units
Fats, Oil and Grease	50 mg/l	10 mg/l	15 mg/l	100 mg/l
Floatables	Not Visible	No Solid Debris	No Solid Debris	No Solid Debris

The effluent standards adopted by Trinidad and Tobago in respect of Class I waters are much stricter than the requirements under Annex III. With respect to Class II waters, the permissible levels for Inland Surface Water and Coastal Nearshore Waters under the WPR are also more stringent as well, with the exception of Total Suspended Solids in respect of Coastal Nearshore Waters, which equals the requirement under Annex III. The permissible levels under the WPR for marine offshore waters are above those stated in Annex III in respect of Total Suspended Solids and Fats, Oil and Grease.

Policies, Programmes, Plans and other Relevant Interventions

There is a vast array of policies, programmes and plans that are relevant to the implementation of Protocol-related activities. These include the following:

- National Environmental Policy, 2005
- Integrated Water Resources Management Policy, 2005
- National Forest Policy, 2011
- National Wetland Policy, 2002
- Protected Areas Policy

- Climate Change Policy
- National Wetland Conservation Programme, 2002
- Coastal Zone Management Policy
- Quarrying Policy
- Water Pollution Management Programme, 2005
- National Programme of Action for the LBS Protocol, 2004
- Vision 2020 National Strategic Plan, 2005
- National Plan of Action to Combat Land Degradation
- National Integrated Waste Management Plan
- National Biodiversity Strategy and Action Plan
- Water and Wastewater Master Plan
- National Physical Development Plan

In 2004, an Inter-Ministerial Committee led by the Institute of Marine Affairs (IMA) was established to coordinate the development of a National Programme of Action (NPA) in respect of the Protocol. The NPA together with a Local Programme of Action have been prepared to guide the implementation of the activities under the Protocol in Trinidad and Tobago. The National Environmental Policy (NEP) is the overarching policy statement in the country in respect of environmentally sustainable development, and is complemented by various sector-oriented policies. It is a comprehensive document that embraces both the polluter pays and the precautionary principles. It contains several provisions that are of direct importance to the implementation of Protocol-related activities, including the prevention and reduction of all forms of pollution and more specifically, reduction of pollution of the marine environment from land-based sources.

The NEP advances that all industries should establish certified environmental management systems and that all sewage effluent should be sufficiently treated prior to being discharged into receiving waters to maintain their integrity. It recognizes the need for integrated water resource management and for protection for the country's forests. All public sector agencies are required by the Environmental Management Act, 2000 (EM Act) to discharge their duties having regard to the NEP.

The Environmental Management Authority (EMA) in accordance with its mandate under the EM Act developed a Water Pollution Management Programme.⁹¹ This programme incorporates the polluter pays and precautionary principles and provides that pollution will be controlled through permits that set pollution limits or performance standards. It also

⁹¹ This programme is available at: <http://www.ema.co.tt>

provides for water pollutant registration, the adoption of best management practices, water quality standards, watershed-based approaches to water pollution management as well as laboratory registration and certification. The Water Pollution Management Programme is currently being revised by the EMA.

The Vision 2020 National Strategic Plan is geared towards the attainment of “developed nation” status by 2020 and presents a pathway through which this will be realized. It identifies a number of environmental issues that need to be addressed, including pollution from untreated domestic wastewater, industrial effluent as well as inadequate enforcement of environmental legislation. The development of the Water and Wastewater Master Plan presents a framework for improving the country’s water and wastewater infrastructure through, for example, rehabilitation, reconstruction and new construction.

The Government of Trinidad and Tobago in November 2011 entered into a loan agreement with the IDB for the sum of US\$50 million to support the Water and Sewerage Authority (WASA) Modernization and Wastewater Infrastructure Rehabilitation Programme, which is aimed at improving water quality. Implementation of the five-year programme has commenced and targets the rehabilitation and integration of a number of abandoned or malfunctioning wastewater treatment plants and sewerage networks from the capital Port-of-Spain to Arima.⁹² It is expected that on completion of the programme, the level of pollution in several rivers will be reduced to reflect compliance with the permissible levels stipulated in the WPR.

Projections are that, while approximately nine thousand (9,000) households that are at present affected by inadequate wastewater management will benefit directly from the intervention, the wider urban population of the country will also benefit from improved water quality.⁹³ Importantly, the programme will also provide for water quality monitoring and training of persons on the modalities for operating and maintaining the rehabilitated infrastructure. Other activities that may potentially be undertaken under the programme include the development of wastewater management plans as well as the development and implementation of public awareness programmes.⁹⁴ In 2008, the IDB also provided technical assistance to the Government of Trinidad and Tobago to review the strategic vision of the water sector. This was followed in 2009 by the provision of further assistance for the preparation of a wastewater rehabilitation programme.

⁹² IDB, 2011, *Trinidad and Tobago to improve water quality with \$50 million loan from the IDB*, available at: <http://www.iadb.org/en/news/news-releases/2011-10-27/water-treatment-plants-trinidad-and-tobago,9645.html>

⁹³ Refer to fn. 92

⁹⁴ Refer to fn. 92

The National Water Resources Management Policy represents the policy framework for water management in Trinidad and Tobago and embraces the polluter pays and precautionary principles. It provides for the restoration of coastal areas and wetlands and encourages planning to be carried out on a watershed-based level. Watershed management proposals include measures aimed at reducing non-point sources of pollution in particular, agricultural run-off and effluent from septic tanks and other systems.⁹⁵ The Coastal Zone Management Policy advocates an integrated approach to coastal zone management. The National Forest Policy and Plan take into account the importance of other sector policies and programmes in facilitating the sustainable management of forests, for example, the Protected Areas Policy, Quarrying Policy and the Climate Change Policy. Efforts are being made to remove any conflicts among those policies and programmes, whether existing or proposed as relates to the management of forests. The National Forest Policy applies to forests whether on State or private lands.

The requirements of water quality monitoring are specified in Water Pollution Permits and in approvals granted under the Certificate of Environmental Clearance (CEC) Rules, 2001. The EMA is empowered under the WPR 2001 to issue Water Pollution Permits where a person releases a water pollutant into a receiving environment⁹⁶ outside the permissible levels specified in Schedule II of the Rules, and which is likely to cause harm to the environment or human health. The permit shall not be valid for a period exceeding five years and the conditions may be varied or the permit suspended or revoked by the EMA. The permit shall specify, *inter alia*, the water pollutant and volumes that are authorized to be released, the location where sampling of the release must be performed as well as the duty to keep water quality monitoring records. Where the permit holder is in non-compliance with the conditions of his/her permit, the EMA may carry out an inspection of the facility and the records, and conduct sampling of the pollutants being released.

Monitoring requirements may also be specified in Certificates of Environmental Clearance, which are issued by the EMA in accordance with the Certificate of Environmental Clearance (CEC) Rules. CECs are required in respect of designated activities, which are specified in the Schedule to the Certificate of Environmental Clearance (Designated Activities) Order, Cap. 35:05. These rules cover a wide range of activities and include agricultural (including animal husbandry), industrial and manufacturing, land reclamation and dredging activities as well as the establishment of facilities for sewage treatment and solid waste disposal. The EMA has an Environmental Police Unit comprising special reserve police officers who are charged

⁹⁵ Refer to fn. 22

⁹⁶ "Receiving Environment" as defined in the WPR means environmentally sensitive areas and /or groundwater, inland surface waters, nearshore coastal waters and marine offshore waters.

with enforcement of the provisions of the EM Act and CEC Rules and other legislative instruments made under the Act. They are also empowered to enforce compliance with the conditions of Water Pollution Permits and CECs.

While there is no reuse of domestic wastewater, this is being addressed. WASA is in the process of determining the opportunities for the reuse of domestic wastewater from the Beetham Wastewater Treatment Plant which was constructed in 2004 and handles about twenty (20) million gallons of wastewater on a daily basis. The potential exists for using the wastewater for industrial cooling at the La Brea, Point Fortin and Point Lisas Industrial Estates.⁹⁷ WASA has developed standards to inform the pre-treatment of industrial discharges for its customers that are connected to its sewers, but compliance with these is voluntary.

With respect to the prevention, reduction or controlling of non-point sources of pollution, the EMA in 2011, developed a National Non-Point Source (NPS) Pollution Management Programme. This programme was established in recognition of the fact that the WPR focuses principally on point sources of pollution and does not provide for non-point sources and it is intended to complement the WPR. The goal of the programme is to protect the country's waters "...from further NPS pollution and restoring water quality through scientific assessment, implementation of voluntary and control measures based on these assessments, and public education and awareness initiative on NPS pollution."⁹⁸ The EMA has undertaken preliminary work towards the development of both economic and non-economic incentives for the reduction of water pollution from both point and non-point sources, on a voluntary basis. The Institute of Marine Affairs serves as an information centre and collects and disseminates information of relevance to entities responsible for the protection of the marine environment not only in Trinidad and Tobago, but in the Caribbean and adjacent regions.

Legislative and Regulatory Framework

There are several legislative instruments that have some relevance either directly or indirectly to the implementation of Protocol-related activities. These include the following:

- Environmental Management Act, Cap. 35:05.
- Water Pollution Rules, 2001.
- Water Pollution (Amendment) Rules, 2006.
- Certificate of Environmental Clearance (Designated Activities) Order, Cap. 35:05.

⁹⁷ Refer to fn. 22

⁹⁸ EMA's response to the interview schedule in Annex I to this report.

- Certification of Environmental Clearance Rules, 2001.
- Public Health Ordinance, Cap. 12, No. 4.
- Water and Sewerage Act, Cap. 54:40.
- Town and Country Planning Act, Cap. 35:01.
- The Municipal Corporation Act, 1990.

The EM Act (sections 52-54) provides expressly for the prevention, reduction and control of water pollution in Trinidad and Tobago. The EMA is mandated to prepare and implement a water pollution management programme and has broad powers in relation to the issue of permits “...to authorize any process releasing water pollutants subject to such terms and conditions as it thinks fit. The terms and conditions of a permit may relate to the design, construction, operation, maintenance, and monitoring of the facilities and processes releasing water pollutants”.⁹⁹ Section 54 of the EM Act prohibits any person from releasing or causing to be released a water pollutant into the environment, which violates any standards, conditions or permits under the Act. The Minister with responsibility for environmental management is authorized to make rules to regulate the quantity, condition or concentration of pollutants or substances containing pollutants that may be released into the environment.

Section 21 of the EM Act provides for the appointment of inspectors who have powers of entry in respect of, *inter alia*, monitoring compliance with standards, conditions of permits and for taking samples for laboratory testing. Importantly as well, Section 34 mandates the EMA to develop, promote and implement incentive programmes aimed at encouraging the voluntary adoption of effective management systems. The CEC Rules make provision for the conduct of EIAs. The disposal of sewage and waste is regulated primarily through the Municipal Corporation Act, the Public Health Ordinance and the Water and Sewerage Act. WASA is responsible under the Water and Sewerage Act for the water supply of the country as well as for the public sewerage systems. The Town and Country Planning Act provides for the regulation of land use and development.

While there are important legislative provisions in Trinidad and Tobago that may support implementation of the Protocol, their effectiveness is limited by inadequate monitoring and enforcement. In addition, the legal regime could be more responsive to water pollution issues through periodic reviews and consequent amendments of legislation or drafting of new instruments as required.

⁹⁹ Section 53 (1) and (2) of the EM Act

Institutional Framework

The EMA has primary responsibility for regulating pollution of riverine and coastal waters and was established in 1995 by the EM Act. Its role with respect to EIAs, the issuance of permits and certificates of environmental clearance has been discussed in earlier sections of the country assessment. It is also charged with, *inter alia*, coordinating the environmental activities in the country, developing and enforcing environmental standards, implementing environmental education and public awareness programmes as well as taking all appropriate action to prevent and control pollution.

WASA was incorporated in 1965 and is required among others, to maintain and develop the existing sewerage system as well as construct and develop further sewerage works as it deems necessary. The Water Resources Agency which is appended to WASA, is responsible for the promotion of water conservation, development and protection and undertakes water monitoring aimed at deriving data on the quality and quantity of surface and groundwater resources.¹⁰⁰ A Steering Committee has been appointed by the Government under the chairmanship of the Board of Commissioners of WASA for monitoring the implementation of the National Water and Wastewater Master Plan.¹⁰¹

The Ministry of Health is responsible for the health portfolio of the country and for addressing health concerns arising from polluted surface, ground and recreational waters. The Institute of Marine Affairs is charged with a broad range of functions, including the conduct of research on the marine environment as well as serving as a repository of coastal and marine information. There are several other institutions that have a role to play in the implementation of the Protocol, including the ministries with responsibility for food production, forestry, works and transport, planning, industry, marine resources and lands, as well as entities such as the Integrated Coastal Zone Management Steering Committee of Trinidad and Tobago.

Education, Training and Public Awareness Programmes

The Corporate Relations and Public Education Department of the EMA is actively involved in the conduct of environmental education and public awareness programmes on various issues, including water pollution. Its programmes target a wide range of audiences, including educational institutions, non-governmental and community-based organizations, clubs, the business community and the general public. It also offers lectures and workshops. The Institute of Marine Affairs also implements environmental education and public awareness programmes in respect of the marine environment.

¹⁰⁰ Refer to: <http://www.wasa.gov.tt>

¹⁰¹ Refer to fn. 22

Areas of the Protocol that are of Greatest Concern

The EMA¹⁰² has identified the following as being of greatest concern in respect of the Protocol:

- Monitoring, Evaluation and Assessment Programmes
- Development of Information Management Systems
- Transboundary Pollution
- Education and Awareness

Challenges Faced in Implementing the Protocol

The primary challenges faced in the implementation of the Protocol are:

- Funding for the industry to improve and install pollution technologies.
- Effective monitoring and enforcement.
- Lack of a designated competent authority to guide implementation of Protocol-related activities.

Potential Assistance under the CReW to Overcome the Challenges to Implementation

The CReW can potentially assist the country in overcoming the challenges that it faces in respect of implementation of the Protocol through the following:

- Provision of “easy” financial arrangements to assist industries in upgrading their treatment technologies to ensure compliance with the Protocol and legislative requirements
- Assistance in enhancing the monitoring and enforcement frameworks
- Assistance in developing public awareness programmes
- Review of the legislative and regulatory framework

¹⁰² The EMA is the focal point for the implementation of the LBS Protocol in Trinidad and Tobago

PART III

ASSESSMENTS OF COUNTRIES THAT HAVE NOT ACCEDED TO THE PROTOCOL



7.0 Introduction to Country Assessments

This part of the report presents an assessment of those countries that have not acceded to the Protocol, namely Barbados, St. Vincent and the Grenadines and Suriname. The assessment for each country includes the following:

- (a) An assessment of the status of river and coastal water quality
- (b) Areas relating to the Protocol that are of greatest concern
- (c) The main stumbling blocks to ratification
- (d) A list of areas where the CReW can assist in moving the accession process forward
- (e) Recommended steps to be taken to accede to the Protocol
- (f) The legal implications of acceding to the Protocol are discussed in section 4 of this report.

Barbados



Assessment of the Status of River and Coastal Water Quality

There are two sewage treatment plants in the country, which are operated by the Government, the first being in Bridgetown and the other in Graeme Hall, on the south coast, both of which discharge effluent into the sea.¹⁰³ Some hotels on the west coast of the country also operate sewage treatment plants. Wastewater from residential and commercial entities generally goes through a process of preliminary treatment involving the separation of solids from liquids, with final disposal being underground by way of septic tanks, sanitary latrines or wells.¹⁰⁴ Industrial wastewater is for the most part untreated and this, coupled with the inadequate treatment of both domestic and commercial wastewater, is negatively

¹⁰³ Approximately two (2) million gallons of treated wastewater is discharged from the Bridgetown Plant daily – refer to fn. 22.

¹⁰⁴ Refer to fn. 22

impacting the quality of coastal and marine waters as evidenced by coastal ecosystem degradation. The Environmental Protection Department (EPD) indicates¹⁰⁵ that inadequately maintained, operated and aging wastewater treatment systems together with a lack of tertiary treatment facilities are primarily responsible for the inadequate treatment of domestic and commercial wastewater in Barbados. There is some reuse of domestic wastewater at hotels and golf courses for irrigation purposes.

The inadequate disposal of agricultural wastewater and manure as well as the increasing use of chemicals in the industrial and transportation sectors are also affecting coastal and marine water quality. The country generates a high level of solid waste and illegal dumping increases storm water runoff and leaching, which results in adverse impacts on coastal ecosystems. The EPD states that there is a general lack of data relating to land-based sources of marine pollution.

Areas of the Protocol that are of Greatest Concern

Although the Government of Barbados has not acceded to the Protocol, it has made significant strides in addressing related issues. National effluent limits in respect of domestic wastewater have been adopted and applied to applications for development in the country. The standards are consistent with those specified in Annex III and the waters are classified based on the seaward boundary.¹⁰⁶

The Marine Pollution Act of 1998 provides for the establishment of discharge standards in respect of wastewater into groundwater and the marine environment. These standards will be listed in a Table of Prohibited Concentrations, a draft of which has been prepared. This will place a requirement on industrial entities that discharge effluent to install systems to ensure compliance with the standards. The legislative framework is, however, weakened by the fact that these standards do not at present form part of regulations. Under the Town and Country Planning Act, Cap. 240, EIAs may be required as part of the planning approval process for proposed developments. The Coastal Zone Management Act, Cap. 394 establishes the Coastal Zone Management Unit and provides for the protection of the marine environment. In general, however, the legal framework is inadequate to fully support implementation of Protocol-related activities.¹⁰⁷ Pollution prevention standards must form part of the legal regime, thus making them enforceable.

¹⁰⁵ The EPD's response to the questions in Annex II to this Report. The EPD forms part of the Ministry of the Environment, Water Resources and Drainage and is the Focal Point for the Protocol.

¹⁰⁶ The seaward boundary is described as the depth equivalent to the 100m bathymetry line of 200m seaward of the bank reef -refer to fn. 105

¹⁰⁷ Refer to fn. 105

Since the 1970s, the EPD has been conducting a water quality monitoring programme, which includes monitoring of nearshore waters. Sampling is carried out weekly at nineteen (19) beaches along the north and south coasts. Nearshore waters are analyzed for enterococci and faecal coliform organisms. In addition, data are collected in respect of, *inter alia*, the temperature and state of the waters as well as the amount of debris on the beach and in the nearshore waters. However, it is not possible to use the findings of the monitoring exercises to inform an assessment of the water quality for purposes of this report, as the data are not available for public use.¹⁰⁸

Assessments are carried out on wastewater treatment plants during the construction phase, followed by annual random monitoring in respect of effluent quality, general sanitation and maintenance as well as record keeping. Wastewater samples are analyzed in respect of the following:¹⁰⁹

- Biochemical oxygen demand
- Biochemical oxygen demand removal rate
- Total suspended solids
- Volatile suspended solids

There are myriad existing policies, strategies and programmes that support the prevention, reduction and control of marine pollution. These include, but are not limited to the following:

- (a) Sustainable Development Policy
- (b) Medium-Term Strategy 2010 – 2014
- (c) Draft Policy Framework for Water Resources Development and Management
- (d) National Programme of Action for Land-Based Sources of Marine Pollution
- (e) Groundwater Protection Zoning Policy
- (f) Revised Policy of Private Sewerage and Waste Water Disposal Systems

The Government provides incentives to the tourism sector in respect of wastewater treatment in the form of rebates under the Tourism Development Act, Cap. 341 and the Income Tax Act, Cap. 73. The Ministry of Agriculture also provides incentives to farmers to adopt sustainable farming techniques. This is complemented by the incentives provided by

¹⁰⁸ Refer to fn. 105

¹⁰⁹ Government of Barbados, Environmental Protection Department, 2012, *Water Quality*. Available at: <http://www.epd.gov.bb/category.cfm?category=12>

the Barbados Investment Development Corporation to businesses to encourage the use of sustainable and clean technologies in agricultural production and agro-processing industries.

There are plans to construct and upgrade some of the sewage treatment plants in the country. A new sewage treatment plant will be constructed on the west coast and the existing plants in Bridgetown and the south coast will be upgraded. A Stormwater and Groundwater Assessment Project is planned which will assess the level of pesticides and pharmaceuticals present in storm and groundwater as well as the amount of pesticides found in benthic organisms.

There are four (4) entities that are principally charged with regulating pollution of rivers and coastal waters:

- Environment Protection Department and the Drainage Division of the Ministry of the Environment, Water Resources and Drainage
- Coastal Zone Management Unit
- Barbados Water Authority

The institutional framework is, however, inadequate to fully support implementation of the activities in respect of the Protocol because of inadequate human and financial resources and technical support.¹¹⁰ These constraints also affect the ability to properly maintain monitoring equipment. There is a need for greater integration of Protocol-related activities into national programmes, strategies and work plans. There are ongoing education and public awareness programmes that can potentially support implementation of the Protocol, for example, the Marine Litter Monitoring Programme. However, there is a need to train the staff charged with the implementation of such programmes, in new technologies.

The above clearly indicates that the Government of Barbados has undertaken a significant amount of work that can potentially contribute to the prevention, reduction and control of pollution of the marine and coastal environments. There are, however, some constraints that have to be addressed, and these include:

- Inadequate financing for the maintenance of wastewater treatment systems.
- Lack of human resources both in terms of numbers and expertise to conduct monitoring and maintenance.
- Inadequate treatment of domestic wastewater.
- The exorbitant costs associated with the installation of wastewater systems primarily as a result of the wide spatial distribution of the population.¹¹¹

¹¹⁰ Refer to fn. 105

¹¹¹ Refer to fn. 11

- Inadequate legislative and institutional frameworks.

The greatest area of concern to the Government of Barbados as relates to acceding to the Protocol is ensuring compliance with the domestic wastewater treatment and agricultural obligations.¹¹²

Identification of the Stumbling Blocks to Accession

The main stumbling blocks to the Government of Barbados' accession to the Protocol are the slow pace of implementation of related activities and more fundamentally, a misunderstanding at the policy level of the benefits to be derived under the Protocol and the repercussions for non-compliance. There may be a perception that the country's existing policies are not in harmony with the provisions of Annexes III and IV of the Protocol.

Potential Assistance under the CReW to Assist in Accelerating the Accession Process

The following have been identified as areas where the CReW can provide support to the Government of Barbados in the process of acceding to the Protocol:¹¹³

- Training relevant staff
- Providing financial support for relevant projects
- Determining the main impacts of domestic wastewater discharges on groundwater and the marine environment
- Conducting a review of the legislative and regulatory framework
- Drafting an Environmental Management Act and other pertinent legislation
- Providing clear legislative guidance on the drafting of wastewater legislation
- Strengthening capacities of the laboratories
- Institutionalizing technical training for core disciplines
- Strengthening the skills and knowledge of operators and inspectors of wastewater and related facilities
- Improving the understanding of the short-, medium- and long-term impacts of wastewater on the environment
- Developing mechanisms aimed at facilitating the payment by individuals for wastewater treatment
- Providing guidance on the development of a wastewater permit system
- Preparing regulator inspection guidance manuals for wastewater treatment plants by type and size

¹¹² Refer to fn. 105

¹¹³ As identified by the Environmental Protection Division

Recommended Steps to be taken for Acceding to the Protocol

All the necessary preparatory work for acceding to the Protocol has been concluded, including a draft Cabinet Paper for submission to the Cabinet of Ministers. The decision is still being awaited. It may be timely to conduct sensitization meetings for the Ministers of Government relating to the Protocol, stressing the benefits to be derived as well as highlighting the fact that there are no sanctions for non-compliance with the provisions of the Protocol. It should also be underscored that Protocol-related activities are already being addressed as part of the day-to-day operations of the relevant institutions. This sensitization for the Government should be complemented by campaigns aimed at increasing awareness among various target groups, including developers, public and private sector personnel, non-governmental organizations (NGOs) and civil society.

St. Vincent and the Grenadines



Assessment of the Status of River and Coastal Water Quality

Sewage from all sources including households, hotels and other commercial properties is primarily disposed of and treated by way of septic tanks and soak-away systems. Central Kingstown is the only sewered part of the country, except for a smaller area in Arnos Vale, which is located close to the capital city. The sewer system, which was constructed about forty years ago, comprises approximately 5.8 km of sewer lines that flow into a collection tank with a capacity of 54,000 gallons. The condition of this tank is fair to poor and requires significant refurbishment.

The sewage from the collection facility is not treated before being disposed of by way of a marine outfall of 4,800 feet in length. This outfall needs to be repaired as it has numerous cracks and a break along its length. This situation results in raw sewage being disposed of within one hundred (100) feet of the nearest bay. It does not appear, however, that this has

resulted in significant coastal or marine pollution primarily because of the depth of the outfall at the point of the break and the high dilution factor of discharging the sewage.¹¹⁴

The south coast supports a very dense population and there are several hotels along the beaches. The septic tanks and soak-away systems used by the hotels tend to create challenges as sewage from seepage is discharged untreated into the sea. Additionally, grey water as a matter of routine is discharged via storm drains directly into the sea. These occurrences have led to pollution of the coastal and marine environments as evidenced from the impacts on aquatic life, in particular, corals. There is also concern as to the safety of the waters along the south coast for recreational purposes.¹¹⁵ Rivers and coastal waters are impacted also by agricultural non-point sources of pollution and deforestation activities. Monitoring of these impacts is proving to be a major challenge. Only a small quantity of industrial waste is being generated and it does not appear to be a pollution threat. The indiscriminate dumping of solid waste is, however, adversely affecting coastal ecosystems.

There is no sustained water quality monitoring programme being implemented. Notwithstanding, the Environmental Health Department¹¹⁶ undertakes some level of monitoring of recreational waters but this does not extend to rivers. In 2012, a request was made by the Government of St. Vincent and the Grenadines to the Pan-American Health Organization (PAHO) to assist in the assessment of the status of the sewage disposal system in Kingstown. A field assessment was undertaken and the report is being awaited.

Areas of the Protocol that are of Greatest Concern

There are no enforceable water quality standards in St. Vincent and the Grenadines and neither is there any classification of the waters. The legislative framework is not adequate to support the implementation of Protocol-related activities. There is no comprehensive legislation in respect of wastewater management and the existing provisions tend to be weak, sectoral in nature and for the most part, outdated. In addition, enforcement is weak and compliance is therefore generally voluntary. The Environmental Health Services Act, No. 14 of 1991 is of particular relevance to Protocol-related issues. It empowers the Environmental Health Department to investigate and institute preventive and remedial measures in respect of environmental pollution as well as to collect and collate relevant data.

¹¹⁴ Refer to fn. 22

¹¹⁵ Refer to fn. 22

¹¹⁶ Ministry of Health, Wellness and the Environment

An Environmental Management Bill was drafted in 2009, which provides for the establishment of a Department of the Environment, with responsibility for the prevention and control of both land-based and marine pollution. The Bill also provides for the development of pollution standards as well as for, *inter alia*, the establishment of a monitoring system. The Bill has not yet been enacted. Notwithstanding, two sets of regulations have already been drafted under the Bill:

- (a) The Environmental Management (Pollution) Regulations
- (b) The Effluent Protection (Effluent Limitation) Regulations

The latter prescribes effluent limits in respect of various types of industrial activity as well as commercial activities. The standards¹¹⁷ are generally consistent with those in Annex III of the Protocol as relates to Class I waters, with the exception of the BOD limit which under the proposed regulations is 50 mg/l, as opposed to 30 mg/l under the Protocol. The proposed BOD limit is, however, well within the limit specified in Annex III for Class II waters (that is, 150 mg/l). The Draft Environmental Management (Pollution) Regulations provide for the development, promotion and implementation of incentives aimed at encouraging the voluntary use of effective management systems as well as improvements in environmental quality.

The Town and Country Planning Act, 1992 provides for the preparation of EIAs in respect of specified environmentally sensitive proposed developments. However, compliance with the mandated mitigation measures is usually voluntary as the monitoring and enforcement capabilities are weak. Draft Environmental Impact Assessment Regulations have been prepared under the Town and Country Planning Act. Although it has been three years since these legislative instruments were drafted, none of them is in force at this time. While this is unfortunate, it provides an opportunity for the review and amendment of the proposed legislation to ensure that they incorporate the country's obligations under the Protocol.

There are broad policies, strategies and plans that can potentially directly and indirectly contribute to the prevention, reduction and control of marine pollution. These include:

- National Economic and Social Development Plan: 2010-2025.
- National Environmental Strategy and Action Plan: 2004-2006.
- Integrated Forest Management Programme: 2002.

¹¹⁷ These standards will apply to industrial activities other than food and fish processing, poultry and brewery industries; as well as to commercial activities. Separate standards are proposed in respect of food and fish processing, poultry and brewery industrial activities.

- The programme of activities related to the Global Plan of Action for the protection of marine resources from land-based sources of pollution.
- Draft National Physical Development Plan: 2002-2022.

The Ministry of Health, Wellness and the Environment and the Central Water and Sewerage Authority are the principal institutions responsible for wastewater management and for regulating coastal and marine pollution. A National Environmental Advisory Board (NEAB) was appointed by the Cabinet of Ministers to coordinate the activities being undertaken by the sectoral entities with an environmental portfolio. The Board comprises persons from these entities and reports to the Cabinet of Ministers. Notwithstanding, the institutional framework is at present constrained by insufficient human, financial and technical resources.

There is generally no reuse of domestic wastewater in St. Vincent but this is not the case in the Grenadines, where hotels with sewage package plants generally use the treated effluent for irrigation purposes. There are on-going public awareness and education programmes in relation to pollution generally, but none that is specifically geared towards the Protocol. In addition, these programmes tend to focus primarily on the human health aspects of pollution.

The greatest concern with respect to the Protocol is the availability of the requisite human, financial and technical resources to put in place the necessary infrastructure and frameworks to support implementation of the required activities and to comply with the obligations. It is evident that implementation of activities related to the Protocol in St. Vincent and the Grenadines will require, *inter alia*, addressing the gaps and shortcomings in the legislative and institutional frameworks, establishing a sustainable water quality monitoring system, ensuring that effluent limits are enforceable as well as upgrading the wastewater infrastructure.

Stumbling Blocks to Accession

The main stumbling blocks to the Government of St. Vincent and the Grenadines acceding to the Protocol are as follows:

- The obligations are perceived to be numerous and the existing human, financial and technical resources are already stretched thinly, so that the capacity required to implement the Protocol is not available.

- St. Vincent and the Grenadines is party to over sixteen (16) MEAs¹¹⁸ and the country already has a vast number of obligations to satisfy with limited resources.
- Acceding to the Protocol has not been deemed by the policy makers to be a national priority.

Potential Assistance under the CReW to Assist in Accelerating the Accession Process

The following are an indication of some of the areas where the can assist in providing support to the Government of St. Vincent and the Grenadines in the process of acceding to the Protocol:

- Conducting a comprehensive analytical review of the existing legislative framework having regard to the provisions of the Protocol
- Reviewing the existing draft legislation and provide support for their amendment if required and subsequent enactment
- Assisting in the drafting of other pertinent legislation
- Enhancing enforcement capacity and capabilities
- Assisting in the development and/or finalization of relevant draft policies and strategies
- Conducting a review of the existing institutional framework
- Conducting a skills audit and assisting in the provision of required training to relevant staff
- Providing training in new technologies
- Assisting in the establishment of water quality monitoring and data management systems
- Determining the current status of water quality of coastal and marine waters
- Providing assistance for the development of a public awareness and education programme directed at preventing, reducing and controlling pollution of the marine environment from land-based sources and activities

¹¹⁸ Global Environment Fund - Small Grants Programme, 2007, *Country Programme Strategy: 2007-2010*. Available at: www.boecs.org/sgp/documents/cps/cps_svg

Recommended Steps to be Taken for Acceding to the Protocol

The recommended steps are outlined in section 8.o. In addition, it is imperative that support be provided under the CReW to assist the Government of St. Vincent and the Grenadines in establishing the requisite infrastructure in preparation for acceding to the Protocol. Without such assistance, it will be difficult to accelerate the process towards accession.

Suriname

Assessment of the Status of River and Coastal Water Quality

The main factors contributing to the pollution of rivers and the marine environment are domestic and industrial wastewater, agricultural and mining activities, contaminated rain water runoff, as well as wastewater from laboratories, hospitals and mortuaries, the latter being discharged untreated into the surface water. Wastewater and sewage from the City of Paramaribo are discharged into the Saramacca Canal and the Suriname River by means of floodgates and pumping stations. Twenty-five (25) sluices and/or pumping stations service the Greater Paramaribo area and a part of the domestic sewage is treated by way of septic tanks, the effluent from which discharges into the street sewer. The sewer system is in dire need of repair, is prone to clogging especially after heavy rains and does not appear to be functioning properly.¹¹⁹

Effluent from a section of northern Paramaribo is pumped directly into the sea. The volume of domestic wastewater flow that is discharged in the coastal waters is approximately 0.7 cubic meters per second.¹²⁰ Septic tanks with filter beds of crushed blocks are, according to the Building Code of Paramaribo, the preferred form of sewage disposal. Contamination of the soil, however, occurs as a result of defects in design specifications and the absence, in instances, of septic tank bottoms or filter beds. The filter beds drain into ditches or the public sewer system. However, during periods of heavy rainfall, there is contamination of surface waters by wastewater, which has received either little or no treatment.¹²¹ Eighty-six (86) per cent of households in Greater Paramaribo are served by septic tanks, with the remaining fourteen (14) per cent using pit latrines.

The septic tanks and pit latrines are emptied when necessary by municipal sewage tankers and the effluent is discharged into the Suriname River at a site designated by the

¹¹⁹ CEPIS et al, 1998, *Sectoral Analysis of Drinking Water Supply and Sanitation in Suriname, Paramaribo – Plan Regional de Inversiones en Ambiente y Salud, Serie Análisis, No. 1.* Available at: <http://www.bvsde.paho.org/muwwww/fulltext/analisis/suriname/suriname.html>

¹²⁰ Cimab, 2010, *Baseline Analysis on Domestic Wastewater Management in the Wider Caribbean Region*, UNEP-CEP Technical Report 55.

¹²¹ Refer to fn. 119

Government. However, when the road to the site is unmotorable, the sludge is dumped in ditches along the road, which poses health and environmental risks.¹²² Grey water from a variety of sources including laundry and kitchen wastes is discharged untreated into the street sewer.

The problems experienced in Paramaribo are similar to those in other coastal areas, in particular, Nieuw Nickerie, Moengo and Albina. In the rural areas, sewage disposal is primarily by way of pit latrines. The University of Suriname is exploring the potential for using artificial wetlands for domestic wastewater treatment.¹²³

Areas of the Protocol that are of Greatest Concern

The Government of Suriname has not acceded to either the Cartagena Convention or the Protocol. There is a lack of policies with respect to wastewater management in the country. While there is a national development plan, wastewater management does not feature as an area requiring priority attention. A Presidential Committee has, however, been established. It is responsible for formulating a policy aimed at the prevention of mercury pollution of rivers in Suriname. The linchpin of this policy will be the adoption of mercury-free gold mining techniques. While there is no sustained water quality monitoring being conducted at present, a programme is being planned which will focus on developing a baseline analysis of the water quality of the Suriname River. The Ministry of Agriculture will be implementing various programmes in respect of the safe and proper use of pesticides as well as alternative agricultural techniques, including the use of compost. The programmes will target farmers and extension workers and are aimed at reducing agricultural non-point sources of pollution of rivers and coastal waters.

There is no existing umbrella legislation that specifically provides for the effective management of the sanitation sector and regulation of the wastewater sub-sector.¹²⁴ There are some sectoral laws that can potentially play a role in protecting rivers and the marine environment, for example, the Fisheries legislation and the Harbour Decree (SB 1981 No. 86), the latter prohibiting the discharge of solid waste and oil into rivers. The Anchylostomiasis Law provides for the protection of wells from contamination from faeces and forbids the use of faeces as a fertilizer. While the country has enacted pesticide-related legislation, the entities that are charged with its administration are non-functional, which results in a lack of regulation of the use of pesticides.¹²⁵

¹²² Refer to fn. 120

¹²³ Refer to fn. 22

¹²⁴ Refer to fn. 22

¹²⁵ Refer to fn. 22

The laws that are of some relevance to the sector are inadequate because they are not comprehensive and are generally outdated, in excess of fifty years old. The legislation is limited in application to the urban areas only and the prescribed penalties are very low, and do not act as a deterrent to persons contravening the provisions. Enforcement of the legislation is difficult primarily because the offences are not clearly articulated and responsibilities are spread across a wide range of entities.

There are no enforceable national effluent limits or wastewater standards or laws that prohibit the discharge of domestic and industrial wastewater into surface waters.¹²⁶ The Government of Suriname has, however, prepared draft legislation relating to environmental management, EIAs, wastewater management in respect of ground water, as well as legislation prohibiting pollution of the coastal waters. It is important that these legislative instruments be enacted with all expediency to improve regulation of wastewater management in Suriname.

There are several entities that are principally involved in wastewater management and these include the following:¹²⁷

- The Ministry of Public Works has responsibility for the management of the sewerage system, including the pumps and floodgates as well as the collection and disposal of sewage in the capital city. It is also charged with measuring water quality and river characteristics.
- The Ministry of Public Health is responsible for the environmental health portfolio of the country, including the disposal of wastes (domestic, hospital and industrial).
- The Ministry of Labour, Technological Development and the Environment is responsible for formulating environmental policy.
- The National Institute for Environment and Development provides technical support to the Ministry of Labour, Technological Development and the Environment in diverse areas including EIAs, planning, research, monitoring, enforcement, education and awareness. It also provides information to the President on matters relating to the sustainable development of natural resources.
- The National Council for the Environment is an advisory body to the Government on environmental matters.

¹²⁶ The World Bank standards are used as a guide in respect of industrial waste.

¹²⁷ Refer to fn. 120

- The Ministry of Planning and Development Cooperation undertakes studies relating to, inter alia, physical and environmental planning.

The institutional framework is, however, inadequate because responsibilities for wastewater management and sanitation are spread among many entities, whose roles are not generally clearly defined. The legislation governing the sector does not provide enough guidance and direction to these entities in respect of their responsibilities. In addition, their ability to operate in an efficient and effective manner is severely constrained by a lack of human, financial and technical resources. The capacity of the institutional framework will have to be enhanced to support implementation of activities related to the Convention and Protocol.

There are no environmental education and public awareness programmes being implemented. However, the Ministry of Labour, Technological Development and the Environment will soon commence the implementation of an awareness programme on wastewater management. While the Government of Suriname has undertaken various activities such as the drafting of environmental legislation, it is evident that there are constraints to the implementation of activities relates to the Convention and Protocol. Overcoming these constraints pose the greatest concern to the Government. They include inadequate:

- Institutional capacity including human and technical resources.
- Sanitation infrastructure and wastewater management.
- Legislative framework.
- Policy framework.
- Funding to support interventions in the sector including the procurement of equipment.
- Public awareness in respect of pollution generally and from land-based sources and activities, in particular.

Stumbling Blocks to Accession

The main stumbling block to the Government of Suriname's accession to the Convention and Protocol is a lack of political will, as accession is not viewed as a national priority.

Potential Assistance under the CReW to Assist in Accelerating the Accession Process

The following are some of the areas where the CReW can provide support to the Government of Suriname to accede to the Convention and Protocol:

- Conduct of a critical analysis of the existing legislative framework
- Development of draft requisite legislation to provide for comprehensive wastewater management

- Formulation and development of relevant policies and plans
- Conduct of an assessment of the wastewater systems in the country
- Assistance in the selection of appropriate technology for wastewater treatment and management
- Financial support for relevant projects
- Development of institutional capacity through, *inter alia*, training of staff and provision of technical assistance
- Improvement of skills and knowledge of operators and inspectors of wastewater and related facilities
- Implementation of public awareness and education programmes on Protocol-related issues

Recommended Steps to be Taken for Acceding to the Convention and Protocol

The recommended steps are outlined in section 8.o. In addition to these, it is important that assistance be provided under the CReW to the Government of Suriname to assist in developing an enabling environment for the implementation of activities related to the Convention and Protocol.

8.0 Steps for Moving the Accession Process Forward In St. Vincent and the Grenadines and Suriname

In an attempt to move the process of acceding to the Protocol (and in the case of Suriname, the Convention and Protocol) forward, emphasis must be placed on sensitizing the political directorate to the benefits that will be derived from such action as well as to the status of pollution in the country and the resulting negative impacts on the economy, environment and human health. It is imperative to both stress and demonstrate that the country has already made some headway in addressing issues related to the Protocol (and Convention, in the case of Suriname) and that it is capable of meeting its obligations, once it accedes.

To this end, it may prove useful to establish an inter-sectoral committee to chart the road to accession. This committee should prepare a proposal for submission to the Cabinet of Ministers outlining, *inter alia*, the following:¹²⁸

- (a) Legal implications of accession
- (b) Consultations that have already been held in country
- (c) Current status of implementation of activities related to the Convention and Protocol
- (d) Any existing limitations or constraints and an indication of how they will be overcome
- (e) Benefits of becoming a party
- (f) Financial implications

It will be useful for a member of the Committee or such other “knowledgeable” person as may be selected, to make an oral presentation to the Ministers after they have had an opportunity to review the proposal. This will allow for any concerns or misunderstandings to be addressed with expediency. This presentation may be followed up by interventions at the sectoral level with those ministers that have responsibility directly or indirectly for Protocol-related matters. This should be complemented by campaigns aimed at increasing awareness among various target groups, including public and private sector personnel, developers, non-governmental organizations and civil society. The UNEP Caribbean Regional Coordinating Unit can provide both financial and technical support for the sensitization of the various target groups.

¹²⁸ UNEP-CEP, *Model Cabinet Memorandum: Land-Based Sources of Marine Pollution Protocol*, available at: www.cep.unep.org/.../lbs-protocol/.../lbs-protocol-accession-or.../file

PART IV

SUMMARY OF MAIN FINDINGS AND RECOMMENDED INTERVENTIONS



9.0 Summary of Main Findings and Recommended Interventions

Tables 6 and 7 present a summary of the main findings for each country in respect of the following:

- (a) Countries that have already acceded to the Protocol:
 - Areas of the Protocol that are of the greatest concern
 - Challenges faced in implementing the Protocol
 - Potential assistance that may be provided under the CReW to overcome the challenges to implementation

- (b) Countries that have not acceded to the Protocol:
 - Areas of the Protocol that are of greatest concern
 - The stumbling blocks to accession
 - Potential assistance that may be provided under the CReW to accelerate the accession process

The principal recommended interventions aimed at addressing the concerns and challenges faced by the countries in implementing or acceding to the Protocol are presented in Table 8.

TABLE 6: SUMMARY OF MAIN FINDINGS: COUNTRIES THAT HAVE ACCEDED TO THE PROTOCOL

Country	Areas of the Protocol of Greatest Concern	Challenges Faced in Implementation	Potential Assistance under the CREW
Antigua and Barbuda	<ul style="list-style-type: none"> • Lack of an established time frame for implementation of activities and by extension, the absence of a national programme of action to guide implementation 	<ul style="list-style-type: none"> • Inadequate legislative and institutional frameworks to support implementation of the Protocol generally • Lack of capacity to conduct the requisite water quality monitoring 	<ul style="list-style-type: none"> • Provision of funding for the development of laboratory capacity in support of the water quality monitoring programmes • Support for the formulation and implementation of relevant policies • Assistance in enhancing institutional capacity, for example, the provision of requisite training • Assistance in the conduct of a review of the legislative and regulatory framework • Provision of technical assistance for the drafting of legislation to address the weaknesses and gaps identified in the review exercise
Guyana	<ul style="list-style-type: none"> • Aligning the legal framework, policies and strategies to address domestic wastewater • Public awareness • Monitoring of water quality 	<ul style="list-style-type: none"> • Inadequate human and technical resources dedicated to the implementation of Protocol activities • Lack of technical capacity to implement a water quality monitoring programme • Inadequate financial resources to fulfill the obligations under the Protocol as well as for capital works required for improving and developing adequate municipal infrastructure for the treatment and disposal of wastewater 	<ul style="list-style-type: none"> • Assistance in developing a National Implementation Plan to establish the framework and timelines to guide the implementation process • Assistance in the implementation of a water quality monitoring system • Provision of technical assistance to conduct an assessment of the current state of water quality • Provision of technical assistance for the review of the legislative and regulatory framework

Country	Areas of the Protocol of Greatest Concern	Challenges Faced in Implementation	Potential Assistance under the CReW
Guyana (Cont'd)		<ul style="list-style-type: none"> • Lack of access to appropriate technology • Lack of coordination of activities among stakeholder entities • Inadequate enforcement of legislation • Lack of public awareness and education on the Protocol and pollution generally 	<ul style="list-style-type: none"> • Assistance in the revision of the existing legislation and drafting of new legislation to ensure compliance with the requirements of the Protocol • Assistance in designing and implementing public awareness and environmental education programmes • Enhancing institutional capacity through training and the provision of technical and other assistance • Assistance in accessing and adopting more appropriate technology • Establishing data management systems both for national analytical purposes and for facilitating the exchange of information at the sub-regional and regional levels
Saint Lucia	<ul style="list-style-type: none"> • Nutrient and wastewater management 	<ul style="list-style-type: none"> • Inadequate capacity of the implementing and supporting agencies to incorporate the requirements of the Protocol into their portfolios • Insufficient water quality monitoring programmes • Overlapping responsibilities of some agencies in respect of Protocol -related activities, which pose a challenge in determining which agency should be charged with the implementation of specific activities 	<ul style="list-style-type: none"> • Conducting a valuation of the economic impacts of pollution resulting from nutrients and wastewater • Conducting a review of the legislative and regulatory framework • Providing technical assistance for the drafting of amendments to existing legislation and new legislation as required, to rationalize the law, clarify roles and responsibilities of agencies as well as to ensure compliance with the Protocol • Assisting in the institutional strengthening of relevant agencies • Assisting in the establishment of a sustained and comprehensive water quality monitoring programme • Assisting in the design and implementation of public awareness and environmental education programmes

Country	Areas of the Protocol of Greatest Concern	Challenges Faced in Implementation	Potential Assistance under the CReW
Trinidad and Tobago	<ul style="list-style-type: none"> • Monitoring, evaluation and assessment • Information management systems • Transboundary pollution • Environmental education and public awareness 	<ul style="list-style-type: none"> • Inadequate funding to improve and install pollution technologies • Ineffective water quality monitoring and enforcement • Lack of a designated competent authority to guide implementation of the Protocol-related activities 	<ul style="list-style-type: none"> • Conducting a review of the legislative and regulatory framework • Providing technical assistance for the drafting of amendments to existing legislation and new legislation as required, to rationalize the law, clarify roles and responsibilities of agencies as well as to ensure compliance with the Protocol • Providing “easy” financing to assist industries in upgrading their treatment technologies to ensure compliance with the Protocol and legislative requirements • Assisting in enhancing the capacity for water quality monitoring and enforcing effluent standards.\ • Assisting in the design and implementation of public awareness and environmental education programmes

TABLE 7: SUMMARY OF MAIN FINDINGS: COUNTRIES THAT HAVE NOT ACCEDED TO THE PROTOCOL

Country	Areas of the Protocol of Greatest Concern	The Stumbling Blocks to Accession	Potential Assistance under the CREW
<p>Barbados</p>	<ul style="list-style-type: none"> Capacity to comply with the domestic wastewater treatment and agricultural obligations 	<p><u>Primary Stumbling Blocks</u></p> <ul style="list-style-type: none"> A misunderstanding at the policy level of the benefits to be derived under the Protocol and the repercussions for non-compliance; there may be a perception that the existing policies are not in harmony with the provisions of Annexes III and IV of the Protocol <p><u>Other Stumbling Blocks</u></p> <ul style="list-style-type: none"> Inadequate legislative and institutional frameworks to support implementation of Protocol-related activities Insufficient funds to properly maintain water quality equipment Lack of a National Action Programme to guide implementation of Protocol activities Exorbitant costs associated with the installation of wastewater systems 	<ul style="list-style-type: none"> Training relevant staff Providing financial support for relevant projects including the maintenance of wastewater equipment Determining the main impacts of domestic wastewater discharges on groundwater and the marine environment Reviewing the legislative and regulatory framework. Assisting in drafting an Environmental Management Act and other pertinent legislation Providing guidance on the drafting of wastewater legislation Strengthening capacities of the laboratories Institutionalizing technical training for core disciplines Strengthening the skills and knowledge of operators and inspectors of wastewater and related facilities Improving the understanding of the short, medium and long term impacts of wastewater on the environment Developing mechanisms aimed at facilitating the payment by individuals for wastewater treatment. Providing guidance on the development of a wastewater permit system Preparing regulator inspection guidance manuals for wastewater treatment plants by type and size \

Country	Areas of the Protocol of Greatest Concern	The Stumbling Blocks to Accession	Potential Assistance under the CREW
St. Vincent and the Grenadines	<ul style="list-style-type: none"> • Adequacy of the institutional and legislative frameworks to support implementation of Protocol-related activities • Capacity to conduct sustained water quality monitoring • Enforcement of effluent standards • Upgrading of wastewater infrastructure 	<ul style="list-style-type: none"> • The obligations are perceived to be numerous and the existing human, financial and technical resources are already thinly stretched so that the capacity required to implement the Protocol is not available. • St. Vincent and the Grenadines is party to over sixteen MEAs and the country already has a vast number of obligations to satisfy with limited resources. • Accessing to the Protocol has not been deemed by the policy makers to be a national priority. 	<ul style="list-style-type: none"> • Conducting a comprehensive analytical review of the existing legislative framework having regard to the provisions of the Protocol • Reviewing the existing draft legislation and provide support for their amendment, if required • Assisting in the drafting of other pertinent legislation • Enhancing enforcement capacity and capabilities • Assisting in the development and/or finalization of relevant draft policies and strategies • Conducting a review of the existing institutional framework • Conducting a skills audit and assist in the provision of required training for relevant staff • Providing training in new technologies • Assisting in the establishment of water quality monitoring and data management systems • Determining the current status of water quality of coastal and marine waters • Providing assistance for the development of a public awareness and education programme directed at preventing, reducing and controlling pollution of the marine environment from land-based sources and activities

Country	Areas of the Protocol of Greatest Concern	The Stumbling Blocks to Accession	Potential Assistance under the CReW
Suriname	<ul style="list-style-type: none"> • Adequacy of institutional, legislative and policy frameworks to support implementation of Convention and Protocol activities • Capacity of the wastewater infrastructure • High level of wastewater management required • Financial implications – to support required interventions in the sector including procurement of equipment etc. • Level of public awareness in respect of pollution generally, and from land-based sources, in particular 	<ul style="list-style-type: none"> • A lack of political will, which results in accession to the Convention and Protocol not being viewed as a national priority 	<ul style="list-style-type: none"> • Conduct of a critical analysis of the existing legislative framework • Development of draft requisite legislation to provide for comprehensive wastewater management • Formulation and development of relevant policies and plans • Conduct of an assessment of the wastewater systems in the country • Assistance in the selection of appropriate technology for wastewater treatment and management • Financial support for relevant projects • Development of institutional capacity through, <i>inter alia</i>, training of staff and provision of technical assistance. • Improvement of skills and knowledge of operators and inspectors of wastewater and related facilities • Implementation of public awareness and education programmes on Protocol-related issues

TABLE 8: SUMMARY OF PRINCIPAL RECOMMENDED INTERVENTIONS

COUNTRIES THAT HAVE ACCEDED TO THE PROTOCOL					
Country	Policies/Programmes/ Plans/Studies	Institutional	Legislative/ Regulatory	Education/ Public Awareness	Other
Antigua and Barbuda	<ul style="list-style-type: none"> • Formulate a wastewater management policy. • Obtain approval from the Cabinet of Ministers in respect of the Draft Agricultural Policy. • Finalize and adopt the Draft National Food Production Plan. • Conduct a review of existing policies, programmes and plans to identify and address Protocol-related gaps. • Develop a National Plan of Action for the implementation of Protocol-related activities. This should include existing and planned interventions (where funding has already been secured to support the activity, this should be stated). • Develop and offer incentives to encourage the use of environmentally sound technologies and practices. 	<ul style="list-style-type: none"> • Conduct an audit of the institutional capacity in respect of the implementation of Protocol-related activities. • Provide and access technical assistance to provide the requisite training to address identified skills deficiencies including training for wastewater operators in respect of management and operation techniques. • Increase the human, financial and technical resources allocated to the entities responsible for implementing Protocol-related activities including those involved in water quality monitoring. 	<ul style="list-style-type: none"> • Conduct an analytical review of the legislative framework highlighting, <i>inter alia</i>, weaknesses and gaps with respect to Protocol-related issues and recommending interventions. • Develop a legislative agenda for the drafting of the required legislation identified in the review exercise above. • Draft priority legislation in the short term. • Amend the Environmental Management and Environmental Health Bills to remove areas of contradiction and to respond more comprehensively to the country's obligations under the Protocol. • Enact the Environmental Management and Environmental Health Bills following amendment. 	<ul style="list-style-type: none"> • Develop and implement environmental education and public awareness programmes specifically related to the Protocol. 	<ul style="list-style-type: none"> • Source financial assistance to support implementation of relevant policies and Protocol-related activities generally. • Source funding for the development of laboratory capacity to support water quality monitoring.

COUNTRIES THAT HAVE ACCEDED TO THE PROTOCOL

Country	Policies/Programmes/ Plans/Studies	Institutional	Legislative/ Regulatory	Education/ Public Awareness	Other
Guyana	<ul style="list-style-type: none"> • Conduct a review of existing policies, programmes and plans to identify and address Protocol-related gaps to include, <i>inter alia</i>: <ul style="list-style-type: none"> - the reuse of domestic wastewater. - the pre-treatment of industrial wastewater. - prevention, reduction and control of agricultural non-point sources of pollution. • Develop and implement a National Plan of Action to guide the implementation of Protocol-related activities. • Develop and implement a sustained national water quality monitoring programme. • Conduct an assessment of the current state of water quality. • Develop and offer incentives to encourage the use of environmentally sound technologies and practices. • Conduct a review of the fees charged by the Guyana Water Inc. for its services towards addressing its budgetary 	<ul style="list-style-type: none"> • Conduct an audit of the institutional capacity in respect of the implementation of Protocol-related activities. • Provide and access technical assistance to provide the requisite training to address the identified skills deficiencies. • Increase the human, financial and technical resources allocated to the entities implementing Protocol-related activities. • Revamp the defunct Legal Unit of the Environmental Protection Agency. • Establish data management systems to meet national, sub-regional and regional obligations. • Increase technical capacity for water quality monitoring. 	<ul style="list-style-type: none"> • Conduct an analytical review of the legislative framework highlighting, <i>inter alia</i>, weaknesses and gaps with respect to Protocol-related issues. • Develop a legislative agenda for the drafting of the required legislation identified in the review exercise above. • Draft priority legislation in the short term. • Amend the Environmental Protection Act, No. 11 of 1996 to incorporate as far as practicable, Guyana's obligations under the Protocol. • Provide for the classification of waters in the legislative framework in accordance with Annex III of the Protocol. • Amend as a matter of priority, existing legislation to provide for effluent standards for domestic wastewater. • Revise the Guidelines for Industrial Wastewater discharges to ensure that they cover the full ambit of pollution from industrial activities. • Improve the capacity for the enforcement of legislative provisions including effluent standards. 	<ul style="list-style-type: none"> • Develop and implement environmental education and public awareness programmes specifically related to the Protocol. 	<ul style="list-style-type: none"> • Access funding for improving and developing adequate municipal infrastructure for the treatment and disposal of wastewater. • Source financial assistance to support implementation of Protocol-related activities. • Secure technical assistance for accessing, identifying and adopting appropriate technology.

COUNTRIES THAT HAVE ACCEDED TO THE PROTOCOL

Country	Policies/Programmes/ Plans/Studies	Institutional	Legislative/ Regulatory	Education/ Public Awareness	Other
	constraints.				
Saint Lucia	<ul style="list-style-type: none"> • Conduct a review of existing policies, programmes and plans to identify and address Protocol-related gaps. • Develop and offer incentives to encourage the use of environmentally sound technologies and practices. • Establish a national water quality monitoring programme to include the analysis of data collected to inform decision making and policy formulation. • Conduct a valuation of the economic impacts of pollution resulting from nutrients and wastewater. 	<ul style="list-style-type: none"> • Conduct an audit of the institutional capacity in respect of the implementation of Protocol-related activities. • Provide and access technical assistance to provide the requisite training to address the identified skills deficiencies. • Increase the human, financial and technical resources allocated to the entities implementing the Protocol-related activities. • Clearly define the roles and responsibilities of each entity in the implementation of Protocol-related activities. 	<ul style="list-style-type: none"> • Conduct an analytical review of the legislative framework highlighting, <i>inter alia</i>, weaknesses and gaps with respect to Protocol-related issues and obligations. • Develop a legislative agenda for the drafting of the required legislation identified in the review exercise above. • Draft priority legislation in the short term which should provide for: <ul style="list-style-type: none"> - a classification of receiving waters in accordance with Annex III of the Protocol. - mandatory effluent standards consistent with Annex III of the Protocol. • Improve the capacity for the enforcement of legislative provisions. • Review and amend if necessary, the Draft Environmental Management Act to ensure that it is reflective of the obligations under the Protocol. 	<ul style="list-style-type: none"> • Obtain approval from the Cabinet of Ministers for the Draft Environmental Education Policy, Strategy and Work Programme. • Implement the policy, strategy and work programme following approval. 	<ul style="list-style-type: none"> • Source financial assistance to support implementation of Protocol-related activities.

COUNTRIES THAT HAVE ACCEDED TO THE PROTOCOL

Country	Policies/Programmes/ Plans/Studies	Institutional	Legislative/ Regulatory	Education/ Public Awareness	Other
Trinidad and Tobago	<ul style="list-style-type: none"> • Conduct a review of existing policies, programmes and plans to identify and address Protocol-related gaps. • Review the charges for sewerage services towards cost recovery. • Develop and implement national programmes in respect of monitoring and evaluation. • Upgrade the existing information management systems into a national system. • Develop programmes focusing on curbing trans-boundary pollution. 	<ul style="list-style-type: none"> • Conduct an audit of the institutional capacity in respect of the implementation of Protocol-related activities. • Provide and access technical assistance to provide the requisite training to address the identified skills deficiencies. • Increase the human, financial and technical resources allocated to the entities implementing Protocol-related activities especially those involved in monitoring and evaluation. • Designate a competent entity to guide the implementation of Protocol-related activities. 	<ul style="list-style-type: none"> • WASA’s standards relating to the pre-treatment of industrial discharges must be made mandatory. • Conduct an analytical review of the legislative framework highlighting, <i>inter alia</i>, weaknesses and gaps with respect to Protocol-related issues and obligations. • Develop a legislative agenda for the drafting of the required legislation identified in the review exercise above. • Draft priority legislation in the short term. • Improve the capacity for monitoring and enforcement of legislative provisions. 	<ul style="list-style-type: none"> • Develop and implement environmental education and public awareness programmes specifically related to the Protocol. 	<ul style="list-style-type: none"> • Source funding for improving and adopting pollution technologies. • Source financial assistance to support implementation of Protocol-related activities generally.

COUNTRIES THAT HAVE ACCEDED TO THE PROTOCOL

Country	Policies/Programmes/ Plans/Studies	Institutional	Legislative/ Regulatory	Education/ Public Awareness	Other
Barbados	<ul style="list-style-type: none"> • Generate and compile data on land-based sources of marine pollution. • Develop a maintenance programme for water quality monitoring equipment. • Develop and implement programmes for the treatment of domestic wastewater and for the prevention, reduction and control of agricultural non-point sources of pollution in accordance with the Protocol. • Conduct a study to assess the impact of domestic wastewater discharges on the groundwater and the marine environment. • Develop and adopt mechanisms for payments to be made by individuals for wastewater treatment. • Develop through technical assistance, a wastewater permit system. 	<ul style="list-style-type: none"> • Conduct an audit of the institutional capacity in respect of implementation of Protocol-related activities. • Provide and access technical assistance to provide the requisite training to address identified skills deficiencies. • Increase the human, financial and technical resources allocated to the entities implementing the Protocol-related activities. • Specifically, enhance human capacity in terms of numbers and expertise to conduct water quality monitoring, maintenance, operation and inspections of wastewater treatment systems. • Enhance the capacity of the existing laboratories. • Institutionalize technical training in core disciplines. • Secure technical assistance to prepare regulator inspection guidance manuals for wastewater treatment plants by type and size. 	<ul style="list-style-type: none"> • Conduct an analytical review of the legislative framework highlighting, <i>inter alia</i>, weaknesses and gaps with respect to Protocol-related issues and obligations, in particular, obligations relating to effluent standards. • Develop a legislative agenda for the drafting of the required legislation identified in the review exercise above including the drafting of an Environmental Management Act. • Draft priority legislation in the short term. 	<ul style="list-style-type: none"> • Train staff delivering related education and awareness programmes in new technologies. • Develop Protocol-specific education and awareness programmes to sensitize all stakeholders including civil society on the Protocol and related activities and obligations. • Improve knowledge of the short, medium and long term impacts of wastewater on the environment. 	<ul style="list-style-type: none"> • Source funding for the maintenance of wastewater treatment systems. • Source financial assistance to support implementation of Protocol-related activities. • Sensitize the political directorate of the: <ul style="list-style-type: none"> - benefits to be derived from accession to the Protocol. - lack of penalties for failure to satisfy the obligations under the Protocol. - consistency between existing policies and the provisions of Annex II and IV of the Protocol. • Accede to the Protocol.

COUNTRIES THAT HAVE ACCEDED TO THE PROTOCOL

Country	Policies/Programmes/ Plans/Studies	Institutional	Legislative/ Regulatory	Education/ Public Awareness	Other
St. Vincent and the Grenadines	<ul style="list-style-type: none"> • Conduct a review of existing policies, programmes and plans to identify and address Protocol-related gaps. • Review and adopt relevant draft policies and strategies. • Establish a national data/information management system. • Establish a national water quality monitoring programme to include the analysis of data collected to inform decision making and policy formulation. • Conduct a study on the status of water quality of coastal and marine waters. 	<ul style="list-style-type: none"> • Conduct an audit of the institutional capacity in respect of the implementation of Protocol-related activities. • Provide and access technical assistance to provide the requisite training to address identified skills deficiencies including training in new technologies. • Increase the human, financial and technical resources allocated to the entities implementing Protocol-related activities. 	<ul style="list-style-type: none"> • Conduct an analytical review of the legislative framework highlighting, <i>inter alia</i>, weaknesses and gaps with respect to Protocol-related issues and obligations. • Review and if necessary, amend the Environmental Management Bill, the Draft Environment Management (Pollution) Regulations and the Draft Effluent Protection (Effluent Limitation) Regulations to ensure consistency with the provisions of the Protocol. • Review the Draft Environmental Impact Assessment Regulations and amend if necessary. • Enact the Bill and Regulations cited above following their review and amendment. • In addition, develop a legislative agenda for the drafting of the required legislation identified in the review exercise above. • Draft priority legislation in the short term. • Improve the capacity for monitoring and enforcement of legislative provisions. 	<ul style="list-style-type: none"> • Develop and implement environmental education and public awareness programmes specifically related to the Protocol. 	<ul style="list-style-type: none"> • Sensitize the political directorate on the Protocol, through for example, establishing an inter-sectoral committee to prepare a proposal for submission to the Cabinet of Ministers. The proposal should include: <ul style="list-style-type: none"> - the legal implications of accession. - benefits to be derived. - the current status of implementation of activities related to the Convention and Protocol. - related consultations that have been held in the country. - any existing limitations or constraints and an indication of how they will be overcome. - the financial implications.

COUNTRIES THAT HAVE ACCEDED TO THE PROTOCOL

Country	Policies/Programmes/ Plans/Studies	Institutional	Legislative/ Regulatory	Education/ Public Awareness	Other
St. Vincent and the Grenadines (Continued)					<ul style="list-style-type: none"> • Sensitize relevant individual Ministers of Government to lobby support for accession to the Protocol. • Sensitize all constituents on the Protocol. • Accede to the Protocol.

COUNTRIES THAT HAVE ACCEDED TO THE PROTOCOL

Country	Policies/Programmes/ Plans/Studies	Institutional	Legislative/ Regulatory	Education/ Public Awareness	Other
Suriname	<ul style="list-style-type: none"> • Conduct a review of existing policies, programmes and plans to identify and address Protocol-related gaps. • Formulate and develop relevant policies, programmes and plans to address the gaps identified. • Conduct an assessment of the status of wastewater systems in the country. 	<ul style="list-style-type: none"> • Conduct an audit of the institutional capacity in respect of the implementation of Protocol-related activities. • Provide and access technical assistance to provide the requisite training to address the identified skills deficiencies. • Increase the human, financial and technical resources allocated to the entities implementing Protocol-related activities. • Specifically, enhance the knowledge and skills of operators and inspectors of wastewater and related facilities. 	<ul style="list-style-type: none"> • Conduct an analytical review of the legislative framework highlighting, <i>inter alia</i>, weaknesses and gaps with respect to issues and obligations related to the Convention and Protocol, including effluent standards. • Review and amend if necessary, existing draft legislation that is of relevance to the Convention and the Protocol. • Following review and amendment, enact the legislation. • Develop a legislative agenda for the drafting of the required legislation identified in the review exercise above. • Draft priority legislation in the short term. • Improve the capacity for monitoring and enforcement of legislative provisions. 	<ul style="list-style-type: none"> • Develop and implement environmental education and public awareness programmes specifically related to the Protocol 	<ul style="list-style-type: none"> • Sensitize the political directorate on the Convention and Protocol, through for example, establishing an inter-sectoral committee to prepare a proposal for submission to the Cabinet of Ministers. The proposal should include the: <ul style="list-style-type: none"> - legal implications of accession. - benefits to be derived. - current status of implementation of activities related to the Convention and Protocol. - related consultations that have been held in the country. - existing limitations or constraints and an indication of how

COUNTRIES THAT HAVE ACCEDED TO THE PROTOCOL

Country	Policies/Programmes/ Plans/Studies	Institutional	Legislative/ Regulatory	Education/ Public Awareness	Other
					they will be overcome. - financial implications.
Suriname (Continued)					<ul style="list-style-type: none"> • Sensitize Ministers of Government individually to lobby support for accession • Sensitize constituents on the provisions of the Convention and Protocol. • Accede to the Convention and Protocol. • Source financial assistance to support implementation of Convention and Protocol activities. • Secure technical assistance to identify and select the most suitable technology for the country in respect of wastewater management. • Access funding for improving and

COUNTRIES THAT HAVE ACCEDED TO THE PROTOCOL

Country	Policies/Programmes/ Plans/Studies	Institutional	Legislative/ Regulatory	Education/ Public Awareness	Other
					developing wastewater infrastructure.

From Tables 6-8 above, it is evident that there are some commonalities across the various countries in respect of the main findings and the recommended interventions. While addressing some of these obviously lies within the purview of the national governments, there are others that could be addressed through interventions at the regional level including projects such as the CReW. A regional approach could potentially be adopted in respect of the following:

- (a) The conduct of analytical reviews of the national legislative and regulatory frameworks
- (b) Drafting of requisite legislation to make the national legislative frameworks compliant with the requirements of the Protocol
- (c) Amending existing legislation to ensure compliance with Protocol obligations
- (d) Conducting reviews of the national institutional and policy frameworks and providing support as far as practicable for the formulation of requisite policies, training and technical expertise to enhance capacity shortcomings
- (e) Assisting those countries that have not acceded to the Protocol with the sensitization of the political directorates and stakeholders generally
- (f) Assisting with accessing and installing appropriate technology
- (g) Assisting in the sourcing of funding for national projects to enable the countries to fulfill their obligations or proposed obligations under the Protocol as the case may be
- (h) Assisting in the establishment of national water quality monitoring programmes, including the provision of technical expertise for the laboratories involved in analyzing water quality samples
- (i) Assisting in the design of public awareness and environmental education programmes related to the Protocol
- (j) Establishing data management systems

Notwithstanding, there are individual requirements of the countries including the conduct of specific studies that could be funded under the CReW and other regional projects.

PART V

CONCLUSION



10.0 Conclusion

It is evident that there is a great disparity between the countries with respect to their status in relation to the Protocol. While all of the countries have to some extent sought to prevent, reduce and control pollution of the marine environment from land-based sources and activities, some have made greater strides in that regard than others. Even those countries that have not acceded to the Protocol are undertaking activities that fall within its purview.

Notwithstanding, it is clear that the countries for the most part, all face the same challenges and constraints in their efforts to address Protocol-related activities, albeit to varying extents. It has been revealed that lack of financing is a major constraint to effective and efficient management of wastewater. Policy, legislative and institutional frameworks are generally inadequate to facilitate the fulfillment of the countries' obligations under the Protocol. The legislation tends to be sectoral in nature, somewhat outdated, with responsibilities spread across a number of entities. This does not facilitate an integrated approach to wastewater management and it makes enforcement more challenging. The entities are constrained by a lack of human, financial and technical resources. While there is a plethora of policies in the countries, there is no single policy that is specifically focused on the prevention, reduction and control of pollution of the marine environment from land-based sources and activities.

It is also clear that sewage is a major polluter of the marine environment. The infrastructure in the countries for the disposal and treatment of sewage is generally old and in need of rehabilitation. Some countries have, however, been making strides in upgrading their systems. There are still many instances of raw sewage being discharged into the marine environment as a result of, *inter alia*, seepage, mal-functioning sewerage systems and sewage package plants, lack of adequate maintenance and poor operational systems. There is a need for sustained water quality monitoring programmes to be implemented as well as more comprehensive information management systems. There is also a need for more focussed public awareness and environmental education programmes in respect of pollution of the marine environment.

Under the CReW, the countries will be able to harness both financial and technical assistance to enable them to address some of the constraints which they face. Notwithstanding, the responsibility rests with each country to vigorously promote the need to prevent, reduce and control marine pollution from land-based sources and activities and to ensure that the issue becomes a national priority. Sensitization of the

decision and policy makers in this regard is important in all jurisdictions but more so, in those where accession to the Protocol is still outstanding.

ANNEXES



ANNEX I
INTERVIEW SCHEDULE: COUNTRIES THAT HAVE ACCEDED TO THE
PROTOCOL

The Status of River and Coastal Water Quality

- (a) Existing national effluent limits in relation to Domestic Wastewater (if possible, in the format below – excerpt from Annex III of the LBS Protocol) and an indication of the relevant regulatory instrument(s).

Effluent Standards for Class I Waters

PARAMETER	EFFLUENT LIMIT
Total Suspended Solids	
Biochemical Oxygen Demand (BOD ₅)	
pH	
Fats, Oil and Grease	
Faecal Coliform (Parties may meet effluent limitations either for faecal coliform or for E. coli (freshwater) and enterococci (saline water).)	
Floatables	

Effluent Standards for Class II Waters

PARAMETER	EFFLUENT LIMIT
Total Suspended Solids	
Biochemical Oxygen Demand (BOD ₅)	
pH	
Fats, Oil and Grease	
Floatables	

- (b) The main factors impacting water quality in your country.
(c) Any water quality monitoring programmes – existing or planned?

Policies, Projects, Programmes, Strategies, Plans and Incentives

- (a) Any domestic wastewater reuse?
(b) Any policies, projects, programmes, strategies, plans or incentives in respect of:
 - Improving sewage disposal?
 - Pre-treating industrial discharges?

- Preventing, reducing or controlling agricultural non-point sources of pollution?
- (c) Any other policies, projects, programmes, strategies, plans or incentives that will contribute to the prevention, reduction or control of pollution of the rivers and coastal waters of your country?

Legislative and Regulatory Framework

- (a) Adequacy of the legislative and regulatory framework to support implementation of the LBS Protocol.
- (b) How can it be improved? Any planned legislation?
- (c) Any existing legislation relating to Environmental Impact Assessments?

Institutional Framework

- (a) Which entity or entities is/are primarily responsible for regulating pollution of the rivers and coastal waters?
- (b) Adequacy of the existing institutional framework to support implementation of the LBS Protocol related activities.
- (c) How can it be improved? Any planned re-structuring?

Education, Training and Public Awareness Programmes

- (a) Any programmes that could potentially support the LBS Protocol?

General Questions

- (a) What areas of the Protocol if any, are of greatest concern?
- (b) What are the challenges faced in implementing the Protocol?
- (c) How can the Caribbean Regional Fund for Wastewater Management (CReW) assist your country in overcoming these challenges?
- (d) How would you assess the status of the Protocol in your country?

ANNEX II

INTERVIEW SCHEDULE: COUNTRIES THAT HAVE NOT ACCEDED TO THE PROTOCOL

The Status of River and Coastal Water Quality

- (a) Existing national effluent limits in relation to Domestic Wastewater (if possible, in the format below – excerpt from Annex III of the LBS Protocol) and an indication of the relevant regulatory instrument(s).

Effluent Standards for Class I Waters

PARAMETER	EFFLUENT LIMIT
Total Suspended Solids	
Biochemical Oxygen Demand (BOD ₅)	
pH	
Fats, Oil and Grease	
Faecal Coliform (Parties may meet effluent limitations either for faecal coliform or for E. coli (freshwater) and enterococci (saline water).)	
Floatables	

Effluent Standards for Class II Waters

PARAMETER	EFFLUENT LIMIT
Total Suspended Solids	
Biochemical Oxygen Demand (BOD ₅)	
pH	
Fats, Oil and Grease	
Floatables	

- (b) The main factors impacting water quality in your country.
(c) Any water quality monitoring programmes – existing or planned?

Policies, Projects, Programmes, Strategies, Plans and Incentives

- (a) Any domestic wastewater reuse?
(b) Any policies, projects, programmes, strategies, plans or incentives in respect of:
- Improving sewage disposal?

- Pre-treating industrial discharges?
 - Preventing, reducing or controlling agricultural non-point sources of pollution?
- (c) Any other policies, projects, programmes, strategies, plans or incentives that will contribute to the prevention, reduction or control of pollution of the rivers and coastal waters of your country?

Legislative and Regulatory Framework

- (a) Adequacy of the legislative and regulatory framework to support implementation of the LBS Protocol related activities.
- (b) How can it be improved? Any planned legislation?
- (c) Any existing legislation relating to Environmental Impact Assessments?

Institutional Framework

- (a) Which entity or entities is/are primarily responsible for regulating pollution of the rivers and coastal waters?
- (b) Adequacy of the existing institutional framework to support implementation of the LBS Protocol.
- (c) How can it be improved? Any planned re-structuring?

Education, Training and Public Awareness Programmes

- (a) Any programmes that could potentially support the LBS Protocol?

General Questions

- (a) What areas of the Protocol if any, are of greatest concern?
- (b) What are the “stumbling blocks” to acceding to the Protocol?
- (c) How can the Caribbean Regional Fund for Wastewater Management (CReW) assist your country in overcoming these “stumbling blocks”?
- (d) Do you anticipate that your country will accede to the Protocol in the short term (by 2013)?



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