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First Meeting of the Interim Scientific, Technical
and Advisory Committee (ISTAC) to the Protocol
Concerning Pollution from Land-Based Sources
and Activities (LBS) in the Wider Caribbean Region

Ocho Rios, Jamaica, 19-23 February 2001

REPORT OF THE MEETING

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INTRODUCTION

1. Decision No. 29 (b) of the Ninth Intergovernmental Meeting on the Action Plan for the Caribbean Environment Programme (CEP) and the Sixth Meeting of the Contracting Parties to the Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region (Kingston, Jamaica, 14-18 February 2000) agreed to bring into existence an *Ad Hoc* Group of Government-designated Experts to begin to function as an Interim Scientific and Technical Advisory Committee (ISTAC) on Land-based Sources and Activities and Assessment and Management of Environmental Pollution (AMEP) activities as they relate to the Protocol, until the Protocol enters into force.
2. In light of the above, this Meeting was convened by UNEP's Caribbean Environment Programme in Ocho Rios, Jamaica from 19-23 February 2001.
3. The Meeting was convened by the Secretariat with the following objectives:
 - to review the current status and activities of the LBS Protocol;
 - to review the draft Terms of Reference for Creation of a Regional Activity Centre (RAC) for Marine Pollution from Land-based Sources and draft Agreement between the Government of Cuba and UNEP-CAR/RCU;
 - to review relevant activities of the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA), the Global International Waters Assessment (GIWA) and other relevant initiatives; and
 - to develop the 2002-2003 Workplan and Budget of the LBS Protocol for subsequent approval by the Tenth Intergovernmental Meeting.
4. The experts invited to the Meeting were nominated by the National Focal Points of the Caribbean Environment Programme, these included representatives from the Ministries of Environment and of Planning and Finance, as well as other relevant national agencies. Additionally, representatives of international, regional, intergovernmental, and non-governmental organizations were invited to attend the Meeting as Observers, as well as the speakers and presenters of the UNEP/GPA Regional Working Group on Municipal Wastewater representing, in their expert capacity, relevant institutions from the region.

Agenda item 1: Opening of the Meeting

5. The Meeting was opened by Mr. Nelson Andrade Colmenares, Co-ordinator of UNEP's Regional Co-ordinating Unit for the Caribbean Environment Programme (CEP) on Monday, 19 February 2001 at 9:30 a.m. in the Portland Suite, of the Renaissance Jamaica Grande Hotel in Ocho Rios, Jamaica.
6. In his welcoming remarks Mr. Andrade made reference to the adoption of the Protocol Concerning Pollution from Land-Based Sources and Activities (LBS Protocol) in Aruba in October 1999, which set a precedent with the adoption of definitive regional measures for the control of pollution from sewage. He reminded the Meeting, however, that although the Protocol in itself is a great achievement for the region, if it is not implemented, it will only be good intentions on paper. Therefore, he urged the Governments' commitment at the political, economic and social level in order to make Protocol implementation a reality. He highlighted the role that the LBS Protocol needs to play in the implementation of the Global Programme of Action (GPA), demonstrated by the initiative of the GPA Coordination Office and the Secretariat of the LBS Protocol to jointly convene this LBS ISTAC meeting with the UNEP/GPA Regional Working Group on Municipal Wastewater.
7. In this context he outlined a few of the activities in support of the LBS Protocol which are currently being planned and coordinated with the GPA. These included the selection of the LBS Protocol in the Wider Caribbean Region by the Coordination Office of the GPA, as one of the examples of progress in the area of pollution control from land-based sources and activities to be presented to the Intergovernmental Review Meeting of the GPA to be held on 26-30 November 2001 in Montreal, Canada. Additionally, the Caribbean Environment Programme will take part in two GPA projects on physical alteration and destruction of habitats and on municipal wastewater which, in total, would have a budget of approximately US\$3.2 million.
8. Mr. Andrade noted that with the active participation of Governments at all levels and the joint cooperation of the donor agencies, the financial institutions and international banks, the implementation of the Protocol would become a reality for the Wider Caribbean Region. In this regard, he invited all participants gathered on this occasion, and representing the various stakeholders groups relevant to LBS and activities of marine pollution, to participate actively and decisively in the critical review of the needs of the Protocol and in the identification of the necessary tools to put in place its provisions in order to achieve its entry into force as soon as possible. He also urged participants to be creative with their fundraising efforts and ideas and to produce a workplan and budget in support of the LBS Protocol for 2000-2003 which is concrete and realistic.

Agenda item 2: Election of Officers

9. The Meeting elected from among the experts the following officers of the Meeting:

Chairperson:	Mr. Gerardo Viña Vizcaino	(Colombia)
1 st Vice-chairperson:	Ms. Gladys Rosado	(Dominican Republic)
2 nd Vice-Chairperson:	Mr. Urvin Batta	(Netherlands Antilles)
3 rd vice-Chairperson:	Mr. Edwin Cyrus Cyrus	(Costa Rica)
Rapporteur:	Ms. Mearle Barrett	(Jamaica)

Agenda item 3: Organization of the Meeting

(a) Rules of procedure

10. The Meeting agreed to apply *mutatis mutandis* the Rules of Procedure of the Governing Council of UNEP as contained in document (UNEP/GC/3/Rev.3).

(b) Organization of the work

11. English, French and Spanish were the working languages of the Meeting. Simultaneous interpretation in these languages was provided by the Secretariat for the plenary sessions of the Meeting. The working documents of the Meeting were available in all working languages.
12. The Secretariat convened the Meeting in plenary sessions, with the assistance of working groups established by the Chairperson. Simultaneous interpretation was not available for the working groups.
13. As previously agreed with the Governments, the GPA Coordination Office and the CAR/RCU held the Regional Working Group on Municipal Wastewater within the context of this First ISTAC Meeting as noted in Agenda item 6 of this Report.

Agenda item 4: Adoption of the Agenda

14. The Secretariat presented the Provisional Agenda for approval of the Meeting as contained in document UNEP(DEC)/CAR WG.18/1.
15. During the adoption of the agenda, the Meeting requested flexibility with the agenda to ensure that if the deliberations of the GPA Working Group on Municipal Wastewater (see Agenda Item 6) were completed earlier than expected, the deliberations on ISTAC should be resumed immediately as there were many substantive issues which the ISTAC had to address in the interest of the LBS implementation such as the agricultural non-point sources, the proposal on the establishment of a RAC and long-term plans. In this context, it was also agreed that in the interest of time, the wastewater issues related to the 2002-2003 draft workplan were also to be addressed during the GPA Working Group on Municipal Wastewater.
16. The delegation of Trinidad and Tobago requested that an additional point be included on the agenda to address a new proposal for an LBS/RAC to be presented by their

Government. The Meeting agreed to include this proposal during Agenda item 8, which includes the proposal from the Government of Cuba for an LBS/RAC.

Agenda item 5: Review of Status and Activities in support of the LBS Protocol

17. The Secretariat made a presentation evaluating the major achievements of the projects implemented within the Sub-programme on Assessment and Management of Environmental Pollution (AMEP), in support of the LBS Protocol. During the presentation the Secretariat referred to document UNEP(DEC)/CAR WG.18/3, which contains a detailed review of the various AMEP activities developed in support of the LBS Protocol.
18. The Secretariat outlined the main activities of the programme and protocol coordination which include support for ratification of the Protocol, discussions with the Government of Cuba regarding the proposal on the establishment of the Regional Activity Centre (RAC), coordination with GPA and the GIWA project, relevant consultations and coordination with governments, development of fundraising efforts, and work to initiate development of an LBS Focal Point list. With regard to overall coordination, it was noted that additional support is now in place as a Programme Officer for CEPNET has recently joined the RCU and an Associate Programme Officer for both AMEP and SPAW sub-programmes is soon to come on board, following a vacancy announcement recently circulated.
19. The Secretariat provided a summary of the status of signatories to the LBS Protocol which now includes six Contracting Parties of the Cartagena Convention since the Protocol was adopted in October 1999. These governments are: Colombia, Costa Rica, Dominican Republic, France, the Netherlands, and the United States.
20. The following major activities were outlined and reviewed by the Secretariat :
 - Reducing pesticide run-off designed to assist with the implementation of Annex IV of the Protocol through a GEF PDF-Block B project for the development of national plans to control agricultural run-off in four countries (Colombia, Costa Rica, Panama and Nicaragua). The Secretariat highlighted the productive partnerships that had been developed with the private sector, as well as interest expressed by FAO to participate in its implementation. This was viewed with optimism by the Secretariat as the GEF is only a co-funding partner and approximately US\$4.5 million still had to be raised to match a similar contribution from GEF.
 - Pilot projects on sewage treatment needs is an activity still in the development stage and includes review of the requirements of Annex III of the Protocol and design of a methodology or "how to" guidance manual to plan for Annex III. Countries which have expressed interest and will be included in the pilot activities are: Belize, Colombia, St. Lucia and Venezuela.

- Integrating Watershed and Coastal Area Management in Small Island Developing States (SIDS), is another GEF PDF project financed under a Block B grant that involves all thirteen SIDS of the Wider Caribbean. This PDF involves the preparation of national reports and action plans, and a recently concluded sub-regional workshop reviewed the draft reports. The Secretariat noted that CEHI is the co-executing agency and that the OAS and CARICOM also participate in the project.
- Under the project on rehabilitation and coastal planning in the wake of Hurricane Mitch the Secretariat is currently working to identify target watersheds for which management plans will be developed through stakeholder participation. The Centro Agronómico Tropical de Investigación y Enseñanza (CATIE) has been selected as the partner organization for this project. The project is also expected to involve demonstrations of innovative sewage treatment systems for small communities.
- Rehabilitation of Contaminated Bays. The Secretariat noted that this is an area in which CEP has been involved for several years now and current activities include development of the regional and technical component of the UNDP GEF funded project. The overall project which will provide approximately US\$2 million each to Cuba and Jamaica for nutrient removal as part of their planned wastewater treatment facilities will include two regional training workshops on nutrient removal and sludge utilization. Additionally, a "lessons learnt" workshop will also be convened to share information on final technologies employed.
- Clearinghouse Node. This activity implemented through the CEPNET subprogramme of CEP puts in place the agreement with the GPA to strengthen RCU capacities on a data directory, direct access for decision-makers and capacity building. A prototype node is under development which is expected to be populated by the member governments of CEP.
- A financial strategy for implementation of the LBS Protocol is planned, giving particular attention to Annex III of the LBS Protocol. The project will review possible and innovative alternatives to attract donor funding and it is expected to produce a fundraising guide for use at the national and regional levels for implementation of the Protocol.
- Assessing Non-Point Source Loadings to the Marine Environment is designed to identify and apply an appropriate methodology to quantitatively and qualitatively analyze loadings of non-point sources. However, he noted that this project has

not yet been funded and thus the Secretariat proposes to combine it with a relevant activity of the 2002-2003 draft workplan.

21. In addition to the above activities, and in keeping with decisions of the Ninth Intergovernmental Meeting and Sixth Meeting of the Contracting Parties to the Cartagena Convention, the Secretariat added that it will also assist the GPA Coordination Office with preparations for the regional reporting on GPA implementation to be presented at the GPA Intergovernmental Review meeting and this ISTAC meeting is also expected to contribute to such process. Additionally, this ISTAC meeting will also assist GPA with the further development of the strategic action plan for municipal wastewater.
22. The Meeting was invited to provide comments on the implemented activities and to give particular ideas and suggestions that can be developed. One delegation raised a concern regarding non-inclusion of several Caribbean island nations in the GEF project aimed at reducing pesticide runoff in the Caribbean Sea, noting that the use of pesticides in some countries was alarming in relation to their surface area. The Secretariat explained that the project originated in 1998 under a GEF Grant. At that time, countries with a particular interest in reducing pesticide run off approached the Secretariat, requesting to be involved in the project. It was pointed out, however, that GEF projects are designed to be replicated in other countries and may serve as a training ground for similar actions in other countries. In this regard, the Chairman urged member countries to consider the Caribbean as a single unit.

Agenda item 6: Temporarily adjourn First ISTAC Meeting/Open UNEP/GPA Regional Working Group on Municipal Wastewater: *Regional Cooperation for Innovative Action*

23. Decision No. 29 (c) of the Ninth Intergovernmental Meeting invited the LBS/ISTAC to co-ordinate through the Secretariat with all relevant programmes, *inter alia*, the GPA Coordination Office to ensure coordination of projects and activities.
24. In light of the above, and in an effort to maximize time and resources, UNEP-CAR/RCU and the UNEP/GPA Coordination Office convened a working group on municipal wastewater during the First LBS/ISTAC Meeting.
25. The GPA Coordination Office is currently implementing a global strategy for Municipal Wastewater and is conducting regional workshops for input into the strategy. Because the goals of the GPA are closely linked to the implementation of the LBS Protocol, it was felt that integration of the meetings was important. The ISTAC meeting was temporarily suspended and the GPA Working Group was opened. In addition to the government experts designated for the ISTAC meeting, the GPA Working Group included participants representing Ministries of Finance and/or Planning, as well as other experts in the field of municipal wastewater. The Chair's conclusions, summarizing the results and recommendations of the GPA Working Group, were brought forward into the ISTAC Meeting as noted in **Annex V** to this Report.

Agenda item 7: Resume ISTAC Meeting: Presentation and Review of Other Relevant Activities and Initiatives

26. Consistent with Decision No. 29 (c) of the Ninth Intergovernmental Meeting, the LBS/ISTAC is to co-ordinate with all relevant programmes, including the Global International Waters Assessment (GIWA) Project. As such, a representative of GIWA presented the project to the Meeting and relevant linkages were discussed.
27. In his presentation, the representative of GIWA outlined the main objective and goals of this Programme. GIWA's main objective is to develop a comprehensive assessment of transboundary issues and their root causes in the international waters area. This is an interdisciplinary study bridging physical and social sciences and integrating seas with the related land catchment areas. GIWA will make a major contribution to policies and actions that will lead to the protection and more sustainable use of international waters. The main products include: strategic assessments of ecological status of transboundary waters for the use of GEF and cooperating donors; provision of a framework for projects to decide upon appropriate management interventions; identification of more sustainable approaches to water use and its associated resources; methods for conducting causal chain and transboundary diagnostic analyses through intensive use of indicators; and a baseline of information at the regional and sub-regional level to facilitate the preparation of these analyses. GIWA's focus is on water quality and quantity, uses, anthropogenic pollution and projections of future conditions. GIWA's work is concentrated in five major areas of concern, including pollution. In this context, GIWA could be a useful tool for governments for the implementation of the LBS Protocol, in particular its assessment methodology which is currently available.
28. After this presentation, a participant requested additional information on GIWA's use of indicators and how these are harmonized and complimented with other indicators already being developed in the Caribbean through various initiatives. The GIWA representative noted that indeed, more than a hundred indicators are described as part of the methodology for worldwide use. The selection of indicators to be used in each sub-region will be carried out by a local team of experts according to the availability of data and relevance of the indicators for each specific aquatic system.
29. Representatives from other relevant programmes and initiatives were also invited to briefly present their programmes with a view to identifying linkages, and avoiding overlap with activities identified by the LBS/ISTAC for implementation.
30. The representative of the International Atomic Energy Agency (IAEA) described the activities of the Marine Environmental Studies Laboratory (MESL) in support of the Regional Seas Programme. MESL, part of the IAEA's Monaco Laboratory, has expertise in marine analytical chemistry and chemical oceanography. MESL is responsible for the study of non-nuclear marine pollution and is the only such laboratory in the UN system.

MESL investigates inorganic (heavy metals, methylmercury, tributyltin) and organic (petroleum hydrocarbons, organochlorinated compounds, pesticides) pollutants.

31. MESL collaborates with UNEP and UNESCO/IOC in the Inter-Agency Programme on Marine Pollution. The laboratory also has extensive collaboration with Regional Seas Programmes and Action Plans, notably in the ROPME Sea Area and the Mediterranean, Black and Caspian Seas. Support activities include assistance with Quality Assurance procedures (Reference Methods, inter-calibration exercises, Reference Materials), capacity building (Quality Assurance missions, advice for purchase of equipment and supplies), training (courses in Monaco or the regions, fellowships) and establishing monitoring programmes. Various examples of research in different regions were highlighted. MESL seeks new partners in need of assistance in the monitoring and assessment of non-nuclear pollution in the marine environment.
32. The representative of the Natural Resources Management Unit of the Organisation of Eastern Caribbean States (OECS-NRMU) made a presentation on the current development of the Environmental Charter of the OECS. His presentation included the following points:
 - The St. Georges Declaration of Principles for Environmental Sustainability in the OECS first started out as the Environmental Charter of the OECS, which was mandated by the Ministers of the Environment of the OECS at the Third Environmental Policy Committee meeting held in Anguilla in 1999. The development of the Declaration was done through broad-based consultation and round-table discussions with all pertinent stakeholders, which included representatives from the Member States, regional and international developmental and donor agencies, as well as non-government organisations (NGOs) and civil society. Every effort was made to present the Declaration to as many groups and pertinent stakeholders to ensure that a truly "peoples" Declaration was developed and reflected the needs and aspirations of the people of the OECS region.
 - The Declaration is based on the premise that effective management of resources at local, national and international levels is an essential component of sustainable social and economic development. The Declaration also recognises the peculiar nature of small islands as a fully integrated complete system which also requires an integrated approach to the management of the use of natural resources of an island. The Declaration is comprised of 21 Principles, 17 of which speak to the substantive issues affecting sustainable environmental development in the OECS region and by which all human conduct affecting the environment is to be guided and judged. The remaining 4 principles of the Declaration refer to administrative obligations of contracting parties. The Declaration is expected to be adopted by contracting parties in 2001, and will be implemented through an Environmental Strategy currently being developed with completion expected in 2001. Further development of the Charter is expected to continue.

33. The representative of the Caribbean Industrial Research Institute (CARIRI) made a presentation on the work of this institution in support of the Basel Convention on transboundary movement and environmentally sound disposal of hazardous waste, which is complementary to the objectives of the LBS Protocol. Her presentation noted the following:
- CARIRI is one of the 3 sub-regional centres established under the framework of the Basel Convention to assist governments with its implementation. Regional centres have been established by the Secretariat of the Basel Convention on behalf of the Basel Party States. A Regional Centre for Latin America and the Caribbean (LAAC) is located in Uruguay and Sub-regional Centres in Argentina, El Salvador and Trinidad and Tobago.
 - During the first year of operation the Caribbean Sub-regional Centre will focus on assisting Parties with the establishment of systems to conduct national inventories of hazardous materials and hazardous waste. These inventories will be utilised to provide the competent national authorities of the Basel Convention with databases recording the status of storage and disposal of these materials.
 - Hazardous waste as defined by the Basel Convention includes biological wastes, pesticides and oily wastes. Substances of concern under several conventions and protocols.
 - The Sub-regional Centre (SRC) views hazardous waste as a subset of land-based sources of pollution. It is the SRC's opinion that future activities should build on existing regional and national initiatives and collaboration with relevant agencies. SRC seeks the recommendation of the representatives at this Meeting that the Basel SRC's activities be planned in conjunction with the RCU's programme of activities and that a collaborative mechanism be developed between the RCU and the Basel Sub-regional Centres to achieve coordination and support as appropriate.
34. The representative of the Caribbean Environmental Health Institute (CEHI) made a presentation on their main activities as these relate to the LBS Protocol:
- CEHI is an intergovernmental agency serving sixteen (16) Member States in the Commonwealth Caribbean. It is a technical and policy advisory agency, which was established through the Caribbean Environmental Health Strategy and with initial support from UNEP. The governing body of CEHI is the CARICOM Conference of Ministers of Health.
 - The work of the Institute is guided by the Environment Health Strategy, which gives CEHI a very broad mandate in environmental management issues. Two regional policy documents give CEHI its specific focus, the Caribbean Cooperation in Health Strategy, Phase (II) (CCH-II) and the Small Island

Developing States Programme of Action (SIDS POA). The CCH-II gives CEHI the coordinating responsibility for Environmental Health, while the SIDS POA and the Caribbean Inter-Agency Coordinating Group, gives CEHI the lead agency role for Waste Management and Water Resources Management.

- CEHI receives financial support from its sixteen Member States that provide established contributions on an annual basis. The Institute also receives financial support for projects through several donor agencies including GTZ, USAID, IDRC, OAS, and UNEP. It has well-established relationships with numerous regional, international and national agencies. Since tourism, agriculture and trade are the sectors that contribute to the economic survival of the majority of its Member States; CEHI has developed particularly strong linkages with these sectors.
- The Institute has engaged significantly in the areas of Waste Management and Water Resources Management to include liquid waste, solid waste, and hazardous waste management, drinking water, coastal and effluent quality monitoring, water supply and water management. CEHI has delivered on its programmes through the provision of engineering, laboratory and information services. It has engaged significantly in capacity building including the provision of training and equipment. Through this capacity-building drive, a cadre of trained personnel in water quality testing, sewage treatment plant operations and waste management in general has been created.
- CEHI has developed technology-based effluent guidelines that have fed into the substance of the LBS Protocol and it has been integrally involved in its development. The laboratory services offered by CEHI include testing for pesticide residues and heavy metals. CEHI also coordinates a network of water quality testing laboratories in its Member States which allows for the use of its facilities as a regional centre, providing complex analyses and quality assurance to the more day-to-day testing carried out at the national level.

35. After these presentations, participants expressed interest in the services currently being provided by many of these institutions. Additional information was requested from organizations such as: IAEA, CARIRI and CEHI regarding the assistance that they can provide to countries on pollutants, assessment, monitoring and analysis. The Chairman thanked all the presenters for their efforts to coordinate and seek linkages in the context of the LBS Protocol, as demonstrated through their participation at this Meeting. He noted that the valuable information provided enriched the pool of knowledge of the participants and will be useful during the discussions on Agenda item 9 addressing the Workplan for 2002-2003, in support of the LBS Protocol.

Agenda item 8: Review Draft Terms of Reference for the Creation of Regional Activity Centres (RACs) for Marine Pollution from Land-Based Sources and Draft Agreements Between the Governments of Cuba and Trinidad and Tobago and UNEP-CAR/RCU

36. Decision No.15 of the Ninth Intergovernmental Meeting on the Action Plan for the Caribbean Environment Programme (CEP) and the Sixth Meeting of the Contracting Parties to the Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region (Kingston, Jamaica, 14-18 February 2000), welcomed the proposal from the Government of Cuba for the establishment of a Regional Activity Centre (RAC) for land-based sources of marine pollution in the Wider Caribbean Region and authorised the Secretariat to *undertake negotiations with the Government of Cuba with a view to revising the proposal to include inter alia provisions for institutional strengthening of existing regional institutions and details regarding administration and financial requirements, and report to the Thirteenth Meeting of the Monitoring Committee and Special Meeting of the Bureau of Contracting Parties on any progress made.* Additionally, as was decided during Agenda Item 4: Adoption of the Agenda, it was agreed that this agenda item would also include a presentation of the RAC proposal from the Government of Trinidad and Tobago.
37. In light of the above, the delegations of the Government of Cuba and Trinidad and Tobago each made separate presentations on their proposals, including their Draft Terms of Reference for the Creation of a Regional Activity Centre (RAC) for Marine Pollution from Land-Based Sources and Draft Agreement Between their governments and UNEP-CAR/RCU. The presentations covered a general overview of the respective institutions in the two countries being proposed as RACs. The two delegates discussed the experience of their centres and provided an overview of the administrative and financial arrangements being proposed between the respective centres and UNEP-CAR/RCU. **Annex VII** includes the proposals by the Government of Cuba and **Annex VIII** includes the proposals by the Government of Trinidad and Tobago.
38. The Chairman commended the presenters on two well defined proposals. He invited the participants to comment on the two proposals and reminded the Meeting that the ISTAC was not a decision-making body, but rather a technical and advisory body with the capacity to make recommendations to the Meetings of the Parties.
39. In response to the Chairman's invitation to make comments regarding the proposals received by the Governments of Cuba and Trinidad and Tobago for the siting of the Regional Activity Centre (RAC) in their respective countries, several delegations expressed diverse opinions regarding the financial, administrative and practical feasibility of such a venture. One delegation, supported by several others, suggested that, rather than creating a RAC, it might be advisable to strengthen the agencies that already exist in each country for the implementation of the Protocol in order to seize the opportunity and commitment at the national level. In endorsing this view, another delegation added that given the potential budgeting implications to the CTF, the question of siting was not as important as ensuring the financial feasibility and long-term sustainability of a RAC.

40. It was also noted that there is an obvious need in the region for the sharing of experiences and information on issues of common concern, as well as for the promotion of greater collaboration at the regional level among the existing national institutions and laboratories. Additionally, it was recognised that while some countries have extensive national technical capabilities, others still lack even basic laboratory facilities. In this context, and in light of the institutional demands of RACs, it was further suggested that at this point in time it might be more appropriate to develop a Regional Activity Network (RAN) of institutions and laboratories that collaborate on issues relevant to the LBS Protocol. This could be done with the objective to take advantage of the existing strengths in each of the institutions participating in the RAN, while building the capacity of others. In addition, existing sub-regional networks, with mandates relevant to the objectives of the LBS Protocol, could also be included in the RAN.
41. Notwithstanding the desirability of a RAN, some delegations also highlighted that the work of coordinating, promoting and maintaining a RAN required the work of a coordinating body. Therefore, it was noted that the establishment of a RAN would not necessarily serve the same purpose as the RAC. It was further suggested that a needs assessment be carried out at the regional level to determine whether the need for an LBS RAC and/or RAN remains the same as ten years ago when the concept of RACs and RANs was first proposed.
42. Other delegations sought clarification on the effectiveness of those RACs already established, notably their financial needs, their ability to deliver at the broader regional level and their technical capability. In this context, the Secretariat provided additional information on the existing RACs already developed under the framework of the Caribbean Environment Programme (CEP). The Secretariat explained that the Regional Marine Pollution Emergency Training Centre (REMPEITC) established in Curacao was receiving direct support from the Governments of the Netherlands, the Netherlands Antilles, and the United States as well as from the IMO. The operating costs of the RAC in Guadeloupe in support of the SPAW Protocol are fully supported by the Government of France, including the costs of coordination with the RCU for which France has provided specific funds to the RCU through the Caribbean Trust Fund. The Secretariat also noted that the SPAW/RAC was relatively new and that REMPEITC will be established as a RAC in July 2001. The first evaluation of the performance of the SPAW/RAC will be presented to the next Meeting of the Monitoring Committee and Contracting Parties Meeting to be held later in June 2001.
43. The Secretariat further explained that in keeping with the concept behind the establishment of RACs, RACs are to be specialised institutions, selected on their technical capabilities to support the implementation of the Protocols and that their selection, funding and terms of reference, are to be decided through the appropriate Intergovernmental process.
44. A delegation reminded the Meeting that the Protocol had been adopted only over a year ago, and this was the first opportunity for countries to examine the activities and steps

- required for its implementation. In this regard, a number of delegations suggested that perhaps efforts should concentrate in identifying the steps and requirements for the entry into force of the Protocol, as it could be premature at this point to identify activities for its implementation through a RAC.
45. The Chairman summarised the three key elements as a result of the discussions: the need to further clarify the purpose, the financial viability and long-term sustainability of RACs. Some delegations reminded the Meeting that any recommendation of this ISTAC should be consistent with Decision No. 15 of the Ninth Intergovernmental Meeting and Meeting of the Contracting Parties, the highest decision-making body of the Caribbean Environment Programme.
 46. The Delegations of the Governments of Cuba, and Trinidad and Tobago responded effectively to each one of the questions posed by the Meeting and circulated in writing during the deliberations (See **Annex VI**), as well as questions related to the value added for the region on the establishment of a RAC in their countries. It was further recommended that any future proposals also respond to the questions identified in **Annex VI** and the other questions posed by the Meeting and annex them to their proposals.
 47. In summary of this Agenda Item, the Meeting welcomed the proposals by Cuba and Trinidad and Tobago to host a RAC. The Meeting also took note of the expressions by other Member Governments that additional proposals may be forthcoming.
 48. There was general recognition of the critical importance of ratification and entry into force of the Protocol and that since no Government in the Region can implement the Protocol alone, regional cooperation is required.
 49. Consensus on how best to achieve this cooperation was not reached. Some delegations favoured the establishment of a RAC, while others favoured exploring whether a RAC is needed now or whether other options (e.g., the creation of a RAN) should be taken. It was noted that whatever decision will be taken, it must be taken within the context of a realistic assessment of resource constraints as well as the potential for long-term sustainability.

Agenda item 9: Review of the Draft 2002-2003 Workplan and Budget in support of the LBS Protocol

50. The Secretariat presented the Draft Workplan and Budget in support of the LBS Protocol for the 2002-2003 biennium within the AMEP Subprogramme and as contained in document UNEP(DEC)/CAR WG.18/5. The draft Workplan was prepared based on inputs requested from Governments in September 2000, as well as information on ongoing relevant initiatives of CEP.
51. The Secretariat outlined the objectives, in addition to coordinating activities, as being the following:

- a) to support Protocol ratification and accessions;
 - b) to assist in developing and coordinating LBS Regional Activity Centre(s) as requested by the Parties;
 - c) to coordinate activities in support of LBS Protocol implementation, and
 - d) to continue fundraising activities.
52. The Secretariat emphasized that the AMEP Programme Officer and other CEP staff will continue efforts to secure ratification of the LBS Protocol. In respect of the establishment of RACs, he pointed out that any further development of a Regional Activity Centre(s) may require considerable time as well. He noted that one of the major efforts of overall coordination will be the identification and development of partnerships that combine regional and global efforts in order to provide complementary programmes and leverage funding.
53. With regard to the LBS Protocol coordination, the Secretariat noted that the CEPNET sub-programme as well as an Associate Programme Officer would also support the activities to implement the LBS Protocol. The Second Meeting of the ISTAC is proposed during the 2002-2003 biennium in order to develop a workplan and budget for 2004-2005. Coordination will continue with UN and non-UN partners and particular efforts will be made to bring development assistance into the WCR from other countries, multilateral funding institutions and private donors.
54. The Secretariat outlined those projects that were underway and/or proposed in the workplan. Emphasis was placed on the fact that a realistic view of the budget from the Caribbean Trust Fund was necessary and that counterpart funding was being sought for the biennial budget. The Secretariat indicated that a balance of approximately US\$10 million each year was needed in terms of co-financing, most of it in respect to GEF projects. The Secretariat stressed that GEF projects, in addition to the benefits to the individual participating countries, also have greater regional benefit through regional workshops, replicability of demonstration projects and the development of regional tools.
55. In reacting to the report of the Secretariat, one delegation stated that more concise activities geared towards the fulfillment of the objectives of the Protocol should be included. Another delegation stressed the need for a strong education and awareness programme to achieve ratification, accession, and implementation of the Protocol. It was suggested that a series of brief workshops on awareness be held at different levels, particularly at the decision-making level, which in turn could promote the organization of further workshops at the national level. It was further noted that this very important strategy of promoting the Protocol, with a view to its ratification, had not been covered in the budget. The Secretariat requested members to consider the question of funding for these workshops as a lack of resources would severely limit both commitment and action. In response, the Government of Colombia offered its support toward the development of such workshops.

56. One delegation pointed out the need for a greater link between the projects and the Protocol obligations and additionally requested that the Secretariat prepare a checklist of policy, legislative or technical requirements of the Protocol which would be useful as a needs analysis for ratification and accession. The importance of pilot projects and demonstration activities was also stressed, especially those showing Best Management Practices, to support the requirements of Annex IV to the Protocol. Such demonstration activities should focus on specific agricultural activities, such as appropriate crop cultivation design, pesticide and fertilizer use and livestock management techniques.
57. Suggestions were also made regarding the development of an information clearinghouse, and a web-based GIS possibly with the support of counterpart funds. An Observer remarked that the node could become a strong starting point for a RAN. Another Observer urged the RCU to familiarize itself with the work being carried out at this time by national and regional agencies that should be of interest to CEP. In this regard, one Observer expressed its interest in the planned project on pesticides, while highlighting its experience in capacity building in several countries of the region.
58. In responding to the questions raised by the delegations, the Secretariat pointed out that some projects had been included in this budget, although they extended beyond the 2002-2003 biennium, as a means of indicating what the total budgetary requirement would be and in order to use the budget as a means of raising funds.
59. With regard to the idea of workshops on Protocol implementation, the Secretariat welcomed this suggestion and invited countries to organize these at the national or sub-regional levels. It was pointed out that visits by the Secretariat to countries of the region generally included a presentation followed by an invitation to ratify both the Cartagena Convention and its Protocols. The absence of a Programme Officer for Education, Training and Awareness in the RCU meant that public education and public relations activities had to be undertaken by other members of the Secretariat, in addition to their other responsibilities. In this regard, a brochure is being produced this year outlining the work of CEP. One delegation suggested that the Secretariat could use the websites of existing regional and national environmental agencies to disseminate information on this Protocol as well as the associated regional activities, in order to assist in the awareness process.
60. The Delegation of Colombia, as the Depositary of the Cartagena Convention, reminded the Meeting that the Cartagena Convention and its three protocols were no longer open for signature. This means that countries that had not yet signed, could now only accede to them. It was further pointed out that nine Parties are needed to have ratified or acceded to the LBS Protocol for it to enter into force. The Delegation of the USA pointed out that there was a discrepancy between the text of the LBS Protocol as adopted in French, from that of the Spanish and English texts which were consistent with each other. This discrepancy would be communicated to the Government of Colombia, as Depositary of the Convention and its Protocols.

Agenda item 10 : Other Business

61. The participants of the Meeting were invited to raise other issues not covered by the preceding agenda items, but relevant to the scope of the Meeting.
62. The Secretariat informed the participants that within the framework of CEP for the year 2001, negotiations were underway with the Governments of Costa Rica and Cuba with a view to holding the Monitoring Committee Meeting in Costa Rica, 25-29 June 2001, and the First Meeting of the Contracting Parties to the SPAW Protocol in Cuba 24-28 September 2001.
63. The Meeting was also informed that attempts were being made to integrate the various types of electronic media in order to disseminate information more effectively. In this regard, integration of CEPNET with CEPNEWS was envisaged, as well as the establishment of e-groups for the various groups of CEP Focal Points.
64. The Secretariat also introduced a new staff member, Luc St. Pierre, Programme Officer for CEPNET. The Meeting was also informed that Jorge Flores had been replaced as Fund Management Officer by Jose Maria Beato, whose post is supported by the 13% Programme Support Costs. It was pointed out that the RCU was now better equipped in terms of staffing.
65. One delegation recommended that in selecting venues for future CEP Meetings a more reliable and economical communications area (e.g., phone, fax and Internet) should be provided to the delegates, as this is an important means to contact their governments during the course of the meetings. The issue of disseminating pre-conference documentation was also raised and it was pointed out that the Secretariat should consider sending printed copies of working documents as it was not always possible to download information from the websites. Other suggestions included email attachments to be sent at the same time as invitations to the meeting and CD-ROMS for other countries with difficult e-mail access. The Chairman asked delegations to indicate their technology capability in order to assist the Secretariat in forwarding documents. Another delegation indicated the need to set meeting dates for future meetings as soon as possible to allow for adequate planning by Parties.
66. The Secretariat was requested to form enhanced relationships with financial institutions to facilitate access to resources for the implementation of the Protocol. The question was also raised regarding access by individual countries to the funding which was noted as being potentially available during the Protocol negotiations.
67. Three delegations raised issues relating to their individual countries and territories. In the first instance, the Blue Water waste from commercial airlines and marinas had become a serious problem and it was felt that this could be included as a LBS issue to be looked at by the Secretariat as well as marina waste. The second issue was in regard to

an increased need to look at issue of plastic waste and in the third instance, the Secretariat was congratulated for its assistance regarding technologies available for on-board treatment of sewage waste by yachts.

68. In response to the question raised regarding the venue of the Meeting, the Secretariat indicated that the Meeting had been held outside of Kingston at the suggestion of the member countries. The north coast of Jamaica was selected after discussions with other potential host governments did not result in a meeting site outside Jamaica. The Secretariat had been limited in providing Internet access to delegates because of the high cost of the meeting. It was also pointed out that no funds had been budgeted a year ago for this type of meeting and that funds were being sought even as the meeting was being planned. Thanks to donations from the governments of the USA, Norway and the Netherlands the Secretariat was able to convene this Meeting.
69. In relation to the upcoming Thirteenth Meeting of the Monitoring Committee and Special Meeting of the Bureau of Contracting Parties (13th MonCom), the Secretariat informed the Meeting that the 13th MonCom would be held in Costa Rica and that these observations and recommendations would be taken into account for the meeting site.

Agenda item 11: Adoption of the Report of the Meeting

70. The Rapporteur of the Meeting presented the draft report of the Meeting (UNEP(DEC)CAR WG.18/CRP.6). The Meeting adopted the Report with amendments as reflected in this document.

Agenda item 12: Closure of the Meeting

71. Prior to closing remarks by the Chairman, the Delegation of the Government of Trinidad and Tobago expressed his appreciation for the frank and open manner in which the Chairman conducted the Meeting. The Delegate also remarked on the commitment and professionalism shown by the Secretariat in the preparation and execution of the Meeting. He noted that he was grateful for the cooperation shown by all delegations and for their dedicated work during the meeting.
72. In his closing remarks, the Chairman thanked the delegates for their hard work and efforts during the deliberation of the important issues presented during the Meeting. He expressed his appreciation to the interpreters and translators who worked behind the scenes at the Meeting. He also expressed his gratitude to the Secretariat, led by Nelson Andrade, and its important continuing efforts to work together for the good of the Wider Caribbean Region.
73. In closing remarks made by the Secretariat, the Co-ordinator of UNEP-CAR/RCU also noted the tremendous work of the delegates. He noted the significant number of representatives from the Region in attendance and that this reflected the interest of the

governments to participate in the protection of the marine environment of the Wider Caribbean as our common water-body.

74. The Chairperson of the Meeting and the Secretariat closed the Meeting on Friday, 23 February 2001, at 6:30 p.m.

ANNEX I/ANNEXE I/ANEXO I

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UNEP(DEC)CAR WG.18/CRP.6

Annex III

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ANNEX II

AGENDA

1. Opening of the Meeting
2. Election of Officers
3. Organisation of the Meeting
 - a. Rules of Procedure
 - b. Organisation of Work
4. Adoption of Agenda

5. Review of status and activities in support of the LBS Protocol
6. Temporarily adjourn First ISTAC Meeting/Open UNEP/GPA *Regional Working Group on Municipal Wastewater: Regional Cooperation for Innovative Action*
7. Resume ISTAC Meeting: Presentation and Review of Other Relevant Activities and Initiatives
8. Review Draft Terms of Reference for Creation of Regional Activity Centres (RACs) for Marine Pollution from Land-Based Sources and Draft Agreements Between the Governments of Cuba and Trinidad and Tobago and UNEP-CAR/RCU
9. Review of the Draft 2002-2003 Workplan and Budget in support of the LBS Protocol
10. Other Business
11. Adoption of the Report of the Meeting
12. Closure of the Meeting

ANNEX III

LIST OF DOCUMENTS

Working Documents

UNEP(DEC)CAR WG.18/1	Agenda
UNEP(DEC)CAR WG.18/2	Annotated Agenda
UNEP(DEC)CAR WG.18/3	Status of Activities of the Sub-Programme on Assessment and Management of Environmental Pollution (AMEP) in support of the Protocol Concerning Land Based Sources and Activities of Marine Pollution (LBS)
UNEP(DEC)CAR WG.18/4	Draft Terms of Reference for Creation of a Regional Activity Centre (RAC) for Marine Pollution from Land-Based Sources and Draft Agreement Between the Government of Cuba and UNEP-CAR/RCU
UNEP(DEC)CAR WG.18/5	Draft Workplan and Budget for the Sub-Programme on Assessment and Management of Environmental Pollution (AMEP) in support of the Protocol Concerning Land Based Sources of Marine Pollution (LBS), 2002-2003 Biennium
UNEP(DEC)CAR WG.18/6	Report of the First Meeting of the Interim Scientific, Technical and Advisory Committee (ISTAC) to the Protocol Concerning Land-Based Sources and Activities of Marine Pollution

Information Documents

UNEP(DEC)CAR WG.18/INF.1	List of Documents
UNEP(DEC)CAR WG.18/INF.2	List of Participants
UNEP(DEC)CAR WG.18/INF.3	Report of the Conference of Plenipotentiaries to Adopt the Protocol Concerning Pollution from Land-Based Sources and Activities to the Convention for the Protection and Development of the Marine Environment of the Wider

Caribbean Region, Final Act, 1999

UNEP(DEC)CAR WG.18/INF.4

Protocol Concerning Pollution from Land-Based Sources and Activities to the Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region

UNEP(DEC)CAR IG.17/12

Workplan and Budget for the Caribbean Environment Programme for the 2000-2001 Biennium

UNEP(DEC)CAR IG.17/5

Report of the Ninth Intergovernmental Meeting on the Action Plan for the Caribbean Environment Programme and Sixth Meeting of the Contracting Parties to the Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region, Kingston, Jamaica, 14-18 February 2000

Reference Documents

UNEP(WATER)CAR IG.15/7

Report of the Meeting of the Contracting Parties to the Cartagena Convention to Negotiate a Final Protocol Concerning Pollution from Land-Based Sources and Activities in the Wider Caribbean Region, Kingston, 16-18 June 1998

UNEP(WATER)CAR WG.21/6

Report of the Second Meeting of Legal/Technical/Policy Experts for the Development of a Protocol Concerning Pollution from Land-Based Sources and Activities to the Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region, Kingston, 24-28 February 1997 (English, Spanish)

CEP Technical Report No. 40

Appropriate Technology for Sewage Pollution Control in the Wider Caribbean Region (English, French)

CEP Technical Report No. 41

Best Management Practices for Agricultural Non-point Sources of Pollution (English, French)

UNEP(OCA)/CAR WG.20/4

Report of the First Meeting of Legal/Technical/Policy Experts for the Development of a Protocol Concerning Pollution from Land-Based Sources and Activities to the Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region, Kingston, Jamaica, 4-7 June 1996

UNEP(OCA)/CAR WG.14/5	Report of the Second Meeting of Experts on Land-Based Sources of Marine Pollution in the Wider Caribbean Region, San Juan, Puerto Rico, 21-25 March 1994
UNEP(OCA)/LBA/IG.2/7	Global Programme of Action to Protect the Marine Environment from Land-Based Sources and Activities, Washington, D.C., 23 October - 3 November 1995
UNEP IETC Report 5	Proceedings of the Workshop for the Wider Caribbean Region on Adopting, Applying and Operating Environmentally Sound Technologies for Domestic and Industrial Wastewater Treatment for the Wider Caribbean Region, Montego Bay, Jamaica, 16-20 November 1998 (English only)
United Nations, N.Y., 1983	Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region and Protocol Concerning Co-operation in Combating Oil Spills in the Wider Caribbean Region
UNEP, 1990	Protocol Concerning Specially Protected Areas and Wildlife in the Wider Caribbean Region, Final Act, Kingston, 15-18 January, 1990
UNEP, 2000	Agreement Between the Government of the French Republic and the United Nations Environment Programme for the Contracting Parties to the Cartagena Convention Regarding the Establishment in the French Department of Guadeloupe of a Regional Activities Centre for the Specially Protected Areas and Wildlife in the Wider Caribbean Region.

ANNEX IV

RECOMMENDATIONS OF THE MEETING

The Meeting:

Taking into account the "Status of Activities of the Sub-Programme on Assessment and Management of Environmental Pollution (AMEP) in support of the Protocol Concerning Land-Based Sources of Marine Pollution (LBS)" (UNEP(DEC)/CAR WG.18/3).

Having jointly convened the GPA Regional Working Group on Municipal Wastewater: *Regional Cooperation for Innovative Action*, during this First Meeting of the LBS/ISTAC;

Taking note of the presentations by other regional and global organisations regarding initiatives relevant to the implementation of activities in support of the LBS Protocol;

Taking into account the "Draft Workplan and Budget for the Sub-Programme on Assessment and Management of Environmental Pollution (AMEP) in Support of the Protocol Concerning Land-based Sources of Marine Pollution for the 2002-2003 biennium", (UNEP(DEC)/CAR WG.18/5); and

Further to Decision No.15, of the Ninth Intergovernmental Meeting, regarding the proposal of the Government of Cuba to establish a RAC for the LBS Protocol, and considering the opportunity to evaluate the proposal of the Government of Trinidad and Tobago, presented at the beginning of the Meeting;

Recommends that:

1. The Conclusions and Recommendations of the GPA Regional Working Group on Municipal Wastewater, as contained in **Annex V** of this Report, be forwarded to the Intergovernmental Review (IGR) Meeting of the GPA (to be held in Montreal, 26-30 November 2001); and that the IGR take these recommendations into consideration in the development of any further GPA activities on municipal wastewater.
2. All Governments of the Wider Caribbean assist the GPA Coordination Office in preparation for the IGR, by completing the questionnaire as contained in the *Country Reporting Guide*, provided by the GPA Coordination Office and attached to Circular Letter CAR 02/2001, distributed during the Meeting. The completed questionnaire should be submitted to UNEP-CAR/RCU by 31 May 2001.
3. The Secretariat continue to explore opportunities for partnerships with, and support from, other regional and global institutions and initiatives to further the goals and objectives of

the LBS Protocol, including the implementation of projects and activities in support of the LBS Protocol, agreed to by the Governments.

4. The Secretariat revise the Draft Workplan and Budget in Support of the LBS Protocol for the 2002-2003 biennium, to reflect the issues and comments raised during the discussion of Agenda item 9 of this Meeting and that the draft Workplan and Budget be submitted to the next Meeting of the Monitoring Committee and Bureau of Contracting Parties for further elaboration. Among the things to be included in the revised workplan and budget are:
 - a) development of an activity to promote awareness and ratification of the Protocol to include national or regional awareness workshops for different levels of stakeholders and electronic information systems such as links to other relevant regional and national websites and workplans to maximise coordination;
 - b) development of a checklist of the activities necessary for countries to ratify or accede to the Protocol;
 - c) development of projects on agricultural non-point sources to demonstrate best management practices in the areas of livestock management and other relevant issues; and
 - d) projects related to the development of the Information Clearinghouse Node and web-based geographic information system for the Wider Caribbean, should such activities not be completed in the current biennium of 2000-2001.

In addition, future workplan activities should, to the extent possible, show a more direct link to the needs of the Protocol and the needs of the Parties to ensure ratification and accession with a view towards entry into force.

5. Governments should make the relevant arrangements to ensure the transfer of necessary information to allow the Depositary to act quickly to resolve the language discrepancies, noted during the Meeting, between the English and Spanish versions of the Protocol and the French version, as such discrepancies are delaying the ratification process in some countries.
6. Contracting Parties to the Cartagena Convention, interested in hosting a RAC or RAN for the LBS Protocol, should be encouraged to provide information on the issues and questions presented in the discussion, which are documented in the Report of this Meeting and summarised in **Annex VI**. Such information should be submitted to the Secretariat no later than 15 April 2001, so that the Secretariat can collate and disseminate this information to provide the basis for a more informed discussion at the Thirteenth Meeting of the Monitoring Committee and Special Meeting of the Bureau of Contracting Parties, 25-29 June 2001.

7. UNEP-CAR/RCU, in co-operation with the GPA Co-ordination Office and the WHO/Pan-American Health Organisation, (i) compile information on past and current projects and initiatives in the region which could be useful as case studies on wastewater management; (ii) summarise main lessons learnt from these case studies; and (iii) make this information available to all Caribbean countries (e.g., through hard copies and the clearing-house mechanism) before the end of 2001. This analysis and resulting recommendations could be an additional contribution from the Caribbean region to the 2001 GPA Intergovernmental Review meeting.

8. UNEP-CAR/RCU prepare draft project proposals to implement the next phases of the ongoing pilot projects (sewage treatment needs assessment; and implementation of Annex III of the LBS Protocol), to be brought forward to the 2001 GPA Intergovernmental Review meeting for possible financing.

ANNEX V

CONCLUSIONS FROM THE CHAIR SUMMARY AND RECOMMENDATIONS

UNEP/GPA REGIONAL WORKING GROUP ON MUNICIPAL WASTEWATER: REGIONAL COOPERATION FOR INNOVATIVE ACTION Ocho Rios, Jamaica, 19 - 21 February 2001

Introduction

Domestic wastewater discharges are one of the most significant threats to sustainable coastal developments worldwide. The priority for action on “sewage”, as identified by the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA), was reconfirmed by seven regional workshops of Government-designated experts organised (1996-1998) by the United Nations Environment Programme (UNEP) as GPA Secretariat within the framework of the Regional Seas Programme and by UNEP's Governing Council (decision 20/19 of 1999).

The effects of individual domestic wastewater discharges are usually localised, but they are a major source of coastal and marine contamination in all regions and therefore a global issue. Pathogenic organisms in domestic wastewater-contaminated marine and estuarine waters cause massive transmissions of infectious diseases to bathers and consumers of raw and undercooked shellfish with a global economic impact recently estimated at US\$10 billion per year (GESAMP 2001)¹.

The concern for domestic wastewater in the Wider Caribbean region led to the development of a special Annex of the Protocol Concerning Pollution from Land-based Sources and Activities to the Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region (LBS Protocol). In response to the above, the UNEP/GPA Coordination Office, in cooperation with the World Health Organization (WHO), the United Nations Centre for Human Settlements (Habitat) and the Water Supply and Sanitation Collaborative Council (WSSCC) developed the GPA Strategic Action Plan on Municipal Wastewater (SAP) (UNEP/GPA/WG. CAR.1/2). An important part of the SAP is the Recommendations for Decision-making on Municipal Wastewater (UNEP/GPA/WG. CAR.1/3) and the organization of regional partnership meetings.

This meeting in the Caribbean is the first of a series of similar regional partnership meetings UNEP is planning during 2001. The result of these meetings and the experiences gained will significantly contribute to a special session dealing with the problems associated in

¹ UN-sponsored Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection and ACOPS. 2001. Protecting the oceans from land-based activities – Land-based sources and activities affecting the quality and uses of the marine, coastal and associated freshwater environment. Rep. Stud. GESAMP No. 71, 162 pp.

municipal wastewater during the first intergovernmental review meeting on implementation of the GPA (Montreal, Canada, 26-30 November 2001) which is under preparation.

Mr. Gerardo Viña, from the Colombian delegation and Chair of the First Meeting of the Interim Scientific, Technical and Advisory Committee (ISTAC) to the LBS Protocol, chaired the meeting of the present Working Group. Dr. Mearle Barrett, from the Jamaican delegation, was elected as Rapporteur. The purpose of this document is to summarise the main outcome of the discussions and to identify action to be taken by the Secretariat, ISTAC, Governments, the GPA Co-ordination Office and other partners.

The aim of the Working Group was to contribute to the implementation of the LBS Protocol by providing a forum for exchanging experience and expertise and by facilitating the establishment of partnerships among stakeholders to promote national and regional action.

The particular objectives of the Working Group were to:

- (i) Review the Recommendations for Decision-making on Municipal Wastewater and develop regional annexes, as appropriate, to reflect common views of stakeholders on priorities, capacities and needs;
- (ii) Exchange experience and expertise with regard to innovative, financial, technical and institutional arrangements related to the management of municipal wastewater, and to foster partnerships;
- (iii) Identify demonstration projects which could facilitate implementation of Annex III (on domestic wastewater) of the LBS Protocol and also illustrate the application of the Recommendations for Decision-making on Municipal Wastewater; and
- (iv) Provide recommendations to the ISTAC with regard to activities to be incorporated in the 2002-2003 workplan and budget for the LBS Protocol.

The Meeting was attended by representatives of national and local Governments, regional and international intergovernmental and non-governmental organisations, and the private sector (see the List of Participants in Annex I to the report of the ISTAC meeting).

Summary and Recommendations

(i) Review of the Recommendations for Decision-making on Municipal Wastewater

The Working Group welcomed the Recommendations for Decision-making for Municipal Wastewater as a general guidance to wastewater management approaches. The document was considered a useful tool to facilitate implementation of Annex III of the LBS Protocol, in accordance with national policies and plans.

The Meeting established three parallel *ad hoc* working groups to review a draft document submitted by the GPA Secretariat summarising the key issues of the Recommendations for

Decision-making, as follows: integrated approaches, stakeholder involvement, financial sustainability, institutional arrangements and innovative technologies. The revised draft, incorporating the changes suggested by the Meeting (Appendix 1 to this Annex), will be submitted to similar meetings being organised by the GPA Secretariat in other Regional Seas Programmes during 2001 and to the GPA intergovernmental review meeting.

(ii) *Exchange of experience and expertise*

Case studies

Five case studies, illustrating experiences with innovative financial, technical and institutional approaches in the Wider Caribbean region, were presented to the meeting (summarised in Appendix 2) as follows: (i) Mr. Gonzalo Arcila (Planetary Coral Reef Foundation and ECORED, Mexico) on the use of natural systems to treat wastewater; (ii) Mr. Errol Frederick (Water and Sewerage Company, St. Lucia) on the willingness and ability of householders of connecting to sewers; (iii) Mr. Joan Borrel (Aguas de Cartagena, Colombia) on public-private partnerships with special attention to low income inhabitants; (iv) Mr. Manuel Finke (Hotel Association of Puerto Rico) on experiences of the tourism sector in wastewater management; and (v) Mr. Reinaldo Pieters (Department of Public Works, Bonaire) on wastewater management and water re-use.

The following major conclusions from the presentations and from the subsequent discussion were drawn by the Meeting:

1. There are no unique or ideal solutions and thus no one single alternative can be considered in isolation;
2. There is a need to switch from the conventional approach to the sustainable approach and from short-term to a long-term vision;
3. There should be a requirement to develop and implement proper wastewater treatment systems and solid waste management solutions prior to the beginning of any dwelling and construction where human activities will take place;
4. There is a recognition of the importance of taking into account the carrying capacity of the ecosystems where wastewater is being discharged and not only the standards criteria;
5. Cost-benefit studies are important to assist decision-makers in determining priorities for investment;
6. Viable and practical solutions need to be developed in the context of local realities which integrate effluent limitations with the specific uses and objectives of the receiving waters;
7. The management of wastewater systems should be flexible to allow future adjustments, as required;
8. Willingness of users to pay fees (e.g., those for tourism) increase once the benefits are apparent. It is important to ensure transparency on how the fees

collected are used, e.g., towards protecting the natural resources (for instance, coral reefs);

9. The financial aspects of wastewater systems are critical in particular for developing countries and thus innovative alternatives to ensure their sustainability are required. Examples of these include a tourist tax in areas where tourism is the main economic activity as well as an important contributor to pollution, government economic incentives for the private sector, etc; and
10. The civic society plays a critical role in the decision-making process.

A number of delegations brought to the attention of the Working Group additional case studies dealing with domestic wastewater management in the Caribbean (e.g., British Virgin Islands, Barbados, Venezuela, Jamaica, Dominican Republic, Turks and Caicos Islands). Participants agreed to make available to the Secretariat information on these and other case studies for their compilation and dissemination (see template in Appendix 3, as an initial effort to begin compiling this information).

Based on the presentations and on the discussions carried out by the three *ad hoc* working groups mentioned above, the meeting identified lessons learnt in managing domestic wastewater in the region. They can be grouped in the following main categories:

A. Harmonisation

1. Need for an harmonised approach to adopt and implement regional effluent standards at the national level as reflected in Annex III of the LBS Protocol of the Wider Caribbean. This approach encourages the application of appropriate technologies and discourages development interests moving from territory to territory seeking lower standards/development requirements within the region.
2. Marina-related developments should be considered within the context of land-based sources and activities.
3. Need to value land differently, with the wealthy subsidising the poor to expand use of wastewater systems.
4. Need to develop appropriate methodologies for the development of management systems in small island States and larger countries with multiple river systems, varied coastlines and borders.
5. Need for a common level of regional commitment.
6. Incentive programmes have been overvalued and community commitments should be included in developing planning and approval process. Both public and private sector developments should involve the public during the process.
7. Enhancement of the public capacity to influence planning and contract approval processes (i.e., negotiating skills) needs to be developed, possibly through regional sharing of country expertise or supported by training by the World Bank, the Inter-American Development Bank and the United Nations Development Programme, among others.

8. Equity and cost-effectiveness are important criteria for strategic planning. It is crucial to balance the quality of the service and the investment cost.
9. Need for the political will to establish port waste reception facilities for the management of waste from ships.

B. Finance and infrastructure

1. A minimum institutional capacity is essential to utilise and implement technology.
2. Need for planners to recognise who the beneficiaries of development really are in order to take their needs into account.
3. Financial viability should be based on economic rates of return and a rate of return relating to broader economic analysis.
4. There is no quantification of environment assets (natural resource accounting) and, as a result, environmental concerns are not incorporated into financial feasibility.

C. Training

1. Programmes of technology and know-how transfer should be promoted among the countries of the region and other developed countries.
2. Training is needed to build capacity in evaluation of environmental assets, as well as in the field of environmental economics.
3. Programmes to strengthen research capacity using peer exchanges and exchange of experiences.

D. Public awareness and participation

1. Public awareness can be used to attain long term sustainability rather than short term financial or political returns. The effectiveness of marketing/education strategies aimed at involving the public in wastewater management need to be reviewed. There is a need for broad public education involving all levels.
2. Stakeholder participation is essential from the beginning of the planning process. Make sure everybody “hooks up” in the project planning.
3. Information must be available to the public. Systematic and coordinated public disclosure of information on, for example, case studies (what has worked and not worked) is essential to enhance environmental awareness.
4. Planning processes should include mechanisms to provide connection to sewerage systems/potable water systems regardless of ability or willingness to connect.

E. Monitoring and evaluation

1. Need for projects/initiatives on wastewater management to implement long term monitoring plans. Monitoring the performance of the wastewater treatment systems is also very important.

International financing and intergovernmental organisations

In addition to the above case studies, representatives of international financing institutions and intergovernmental organisations were invited to brief the meeting on their role and activities in support of wastewater management in the Caribbean region (their presentations are summarised in Appendix 4), as follows: (i) Mr. Steven Stone (Inter-American Development Bank, Jamaica Office) on the role of the IDB in financing water and wastewater management with a focus in the Caribbean; (ii) Mr. Samuel Wedderburn (World Bank); (iii) Mr. Gerardo Galvis (Pan-American Health Organisation/World Health Organisation, Washington, DC, USA) on PAHO's technical GPA-related co-operation activities; (iv) Mr. Harry Philippeaux (PAHO/WHO, Caribbean Region, Barbados) on considerations for PAHO's project development in wastewater management in the Caribbean; and (v) Mr. Bernhard Griesinger (Organisation of American States) on OAS activities on water.

The following main lessons learnt and recommendations were drawn from the presentations and the ensuing discussion:

1. A strong legal and regulatory framework is essential to gain short-term financing;
2. Leverage private resources where possible (e.g., through public private partnerships);
3. Use the full range of multilateral development banks (MDB);
4. Coordinate donors and lenders to achieve long term goals;
5. Involve major stakeholders on decision-making processes;
6. Need to ensure proper collection of data and information as a basis for adoption of regulatory measures;
7. Need to make available relevant and credible information to decision-makers and civil society at the national and local levels;
8. Water services should be planned based on their sustainability;
9. Develop alliances with Ministries of Finance and Planning;
10. It is highly important that decision-makers be informed of the financing process of the development banks. It is also important that each sector coordinates within its own country to identify its priorities, make them known and get their government to include them on their list of priorities, at a national level;
11. Since the development banks have requirements regarding legal aspects and the LBS Protocol offers very good guarantees to these institutions, there is a strong argument in favour of ratifying the Protocol as soon as possible;

12. Need for donor countries to focus their attention in supporting the efforts of recipient countries in implementing management approaches in accordance with their own policies and needs.

(iii) Identification of demonstration projects

The Working Group agreed that the results of the two ongoing pilot studies (pilot projects in sewage treatment needs assessments; and on implementation of Annex III of the LBS Protocol) would be an input from the region to the 2001 GPA intergovernmental review meeting.

(iv) Recommendations to ISTAC

1. The Working Group recommends that ISTAC invite the CAR/RCU, in co-operation with the GPA Co-ordination Office and the WHO/Pan-American Health Organisation, to (i) compile information on past and current projects and initiatives in the region which could be useful as case studies on wastewater management; (ii) summarise main lessons learnt from these case studies; and (iii) make this information available to all Caribbean countries (e.g., through hard copies and the clearing-house mechanism) before the end of 2001. This analysis and resulting recommendations could be an additional contribution from the Caribbean region to the 2001 GPA intergovernmental review meeting.

2. The Working Group recommends that ISTAC requests the CAR/RCU to prepare draft project proposals to implement the next phases of the ongoing pilot projects (sewage treatment needs assessment; and implementation of Annex III of the LBS Protocol), to be brought forward to the 2001 GPA review meeting for possible financing.

APPENDIX 1

RECOMMENDATIONS FOR DECISION-MAKING ON MUNICIPAL WASTEWATER

KEY ISSUES AND RECOMMENDATIONS

The prerequisites for addressing the management of wastewater in order to safeguard human and ecosystem health, and to avoid the degradation of water quality and other coastal and marine resources include:

- (i) Stakeholder involvement, which will foster the political will to assign a high priority to wastewater management among other pressing public investment needs; and
- (ii) Financial affordability and sustainability

The key principles for managing wastewater in a sustainable manner are to **conserve water resources** by eliminating pollution at the source, using water efficiently and maintaining water quality, and to **respond effectively** to demands from society;

The Recommendations for Decision-making on Municipal Wastewater, a practical policy guidance for addressing sewage within the context of the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA), identifies the following key issues and recommendations:

Integrated Approach

- Quantify and qualify socioeconomic, environmental and public health impacts of pollution to determine priorities for investment
- Integrate wastewater management with other considerations such as water supply, land use, and carrying capacity of the natural environment and infrastructure limitations, consistent with integrated approaches for the management of river basins and coastal zones
- Establish effluent and water quality criteria with a timetable designated to translate these into legally enforced standards
- Employ a mix of appropriate technological options and managerial approaches, optimal and sustainable for residential, rural, and urban areas

Stakeholder Involvement

- Invest in education, creating awareness and commitment among stakeholders, citizens and users
- Devolve decision-making to the appropriate administrative level and involve all stakeholders in the process

Financial/Economical Sustainability

- Adopt by consensus the polluter pays principle
- Evaluate the financial feasibility of obtaining capital investment funding and revenue for operations and maintenance for implementing and putting into service new wastewater collection and treatment infrastructure
- Let the polluter and the water user pay, including the benefiting stakeholders
- Balance the quality of service, the investment cost and the tariffs households are willing and able to pay
- Apply appropriate financial instruments
- Promote the use of all allocated resources to the integrated management of watersheds to support the development of management systems for wastewater

Institutional Arrangements

- Recognize the enabling task of central government to encourage local governments, private sector, river basin agencies and others to act
- Develop a long-term strategy for institutional reform and capacity building, as appropriate as well as a policy framework for wastewater management
- Facilitate Public Private Partnership as an important tool to assist in financing and operating infrastructure for wastewater management
- Apply restrictive and enabling regulations together with feasible means of enforcement
- Incorporate market-based instruments into the regulatory framework
- Develop appropriate systems for data gathering, assessment, evaluation, monitoring and sharing of information
- Develop a programme for small community systems and their unique managerial, technical, and financial needs

Technological Innovations

- To facilitate the introduction of appropriate strategies aimed at waste prevention and minimization (on-site)
- Appropriate technologies which reflect cost-effectiveness, simplicity, and maintenance considerations, such as the use of natural treatment systems, ventilated improved pit (VIP) latrines, and reuse of water and waste
- Segregate domestic, storm and industrial wastewater when appropriate
- Facilitate the exchange of research and development information and experiences on the implementation and operation of different technologies including small community systems.
- Ensure the pretreatment of industrial effluents which interfere with the treatment of municipal wastewater
- Reinforce research and capacity at the regional or country level for the purpose of making available knowledge relevant to the impacts of GPA in the regional context

APPENDIX 2

A NEW APPROACH TO WASTEWATER TREATMENT

Gonzalo Arcila G.

PCRF together with ECORED have developed a biological, sub-surface flow wastewater treatment system designed for use both inland and by the sea. When used along the coast, they can help protect coral reefs from the damaging impacts of human sewage. of the adjacent businesses.

The Wastewater Gardens are a low cost, low maintenance solution to the problem of human waste in coastal developments. They have no mechanical or moving parts and use no chemicals. Using only plants, microbes, limestone gravel, cement, plastic pipe and gravity, these systems remove over 99.9% of fecal coliform and more than 86% of the environmentally harmful phosphates and nitrogen. Locally available plants are selected to make an elegant ecosystem.

The system works by letting wastewater from toilets, showers, and kitchens flow by gravity into sealed septic tanks and then into these specially designed concrete units. A layer of limestone gravel interacts chemically to remove phosphorous, protozoa consume fecal coliform, a special cache of microbes feed on the waste breaking it down into nutrients that are absorbed by the plants roots, and the plant roots pump oxygen to the lower level.

Fifty percent of the water is evaporated and the remaining water produced by the system is reclaimed to irrigate gardens or fields and for flushing of toilets. PCRF's special garden ecosystems add beauty to any landscape and create new habitats, provide food, flowers, or other usable products as well as enriching and sustaining local biodiversity.

The wastewater is kept at least two inches below the top of the gravel, eliminating odors and prevention of accidental human contact. This living system grows more efficient with time and has an effective life span of several decades. Wastewater Gardens are a natural way to purify human sewage before it gets to the groundwater or ocean and help protect these marine environments from the harmful effects of untreated wastewater.

Range of applications

Wastewater Gardens can be designed in a range of applications form single family dwellings, to hotels, parks, schools, and other public facilities, as well as for municipalities, including landfill leachates, and industry.

Research and Development

The Wastewater Garden system has been developed by PCRF from a line of research that began in the 1970's with NASA scientist Dr. Bill Wolverton who commenced the first studies of wastewater treatment using plants.

Main conclusions and recommendations

- The need of a change of paradigm switching from the conventional approach to the sustainable approach and from short term vision to that of a long term vision;
- Application and vigilance relevant to wastewater disposal and the performance of regular and continuous environmental audits and monitoring of the wastewater;
- The stipulation of a requirement to build and implement proper wastewater treatment systems and solid waste management, as a first step, prior the beginning of any habitat, dwelling and constructions where human activities will take place;
- The success in the models built in the State of Quintana Roo Mexico, as a solution of the problem of wastewater management, to prevent irreversible coral reef damage and pollution of water tables above and below the surface.

CASE STUDY ON THE RODNEY BAY SEWERAGE SCHEME IN ST LUCIA

Errol Frederick

Preamble

The town of Gros Islet and the neighbouring community of Rodney Bay are located on the north-western coast of the island of St. Lucia and approximately eight miles north of the capital Castries. This northern section of the island has been experiencing significant developmental growth in residential, commercial and tourist related activities since the mid 1970s when the Rodney Bay Marina, a man-made lagoon and other development infrastructure were constructed to open up lands in the area. The marina is now the final destination for yachts taking part in the Atlantic Rally for Cruisers (ARC) and was host to over 200 yachts last December. Besides its main attraction the marina serves as a primary settling basin for silt and organic wastes brought down from the adjacent watershed area where continuous construction of residential and commercial buildings are taking place. The contents of the marina finally drain to the coastal waters of Rodney Bay through a narrow and only exit to the coast.

Rodney Bay Sewerage Project

In order to facilitate the unrestricted development in the north of the island it became necessary for government to deal with the collection and treatment of wastewater in the captioned area. After several years of preliminary studies followed by a feasibility study in 1987, a EC\$25 million sewerage project was constructed and commissioned in 1995.

The project was implemented to primarily reduce the pollution in the near-shore coastal waters of Rodney Bay that had been receiving inadequately treated sewage effluent from a privately owned package treatment plant which served several hotels and commercial and residential properties at Rodney Bay. This plant had reached its maximum capacity by 1985. The project's components included:

Construction of approximately 12 km of gravity and pressure sewers ranging from 150 mm to 500 mm Construction of a wastewater treatment plant utilizing the stabilization ponds concept with associate laboratory facilities. The refurbishing of two previously privately owned pumping stations and the construction of a new and larger main pumping station.

Connections to the System

Since the construction of the system, the town of Gros Islet which is immediately north of the Marina has had difficulty in connecting to the sewers. This town, which sits on a water table of three to five feet below ground level, is of a high housing density, with low income earners, several of whom are unable to provide the basic sanitation facilities and water connection to their properties.

Expressed as a percentage of the total potential connections, Gros Islet has to date only 25% connections from a total of 600 properties, while in comparison Rodney Bay, a more affluent community with middle and high income residents and tourist related commercial buildings is almost 100% connected to the sewerage system. All newly constructed buildings in both communities are obligated by law and enforced by the Development and Coastal Authority of the Ministry of Planning to connect to the system.

Incentives for Connection

In view of the low rate of connections experienced over the six-year period since the construction of the system, the Water and Sewerage Company Inc. (WASCO) as well as its predecessor WASA have introduced some incentives aimed at encouraging connections to the system. In 1995 the Water and Sewerage Authority (WASA) introduced a fixed charge of EC\$420.00 and EC\$620.00 (US\$155.00 and US\$228.00) for domestic and commercial connections respectively.

Following the corporatization of the utility in November 1999 to a government-owned company, WASCO, another incentive was introduced. This incentive was in principle, charging the applicants for domestic connections only the cost of the materials used in the connection and a small transportation charge while the Company absorbed the labour and other charges. In spite of these incentives, there has been no significant improvement in the rate of connections in the town of Gros Islet and its immediate environs.

Lessons Learnt from the Project

Community Involvement and Participation

There was an absence of community involvement at the conceptual stage of the project particularly in relation to the inputs and concerns of the residents of Gros Islet.

Public Education and Awareness

To date there has not been an effort to sensitize the communities in the project area on the significant and important environmental and other socio-economic factors relative to the collection and disposal of wastewater and how these impact on their communities.

Cost Benefit Analysis

A cost benefit analysis appears not to have been done in the preliminary stages of the project since the major emphasis was on controlling the pollution levels in the coastal waters to allow for further development of tourism.

Ability and Willingness to Pay

Consideration was not given to the special case of the low income residents of the town, several of whom do not have the ability to pay unlike their neighbours at Rodney Bay.

Legislation

Legislation for mandatory connection to the system within two years of the system being in place was provided in the Water and Sewerage Act and Regulations for residential and other properties. However, there has been no legislation for the mandatory disposal of wastewater from the yachts and the pollution from these vessels most likely still exists in the marina.

Connection Policy

The incorporation of an adequate connection policy was not considered that would facilitate the connection of the lower income residents on to the system.

Appropriateness of Technology

Not much consideration was placed on the appropriateness of the technology used particularly with regard to the inhabitants of the town.

CARTAGENA WATER SUPPLY, SANITATION AND ENVIRONMENTAL MANAGEMENT MASTER PLAN

Joan Borell

Cartagena, founded in 1533 by Pedro de Heredia, is the capital of the Department of Bolívar, Colombia. Its current population is nearly 1 million. The city, which was designated a World Heritage Site, retains a good deal of its colonial heritage and is an internationally known tourist centre.

Its water supply and sanitation systems have been managed since 1995 by Aguas de Cartagena, S.A. E. S. P., a jointly owned public utilities company, which was at the time the first joint venture model for the public and private sectors in Colombia. The District of Cartagena holds 50 per cent of the capital stock, and the operating partner, Aguas de Barcelona, 48 percent; the remaining 4 per cent is held privately.

For the payment of public utilities, the Colombian population is divided into six levels, the first three (1, 2 and 3) being subsidized by the last two (5 and 6), while level 4 is neutral and pays for the cost of the service it receives. Since the new company took over, water supply coverage has risen from 72 to 88 per cent, with more than 200,000 beneficiaries (44 per cent in level 1, 30 per cent in level 2 and 11 per cent in level 3), while sanitation coverage has risen from 57 to 75 per cent, with 146,000 new users (23 per cent in level 1, 41 per cent in level 2 and 17 per cent in level 3). Other relevant data indicate improvements in the percentage of metering (from 45 to 98 per cent), collection of payments (from 47 to 88 per cent) and unaccounted water (from 80 to 41 per cent).

A Water Supply and Sanitation Master Plan is being developed with the aim of reaching more than 95 per cent coverage in both services (150,000 and 270,000 persons in the poorest neighbourhoods will be covered, respectively). During its third and last stage, the Plan will include a component for the treatment and disposal of the city's wastewater.

This third stage will cost \$117.2 million, \$20 million of which represents a non-reimbursable grant from the Colombian Government, \$7.8 million from the District of Cartagena, \$4.6 million from Acuacar, an \$85 million credit from the World Bank to the District guaranteed by the Colombian Government and repayment assistance from Acuacar, which will contribute \$15.4 million to service the debt between 2005 and 2011. The credit is for 22 years, with a five-year grace period.

The study to select the wastewater treatment and disposal system for wastewater (strictly domestic wastewater, since the industrial zone is not connected to the sewage system) was subject to international competitive bidding to evaluate the various alternatives as to which bodies of water could receive the effluent, the different degrees of treatment and the location of the disposal system chosen. All the alternatives were assessed from the environmental, social, technical and economic point of view. The chosen solution was that of preliminary treatment with final discharge into the Caribbean Sea through an ocean outfall.

The treatment plant will consist of a series of 1 to 1.5 mm rotary screens and centrifuge de-sludgers. The land portion of the outfall will measure 20 km, with a diameter of 1.83 m, a submerged length of 2,880 m, a depth of 20 m and a diffuser section of 540 m, with 27 dual outlets.

The combination of the type of treatment and disposal method will ensure, together with the local conditions at the point of discharge, compliance with the water quality standards for the most restrictive uses envisaged in Colombian environmental legislation. Concretely, the sanitary condition of the beaches will be protected, and the primary contact standard of 200 MPN/100 ml of faecal coliform will be met.

A monitoring programme and contingency plan will allow for the evaluation of the system's effectiveness and for consequent action to guarantee the safety of the effluent. In addition, a 20-hectare zone will be available next to the treatment plant for future expansion if demands arise for the re-use of the effluent or future environmental requirements. A social management and communication programme, for the purpose of mitigating the impact and providing information about the situation and progress of the project, will be included.

Main Conclusions and Recommendations

- Private participation in the provision of public water, sanitation and municipal wastewater management shows good signs of success and appears to be effective in extending the coverage of these services to the poorest sectors
- The mechanism makes it easier to finance and mobilize resources to meet these needs
- Each case of wastewater management is specific, and the solution adopted should be specific and appropriate to the concrete situation in which it is applied
- The uses for which the receiving body of water is intended should be taken into account, and quality targets that are consistent with such uses should be established
- The effluent limits should ensure that quality standards in the receiving bodies of water are being met
- Treatment and disposal systems as a whole should take into account priorities and capacities and should be feasible and flexible enough to be adaptable to future requirements or needs.

**LA EXPERIENCIA DEL TRATAMIENTO DE LAS AGUAS NEGRAS POR EL
SECTOR PRIVADO EN EL COMPLEJO PLAYA DORADA**

Manuel Finke

El Complejo Turístico Playa Dorada fue desarrollado en la Costa Norte de la República Dominicana, en la década de los 70's, por iniciativa estatal. En 1980, inició su operación el primer hotel, seguido de un sorprendente crecimiento del número de habitaciones durante los siguientes diez años. En 1990 superamos las 3,000 habitaciones y en el 2000 sobrepasamos las 4,500. Aunque el complejo desde su inicio, contó con un sistema de tratamiento de lodos activados, en el 1990 la capacidad de este sistema había sido sobrepasada.

El aporte de nutrientes al cuerpo receptor, por la baja eficiencia de la planta de tratamiento, provocó el crecimiento de algas sobre una zona de la barrera coralina cercana al emisor submarino, lo que puso en peligro la integridad de la misma y por consiguiente la integridad del principal activo del complejo, su playa. Por decisión de la Asociación de Hoteles de Playa Dorada, con recurso privado, se construyeron obras para aumentar la capacidad total de tratamiento de aguas residuales a 100 lts/seg. (1,600 GPM), caudal que generarán 6,000 habitaciones hoteleras, número máximo de habitaciones a construirse en el Complejo. La operación del sistema fue contratada al sector privado por la Asociación de Hoteles.

El resultado más importante de dos años de operación privada del sistema es que los efluentes han permanecido dentro de las normas sanitarias universalmente aprobadas, con eficiencia registrada mayor al 92%, con bajo niveles de DBO, SS y coliformes.

La construcción de las obras de infraestructura, tuvo un costo de alrededor de US\$ 1,000,000.00 y el costo anual de operación ronda los US\$ 315,000.00 por año. Lo que representa un costo de operación de US\$ 70.00 por habitación/año.

En la actualidad, la Asociación de Hoteles de Playa Dorada está trabajando en un proyecto para la implantación de un Programa de Gestión Ambiental, con miras a la obtención de la Certificación "Green Globe" para los 13 hoteles que componen el Complejo, de igual forma se pretende obtener la certificación de "Banderas Azules" para nuestra playa. En un mediano plazo pretendemos re-utilizar las aguas tratadas para la irrigación del campo de golf y las áreas verdes, dando a estas aguas un tratamiento terciario.

Asuntos principales y Recomendaciones

- La iniciativa del generador de residuos de invertir, aun sin incentivo, en el tratamiento de los residuales líquidos que produce para asegurar la sostenibilidad de su actividad económica
- Búsqueda de tecnología para eficientizar el sistema de tratamiento para lograr el cumplimiento de la normativa establecida
- Preferencia de una operación en manos del sector privado, sobre la operación estatal
- Otras iniciativas del sector hotelero para trabajar en la reducción del consumo de agua y energía, reducción y tratamiento de los desechos sólidos y líquidos.

THE ROLE OF THE IDB IN FINANCING WATER AND WASTEWATER: FOCUS ON THE CARIBBEAN

Steven W. Stone

An Overview of the Bank's Resources

- Capital Subscriptions: US\$ 112 billion
- Loans approved 1999: US\$ 9.5 billion
- Disbursements 1999: US\$ 8.4 billion

Financing Mechanisms of the IDB Group

- Inter-American Development Bank
- Inter-American Investment Corporation
- Multilateral Investment Fund
- Private Sector Department
- Technical Cooperation Trust Funds

The Bank's Role in Water and Wastewater

- Bank Policy: Water and wastewater investments go together
- 1997 - 8 operations, US\$ 588 million
- 1998 - 12 operations, US\$ 1.169 billion
- 1999 - 13 operations, US\$ 660 million

Some Case Studies from the Caribbean

Dominican Republic Modernization of Potable Water and Sanitation US\$ 89 m

- IDB - US\$ 71 m
- GoDR - US\$ 18 m
- Total - US\$ 89 m

Objectives:

- enhance the efficiency of existing public water corporations
- decentralize national water and sanitation institute
- improve basic infrastructure in key urban areas

Haiti Potable Water and Sanitation Programme

- US\$ 54 m IDB
- US\$ 1 m MIF
- US\$ 6 m GoH

Objectives:

- Establish regulatory framework and agency
- Restructure and merge existing water companies
- Rehabilitate and expand distribution and collection/treatment network

Jamaica Kingston Water and Sanitation

- US\$ 35 m IDB
- US\$ 15 m GOJ
- US\$ 2.5 m GEF*

Objectives:

- enhance efficiency of National Water Commission
- rehabilitate and expand water distribution and collection network
- wastewater treatment (1st phase)

Main lessons learnt

- Strong legal and regulatory framework essential
- leverage private resources where possible (e.g. PRI, IIC)
- coordinate donors and lenders to achieve long term goals

**THE UNIT FOR SUSTAINABLE DEVELOPMENT AND ENVIRONMENT
OF THE ORGANISATION OF AMERICAN STATES
AND WATER RESOURCE MANAGEMENT**

Bernhard Griesinger

The Unit for Sustainable Development and Environment (USDE) is the principal technical branch of the OAS General Secretariat for responding to the needs of member states on matters of sustainability and environmental preservation within an economic development context. Technical issues addressed by the USDE include transboundary management of water resources, reduction of vulnerability to natural hazards, public participation in decision making, adaptation to global climate change, coastal zone management, renewable energy planning, and biodiversity.

Formed in 1963, the Unit has evolved from one dealing with natural resources surveys on a national scale, to a group whose principal charge is to follow up on the mandates of the United Nations Conference on Environment and Development – Agenda 21 and those emanating from the Bolivia Summit of the Americas on Sustainable Development. The Unit currently manages a portfolio of US\$44 million, primarily from externally generated funds, with staff based at headquarters in Washington, DC, and field consultants. One of the principal roles of the Unit is to assist member states of the OAS in the preparation of projects for loan or grant consideration by bilateral and multilateral agencies and interested non-governmental, academic and research organizations.

Its organizational structure comprises one regional unit for the Caribbean and one for the Latin American Countries and two special programs, one dealing with public participation in decision making and one for disaster reduction in development. In water resources management, the Unit acts in the level of policy support, information exchange and technical cooperation.

The Inter-American Water Resources Network (IWRN) is a network of networks whose purpose is to build and strengthen water resources partnerships among nations, organizations, and individuals; to promote education and the open exchange of information and technical expertise; and to enhance communication, cooperation, collaboration, and financial commitment to integrated land water resources management within the context of environmental and economic sustainability.

The IWRN is composed of an Advisory Council of more than 130 institutions, organizations, and private sector representatives. In addition, the IWRN has a national focal point in each of the 34 participating member countries of the OAS. These are governmental appointed institutions for water resources management on a national level. The USDE serves as its technical secretariat.

A very important tool to promote the regional exchange of experiences is the Inter-American Dialogue on Water Management. The first Dialogue was held in Miami, USA, the

second was held in Buenos Aires, Argentina and the Third in Panama City. The Fourth Dialogue will be held in September 2001 in Brazil, and its main objective is to identify development in water resources management in the region. Its principal cross cutting theme is "In Quest of Solution". It will serve also as a preparatory meeting to Rio + 10 and the III World Water Forum to be held in Japan, in March 2003. The OAS is encouraging the Caribbean region to attend and actively participate in IV Dialogue, as well as in the Fifth Dialogue expected to be held in the Caribbean. The support from the Caribbean countries is required to make this event a reality for the region.

PAHO ANALYSIS OF THE WASTEWATER DISPOSAL SITUATION IN THE CARIBBEAN

Harry Philippeaux

This analysis is limited only to the English speaking Caribbean countries. The considerations made in this report are not the same and are no necessarily true for the US territories, the French Departments and the Latin countries in the Caribbean.

Improper disposal of domestic sewage and industrial wastewater is a primary source of pollution of the marine environment and a major cause of environmental health concerns in the Caribbean.

At the exception of Guyana, Belize and Surinam, the English Caribbean comprises of small island states whose coastal zones are the most inhabited area, heavily populated. Many of islands, (particularly in the Windward Islands) are of volcanic origin with high reliefs and narrow coastal plain. Tourism and agriculture being the main income generating activities, All major hotels and resorts are built along the coast. According to the recent WHO/UNICEF Global 2000 assessment, 90% of the 6.8 million inhabitants of the Caribbean have access to sanitation facilities. However, it is only 15% of the population that is served by sewers which are found mainly in the urban settings. Most of the government operated treatment plants are outdated and overloaded. In many instances, they discharge raw sewage into the bays. Hotels and private institutions operate the other treatment installations in the islands.

The hotels operated wastewater treatment systems are all package plants. A PAHO study in 1993 reveals that 50% of those plants were not functional continuously throughout the year and 75% of their effluents did not comply to the international standards and neither to the CEHI standards and was often discharged raw sewers in to sea. This situation is caused by the fact that untrained staff operating most of the plants.

On the other hand, 75 % of the domestic wastewater were treated by onsite disposal system: septic tanks and pit privies. However, a majority of the septic tank were not operated efficiently due, for some of them, of improper construction, For others, it is the ground formation which doesn't land itself to on site disposal system. Many parts of those islands are made of volcanic soil or clay formation therefore limiting percolation for proper functioning of soak-

away wells. In other parts, the rocky formation prevents simply any type of excavation, therefore any installation of pit privies, soak away well or absorption field required for septic tank use. In other cases, it is the marginal situation of some squatting development which by limited lot space make it impossible to build any proper sanitation facilities.

In addition, the predominance of onsite disposal system (septic tank, pit latrines and package treatment plants) has created another source of environmental concern which is the disposal of sludge. At present, many of the countries do not have any infrastructure to receive those sludge. As a result, those sludge are dumped indiscriminately in open pits in some island or in unsuited and uncontrolled sited, others are dumped in open pits of the government operated dumps sites. Few countries like Trinidad and Barbados have treatment facility for reception and treatment of septage. And in most countries, the issue of disposal of septage is not regulated.

The solution to the improper disposal of domestic wastewater in the Caribbean could have been resolved if the countries could extend sewage services to the unserved urban population with properly operated treatment plants. But, the limiting factors to extend are a matter of investment cost. The exorbitant cost of sewerage construction is the key constraining factor limiting the expansion of sewerage system in the Caribbean. In Barbados for instance, the cost of sewer construction is 2.5 million US dollars per kilometer of sewer in Barbados or about US. \$ 10,000 to 5,000 per capita in the Caribbean.

Based on the situation described in this paper and conscientious that the country present economic situation will not permit them to embark in a large investment of construction of municipal sewers for the population in needed of alternative system for disposal of domestic sewage, PAHO position is to adopt the following strategies to assist those countries:

There are three lines of action that the office PAHO in the Caribbean has identified, which could lead to improvement of municipal sewage disposal in the English Caribbean:

1. Resource Mobilization

- Innovative approaches to resource mobilization (using non traditional donors).
- Making Government officials aware of the critical nature of resource mobilization to improve municipal sewerage.
- Promotion of private sector involvement

2. Area of Technology

- Support to construction of cluster sewerage system for specific area where construction of onsite disposal is not possible.
- Promotion of community financed onsite system.
- Support of research of package plants for domestic wastewater treatment.
- Promotion of septage lagoon type for treatment of septic sludges.
- Promotion of innovative treatment technologies such as sea outfall, wetland gardening for small systems.

3. Policy Orientation

- Promotion of CARICOM policy on disludging (transport and disposal of sludges).
- Promotion of national regulations for treatment of septic sludge (at landfill or disposition treatment plants).
- Zoning & physical planning resolution for squatting development.
- Promotion & reinforcement of existing policy.
- Community health education.

OVERVIEW OF PAHO TECHNICAL COOPERATION ACTIVITIES UNDER THE PERSPECTIVE OF THE GPA Gerardo Galvis

La OPS/OMS, en equipo con UNICEF y con grupos de trabajo nacionales, evalúa periódicamente la situación de agua potable y saneamiento (AP&S) en la Región de las Américas. Evaluación 2000, se realizó con base en el análisis de datos de 1998 y en informes analíticos de los países. Información sobre Evaluación 2000 está disponible para consulta y opiniones en <http://www.cepis.org.pe/eswww/eva2000/eva2000.html>. A pesar de los avances en la cobertura de AP&S en la Región, aún 76.5 millones de personas (15,4%) no tienen acceso fácil a opciones adecuadas de abastecimiento de agua y otras 53.9 millones (10,9%) se abastecen con sistemas sin conexión domiciliar. De otra parte, 103.2 millones (20.8%) no tienen acceso a soluciones adecuadas de saneamiento. Además, existen grandes iniquidades en las coberturas. Los porcentajes de población rural en la Región sin acceso adecuado a AP&S son del orden de cinco veces más altos que en la población urbana. Además, las familias pobres gastan proporcionalmente en estos servicios que las de mayores ingresos. En LAC, el 48.6% de la población tiene acceso a conexión domiciliar de alcantarillado y solo 13,7% de las descargas de los alcantarillados reciben algún tratamiento. Esta situación atenta contra la sostenibilidad del recurso hídrico y hace mucho más difícil el abastecimiento de agua con criterios de calidad.

In this context, the following PAHO Technical Co-operation Activities are overviewed in this presentation:

- Evaluation 2000 (PAHO/WHO-UNICEF) of Water Supply and Sanitation (WS&S) Services. Reference person Eng. L.C. Soares, soareslu@paho.org.
- WS&S Sectoral Analyses. Reference person Eng. L.C. Soares, soareslu@paho.org
- Integrated Systems for Wastewater Treatment and Use: Reality & Potential. IDRC-CEPIS/PAHO. Reference person Eng. J. Moscoso, jmoscoso@cepis.ops-oms.org

- Laboratory Accreditation Initiative. PAHO-CAEAL (Canadian Association for Environmental Analytical Laboratories); Reference persons Dr. P. Toft, toftpete@paho.org and Dr. M. L. Esparza, mesparza@cepis.ops-oms.org
- Virtual Library in Health & Environment. CEPIS Web Page: www.cepis-ops-oms.org
Reference person Lic. M. Bryce, mbryce@cepis.ops-oms.org
- Inter American Water Day (IAWD):IAWD Web Page at PAHO/CEPIS. Reference person Eng. P. C. Pinto, pcpinto@paho.org

MANAGING MUNICIPAL WASTEWATER IN BONAIRE'S COASTAL AREA

presented by Ir. Renaldo F. Pieters

Director of Public Works of Bonaire, Netherlands Antilles

Characteristics of Bonaire

Bonaire, known as the flamingo island due to the largest colony of flamingos in the Caribbean, is a leeward Caribbean island, 50 miles north off the coast of Venezuela. The island is 24 miles long and 3 – 7 miles wide, with a total of 112 square miles. It is the second largest in size of the five Netherlands Antilles islands: the leeward islands Bonaire, Curaçao and the windward islands St. Maarten, Saba and St. Eustatius. The population of Bonaire is approximately 14.400 inhabitants. Its capital is Kralendijk.

The average annual temperature is 27,5 C (82 F), with eight hours sunshine daily and 22 inches of rainfall annually (half of which falls in November).

The major economical activity is tourism; especially dive tourism. Bonaire supports some of the best coral reefs in the Caribbean. The Bonaire National Marine Park offers over 80 diving spots for about 50.000 tourists a year. There are few places in the world, certainly not in the Caribbean Sea, that have more to offer underwater than Bonaire. The importance of the reefs is reflected by the text "Divers Paradise" on the license plates of the cars in Bonaire.

Apart of the tourism industry, Bonaire's other few industrial activities include an oil terminal and the production of solar salt. Solar salt is a natural product of seawater, sunshine and wind. Fisheries and agriculture on the island have no real economic importance. Almost all consumer products, food as well as non-food, have to be imported.

E. The challenge

Bonaire is striving for a sustainable development by taking into account the carrying capacity of the island. The challenge for Bonaire is to keep a sustainable economical development and protect one of the important sources for this development: the reefs. Further

more to turn a threat in an opportunity by introducing a water management system that controls pollution and delivers products with an economical value that enhances said economical development.

A concept of water management has been selected, which will protect and stimulate the economy of the Island of Bonaire, whereby the interest of all stakeholders will be reflected. This will be the key for success.

The new approach

The Bonaire National Marine Park exists for over twenty years and is the oldest marine park in the Caribbean Region. The Marine Park consists of the surrounding waters of Bonaire and Little Bonaire till 60 meter depth. The park is very well managed; the largest threat is pollution originating from land-based sources. Taking into account the goals set by Bonaire the point has been reached where managing of the pollutants is of utmost importance, namely sewage and rainwater run-off, while using them optimally as useful products by conditioning so that they have an economic value. A vision was born: “Integral Water Management” supported by the community, the politicians and all other stakeholders.

The first step is to concentrate on the wastewater management followed by management of rainwater run off.

Our concept is unique: conservation of the reefs as an economical and tourist asset, the need of a sustainable and economic development of this asset, the need to control pollution, the need of sewage treatment, the opportunity to reuse the wastewater as an economic asset for the further development of tourism (diving), landscaping and horticulture.

The old idea of building a “sewage treatment plant” is placed in a whole new concept of different perspectives: Nature Conservation and Stimulation of the Economy.

This presentation will concentrate on wastewater.

Process

As already said the desire for realizing this project is the deep rooted attitude of nature conservation of the people of Bonaire and the political will to accomplish that.

In the Caribbean, there has been a lot of development in handling and treating wastewater. Therefore, Bonaire has chosen to make optimal use of the experiences of others.

Curaçao, as mentioned a sister island of Bonaire, has developed in the past 20 years vast experiences and expertise in wastewater management. They have constructed and managed three different sewage treatment plants and they will share their experiences with Bonaire.

These treatments systems are:

1. The Imhoff tank.
This is an anaerobic system. It is a combination of physical and biological processes. The main feature of the physical process is separation of solids and gases from the fluids. That of the biological process is degradation of decomposable organic matters under anaerobic conditions.
2. The trickling aerobic system.
This system consists of the water line and the sludge line. The wastewater is flowing through trickling filters, from the top to the bottom and trickles down through the filter material. During the passage soluble compounds are removed and some solids are taken up into the bio-film that is adhered to the carrier material. This treated water has to stay several days in ponds to be polished. Afterwards this water is ready to deliver to be used for horticulture, landscaping and irrigation of golf courses. The other part of this process is the treatment of the sludge. This delivers gas and compost as byproducts.
3. The activated sludge treatment system. The Caroussel.
This system consists also of a water line and a sludge line. The wastewater is brought into an aeration tank where air is provided by surface aerators. The bacterial growth within the aeration tank has to remain as high as possible by returning sludge from the sludge line. The treated water is infiltrated by means of wells in the ground and is pumped up for delivery to horticulture and for landscaping. The other part of this process is the treatment of the sludge. This delivers compost as byproduct.

The project “Sewerage Kralendijk Bonaire” consists of two phases:

- Phase 1: The short-term action plan consists of the implementation of a system of wastewater collection and treatment for the hotel area “Playa Lechi”.
- Phase 2: The long-term action plan consists of the implementation of a system of wastewater collection and treatment for the households of Kralendijk and surroundings.

For the treatment of the wastewater the activated sludge treatment system will be used in combination with infiltration ponds.

As part of our efforts to realize the on going project “Sewerage Kralendijk Bonaire”, the draft of the UNEP guide: “Recommendation for Decision-making on Municipal Wastewater, will form the basis of discussions on Bonaire with a wide variety of stakeholders, including (inter)national and local experts, representatives from environmental non-governmental organizations (NGOs) like Stinapa (Nature Parks Foundation), the private sector like hotels and divers companies, international financial institutions and potential donors like European Union and the Netherlands.

Financing options

The project as presented here is not feasible if the costs for investments, operations and maintenance have to be borne in full by user charges. It is unlikely that hotels or the households in Bonaire can afford said charges.

The authorities of Bonaire and the Netherlands Antilles have therefore requested financial assistance from the European Development Fund. Under EDF-8 part of the investments of this project has been earmarked. The other part will possibly come from the Dutch Development Funds.

Planning

A pre-feasibility study for the sewerage of Kralendijk has been executed in 1999. The tender for the consulting services has been started just now. After awarding the contract the consultant has 10 months to produce the final tender documents for the project. This will be by mid 2002. The construction time is scheduled to be 18 months. So by the beginning of 2004 the treatment plant will be in operation.

Finally

During this introduction I informed you of the experiences we have in Bonaire and those that Curaçao is going to share with us. The Caribbean is a relatively small basin, but sometimes there is a whole ocean for the Caribbean people to reach each other. I want to invite you who have experience with wastewater collection and treatment to share it with all of us in the Caribbean. As already mentioned we shall follow the UNEP recommendations and we shall inform you of the results in due time.

LESSONS LEARNT REGARDING THIS PROJECT

1. The people of Bonaire do care for their environment.
2. Economic value of nature (reefs, Divers Paradise).
3. By using nature (diving, recreation) a lot of threat for damaging the eco-system (wastewater) is introduced.

Change the threat in an opportunity. Look for a win-win situation for nature and economy. Treat wastewater, protect your reefs, reuse the effluent and sludge for economic activity as horticulture, landscaping and compost.

ANNEX VI

ISSUES TO BE ADDRESSED ON THE ESTABLISHMENT OF THE REGIONAL ACTIVITY CENTRE (RAC)

A. QUESTIONS ON FINANCING

1. What is the estimated annual operating expense of the RAC minus projects?
2. What is the total staffing projected for the RAC including in-country staff, UNEP personnel, and detailees?
3. What in-country staff are to be paid through UNEP trust funds? Please provide a listing of what positions, salary, benefits, and other relevant costs?
4. Will funding of the Centre be fully covered by the host country or through allotment of the CEP Trust Fund?
5. Describe the arrangements to be made to ensure the financial viability and long-term sustainability of the RAC.

B. ADMINISTRATION AND OTHER ISSUES

1. Clarify the purpose and functions of the RAC
2. How will the proposed RAC specifically support the member states in implementing the Protocol (please be as specific as possible)?
3. How many professional staff at the proposed RAC will be fluent in French? In English? In Spanish?
4. How many support staff at the proposed RAC will be fluent in French? In English? In Spanish?
5. What translation and interpretation capabilities will be available at the Centre and will they be billed to the Trust Fund?
6. Is the proposing country willing to establish a RAN or a similar electronic network as a less costly alternative to a RAC for sharing information and catalyzing projects and other initiatives in co-operation with the efforts of the RCU?
7. Describe the value added to the Region by the establishment of the subject RAC.
8. What is the capacity of the proposed RAC to mobilise additional resources to support implementation of the Protocol?

ANNEX VII

**Draft Terms of Reference for the Creation of a Regional Centre (RAC) for
Marine Pollution from Land-Based Sources and
Draft Agreement Between the Government of Cuba and UNEP-CAR/RCU
for the Establishment of a RAC
(Presented by the Government of Cuba)**

Background

In conformity with Decision No.15 of the IX Intergovernmental Meeting and the VI Meeting of Contracting Parties to the Cartagena Convention (Kingston, February 14-16, 2000) which supported the proposal of the Government of the Republic of Cuba for the establishment of a Regional Activity Centre for Marine Pollution from Land-Based Sources and authorized the Secretariat to carry out negotiations with the Government of the Republic of Cuba with a view to revising the proposal to include, *inter alia*, provisions for the strengthening of regional institutions as well as details on the administrative and financial requirements and to inform the XIII Meeting of the Monitoring Committee and Bureau of the Contracting Parties to the Cartagena Convention of its progress.

The Government of the Republic of Cuba, in consultation with the Secretariat, has prepared the following document. These terms of reference are based on the document UNEP (OCA)/CAR WG 10/3 entitled «Concept Paper for Regional Activity Centres and Regional Activity Networks » and on the Document UNEP (OCA)/CAR IG.12.7) entitled « Legal Framework for the Administrative and Financial Operation of RACs and RANs » adopted by the XI meeting of the Monitoring Committee and the Special Meeting of the Bureau of Contracting Parties to the Cartagena Convention and the VII Intergovernmental Meeting of the Action Plan for the Caribbean Environment Programme for the Caribbean and the IV Meeting of the Contracting Parties to the Convention for the Protection and Development of the Marine Environment in the Wider Caribbean Region (Kingston, December 12-14, 1994).

The present draft of the revised document will be presented for consideration by the XIII Meeting of the Monitoring Committee for the Action Plan for the Caribbean Environment Programme and the Special Meeting of the Bureau of Contracting Parties to the Convention for the Protection and Development of the Marine Environment in the Wider Caribbean Region before its presentation to the X Intergovernmental Meeting on the Action Plan and VII Meeting of the Contracting Parties to the Convention for the Protection and Development of the Marine Environment of the Wider Caribbean.

The establishment of the Centre for Engineering and Environmental Management of Bays and Coastal Areas (Centro de Ingeniería y Manejo Ambiental de Bahías y Costas), CIMAB of the Republic of Cuba as a RAC is based on the experience and capacity demonstrated for over 25 years by this research institution in marine pollution and environmental management of bays

and coastal zones in the Caribbean Region including participation and co-ordination with satisfactory results in several various agencies in the United Nations system.

Proposal from the Government of Cuba

The Government of the Republic of Cuba is proposing to establish the RAC for Land-Based Sources of Marine Pollution within the institutional framework of the Centre for Engineering and Environmental Management of Bays and Coastal Areas (CIMAB). The administrative headquarters of CIMAB will function as the administrative unit of the RAC for Land-Based Sources of Marine Pollution.

The RAC for Land-Based Sources of Marine Pollution will support the Protocol Concerning Land-Based Sources of Marine Pollution in the scientific and technical domain as well as in the co-ordination of special activities in conformity with the decisions of the Intergovernmental and Contracting Parties Meeting.

The RAC for Land-Based Sources of Marine Pollution, under the direct supervision of the RCU, will give the necessary support to co-ordinating the implementation of the programme deriving from the LBS protocol and will have the following objectives:

Administrative Requirements

The Regional Activities Centre (RAC) for the Programme of Land-Based Sources of Marine Pollution as proposed by the Government of the Republic of Cuba, will fulfil the basic requisites enunciated by the above mentioned conceptual document about RACs and RANs, including the capacity of communication by means of the three working languages.

The Government of the Republic of Cuba has proposed the establishment of the RAC for the Land-based sources of Marine Pollution within the institutional structure of the CIMAB. The administrative headquarters of CIMAB will house the Administrative Unit of the RAC for Land-Based Sources of Marine Pollution.

The Government of the Republic of Cuba will also provide the offices and the necessary personnel, materials and equipment. Annex I shows in details the contributions assumed by the Cuban Government.

The national personnel of the RAC will be hired by the Government of the Republic of Cuba and supervised by CIMAB. The international personnel of the RAC for Land-Based Sources of Marine Pollution will be hired directly by the United Nations in conformity with the Government of the Republic of Cuba, in accordance with the laws and regulations of UNEP as well as Cuban legislation.

The RAC for land-based sources of Marine Pollution will begin to work after the signature of a Letter of Agreement between the United Nations Environment Programme (UNEP) and the Government of the Republic of Cuba.

With regards to the communication for the RAC for Land-based sources of Marine Pollution the following will be applied:

- The communications on technical matters related with specific activities will be made directly among the competent designed national authorities, the focal point of the Protocol on Land-Based Sources of Marine Pollution, the participants institutions and members of the RAN. Information on these communications will be sent to the Regional Co-ordinating Unit (RCU) through half-yearly progress reports.
- The only official channel of communication over political matters involving the Governments of the participating countries (PAC) will be through the RCU.
- All the correspondence relative to administrative, financial, substantive or technical matters between the RAC Land-Based Sources of Marine Pollution and the RCU will be sent to the following addresses:

To UNEP

Dr. Nelson Andrade
Co-ordinator
UNEP-Regional Co-ordinating Unit of the
Caribbean Environment Program Region
14-20 Port Royal Street
Kingston, Jamaica

To the RAC

Dr. Manuel Alepúz
General Director CIMAB
Carretera del Asilo s-n
Finca Tiscornia, Casablanca,
La Habana, C.P. 11700
Cuba

F. Technical Capabilities

The RAC for Land-Based Sources of Marine Pollution will aid in the scientific and technical media as well as in the co-ordination of specific activities from the Protocol of Land-Based Sources of Marine Pollution, according to the Intergovernmental and Contracting Parties Meeting.

The RAC for Land-Based Sources of Marine Pollution, under the direct authority of RCU will give the necessary support to the co-ordination for the fulfillment of the following objectives of the Protocol designed for Land-Based Sources:

- To compile, update and divulge information, prepare reports and specialised knowledge in the appropriate form to the nations and territories of the region, as well as to participant organisations associated in the Programme.
- To provide technical assistance (experts advisory) at the request of governments and institutions.
- To help the development of programs, including new activities, which may insure the achievement of these objectives.
- To gather information related to the most advanced technology necessary for the management and treatment of wastes from urban, industrial and maritime-port activities to be used by governments and institution which may request it.
- To favour the co-operation between specialised agencies of United Nations, intergovernmental, governmental and non-governmental organisations.
- To promote individual or jointly the activities of the programme in co-operation with United Nations specialised organisations and intergovernmental or non-governmental institutions.
- To establish the RANs of the Protocol of Land-Based Sources of Marine Pollution which will work jointly with the RAC Land-Based Sources of Marine Pollution, and to keep regular contacts with national or regional institutions and organisations.
- To promote the standardisation of methods and co-operation concerned with research needs and monitoring, concerning the integrated coastal zone in the Wider Caribbean Region.
- To assist and co-operate with members of the RAN in the implementation of quality management systems on the basis of the ISO standards Guide 17025.

In order to attain these objectives, as far as possible, the RAC for Land-Based Sources of Marine Pollution will undertake, in collaboration with the RCU, the following functions:

- To maintain with all the nations and territories of the CEP and issues are belonging to the activities of the program for Land-Based Sources of Marine Pollution.
- To guarantee the harmonic and effective participation of all members of the RAN in the activities of the program for Land-Based Sources co-ordinated by the RAC of Land-Based Sources of Marine Pollution with the aim to develop the co-operation among countries of the Wider Caribbean Region and to favour the success in the

scientific and technical media of the activities of the Regional Programme for Land-Based Sources of Marine Pollution.

- To guarantee a reasonable geographic distribution of granted subcontracts and advisory.
- To co-operate as much as possible, with other agencies of United Nations as well as with intergovernmental and non-governmental organisations.
- To adopt the necessary actions in order to guarantee the standardisation of viewpoints and methods to be used in the diverse activities of the Programme for Land-Based Sources of Marine Pollution.
- To organise and maintain the necessary meetings, workshops, seminars and field work missions, including other information and training activities (courses, seminars, workshops, etc.), essential for the fulfillment of the objectives of the Program co-ordinated by the RAC for Land-Based Sources of Marine Pollution.
- To carry out, in co-ordination with the RCU, any other pertinent measures comply with the objectives of the Program co-ordinated by the RAC for Land-Based Sources of Marine Pollution.

Specifically, the RAC for Land-Based Sources of Marine Pollution will help the RCU in designing activities of the Programme for Land-Based Sources of Marine Pollution related to:

- Formulation of common guidelines and approaches for the identification, selection management and evaluation of land-based sources of marine pollution.
- The characterisation and management of dangerous urban-industrial and maritime-port wastes coming from land based sources of pollution.
- The qualification, information, education, and awareness, particularly, of populations in coastal zones.
- The mobilisation, as far as possible, of human financial and material resources demanded by governments and institutions of the RANs.
- The RAC for Land-Based Sources of Marine Pollution will accept the current regulations of the United Nations system, particularly those, which rule the UNEP, and the operative proceedings that may be adopted for the RAC for Land-Based Sources of Marine Pollution.

Final Aspects

In conformity with the financial agreements which were generally explained in the conceptual document of RACs and RANs, and approved by the VI Intergovernmental Meeting and the III Meeting of the Contracting Parties of the Agreement of Cartagena (Kingston, November 16-18, 1992) the Government of the Republic of Cuba is willing to cover the initial contribution and operative costs of the RAC for Land-Based Sources of Marine Pollution as detailed in Annex 1. This investment may be of special attraction to others multilateral and counterparts sources for additional financing.

The UNEP will take care of transferring the necessary funds for the RAC for Land-Based Sources of Marine Pollution in order to assist the co-ordination and functioning of specific activities assigned to the RCU.

Financial Reports

Status of Accounts. The RAC for Land-Based Sources of Marine Pollution will submit a quarterly report of its expenses to the head of the programme[s] fund at the UNEP headquarters and to the RCU Co-ordinator. The necessary format for this report will be advice by the RCU/CAR-UNEP. Within a period of sixty (60) days before ending the activities described in the Project Document, the RAC for Land-Based Sources of Marine Pollution will submit to the RCU a detailed final report of the state of expenses accounts in accordance with the RAC budget certified by a paid accountant within the contribution of the RAC for Land-Based Sources of Marine Pollution. If the cost of the activity would be lesser than the cost prescribed in the Project, the difference will be reimbursed to UNEP. Any extra expenses exceeding the budgeted cost will be financed by the RAC for Land-Based Sources of Marine Pollution, unless a written authorisation of the RCU has been previously made.

Non-expendable equipment. The authorisation of the RCU is required for the acquisition of:

(a) Non-expendable equipment with a cost over 1500.00 USD

(b) Microcomputers

The RAC for Land-Based Sources of Marine Pollution will keep a register of non-expendable equipment, articles with a cost of 1 500.00 USD and over as well as portable articles, such as pocket calculators acquired with funds of UNEP and will present annually a detailed inventory of such equipment to the RCU, indicating the cost, date of purchase and the current condition of this article. This inventory will be attached to the Progress Report to be presented on December 31, each year (see next paragraph).

The non-expendable equipment purchased with funds administrated by UNEP will remain property of UNEP until their transfer is authorised. The RAC for Land-Based Sources of Marine Pollution will be responsible for any loss or damage to the equipment

acquired by funds of UNEP. The profits from authorised sales of equipment will be credited to UNEP accounts.

Report on Substantive Matters

- (a) On June 30 and on December 31 the RAC for Land-Based Sources of Marine Pollution will present to the RCU a semi-annual progress report in the format established by the RCU. Within 60 days before ending the activities of the RAC for Land-Based Sources of Marine Pollution will present to the RCU a final report with the format recommended by this institution.
- (b) The RAC for Land-Based Sources of Marine Pollution will send to the RCU three copies of every substantive document prepared for activities of the AMEP (reports, surveys, etc.) in draft form for its approval before their publication.

Proposals for International Funding to Promote CIMAB as a RAC

The RAC-CIMAB, in conjunction with UNEP-CAR/RCU, will assist in identifying funds within the Agencies of the United Nations system or from third party donors, with the aim of implementing the projects outlined in the Protocol Concerning Pollution from Land-Based Sources and Activities in the Wider Caribbean.

The modalities for external funding of the RAC will be on the basis of co-ordination and execution of regional projects.

The RAC-CIMAB will be responsible for co-ordinating, under the supervision of UNEP-CAR/RCU, projects carried out within its sphere of competence. The cost of this co-ordination will be borne by the funds assigned to each specific project.

The RAC-CIMAB will be able to sub-contract to third parties, specialized consultancies for carrying out the activities deemed necessary within the countries participating in the project. The cost of these consultancies will be borne by the project funds, subject to discussion and approval by the relevant authorities of the countries involved and UNEP-CAR/RCU.

The RAC-CIMAB will attempt to obtain available funds from organizations within the United Nations system as well as third parties for the setting-up of training courses of interest to countries in the region. These courses could be carried out at CIMAB locations, thereby reducing their costs. Additionally, within the framework of approved activities under the project, in-house training courses can be organized for specialists within the participating countries. The cost of these courses will be shared between CIMAB and national authorities.

This form of budget distribution for project execution has been successfully used in two projects carried out within the Wider Caribbean in which CIMAB had responsibility for co-ordination under the supervision of UNEP-CAR/RCU in Kingston.

Contribution of the Government of the Republic of Cuba to promote the CIMAB as a Regional Activity Centre (RAC)

The Centre of Engineering and Environmental Management of Bays and Coasts (CIMAB) of the Republic of Cuba is non-lucrative and self-financed institution for research and training with its own legal capacity.

The CIMAB is conceived in order to determine the causes of marine pollution and to find solutions for existing problems and costs of these solutions. This institution is structure by three main departments: Coast Ordaining, Marine Pollution and Industrial Ecology. Directly links to CIMAB headquarters are two groups: one is Financial Planning and Accounting, the other is Applied Mathematics and Computer Studies. It employs 43 persons, 18 of which are researchers and 13 higher level technicians.

The technical personnel of CIMAB possess over 20 years of experience in environmental management of heavily polluted bays and coastal areas.

CIMAB's Experience in Cuba

- Carrying out environmental management projects in the bays of Santiago de Cuba, Cienfuegos, Nipe, Matanzas and the Varadero-Cardenas zone;
- Carrying out various projects within the National Programme for the Development of the Tourism Industry;
- Carrying out various projects within the National Programme for the Management, Treatment and Disposal of galvanic waste;
- Carrying out projects for the management of solid and liquid waste in marinas as well as recreational and commercial ports;
- Projects for the rehabilitation of beaches and the protection of coastal areas;
- Design, establishment and implementation of Environmental Monitoring Systems for polluted bays and coastal areas.

CIMAB's International Experience

- Carrying out various regional projects on environmental planning and management of heavily polluted bays and coastal areas in the Caribbean region, with the participation of Mexico, Jamaica, the Dominican Republic, Trinidad and Tobago, Venezuela, Colombia, Panama, Costa Rica, Nicaragua and Cuba;
- Carrying out three projects for the evaluation of the environmental impacts of the autonomous regions of Nicaragua of the North and South Atlantic;
- Consultation on the executive of a project for the integrated management of the coastal zone in the District of Cartagena de Indias in Colombia;
- Development of training and postgraduate courses in various countries of the Caribbean region;

- Consultancy at the Institute of Marine Affairs in Trinidad and Tobago in research projects carried out within the framework of regional projects;
- Consultancy at the Ministry of Agriculture of the Dominican Republic on research carried out within the regional project;
- Consultancy at MARENA in Nicaragua in regional project research
- Consultancy at INDOTEC in the Dominican Republic in Environmental Impact Assessment.

Given the experience that the CIMAB specialists have developed in Cuba and in other countries of the region, it is obvious that there are activities in which this institution can contribute as a Regional Activity Centre:

- Co-ordination of projects under the supervision of UNEP-CAR/RCU, on the pollution of the Caribbean Sea from Land-Based Sources of Marine Pollution.
- Co-ordination of projects, under the supervision of UNEP-CAR/RCU on the Integrated Management of Coastal Areas in the Wider Caribbean.
- Teaching of postgraduate courses in subjects dealing with marine pollution and integrated management of coastal zones.
- On-the-job training of junior specialists in physical and chemical oceanography, rehabilitation and protection of beaches, geographic information systems, determination of organic and inorganic toxins, determination of microbiological contamination, characterization of point and non-point sources of pollution, conceptual design of submarine outfalls and other treatment systems for liquid and solid wastes.
- Design of projects for the management of urban and industrial solid wastes.
- Execution of projects in physical oceanography, coastal engineering, port planning, environmental impact assessment and management of solid and liquid wastes.
- Quantitative and qualitative assessment of the main organic and inorganic pollutants in water, sediments and organisms.

Financial Proposal by the Government of Cuba for promoting CIMAB as a RAC

The Government of Cuba will make available to the Action Plan of the Caribbean Environment Programme the facilities and equipment currently owned by CIMAB and which are set out as follows:

Buildings, laboratories and offices

187, 000.00

Laboratory equipment for measurement and analysis	176, 495.00
Other equipment including transportation equipment	105, 206.00
Furniture and miscellaneous	22, 350.00
Total	491,051.00

The Government of the Republic of Cuba will be willing to finance approximately 4000,000.00 pesos annually, covering salaries and overheads.

This financing would be covered through the granting to CIMAB of projects under the National Plan for Science and Technology from Cuba and of other projects of national importance.

CIMAB is staffed by 12 high-level specialists with more than 20 years experience in the environmental management of polluted bays and coastal areas. The skill of these specialists will form part of the Cuban government's contribution towards the promotion of CIMAB as a RAC.

Location, Facilities, Equipment and Materials

The RAC will be supported by the Government of the Republic of Cuba and other government institutions belonging to the ministries of Science, Technology and Environment, Transport, as well as the Ministry of Primary Industry among others.

The RAC will be established at the headquarters of CIMAB in Havana City, Cuba.

Personnel Available at CIMAB

The Centre for Engineering and Environmental Management of Bays and Coastal Zones has the following personnel:

- Forty specialists, including:
 - Chemists
 - Biochemists
 - Marine Biologists
 - Microbiologists
 - Physicists
 - Geographers
 - Sanitary Engineers
 - Chemical Engineers
 - Civil Engineers
 - Oceanographic Engineers
 - Auxiliary Technicians
 - Professional Divers

**Establishment of a Regional Activity Centre
For Marine Pollution from Land Based Sources in the Wider Caribbean**

Preamble

The Government of the Cuban Republic and the United Nations Environment Programme for the Contracting Parties to the 1983 Cartagena Convention:

Having in mind the decision No.1 of the VI Intergovernmental Meeting and the III Meeting of Contracting Parties of the Agreement of Cartagena (Kingston, November 16-18, 1992) which supports Recommendation No.3 of the X Meeting of the Supervision Committee for the Action Plan of the Caribbean Environmental Programme and the Special Meeting of the Board of Directors of the Contracting Parties of the Agreement of Cartagena (Kingston November 11-13, 1992) the Secretary's Office, in consultation with the Government of the Republic of Cuba, has issued the following document. The terms of reference as based on the UNEP document (OCA)/CAR WG 10/3 named Conceptual Document for Regional Activities Centre and Nets and on the Report of the VII Intergovernmental Meeting of the Action Plan for the Environmental Programme for the Caribbean and the IV Meeting of the Contracting Parties for the Agreement for the Protection and Development of the Marine Environment in the Wider Caribbean Region (Kingston, December 12-14, 1994).

Underlining the need to organise co-operation at the regional level to implement activities of the Action Plan for the Caribbean Environment Programme,

Recognising the value all the States of the Caribbean region benefiting from the Cuban experience in the area of natural environment management and, in particular, that of the Centre of Engineering and Environmental Management of Bays and Coastal Areas,

Recalling in this regard decision No.1 of file Sixty Intergovernmental Meeting and third Meeting of the Contracting Parties to the Cartagena Convention backing recommendation No.3 of the Tenth Meeting of the Contracting Parties of the Cartagena Convention, taken in 1992 in Kingston, Jamaica.

In conformity with the decision of the Seventh Intergovernmental Meeting and Fourth Meeting of the Contracting Parties to the Cartagena Convention taken in December 1994 in Kingston Jamaica, adopting the Terms of Reference for establishing a Cuban Regional Activities Centre for the marine pollution from land based sources in the Wider Caribbean.

Have agreed as follows:

ARTICLE 1 DEFINITIONS

For the purpose of this Agreement:

(1) “Regional Activities Centre (RAC)” means an entity established under the laws and regulations of the Cuban Republic pursuant to the relevant decisions of the Contracting Parties to the Cartagena Convention to undertake under the terms and conditions set forth in this agreement. Regional activities in accordance with the terms of reference defined by the Contracting Parties to the Cartagena Convention.

(2) “Regional Co-ordinating Unit (RCU)” means the Regional Co-ordinating Unit of the Caribbean Environment Programme of UNEP established in Jamaica on 10 November 1984 to service the Caribbean Action Plan, which on behalf of UNEP performs secretariat functions for the Contracting Parties to the Cartagena Convention.

(3) “Regional Activities Network” means the networked regional and national institutions designated by the States participating in the Action Plan for the Caribbean Environmental Programme.

(4) “Trust Fund” means the fund specifically established to finance the activities of the Caribbean Environment Plan and funded by the States Parties to the Cartagena Convention.

ARTICLE 2 OPERATIONS/FUNCTIONS

1. The RAC shall have a regional role as defined and financed in accordance with the relevant decision of the Contracting Parties to the Cartagena Convention. In carrying out its regional role, the Centre shall perform the tasks assigned to it by the Contracting Parties.

2. Pursuant to the terms of reference of the RAC defined by the Contracting Parties to the Cartagena Convention and acting under the aegis of the RCU, the Centre shall, in particular, perform the following functions.

- a. Establish and implement the functioning of a Regional Activity Network (RAN) which will operate within the framework of the Protocol Concerning Land Based Sources of Marine Pollution
- b. Gather relevant information thereby contributing to the implementation of the Protocol Concerning to marine pollution from land based sources in the Wider Caribbean and communicating these, upon request, via the Regional Co-ordinating Unit, to the members of the Regional Activities Network, through the National Authority designated for said purpose,

- c. Gather, assess and transmit relevant scientific and technical information as well as experiences useful to members of the Regional Activities Network,
- d. Collect information on technologies and leading-edge know-how in the field of management of marine pollution from land based sources in the Wider Caribbean region and transferring these to the members of the Regional Activities Network at their request,
- e. Develop training activities such as courses, seminars, workshops, training sessions, for members of the Regional Activities Network,
- f. Furnish scientific and technical assistance to members of the Regional Activities Network at their request,
- g. Co-operate with Agencies of the United Nations, with relevant intergovernmental, governmental and non-governmental organisations, and , where appropriate, with any other institution to develop joint projects as well as for the direct implementation of activities related to the Protocol and the Regional Programme for Marine Pollution from Land based Sources in the Wider Caribbean,
- h. Establish and maintain regular exchange with all the members of the Regional Activities network relevant to the Protocol and the Programme for Marine Pollution from Land Based Sources in the Wider Caribbean,
- i. Contribute to the balanced participation of all the members of the Network for the purpose of fostering regional co-operation and carrying out the objectives of the Protocol and the Programme.
- j. Encourage the harmonisation of approaches and methodologies utilised in the Network as well as among the various programmes of the Action Plan for the Caribbean Environment Programme.
- k. Organise meetings, symposiums and missions in the field, useful for carrying out these objectives. The meetings and international conferences organised by the Regional Activities Centre and financed with funds administered by the United Nations Environment Programme are open to representatives designated by the competent authorities of the States Parties to the Cartagena Convention.
- l. Review and, in consultation with the Regional Co-ordinating Unit, take any other appropriate initiatives for carrying out the objectives of the Protocol Concerning Land Based Sources of Marine Pollution in the Wider Caribbean and the Sub-Programme for Evaluation and Management of Environment Pollution.
- m. Develop the guidelines and joint criteria for identifying, selecting, establishing, managing and protecting of areas designated by the Parties to the Protocol

Concerning to Marine Pollution from Land Based Sources in the Wider Caribbean.

- n. Establish an inventory, preserve, restore and manage threatened or endangered areas designated by the Parties to the Protocol,
- o. Provide training and increase public participation in the design and execution of management plans for the designated areas,
- p. Establish, facilitate and monitor the network of protected areas provided for under Article Paragraph, of the Protocol Concerning to Marine Pollution from Land Based Sources in the Wider Caribbean,
- q. Mobilise human, financial and material means in order to meet, where appropriate, the requests of members of the Regional Activities Network, as well as possibly supplying equipment to improve the management of the studied areas.

3. Activities of the RAC, which are not related to its regional role and which are assigned to it by the relevant Cuban authorities, shall be defined and financed by the Government of the Republic of Cuba. Every effort shall be made to ensure that such activities do not interfere or affect with the regional role of the RAC and its related commitments.

ARTICLE 3 ADMINISTRATIVE AND FINANCIAL MATTERS

1. The activities of the RAC relevant to its regional role shall be carried out under tile general guidance and supervision of the RCU.

2. Concrete tasks to be performed by the RAC in carrying out its regional role, as well as the legal and financial obligations of the Centre, shall be specified in project documents signed by the Centre and UNEP acting on behalf of the Contracting Parties.

3. The Government of the Republic of Cuba undertakes to finance the regional activities of the Centre as provided for in the Annex to this agreement. The Cuban Government, in particular undertakes to ensure the availability of adequate premises needed for the work of the Centre, including furnishing of the premises, telecommunication facilities and maintenance of the premises and facilities, and shall provide in-cash counterpart contribution for general operation of the Centre.

4. Pursuant to the relevant decisions of the Contracting Parties to the Cartagena Convention, the regional activities of the Centre shall also be financed through the Caribbean Trust Fund.

5. The Government of the Republic of Cuba and UNEP, acting on behalf of the Contracting Parties to the Cartagena Convention, individually or jointly, shall seek additional resources for the Centre from sources other than Caribbean Trust Fund.

6. The financial resources provided to the RAC by the Contracting Parties of the Cartagena Convention through the Caribbean Trust Fund will be made available to the RAC for the implementation of its regional activities in conformity with the project documents signed by the Centre and UNEP acting on behalf of the Contracting Parties.

ARTICLE 4 LOCATION OF THE RAC

In order to accomplish its mission and in conformity with the Terms of Reference of the Regional Activity Centre, the Centre will be located in the Territory of the Republic of Cuba. It will be located at the headquarters of the Centre for Engineering and Environment Management of Bays and Coastal Zones (CIMAB).

ARTICLE 5 PERSONNEL

1. The RAC shall be administered in accordance with the provision of this agreement.
2. The RAC shall have a Director, appointed by Government of the Republic of Cuba, and such personnel, appointed in accordance with the provisions of this article, as is necessary for the exercise of its functions. The Cuban Government shall make available, to the extent possible, to the Centre personnel, which are essential for the exercise of its functions.
3. The Director will represent the Centre and, subject to the provisions of the present agreement, will have an overall responsibility for the operation and administration of the Centre.
4. Personnel made available to the RAC by the Government of the Republic of Cuba and whose posts are financed by the Government will be appointed by the Director.
5. The Director will appoint international personnel, whose posts will be financed through funds granted by the Contracting Parties to the Cartagena Convention, in consultation with the RCU. Internationally-recruited personnel shall be appointed from among the applicants responding to the vacancy announcements circulated through the RCU to the Contracting Parties to the Cartagena Convention.
6. Consultants and other experts for the RAC, whose posts are financed from the funds provided by the Contracting Parties to the Cartagena Convention, shall be selected after consultation with the RCU.
7. The RAC shall be responsible for the formalities related to the entry visas, residence permits and work permits of its internationally recruited personnel.

ARTICLE 6 PRIVILEGES AND IMMUNITIES

1. Representatives of the Contracting Parties to the Cartagena Convention participating in meetings convened by the RAC or organised with its assistance in the Republic of Cuba shall, while exercising their functions and during their journey to and from, the place of the meeting, enjoy the privileges and immunities provided for in Article IV of the 1946 Convention on the Privileges and Immunities of the United Nations.
2. United Nations personnel and its experts on mission providing assistance to the RAC or travelling to the Republic of Cuba in their official capacity in connection with the activities of the Centre, shall enjoy the privileges and immunities, exemptions and facilities provided for in Articles V, VI and VII of the 1946 Convention on the Privileges and Immunities of the United Nations.
3. Property, funds and assets held and administered by UNEP, including those held and administered on behalf of the Contracting Parties to the Cartagena Convention, wherever located and by whomsoever, held shall enjoy the privileges and immunities, exemptions and facilities provided for in Article II of the 1946 Convention on the Privileges and Immunities of the United Nations.
4. Property, funds and assets transferred to the RAC pursuant to the project documents shall enjoy the immunities and exemptions referred to in paragraph 3 of this Article.

ARTICLE 7 SETTLEMENTS OF DISPUTES

1. The Government of the Republic of Cuba and UNEP shall co-operate in the implementation of this agreement and shall endeavour to solve any dispute relating to the implementation and application of this agreement by negotiation or other agreed mode of settlement in conformity with the objectives of the Cartagena Convention.
2. Any dispute between the Government of the Republic of Cuba and UNEP, which is not settled by negotiation or other agreed mode of settlement, shall be referred to arbitration at the request of either Party. Each Party shall appoint one arbitrator and the two arbitrators so appointed should appoint a third, who shall be the chairman. If within thirty days of the request for arbitration either party has not appointed an arbitrator, or if within fifteen days of the appointment of two arbitrators the third arbitrator has not been appointed, either Party may request the President of the International Court of Justice to appoint an arbitrator. The arbitrators shall fix the procedure for the arbitration, and the expenses of the arbitration shall be borne by the Parties as assessed by the arbitrators. The arbitral award shall contain a statement of the reasons on which it is based and shall be accepted by the Parties as the final adjudication of the dispute.

ARTICLE 8 AMENDMENT AND TERMINATION

1. The present agreement may be amended by written agreement between the Parties.

2. Either Party upon six months notice by the other Party may terminate the present agreement. The agreement shall, however, remain in force for such an additional period as might be necessary for orderly cessation of the regional activities of the RAC, and the resolution of any disputes between the Parties.

**ARTICLE 9
ENTRY INTO FORCE**

This agreement shall enter into force upon signature by UNEP on behalf of the Conference of Parties to the Cartagena Convention, and signature and ratification by the Government of the Republic of Cuba. Done in on day of in three originals in French, English and Spanish languages, the three texts being equally authentic.

For the Government of the Republic of
Cuba

By UNEP on behalf of the Conference of the
Parties to the Cartagena Convention

ANNEX VIII

**Draft Terms of Reference for the Creation of a Regional Activity Centre (RAC) for
Marine Pollution from Land-Based Sources and
Draft Agreement Between the Government of Trinidad and Tobago and UNEP-CAR/RCU
for the Establishment of a RAC
Presented by the Government of Trinidad and Tobago**

PREAMBLE

The Government of the Republic of Trinidad and Tobago and the United Nations Environment Programme (hereafter UNEP), as Secretariat of the Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region (hereafter the Cartagena Convention) and therefore acting on behalf of the Contracting Parties to the Cartagena Convention:

Having in mind the Decision No. 1 of the VI Intergovernmental Meeting and the III Meeting of Contracting Parties of the Agreement of Cartagena (Kingston, November 16-18, 1992) which supports Recommendation No. 3 of the X Meeting of the Monitoring Committee for the Action Plan of the Caribbean Environment Programme and the Special Meeting of the Bureau of the Contracting Parties of the Agreement of Cartagena (Kingston November 11-13, 1992) the Government of the Republic of Trinidad and Tobago made a proposal to the Contracting Parties of the Cartagena Convention to host a Regional Activity Centre (hereafter RAC) for the further implementation of the Protocol Concerning Pollution from Land-based Sources and Activities to the Cartagena Convention. The terms of reference to establish this LBS/RAC are based on the UNEP document (OCA)/CAR WG 10/3 entitled Concept Paper for Regional Activities Centres and Regional Activity Networks and on the Report of the VII Intergovernmental Meeting of the Action Plan for the Caribbean Environment Programme and the IV Meeting of the Contracting Parties to the Convention for the Protection and Development of the Marine Environment in the Wider Caribbean Region (Kingston, December 12-14, 1994);

Underlining the need to organise co-operation at the regional level to implement activities of the Action Plan for the Caribbean Environment Programme;

Recognising the value all the States of the Caribbean region in benefiting from the Trinidad and Tobago's experience in the area of natural resources and environmental management and, in particular, that of the Institute of Marine Affairs, Trinidad and Tobago Bureau of Standards, the Environmental Management Authority and the University of the West Indies, St. Augustine, Trinidad;

Recalling in this regard Decision No. 1 of the Sixth Intergovernmental Meeting and third Meeting of the Contracting Parties to the Cartagena Convention backing recommendation No. 3 of the Tenth Meeting of the contracting Parties of the Cartagena Convention, taken in 1992 in Kingston, Jamaica; and

In conformity with Decision 7 of the Seventh Intergovernmental Meeting and Fourth Meeting of the Contracting Parties to the Cartagena Convention taken in December 1994 in Kingston Jamaica, adopting the Proposed Legal Framework for the Administrative, Technical and Financial Operations of RACs and RANs;

Have agreed as follows:

ARTICLE 1 DEFINITIONS

For the purpose of this Agreement:

(1) "Regional Activities Centre (RAC)" means an entity established under the laws and regulations of Republic of Trinidad and Tobago pursuant to the relevant decisions of the Contracting parties to the Cartagena Convention to undertake, under the terms and conditions set forth in this agreement, regional activities in accordance with the terms of reference defined by the Contracting Parties to the Cartagena Convention.

(2) "Regional Co-ordinating Unit (RCU)" means the Regional Co-ordinating Unit of the Caribbean Environment Programme of UNEP established in Jamaica on 10 November 1984 to service the Caribbean Action Plan, which on behalf of UNEP performs secretariat functions for the Contracting Parties to the Cartagena Convention.

(3) "Regional Activities Network" means the networked regional and national institutions designated by the States participating in the Action Plan for the Caribbean Environmental Programme.

(4) "Trust Fund" means the fund specifically established to finance the activities of the Caribbean Environment Plan and funded by the States Parties to the Cartagena Convention in accordance with Decision No. 1 of the Seventh Intergovernmental and Fourth Contracting Parties Meeting (12-14 December, 1994) and Recommendation No. 4 of the Eleventh Monitoring Committee Meeting (2-9 December, 1994).

ARTICLE 2 OPERATIONS/FUNCTIONS

1. The RAC shall have a regional role as defined and financed in accordance with the relevant decision of the Contracting Parties to the Cartagena Convention. In carrying out its regional role, the Centre shall perform the tasks assigned to it by the Contracting Parties.

2. Pursuant to the terms of reference of the RAC defined by the Contracting Parties to the Cartagena Convention and acting under the aegis of the RCU, the Centre shall, in particular, perform the following functions:
 - a. Gather relevant information thereby contributing to the implementation of the Protocol Concerning marine pollution from land based sources in the Wider Caribbean and communicate these, upon request, via the Regional Co-ordinating Unit, to the members of the Regional Activities Network, through the National Authority designated for said purpose.
 - b. Gather, assess and transmit relevant scientific and technical information as well as experiences useful to members of the Regional Activities Network.
 - c. Collect information on technologies and cutting-edge know-how in the area of management of marine pollution from land based sources in the Wider Caribbean region and transfer these to the members of the Regional Activities Network at their request.
 - d. Develop training and informational activities such as courses, seminars, workshops, training sessions, for members of the Regional Activities Network.
 - e. Provide scientific and technical assistance to members of the Regional Activities Network at their request.
 - f. Co-operate with Agencies of the United Nations, with relevant intergovernmental, governmental and non-governmental organisations, and, where appropriate, with any other institution to develop joint projects as well as for the direct implementation of activities related to the Protocol and the Regional Programme for Marine Pollution from Land Based Sources in the Wider Caribbean
 - g. Establish and maintain regular exchange with all the members of the Regional Activities Network relevant to the Protocol and the Programme for Marine Pollution from Land Based Sources in the Wider Caribbean.
 - h. Contribute to the balanced participation of all the members of the Network for the purpose of fostering regional co-operation and carrying out the objectives of the Protocol and the Programme.
 - i. Encourage the harmonisation of approaches and methodologies utilised in the Network as well as among the various programmes of the Action Plan for the Caribbean Environment Programme.
 - j. Organise meetings, symposiums and missions in the field, useful for carrying out these objectives. The meetings and international conferences organised by the Regional Activities Centre and financed with funds administered by the United Nations Environment Programme are open to representatives designated by the

competent authorities of the States Parties to the Cartagena Convention.

- k. Review and, in consultation with the Regional Co-ordinating Unit, take any other appropriate initiatives for carrying out the objectives of the Protocol and Programme for Marine Pollution from Land Based Sources in the Wider Caribbean.
 - l. Train, disseminate information, raise public awareness concerning the need for the management of marine pollution from land-based sources in the Wider Caribbean.
 - m. Mobilise human, financial and material means to meet, where appropriate, the requests of members of the Regional Activities Network, as well as supply where possible equipment to improve the management of the studied areas.
3. Activities of the RAC, which are not related to its regional role and which are assigned to it by the relevant authorities of Trinidad and Tobago, shall be defined and financed by the Government of the Republic of Trinidad and Tobago. Every effort shall be made to ensure that such activities do not affect or interfere with the regional role of the RAC and its related commitments.

ARTICLE 3

ADMINISTRATIVE AND FINANCIAL MATTERS

1. The activities of the RAC relevant to its regional role shall be carried out under the general guidance and supervision of the RCU.
2. Concrete tasks to be performed by the RAC in carrying out its regional role, as well as the legal and financial obligations of the Centre, shall be specified in project documents signed by the Centre and UNEP acting on behalf of the Contracting Parties.
3. The Government of the Republic of Trinidad and Tobago undertakes to finance the regional activities of the Centre as provided for in Attachment II of the proposal which will be annexed to this agreement. The Trinidad and Tobago Government, in particular undertakes to ensure the availability of adequate premises needed for the work of the Centre, including furnishing of the premises, telecommunication facilities and maintenance of the premises and facilities, and shall provide in-cash counterpart contribution for general operation of the Centre.
4. Pursuant to the relevant decisions of the Contracting Parties to the Cartagena Convention, the regional activities of the Centre shall also be financed through the Caribbean Trust Fund.
5. The Government of the Republic of Trinidad and Tobago and UNEP, acting on behalf of the Contracting Parties to the Cartagena Convention, individually or jointly, shall seek additional resources for the Centre from sources other than Caribbean Trust Fund.

6. The financial resources provided to the RAC by the Contracting Parties of the Cartagena Convention through the Caribbean Trust Fund will be made available to the RAC for the implementation of its regional activities in conformity with the project documents signed by the Centre and UNEP acting on behalf of the contracting Parties.

ARTICLE 4 LOCATION OF THE RAC

In order to accomplish its mission in conformity with the Terms of Reference of the Regional Activities Centre, the Centre will be located in Chaguaramas, in the Republic of Trinidad and Tobago. It will be located at the Institute of Marine Affairs. Additional technical support would be provided by the Environmental Management Authority, the Trinidad and Tobago Bureau of Standards and the University of the West Indies, Trinidad and Tobago.

ARTICLE 5 PERSONNEL MATTERS

1. The RAC shall be administered in accordance with the provision of this agreement.
2. The RAC shall have a Director/Co-ordinator, appointed by Government of the Republic of Trinidad and Tobago, and such personnel, appointed in accordance with the provisions of this article, as is necessary for the exercise of its functions. The Trinidad and Tobago Government shall make available, to the extent possible, members of staff who are essential for the exercise of its functions.
3. The Director/Co-ordinator will represent the Centre and, subject to the provisions of the present agreement, will have an overall responsibility for the operation and administration of the Centre.
4. Personnel made available to the RAC by the Government of the Republic of Trinidad and Tobago and whose posts are financed by the Government will be appointed by the Director/Co-ordinator.
5. The Director/Co-ordinator will appoint International and locally recruited personnel, whose posts are financed with the funds provided by the Contracting Parties of the Cartagena Convention, after consultations with the RCU. Internationally recruited personnel shall be appointed from among the applicants responding to the vacancy announcements circulate through the RCU to the Contracting Parties of the Cartagena Convention.
6. Consultants and other experts for the RAC, whose posts are financed from the funds provided by the Contracting Parties to the Cartagena Convention, shall be selected after consultation with the RCU.

7. The RAC shall be responsible for the formalities related to the entry visas, residence permits and work permits of its internationally recruited personnel.

ARTICLE 6 IMMUNITIES AND PRIVILEGES

1. Representatives of the Contracting Parties to the Cartagena Convention participating in meetings convened by the RAC or organised with its assistance in the Republic of Trinidad and Tobago shall, while exercising their functions and during their journey to and from, the place of the meeting, enjoy the privileges and immunities provided for in Article IV of the 1946 Convention on the Privileges and Immunities of the United Nations.
2. United Nations personnel and its experts on mission providing assistance to the RAC or travelling to the Republic of Trinidad and Tobago in their official capacity in connection with the activities of the Centre, shall enjoy the privileges and immunities, exemptions and facilities provided for in Articles Article V, VI and VII of the 1946 Convention on the Privileges and Immunities of the United Nations.
3. Property, funds and assets held and administered by UNEP, including those held and administered on behalf of the Contracting Parties to the Cartagena Convention, wherever located and by whomsoever, held shall enjoy the privileges and immunities, exemptions and facilities provided for in Articles Article II of the 1946 Convention on the Privileges and Immunities of the United Nations.
4. Property, funds and assets transferred to the RAC pursuant to the project documents shall enjoy the immunities and exemptions referred to in paragraph 3 of this Article.

ARTICLE 7 SETTLEMENTS OF DISPUTES

1. The Government of the republic of Trinidad and Tobago and UNEP shall co-operate In the implementation of this agreement and shall endeavour to solve any dispute relating to the implementation and application of this agreement by negotiation or other agreed amicable mode of settlement in conformity with the objectives of the Cartagena Convention.
2. Any dispute between the Government of the Republic of Trinidad and Tobago and UNEP, which is not settled by negotiation or other agreed amicable mode or settlement, shall be referred to arbitration at the request of either Party. Each Party shall appoint one arbitrator and the two arbitrators so appointed should appoint a third, who shall be the chairman. If within thirty days of the request for arbitration either party has not appointed an arbitrator, or if within fifteen days of the appointment of two arbitrators the third arbitrator has not been appointed, either Party may request the President of the

International Court of Justice to appoint an arbitrator. The arbitrators shall fix the procedure for the arbitration, and the expenses of the arbitration shall be borne by the Parties as assessed by the arbitrators. The arbitral award shall contain a statement of the reasons on which it is based and shall be accepted by the Parties as the final adjudication of the dispute.

ARTICLE 8
AMENDMENT AND TERMINATION

1. The agreement may be amended by written agreement between the Parties.
2. Either Party upon six months notice by the other Party may terminate the present agreement. The agreement shall, however, remain in force for such an additional period as might be necessary for orderly cessation of the regional activities of the RAC, and the resolution of any disputes between the Parties.

ARTICLE 9
ENTRY INTO FORCE

This agreement shall enter into force upon signature by UNEP on behalf of the Conference of Parties to the Cartagena Convention, and signature and ratification by the Government of the Republic of Trinidad and Tobago. Done in on day of in three originals in the French, English and Spanish languages, the three texts being equally authentic.

For the Government of the Republic
of Trinidad and Tobago

By UNEP on behalf of the Conference of
the Parties to the Cartagena Convention

**TERMS OF REFERENCE FOR THE ESTABLISHMENT OF
A REGIONAL ACTIVITIES CENTRE FOR MARINE POLLUTION
FROM LAND-BASED SOURCES**

**PROPOSAL FROM THE GOVERNMENT OF
THE REPUBLIC OF TRINIDAD AND TOBAGO**

Background

1. In keeping with Decision No.1 of the Sixth Intergovernmental Meeting and the Third Meeting of the Contracting Parties of the Cartagena Convention (November 16 –18, 1992) which supports Recommendation No. 3 of the Tenth Meeting of the Monitoring Committee for the Action Plan for the Caribbean Environment Programme and the Special Meeting of the Bureau of Contracting Parties of the Cartagena Convention (November 11-13, 1992), the Government of the Republic of Trinidad and Tobago is submitting this document. These Terms of Reference are based on the document UNEP (OCA)/CAR WG.10/3 entitled “Concept Paper for Regional Activity Centres and Regional Activity Networks” and on the report of the Seventh Intergovernmental Meeting on the Action Plan for the Caribbean Environment Programme and Fourth Meeting of the Contracting Parties to the Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region (December 12-14, 1994).
2. These Terms of Reference for the establishment of the Regional Activity Centre (RAC) for the regional programme on Land-based Sources (LBS) and Activities in the Wider Caribbean, with its Regional Activity Network (RAN) are being submitted for consideration to the First Meeting of the Interim Scientific and Technical Advisory Committee (ISTAC) for the LBS Protocol scheduled to be held in Ocho Rios, Jamaica February 19 - 23, 2001.

Administrative Requirements

3. The Regional Activity Centre (RAC) for the Programme of Land-based Sources of Marine Pollution as proposed by the Government of the Republic of Trinidad and Tobago will satisfy the requirements outlined in the above-mentioned concept paper on RACs and RANs including the capability of communicating in the three working languages of the Caribbean Environment Programme.
4. In establishing the LBS/RAC the Government of the Republic of Trinidad and Tobago would use the Institute of Marine Affairs (IMA) as the principal institution with assistance from other institutions such as the Environmental Management Authority (EMA), the Caribbean Industrial Research Institute (CARIRI) and the Trinidad and Tobago Bureau of Standards (TTBS). The IMA and the additional institutions will provide the physical, scientific and technical capabilities required by UNEP.

5. The IMA is a multi-disciplinary marine and environmental-related research institution, located in the northwestern peninsula of Trinidad, at Hilltop Lane, Chaguaramas. The IMA was established by Act of Parliament No. 15 of 1976. It is incorporated and administered in accordance with the provisions of this Act of Parliament, now Ch. 37:01 in the Revised Laws of the Republic of Trinidad and Tobago as amended by Act No. 13 of 1990. This legislation gives the IMA a Caribbean mandate requiring the organization to conduct research and development activities on the marine environment and other areas that impact upon the environment of the Caribbean and adjacent regions. The IMA is funded by the Government of the Republic of Trinidad and Tobago, but has taken part in many regional projects including those of the UNEP Caribbean Environment Programme.
6. The Government of the Republic of Trinidad and Tobago will provide the required office space, staffing and equipment for the LBS/RAC utilizing the Institute of Marine Affairs which is located on 7 acres of land in Chaguaramas. The existing structures of the IMA are made up of a number of single level buildings in which there is room to house the administrative offices of the RAC. The Government has approved the construction of new facilities for the IMA which is scheduled to commence in 2001. IMA's new facilities will consist of a Research Building (4 floors), an Information Centre Building (3 floors) including a Marine Education Centre and Library, an Auditorium Building to seat 200 persons, an Operations Building (2 floors) and a Cafeteria. The new facilities of IMA will make an impressive setting for the LBS/RAC.
7. The contributions of the Government of the Republic of Trinidad and Tobago in cash and in kind are indicated in Attachment I. The equipment located at IMA which could be utilized by the RAC are listed in Attachment II.
8. National staffing for the RAC will be recruited by the Government of the Republic of Trinidad and Tobago and managed by the IMA. The international staffing for the RAC will be recruited directly by the UN with the approval of the Government of the Republic of Trinidad and Tobago in accordance with the Rules and Regulations of UNEP and with the Laws of the Republic of Trinidad and Tobago.
9. The LBS/RAC will become operational following the signing of the Memorandum of Agreement between the UNEP Regional Co-ordinating Unit and the Government of the Republic of Trinidad and Tobago.
10. With respect to administrative communications, the following shall apply:

- communications on technical matters related to specific activities would be directly between the LBS/RAC and the relevant designated national authorities, focal points, participating institutions and members of the RAN. Information on these communications should be forwarded to the UNEP-CAR/RCU in the half-yearly progress reports;
- the only official channel of communication on policy matters involving Governments participating in the Caribbean Environmental Programme (CEP) should be through the UNEP-CAR/RCU.

11. All correspondence regarding substantive, administrative, financial and technical matters between the LBS/RAC and the UNEP-CAR/RCU will be addressed as follows:

- (a) at UNEP:
Co-ordinator
UNEP Regional Co-ordinating Unit
Caribbean Environment Programme
14-20 Port Royal Street
Kingston, Jamaica
- (b) at LBS/RAC:
Director/Co-ordinator LBS/RAC
Institute of Marine Affairs
Hilltop Lane
Chaguaramas
Republic of Trinidad and Tobago

Technical Capabilities

12. The LBS/RAC will provide the overall supervision, technical guidance and administrative oversight to the implementation of the various activities of the Regional Programme for Land-based Sources of Marine Pollution and other activities. In general the role of the LBS/RAC is to co-ordinate the technical inputs of the institutions comprising the RANs in order to bring about the implementation of project activities.

13. The LBS/RAC will:

- i. provide assistance to and advise UNEP-CAR/RCU on the LBS programme development;
- ii. supervise and co-ordinate the implementation of project activities in the region to avoid the serious impacts of land-based sources of pollution to the marine environment in consultation with the UNEP-CAR/RCU;

- iii. promote the standardization of methods and co-operation of research and monitoring needs of regional concern on aspects relevant to the LBS Protocol;
- iv. foster scientific and technical co-operation with UN specialized agencies, intergovernmental, governmental and non-governmental organizations;
- v. facilitate the provision of technical and scientific assistance (expertise, consultancies), and training to governments, institutions, and members of the Regional Activity Networks (RANs) on request;
- vi. collect information on state-of-the-art technology required for the implementation of the LBS programme activities and to make this information available to governments, institutions and members of the RANs on request;
- vii. establish and up-date databases on national, sub-regional and regional measures adopted for the implementation of this LBS Protocol, including any other pertinent information;
- viii. develop training and informational activities such as courses, seminars and workshops for members of the RAN; and public awareness concerning the need for the management of marine pollution from land-based sources in the Wider Caribbean;
- ix. ensure the harmonious and mutually reinforcing involvement of the institutions participating in the RAN;
- x. mobilise human, financial and material resources to respond, as far as possible, to the demands of governments and institutions in the RAN;
- xi. organize meetings, symposiums and missions in the field useful for carrying out the objectives of the LBS Protocol and the functions of the LBS/RAC.

14. The technical capabilities of the Institute of Marine Affairs to be the LBS/RAC are that the Institute is a multi-disciplinary research organization with the following mission:

To conduct fundamental and applied research in marine affairs to ensure the sustainable use of the natural resources of Trinidad and Tobago; to make the results of such research available to the Government for the formulation of coherent and consistent policies in the conservation and management of the country's marine and related resources; and to respond to general needs for information and collaboration with all sectors of Trinidad and Tobago and the Wider Caribbean.

The research at IMA is conducted under the following programmes which reflect specific tasks and activities related to the systematic investigations of coastal zones, inland waterways and rivers, near-shore waters, and the Exclusive Economic Zone (EEZ):

- Fisheries and Aquaculture
- Environmental Research
- Legal Research

- Marine Chemistry
- Technical Advisory Services

15. The inter-programme research work of the IMA focuses on the marine and coastal environment and covers the following fields:

Marine Fisheries	Aquaculture
Marine Geology/Sedimentology	Environmental Impact Assessment
Socio-Economic Assessment	Pollution Monitoring
Marine and Wetlands Ecology	Physical Oceanography
Taxonomy	Satellite Remote Sensing
Geographic Information Systems	Marine Environmental Policy & Law
Environmental Management and Planning	Public Education & Awareness
Information Management	

The IMA has 30 professional staff specializing in the various disciplines listed above. In addition there are 18 technical staff, 26 administrative staff and 20 support staff. The IMA is headed by a Director and Deputy Director. IMA's Board of Governors is responsible for policy matters.

16. The IMA's facilities includes the following laboratories:

Analytical Chemistry	Microbiology
Toxicology	Geology
Marine Fisheries	Remote Sensing
Aquaculture	Histology
Fish Age and Growth	

17. The IMA, through its Technical Advisory Services Programme, responds to technical inquiries from Government Ministries/Agencies and the private sector in Trinidad and Tobago and the Caribbean, and makes recommendations on matters falling within its purview. Criteria and policy guidelines for marine and coastal resource planning and management, which can contribute to the economic growth of the countries, are also provided.

18. IMA's Information Centre manages its information resources for the benefit of its staff and provides information and education services to a wider user community locally, regionally and internationally. In addition to these, the Information Centre also coordinates the Caribbean Community Ocean Sciences Network (CCOSNET) for the CARICOM Secretariat. The CARICOM Secretariat has also designated the IMA the Remote Sensing Centre for the CARICOM states. The Journal of the Institute of Marine Affairs - Caribbean Marine Studies, is a refereed journal which accepts research papers in a variety of disciplines from researchers in the Wider Caribbean. Papers are accepted for publication in any of the three languages used by the United Nations.

Financial Aspects

19. In keeping with the funding arrangements outlined in the concept paper on RACs and RANs, as approved by the Sixth Intergovernmental and Third Contracting Parties Meetings (November 16- 18, 1992), the Government of the Republic of Trinidad and Tobago proposes to cover the initial and recurring operational costs of the LBS/RAC as contained in Attachment I. This investment will serve, notably, to attract additional funding from multilateral and other counterpart sources. Attachment III contains the proposed financial management scheme for administration of the LBS/RAC.
20. UNEP-CAR/RCU will make the necessary transfer of funds to the LBS/RAC to assist with the co-ordination and implementation of the specific activities assigned to it by the RCU.

Financial Reports

21. (a) Statement of expenditures: LBS/RAC will submit to the Chief, Fund Programme Management Branch, UNEP Headquarters and to the Co-ordinator of the UNEP-CAR/RCU quarterly project expenditure LBS/RAC accounts as required by UNEP.

Within sixty (60) days of the completion of the activities described in the project document, the LBS/RAC will submit to the UNEP-CAR/RCU a detailed final expenditure statement in line with the project budget certified by a chartered accountant paid under the LBS/RAC contribution. Should the cost of the activity be less than that of the cost stated in the project document, the difference will be reimbursed to UNEP-CAR/RCU. Any cost overrun (expenditure in excess of the amount budgeted in each budget sub-line) shall be met by the LBS/RAC unless written authorization has been received in advance from the UNEP-CAR/RCU.

- (b) Non-expendable equipment: Authorization to purchase (a) non-expendable equipment costing more than US\$1500.00, and (b) micro-computer equipment will have to be sought from the UNEP-CAR/RCU.

The LBS/RAC will keep records of non-expendable equipment (items costing US\$1500 or more as well as portable items such as pocket calculators) purchased with UNEP-CAR/RCU funds and will submit an annual detailed inventory of all such equipment to the UNEP-CAR/RCU indicating the cost, the date of purchase, and the present condition of each item. This inventory will be attached to the "Progress Report" submitted on December 31, each year (see (a) below).

-Non-expendable equipment purchased with funds administered by UNEP-CAR/RCU remains the property of UNEP-CAR/RCU until its disposal is authorized by UNEP-CAR/RCU. The LBS/RAC will be responsible for any loss of or damage to equipment

purchased with UNEP-CAR/RCU funds. The proceeds from the sale of equipment (duly authorized by UNEP-CAR/RCU) shall be credited to the accounts of UNEP-CAR/RCU.

Substantive Reports:

22. (a) On June 30 and December 31 the LBS/RAC will submit to the Co-ordinator of the UNEP-CAR/RCU a half-yearly progress report as required by UNEP. Within 60 days of the completion of the activities, LBS/RAC will submit to the UNEP-CAR/RCU a terminal report using the format given by UNEP.
- (b) The LBS/RAC will submit to the UNEP-CAR/RCU three copies of all substantive documents prepared under the framework of the LBS activities (reports, surveys, etc) in draft form for approval prior to their publication.

ATTACHMENT I: EQUIPMENT

The Institute of Marine Affairs is a multi-disciplinary organization which encompasses a wide spectrum of disciplines, such as Marine Analytical Chemistry, Microbiology, Toxicology, Geology, Physical Oceanography, Remote Sensing capabilities, Geographic Information Systems, Information Technology Aquaculture and Fisheries. In addition, a fleet of Research Vessels, and other support vehicles and a well outfitted Library and Education Centre.

	DESCRIPTION	QUANTITY
MARINE ANALYTICAL CHEMISTRY, MICROBIOLOGY AND TOXICOLOGY LABORATORIES EQUIPMENT	Fisher Ion Analyzer	1
	Ainsworth Balance	1
	Brainweigh Balance-Ohaus	1
	Mettler Toledo Balance	1
	Precision Universal Centrifuge	1
	Dynac Centrifuge	1
	Perkin Elmer Fluorescence Spectrophotometer	1
	TROEMNER Weight Calibration Kit	1
	CHRISTIAN BECKER Weight Calibration Kit	1
	Barnstead Glass Still	1
	Milli-Q Reagent Water System	1
	Hemco Fume Hood	1
	Recorder (adjacent to UV/VIS Spec.)	1
	Perkin Elmer UV/VIS Spectrophotometer	1
	Kipp & Zonen Printer	1
	Glass Col 3D Shaker	1
	Helios UV/VIS Spectrophotometer	1
	Gilson Peristaltic Pump	1
	Buchler Polystaltic Pump	1
	Shaking Water Bath	1
	Lab-Line Multi Unit Extractor/Heater (x2)	1
	Vectaire Fume Hood	1
	Fisher Scientific Fume Hood	1
	Buchi Water Bath/Rotavapor	1
	Welch Vacuum Pump (THOMAS)	1
	Precision Convection Oven	1
	Fisher Glassware Dryer	1
	Thermix Stirring Hot Plate	1
	Conductivity Bridge	1
	Fisher Thermix Stirrer	1
	Turbidity Meter	1
Tekmar Power Control	1	
Metrohm Herisau MultiBurette	1	
Tecator Stirrer	1	

ATTACHMENT I: EQUIPMENT (Cont'd)

Accumet Research Dual Channel pH/ION Meter	1
YSI Dissolved Oxygen Meter	1
Tecator Kjeltac System 1002 Distilling Unit	1
Branson 2200-Ultrasonic Cleaner	1
Fisher Low Temperature Incubator	1
Precision Vacuum Oven	1
GallenKamp Water Bath	1
Elma Transsonic Bath 890/H	1
NAPCO Autoclave	1
Electronic Multichannel Pipette	1
Scienceware Colony Counter	1
Precision Coliform Incubator Bath	1
Precision Coliform Incubator Bath	1
Fisher Scientific Stirrer Hot Plate	1
Mettler Basbal Basic Balance	1
Millipore Incubator	1
Oxford Automatic Dispensor	1
Precision Water Bath	1
Gast Vacuum Pump	1
Precision Laboratory Refridgerator	1
Market Forge Sterilmatic Autoclave	1
Imperial (4) Laboratory Oven	1
Imperial (3) Incubator	1
Imperial (3) Incubator	1
Quanti-Tray Sealer-Model 2x	1
Thermolyne Type 142300 Incubator	1
Spectroline-E-Series Ultraviolet Lamp	1
Viewing Cabinet	1
Spectroline Fluorescence Cabinet	1
Dionex (Chelation Ion Chromatograph)	1
Dionex Variable Wavelength Detector- II	1
Dionex Sample Concentration Module	1
Dionex Reagent Delivery Module	1
Dionex Advanced Gradient Pump	1
Perkin Elmer AAS	1
AAAnalyst 100 Atomic Absorption Spectrometer	1
Graphite Furnace HGA-800	1
Flow Injection Analysis System	1
Flame Autosampler AS-91	1
AS91 Controller	1
Dell Triniton Monitor	1

ATTACHMENT I: EQUIPMENT (Cont'd)

Dell Optiplex Gxi	1
High performance Liquid Chromatography	1
Diode Array Detector	1
Ic Pump	1
Scanning Fluorescence Detector & viewing unit	1
PE Nelson computer	1
PE keyboard	1
Carrier Gas Purifier	1
HP GC MODEL 5890	1
HP intergrator	1
GC Autosampler Controller	1
High Voltage Regular X 2	1
HP GC/MS Chromatography fitted with a Mass selective detector	1
Ionisation Gauge Controller	1
Vacuum pump	1
Detector controller	1
System Unit	1
Pulse FPD	1
Vacuum pump	1
Freezer	1
Fridge/Freezer	1
Intergrator Dionex	1
Electron Capture Detector	1
Flame Ionization Detector	1
Brainweigh Balance-Ohaus	1
Mettler Toledo Balance	1
Precision Universal Centrifuge	1
Dynac Centrifuge	1
Perkin Elmer Fluorescence Spectrophotometer	1
TROEMNER Weight Calibration Kit	1
CHRISTIAN BECKER Weight Calibration Kit	1
Barnstead Glass Still	1
Milli-Q Reagent Water System	1
Hemco Fume Hood	1
Recorder (adjacent to UV/VIS Spec.)	1
Perkin Elmer UV/VIS Spectrophotometer	1
Kipp & Zonen Printer	1
Glass Col 3D Shaker	1
Helios UV/VIS Spectrophotometer	1
Gilson Peristaltic Pump	1

ATTACHMENT I: EQUIPMENT (Cont'd)

	Buchler Polystaltic Pump	1
	Shaking Water Bath	1
	Lab-Line Multi Unit Extractor/Heater (x2)	1
	Vectaire Fume Hood	1
	Fisher Scientific Fume Hood	1
	Buchi Water Bath/Rotavapor	1
	Welch Vacuum Pump (THOMAS)	1
	Precision Convection Oven	1
	Fisher Glassware Dryer	1
	Thermix Stirring Hot Plate	1
	Conductivity Bridge	1
	Fisher Thermix Stirrer	1
	Turbidity Meter	1
	Tekmar Power Control	1
	Metrohm Herisau MultiBurette	1
	Tecator Stirrer	1
	Accumet Research Dual Channel PH/ION Meter	1
	YSI Dissolved Oxygen Meter	1
	Tecator Kjeltex System 1002 Distilling Unit	1
	Branson 2200-Ultrasonic Cleaner	1
	Fisher Low Temperature Incubator	1
	Precision Vacuum Oven	1
	GallenKamp Water Bath	1
	Elma Transsonic Bath 890/H	1
	NAPCO Autoclave	1
<u>GEOLOGY</u>	4m aluminium leveling staves	2
FIELD EQUIPMENT	Brunton pocket transit compass	1
	Chicago Steel Tape 7.6m survey staff	1
	Plumb bob	1
	Range poles	4
	Sokkia 7.1m fibre glass rod survey staves	2
	Sokkia illuminator unit	1
	Sokkia survey level	2
	Sokkia tripods	4
	Sokkisha theodolite	1
	Theodolite	1
	Turbometer anemometer	1
	Alvin Precision Drawing Set	1
	Banstead glass still	1

ATTACHMENT I: EQUIPMENT (Cont'd)

	Bausch and Lomb microscope	1
	Blue M oven	1
	Edeco - Picoon 'soil tester'	1
	Ele 'Compaction test' instruments	2
	Ele Soil Tester	1
	Ele Proctor penetrometer	1
	Endecott sieve shaker	1
	Endecotts Test Sieves (6 pieces)	1
	Fisher oven	1
	Labline incubator	1
	Leitz geological microscope	1
	Leitz power adapter	1
	Leitz 'tool for transects'	1
	Leroy-KE stencil set	1
	Master flameless blower	1
	Mettler Toledo balance	1
	Oertling balance	1
	Ohaus triple beam balance	1
	Sample splitter	2
	SGA Scientific timing clock	1
	sieve pans	40
	small mortar and pestle	1
	soil tester	1
	Sybron heater/stirrer	1
	test sieve shaker	1
	UV light	1
	Vacuum pump	1
	Zhunsheng scale	1
	Toshiba Lap Top	1
PHYSICAL	Endeco Current Meter	1
OCEANOGRAPHY	Interocean Systems Current Meter	1
FIELD EQUIPMENT	Seabird Electronics Tide Recorder	1
	SONTEK Argonaut Meter	1
	Acoustic Doppler Profiler	1
	Sonde Water Quality Instruments	2
	Trimble GPS	3
	Raytheon Survey Fathometer	2
	Aanderra Current Meter	2
	YSI DO Meters	9

ATTACHMENT I: EQUIPMENT (Cont'd)

	WILDCO Plankton Splitter	1
	6 Grab Samplers	1
	Tew Impulse Sealer	1
	Sestral Handheld Compass	1
	Davis Handheld compass	1
	Buehler Duostallic Pump	1
	Masterflex Sampling Pump (Horizon)	1
	3 Large drogues	1
	4 Surface Buoys	1
	4 Subsurface Buoys	1
	6 Plankton nets	1
	1 14"x32" Steel Plankton Net	1
	1 Beam Trawl	1
	2 WILDCO Kerimerer Water Samplers	1
	6L Niskin Water Sampler	1
	LICOR Inc. Inites Lightmeter	1
	Coring Checkmate Deluxe	1
	Gurley Precision Instrument Flowmeter	1
	Water Pump	1
	Starlite Automatic Weather Station and Data Collection Unit	1
	Low Voltage Regulator Line Stabilizer Conditioner	1
	Secchi Disc	1
INFORMATION TECHNOLOGY	Computers	65
AQUACULTURE AND FISHERIES LABORATORY AND FIELD EQUIPMENT	Microscopes	10
	Vacuum Oven	1
	Labconco Fume Hood	1
	Fisher ISO Temp. Oven	1
	GE Oven	1
	Goldstar Refrigerator	1
	Leonard Refrigerator	1
	Kelvinator Refrigerator	1
	Kelvinator Freezer	1
	Chest Freezer	2
	Sartorius Balance	1
	1 Mettler Balance	1
	Cast Net	1

ATTACHMENT I: EQUIPMENT (Cont'd)

	Seine Nets	2
	Leica Histoembedder	1
	Microtomes and Blade Sharpener	1
	Sieves	20
	Illuminator Light	1
	Fisher Optic Lights for Microscope	1
	Hobart Chiller	1
	Air Compressor	2
	Computers	8
	Microscopes	10
	Vacuum Oven	1
	Labconco Fume Hood	1
	Fisher ISO Temp. Oven	1
	GE Oven	1
	Goldstar Refrigerator	1
	Leonard Refrigerator	1
	Kelvinator Refrigerator	1
	Kelvinator Freezer	1
	Chest Freezer	2
	Sartorius Balance	1
RESEARCH VESSELS	R.V Kanawa 42 ft. L.O.A. Aluminium Huller vessel, 31 000 lbs. Displacement with Detroit Diesel V8-71 Engines	1
AND OTHER		
SUPPORT VEHICLES	Mako 25 25 ft. L.O.A. Fiberglass vessel, with Twin 150 HP V8 Outboard Engines	1
	Pirogue Cavallla 29ft. L.O.A. Fibreglassed Wooden vessel	1
	Boston Whaler 17ft. L.O.A. Fibreglass vessel with 55HP Johnson Outboard Engine	1
GEOGRAPHIC INFORMATION SYSTEMS	ARC/Info	1
	ARC/View	1
	ARC/View Spatial Analyst	1
	ARC/View Network Analyst	1
	Spans Explorer	1
	AutoCAD	1
	ARC/Info	1
	Digitizer	2
	Scanner	2

ATTACHMENT I: EQUIPMENT (Cont'd)

REMOTE SENSING CAPABILITY	PCI's EASI/PACE v7.0 software (on Pentium III PC).	1
DIVING EQUIPMENT	Seatec CO ₂ life vest	2
	Inflatable lifejacket	1
	Two inflatable work vests	2
	US divers backpacks	6
	MAKO compressors	6
	Air Banks	3
	Cressi and Dacor Regulators	6
	Cressi sub fins	5
	Eighty cubic feet tanks	13
	Fifty cubic feet tanks	2
	Weight belts with fifty-four pounds of weight	6

ATTACHMENT II

ANNUAL BUDGET (IN US\$)

Quantity		IN-KIND	IN-CASH
	1. PERSONNEL		
	<i>A. PROFESSIONAL STAFF</i>		
1	Director	41,904.76	
1	Deputy Director	32,952.38	
1	RAC Co-ordinator		38,095.24
1	RAC Liason Officer		24,761.90
2	Bilingual Secretaries		24,761.90
24	Research Officers	\$480,000.00	
	Sub-total	\$554,857.14	\$87,619.04
	<i>B. ADMINISTRATIVE SUPPORT</i>		
1	Administrative Manager	\$20,000.00	\$20,000.00
1	Accountant	\$20,000.00	\$20,000.00
1	Data Processing Assistant	\$16,761.90	\$7,936.51
	Sub-total	\$56,761.90	\$47,936.51
	PERSONNEL TOTAL	\$611,619.04	\$135,555.55
	2. TRAVEL		
	RAC CO-ORDINATOR		10,000.00
	Other RAC Personnel		\$5,079.37
	TRAVEL TOTAL		\$15,079.37
	3. EQUIPMENT		
	Analytical Instruments and Field Equipment	\$335,924.60	
	PCs and Printers	\$234,377.78	
	Satellite Imaging	\$47,619.05	
	Vehicles (cars/boat)	\$142,857.14	
	Photocopying machines	\$50,793.65	\$20,000.00
	Audio-visual Equipment	\$29,047.62	\$11,746.03
	EQUIPMENT TOTAL	\$840,619.84	\$31,746.03
	4. RENTAL OF OFFICE	\$19,047.62	
	RENTAL TOTAL	\$19,047.62	
	5. OPERATIONS AND MAINTENANCE (O&M)	\$15,873.02	\$10,000.00
	O&M TOTAL	\$15,873.02	\$10,000.00

ATTACHMENT II
ANNUAL BUDGET (IN US\$) Cont'd

	IN-KIND	IN-CASH
6. REPORTING COST	\$31,746.03	\$14,976.19
REPORTING TOTAL	\$31,746.03	14,976.19
7. SUNDRIES		
Communications (telephones, fax and e-mail cost)	\$47,619.05	\$8,000.00
Freight and postal	\$6,349.21	\$3,174.60
Office Supplies	\$31,746.03	\$6,349.21
Hospitality	\$28,095.24	\$3,174.60
SUNDRIES TOTAL	\$113,809.53	\$20,698.41
FINAL TOTAL	\$1,632,715.08	\$228,055.55

ATTACHMENT III

FINANCIAL MANAGEMENT

The Administrator of the LBS/RAC under the overall supervision of the LBS/RAC Co-ordinator:

- will take the necessary steps to ensure that proper accounts are maintained in keeping with the requirements of the UNEP;
- will authorize disbursements, subject to receipt of proforma invoices, and/or invoices within the limits of available resources;
- will ensure that no additional expenses are incurred until all previous obligations have been satisfied;
- will ensure that funds are expended in keeping with approved budget; and
- will be responsible for negotiating, with the IMA's bankers, an agreement concerning the transfer of currency.

UNEP:

- will take appropriate action on the questions raised in the progress reports and administrative and financial reports made by the LBS/RAC Administrator.