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COUNTRY ENVIRONMENTAL PROFILE

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Notice

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GLOSSARY OF TERMS

ACP	African, Caribbean, Pacific
AIDS	Acquired Immune Deficiency Syndrome
BPOA	Barbados Programme of Action
CCA	Caribbean Conservation Association
CDB	Caribbean Development Bank
CDC	Civil Defence Commission
CDERA	Caribbean Disaster Emergency Response Agency
CDM	Comprehensive Disaster Management
CaEP	Caribbean Environment Programme
CEP	Country Environmental Profile
CFTC	Commonwealth Fund for Technical Co-operation
CIG	Conservation International- Guyana
CIDA	Canadian International Development Agency
CITES	Convention of International Trade in Endangered Species
CPACC	Caribbean Planning for Adaptation to Climate Change
CSP	Country Strategy Paper
D & I	Drainage and Irrigation
DCU	Difficult Circumstances Unit
DFID	Department for International Development - UK
EAB	Environmental Assessment Board
EEZ	Ecological Economic Zoning
EEZ	Exclusive Economic Zone
EIA	Environmental Impact Assessment
EPA	Environmental Protection Agency
EC	European Commission
FAO	Food and Agriculture Organisation
FDI	Foreign Direct Investment
FFI	Fauna and Flora International
FPA	Forest Partnership Agreements
GEF	Global Environment Facility
GENCAPD	Guyana Environmental Capacity Development
GEA	Guyana Energy Agency
GFC	Guyana Forestry Commission
GGMC	Guyana Geology and Mines Commission
GMTCS	Guyana Marine Turtle Conservation Society
GNIFC	Guyana National Initiative on Forest Certification
GoG	Government of Guyana
GPAS	Guyana Protected Areas System
GS & WC	Guyana Sewerage and Water Commission
GTA	Guyana Tourism Authority
GUYWA	Guyana Water Authority
GWI	Guyana Water Incorporated
ICZM	Integrated Coastal Zone Management
IDB	Inter-American Development Bank
IUCN	International Union for Conservation of Nature
LAN-NPPAW	Latin American Network for Technical Co-operation in National Parks, Protected Areas and Wildlife
MDGs	Millennium Development Goals
MTIC	Ministry of Tourism, Industry and Commerce
MOU	Memorandum of Understanding
NAO	National Administration Office
NARI	National Agriculture Research Institute
NBAC	National Biodiversity Advisory Committee
NBAP	National Biodiversity Action Plan
NCC	National Climate Committee

NCERD	National Centre for Education Research and Development
NDIB	National Drainage and Irrigation Board
NDS	National Development Strategy
NEAP	National Environmental Action Plan
NEP	National Energy Policy
NFP	National Forest Programme
NGO	Non-Governmental Organisation
NPAS	National Protected Areas System
NRDDB	North Rupununi District Development Board
NREAC	Natural Resources and Environment Advisory Committee
NSCBD	National Strategy for the Conservation of Biological Diversity
NTFP	Non Timber Forestry Products
OP	Office of the President
PAHO	Pan American Health Organisation
PROFOR	Programme for Forests
PRS	Poverty Reduction Strategy
PRSP	Poverty Reduction Strategy Paper
RAP	Rapid Appraisals Programme
RDC	Regional Democratic Council
SEA	Strategic Environment Assessment
SD	Sustainable Development
SFM	Sustainable Forest Management
SFP	State Forest Permission
SIDS	Small Island Developing States
SIMAP	Social Impact Amelioration Programme
SMP	Shore Zone Management Programme
SPAW	Specially Protected Areas and Wildlife Programme
SSEE	Secondary School Entrance Examination
TAC	Treaty for Amazon Co-operation
TFAP	Tropical Forestry Action Plan
TSS	Total Suspended Solids
UG	University of Guyana
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
USAID	United States Agency for International Development
UNEP	United Nations Environment Programme
UNESCO	United Nation Educational, Scientific and Cultural Organisation
UNICEF	United Nations Children's Fund
WHO	World Health Organisation
WSSD	World Summit on Sustainable Development
WTO	World Trade Organisation
WWF	Worldwide Fund for Nature

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(Taken from UNDP website 2003 - http://www.undp.org)

Executive Summary

Guyana, the only English-speaking country located on the North Eastern shoulder of the South American continent north latitude between 1°10' degree and 8°32' and west longitude between 56°30' and 61°20', has a total land area of 214,970 square kilometres (83,000 square miles). The country is bordered by Venezuela to the west, Surinam to the east, Brazil to the south and south-west and the Atlantic Ocean to the north**.**

Four major landform types can be identified in Guyana:

- Low coastal clay belt (often referred to as the Coastal Plain) where most agricultural activities are conducted and where most of the population live.
- Sandy rolling lands to the south of the coastal belt, which includes the intermediate Savannahs.
- Undulating, central peneplain, which comprises more than half of the country's area, and in which is located relatively virgin tropical rainforests and extensive mineral deposits such as gold and diamonds. It also stretches from the sand belt to the country's southern boundary, encompassing the Rupununi Savannahs - that border Brazil.
- The fourth landform, referred to as the Guiana Highlands, is located in the mid western area of Guyana and includes the Pakaraima Mountain Range.

During the last decade, Guyana has made considerable progress in signing international conventions on environmental issues, on designing plans and strategies, and on creating laws, regulations and institutions for environmental management and protection. An Environmental Protection Act has been in existence since 1996.

Despite all the laws that have been approved and all the institutions that have been created, environmental issues still have a low priority on government's agenda when it comes to implemented action. This is reflected in the lack of environmental indicators set for the country and the scarce allocation of funds to environmental divisions (eg: Environmental Protection Agency and the Wildlife Division) and equivalent institutions. The issue of protected areas of different kinds is on the international donor agenda, though the real challenge that lies ahead is related to being able to record significant outcomes of such a large, land-use planning exercise. Existing National Parks (*e.g.* Kaieteur) are viewed to a degree as being protected "on paper" only, not in reality. One of the reasons for this is the weakness of the institutions that are supposed to be responsible for the protection and the control.

The main cause for the limited practical results in environmental management in Guyana is the low level of governance that has prevailed for a long time. Political instability, lack of real enforcement capabilities, corruption and civil service related issues have been, and remain, important factors. Efforts are underway to embark on decentralisation of certain sectors into the Regional Administrative Areas (eg: social services *etc*) but there is still a considerable degree of centralisation of government, which is certainly a specific obstacle when it comes to the handling of environmental concerns. As presently configured, the laws of Guyana (that address environmental issues) are fragmented and not holistic. There is a need for Strategic Environmental Assessment (SEA) to assess the environmental implications of Government of Guyana (GoG) policies, plans and programmes as a first step and to inform the more localised EIA requirements that are currently being pursued. Limited assessment of the cumulative impacts of plans, programmes or policies is undertaken. This should be addressed.

There is a widespread lack of environmental education in Guyana. In particular, there seem to be relatively few people and institutions that have fully absorbed the idea (and the fact) that environmental management and protection is not an isolated subject or a "sector", but that it is "cross-sectoral".

Against the scenario described above, the main line of thought behind the recommendations made for possible EC support, is that the whole environmental challenge should be approached from a "sustainable development" perspective and not from solely conservation or a protection angle. It should also be far more integrated and strategic in its approach. Sustainable management of natural resources must be seen as an investment for the future and not as an expenditure on luxury. This goes for big business as well as for the population in general. The large portion of Amerindian communities in Guyana who damage the environment through unsustainable practices (e.g. illegal logging) do it only (or even mainly) because it is their only option for economic survival, rather than

because of ignorance. Obviously, the best way of changing this is to make it clear – in practice – that sustainable management of soils, water, forests, mining activity, agriculture, biodiversity, *etc*. will produce a benefit for them and not a cost or sacrifice.

This CEP has, through a detailed Issues Analysis and consultation mechanism, derived the following as Major Issues for further attention:

MAJOR ISSUE TITLE	CRITICAL SUB COMPONENTS
1. Unregulated Management of Natural Resources (UMNR);	Minerals, agriculture, forestry, trade in wildlife, fisheries;
2. Climate Change and Vulnerability Assessment (CCVA);	Sea level rise, flood forecasting and warning;
3. Water Management (WM);	Water supply, distribution, wastewater disposal, drainage and irrigation;
4. Solid Waste Management (SWM); and,	Solid waste collection, disposal (landfill), recycling, environmental health/pollution; and,
5. Socio-economic Impacts of Land-use Change (SILC).	Agriculture change, demand for housing, development of ecotourism.

These should be addressed under the following Implementaton Theme headings:

IMPLEMENTATION THEME HEADINGS
• Creating environmental accountability across all sectors; • Improving environmental governance; • Co-ordinating the delivery of environmental management; • Communicating benefits of sustainable development to end users; • Better engagement of all end users in the sector; and, • Ownership of the eventual environmental outcome.

On a country scale, the EC can support collective improvement of legal instruments, information and evaluation systems and environmental education programmes. The EC could also play an important role in improving coordination between international cooperating agencies, starting perhaps with its own Member States. There are already large projects being undertaken in Guyana as a response to the recent devastating flood that hit Guyana in January 2005. The outcomes of the post flood evaluation are not considered in this CEP, though their findings need to be embraced fully within the recommendations of this CEP. As it is now, there are so many actors involved in programmes and projects in the area of environment in Guyana, that it is an almost impossible task for the national coordinating agencies (which are generally weak) to do this on their own.

Given the scale of the environmental challenges outlined above and in this CEP, the risks to the delivery of the PRSP are certainly not negligible.

The key risks are highlighted below:

- Political instability and policy commitment – Guyana continues to be in a transition from current politically divisive atmosphere towards one of greater national consensus on sustainable development issues. The possibility of escalating political instability remains high and with it, the loss of focus on the environment.

- Implementation capacity – decades of outward migration, limited budgetary resources and outdated government processes and systems have left the public sector ill-equipped to deliver against its key environmental policy and objectives.

- Donor Partnership Risks – environmental management and sustainable development requires a partnership approach not only from GoG, but also from the private sector and from the international donor agencies. There is a significant risk that the success of delivering effective environmental management in Guyana could be adversely affected by either duplication of effort (e.g. lots of solid waste management projects getting in the way of a concerted approach) or implementation delays on the part of the donors.

Further to the Main Issues identified above, and subsequent Implementation Themes selected (to help with the mainstreaming of environmental concerns into the economic agenda), the following outlines possible project areas for progression.

Creating environmental accountability across all sectors

Main Issue Title and Code (from Section 6)	**Unregulated Management of Natural Resources (UMNR5)**		
Potential Project Title and Description	Environmentally and Economically Sustainable Trade in NTFP industry Wildlife is by far the most important commercial Non Timber-Forest Product in Guyana and the country's wildlife exports are significant on a global scale. There remains great opportunity as well in sustaining a profitable NTFP business in Guyana. This should not be overlooked, but managed strategically as part of other GoG policy sectors within a strategic environmental assessment (SEA), particularly with regard to transport policies and programmes.		
Non EC Donor Agencies	IDB/UNDP/WWF		
Priority and Timescale	High	**Cost to be determined by EU in due course**	

Main Issue Title and Code (from Section 6)	**Solid Waste Management (SWM2)**		
Potential Project Title and Description	Recycling Waste Project - There are no national programmes to deal with waste recovery, recycling and reusing activities. The aftermath of the recent floods demonstrated the amount of non- biodegradable material present in ditches, yards and on streets. The impact this had on preventing natural drainage of floodwaters through culverts and grates certainly played some part of the flood impacts on localised areas. There needs to be a robust strategy of recycling (tested through pilot project initiatives to determine the best approach) is now critical.		
Non EC Donor Agencies	IDB		
Priority and Timescale	High - immediate	**Cost to be determined by EU in due course**	

Main Issue Title and Code (from Section 6)	**Water Management (WM1)**		
Potential Project Title and Description	Water Sector Reform Complementary Action - DFID is seeking to fund a significant Water Sector Reform programme for Guyana. Specific aspects of this exercise will need to be elaborated upon and separately funded.		
Non EC Donor Agencies	DFID		
Priority and Timescale	High - immediate	**Cost to be determined by EU in due course**	

Main Issue Title and Code (from Section 6)	**Solid Waste Management (SWM1,2 and 3)**		
Potential Project Title and Description	Assistance to Solid Waste Management Plan - IDB is currently funding a Solid Waste Management Programme, however, many sub aspects of this highly important Major Issue heading are likely to require focused attention for all international donor agencies. EU focus on Project SWM2 may be appropriate here. A better appreciation of the environmental health impact on local communities and Amerindian titled areas is required (Project SWM3), the outcome of which would feed directly into updates and revisions of the PRS.		
Non EC Donor Agencies	IDB/World Bank/CIDA		
Priority and Timescale	High - immediate	**Cost to be determined by EU in due course**	

Main Issue Title and Code (from Section 6)	**Socio-economic Impacts of Land Use Change (SILC1 and 3)**		
Potential Project Title and Description	Strategic Environmental Assessment for Guyana - An assessment of cumulative impacts and strategic environmental assessments (SEA) of land-use change, coupled with robust information management at a national level and environmental indicator setting is required to assist national land use planning. A critical issue is being able to evaluate the environmental impact of a transport policy or programme. This can be done through the use of SEA. The Lethem to Georgetown road construction, for example, requires more than just an EIA, which should (at a top level) be able to assess its impact on social groups, economic development as well as on physical impact at all scales.		
Non EC Donor Agencies	IDB		
Priority and Timescale	Medium (2007)	**Cost to be determined by EU in due course**	

Main Issue Title and Code (from Section 6)	**Socio-economic Impacts of Land Use Change (SILC3)**		
Potential Project Title and Description	Tourism Master Plan for Guyana - A robust Tourism Master Plan is required to enable the potential of eco-tourism to become a reality.		
Non EC Donor Agencies	IDB		
Priority and Timescale	Medium (2007)	**Cost to be determined by EU in due course**	

Improving environmental governance

Main Issue Title and Code (from Section 6)	**Unregulated Management of Natural Resources (UNMR2)**		
Potential Project Title and Description	Marine Spatial Planning for Guyana - Although Guyana has reserves of hydrocarbons, these have not been extensively exploited. Indications are that "black gold" is present in large quantities in Guyana's offshore zone in the Atlantic. Currently, the environmental and social concerns are, consequently, of a lower order of priority than those of mining, though the issue of managing offshore resources (including fisheries) and the environmental impacts of such exploration need to be planned for accordingly, ideally as part of a marine spatial planning system.		
Non EC Donor Agencies	IDB		
Priority and Timescale	Medium (2008)	**Cost to be determined by EU in due course**	

Projects WM1, SWM1, SWM2 and SILC3 (raised in Section 9.6.2) also fall within this Implementation Theme header.

Co-ordinating the delivery of environmental management

Main Issue Title	**Unmanaged Regulation of Natural Resources (UNMR3)**		
Potential Project Title	Impact of Global Economies on the Agricultural Sector - The uncertainty for the future hinges on the impact of global economies dictating sugar/rice prices (for example) and the impact that this could have on the agricultural landscape in Guyana (i.e. adaptation to marketing/growing new crops) and the cumulative impact on the socio-economic environment.		
Non EC Donor Agencies	IDB/World Bank		
Priority and Timescale	Medium	**Cost to be determined by EU in due course**	

Main Issue Title	**Climate Change and Vulnerability Assessment (CCVA2)**		
Potential Project Title	Better Flood Forecasting and Warning Systems linked to Flood Risk Management At present, considerable donor attention is being placed on the post flood recovery exercise in Guyana (January 2005 flood event). No exact details of future actions were available at the time of writing this CEP, though of relevance to it are the mechanisms for improving flood forecasting and warning and socio-environmental response to future natural disasters (including but not restricted to floods). Of relevance at the strategic level, is the apparent lack of planning and linkages between meteorological or oceanographic data (.e – the time series data being compiled by the Hydro-meteorological Division) and short term and longer term planning. The paucity of information in terms of helping to undertake flood risk assessments and the current inability to turn weather data into an integrated and meaningful flood forecasting and warning system, for local populations and also for longer term planning, would be of considerable benefit to Guyana.		
Non EC Donor Agencies	IDB/World Bank		
Priority and Timescale	High	**Cost to be determined by EU in due course**	

Projects WM1, SWM2 and SILC1 (raised in Section 9.6.2) also fall within this Implementation Theme header.

Communicating benefits of sustainable development to end users

Main Issue Title	**Climate Change and Vulnerability Assessment (CCVA1)**		
Potential Project Title	Local Emergency Response Plans - In light of the recent devastating flood events, there is considerable interest amongst all international donors on how best to coordinate an effective strategy for recovery. Municipalities and Regional Development Councils must undertake local emergency preparedness plans. Five of the six municipalities are in the lowland coastal areas of Guyana. Appropriately, municipalities want to take a leadership role in co-ordinating and preparing for emergency response within their communities. The EC should seek to broaden the remit of such plans to consider the institutional needs to improve the ownership of other environmental issues which are perhaps best delivered at the RDC level. It is recommended that funding be channelled towards helping municipalities to develop appropriate environmental codes of practice that reflect the local need. This can help to address issues dealing with local pollution spill events or flood emergencies which establish clear lines of funding and accountability for emergency preparedness.		
Non EC Donor Agencies	IDB/World Bank/CIDAUNDP		
Priority and Timescale	High	**Cost to be determined by EU in due course**	

Projects SWM1, SWM2 and SILC2 (raised above) also fall within this Implementation Theme header.

Better engagement of all end users in the sector

Main Issue Title	**Unmanaged Regulation of Natural Resources (UNMR1)**		
Potential Project Title	Socio-cultural Impacts of Mining on Amerindian Communities - The impact on the local indigenous communities involves many social issues such as sexually transmitted diseases and sexual harassment suffered by the local women. The latter is an issue that still needs more attention by the authorities. There are also ongoing issues of land use conflict. The critical issue currently is the management of small scale operations, the ability for the GGMC to enforce both codes of practice and the legislation which is imposed on them to deliver sustainable mining practice and finally, the social impact of mining on local Amerindian communities and the increasing levels of sexual abuse that these communities are facing. The existing CIDA funded GEMCAPD project should be developed further to find solutions to these problems.		
Non EC Donor Agencies	CIDA		
Priority and Timescale	Medium	**Cost to be determined by EU in due course**	

Main Issue Title	**All (though with direct link to ref to UMNR4)**		
Potential Project Title	Public Awareness Campaigns **-** Developing an environmental public information programme that informs and advises citizens how to be prepared to better anticipate and mitigate environmental problems would be very beneficial. This will include public service agencies that have a stake in environmental accountability at a individual level. A focus could be placed on specific sectors: e.g. in relation to development activities in aquaculture threats to land use management and soil degradation come from (a) lack of operational standards for the sector (b) the introduction of exotic fish species and (c) the unregulated use of nitrogen fertilisers and the effect of greenhouse gas emissions.		
Non EC Donor Agencies	CIDA		
Priority and Timescale	High	**Cost to be determined by EU in due course**	

Ownership of the eventual environmental outcome

Main Issue Title	**All (though with key ref to WM1)**		
Potential Project Title	Surface Water Management Strategic Action Plan - There is an acute need for a Surface Water Management Strategy. This has become apparent following the January 2005 floods. NWC needs to assume, as soon as possible, the operation of all primary infrastructure related to surface water management, including all seawalls, headwater dykes, primary canals, kokers, gates, weirs, pumps and all related infrastructure and to regulate the quality of waters within its responsibilities.		
Non EC Donor Agencies	DFID		
Priority and Timescale	High	**Cost to be determined by EU in due course**	

1 Introduction

1.1 Purpose

The European Commission (EC) required a Country Environmental Profile (CEP) to support the development of a Country Strategy Paper (CSP) for Guyana. The EC had not undertaken a previous CEP in Guyana. A National Biodiversity Action Plan was prepared in 1999 based on the Country Study of Biological Diversity of 1992, which provided the only consolidated documentation on the country's biological diversity. Since then, no overall environmental assessment had been prepared.

The purpose of a CEP is not to provide a detailed inventory or commentary on all environmental assets present in the country. Instead it will inform policy makers in Guyana and at the EC on environmental matters, within the wider context of the CSP. The CEP contributes a series of requirements within the assistance programmes that seek to improve the state of environment, public awareness of the environment and contribute to poverty reduction and general improvements to everyday life in Guyana, which is a central theme in both the CSP and the Millennium Goals.

The CEP will constitute an important source of baseline information and contribute to focusing political dialogue and cooperation within Guyana on key areas of concern such as sustainable development as well as raising awareness among policy-makers and international donor agencies.

1.2 Objectives

CEPs have been produced for many other Caribbean states during the past ten years. The CEP for Guyana is being used to test a more focused approach concentrating on the links with poverty reduction and economic development (i.e. this document is the first of the new style CEPs for all ACP nations (Africa/Caribbean/Pacific)). The objective of this CEP is to identify and assess environmental issues to be considered during the preparation of a Country Strategy Paper, which will directly or indirectly influence EC cooperation activities. The CEP will provide decision-makers in the partner country and in the EC with clear information on the key environmental challenges and actors, as well as strategies and programmes designed to address them. This information will ensure that the EC cooperation strategies systematically integrate environmental considerations into the selection of priority focal areas and also establish the necessary environment safeguards for all cooperation activities undertaken in Guyana.

The following outcomes are to be reached in the CEP:

- An assessment of the environment identifying key environmental factors influencing Guyana's development and the responses to these;
- An assessment of national environmental policy and legislation; institutional structures and capacity, and the involvement of civil society in environmental issues;
- An assessment of past and anticipated future trends of environmental indicators;
- An overview of past/ongoing international cooperation in the environment sector, especially with the EC;
- Recommendations and, as far as possible, guidelines or criteria for mainstreaming environmental concerns in priority development areas.

1.3 Methodology

To clarify and avoid misunderstanding, this report is not about documenting or inventorying the state of the environment. Also, this report does not report in detail on issues related to the recent flooding episode (January 2005), as other donor agencies are currently gathering consensus on this matter (March 2005).

The report outlines an evaluation of environmental issues (based on existing information and consultation) their subsequent prioritisation, any constraints to development, linkages with the Government of Guyana's National Development Strategy (NDS) and also with the Guyana Poverty Reduction Strategy Paper (PRSP - 2002).

The methodology adopted was to visit and discuss with key stakeholders their areas of responsibility and interest, and to consider, from their sectoral perspective, the key environmental issues that affect Guyana. A workshop was arranged to encourage engagement and participation from all environmental sectors.

1.4 Structure of Report

The report is structured in the following way. A brief explanation for each section is provided to assist the reader in navigating this report.

Main Section Heading	Sect. No.	Sub Heading	CONTENT
Executive Summary			Provides a summary of the report and recommendations.
1.0 Introduction	1.1	Purpose	Describes the purpose of the CEP.
	1.2	Objectives	Describes the objectives of the CEP.
	1.3	Methodology	Describes the approach.
2.0 State of the Environment	2.1	Current Status	National context setting for the enumeration of 2.2 to 2.8 below.
	2.2	Pressures, Opportunities and Trends	Provides a brief overview of the economic and social challenges that face Guyana's environmental resources.
	2.3	Regulatory Context (national and international)	An overview of the international conventions linked to Guyana and reference to details on the legal framework.
	2.4	Environmental Performance	Provides an overview of the government's stated "commitments to the environment" that occur in the NDS and relevant plans
	2.5 2.6 2.7 2.8	Physical Environment Atmospheric Environment Biological Environment Social-economic Environment	Provides a rapid stocktake of knowledge on these "environments" and reference to more detailed publications.
3.0 Environmental Indicators and Quality Standards	3.1	Overview of Environmental indicators and environmental quality standards	There are no official environmental indicators for Guyana. This section briefly comments on possible indicators that cover the environment and how these could be developed for Guyana and that integrate with existing political, economic and social indicators already in existence.
	3.2	Links with Poverty Reduction Strategy	
	3.3	Links with National Development Strategy	
4.0 Environmental Policy and Legislation	4.1	National Policies, Environmental Strategies and Action Plans	Provides a brief overview of relevant sectoral policies, strategies and action plans, already in existence that addresses the environment.
	4.2	Legislation; Current and in Preparation	This section outlines current and proposed sectoral legislation within Guyana
	4.3	Provision for Public Participation	Overview of how the public are involved in national policy setting.
	4.4	Enforcement of environmental policies	A commentary on the effectiveness of legislation enforcement.

Main Section Heading	Sect. No.	Sub Heading	CONTENT
5.0 Environmental Institutional Framework	5.1	Institutional Structure Roles and Responsibilities	Indicates the national framework for environmental management.
	5.2	Sectoral Institutional Frameworks	Outlines the sectoral ministries and divisions and their individual frameworks.
	5.3	Key Stakeholders within each Sector, their capacity and financial resources.	Identifies the key governmental /non-governmental stakeholders for each sector including an indicative assessment of human resource and financial capacity (where known) of public/private sector organisations/ institutions .
6.0 Integration of Environmental Concerns into the Main Economic Sector	6.1	Identification of Environmental Issues	An identification of issues/concerns deduced from preliminary stakeholder consultation and participation (drawing from the workshop)
	6.2	Description of each Major Issue and its prioritisation	A prioritisation of issues/concerns deduced from preliminary stakeholder consultation and participation (drawing from the workshop)
7.0 EC Co-operation	7.1	Review and Evaluation/Impact of Previous Interventions	Previous EC cooperation/interventions are indicated and briefly described
	7.2	Risk Evaluation	Previous interventions are discussed in terms of: Effectiveness, Relevance, Efficiency, Impact and Sustainability
8.0 Co-operation Funded by Other Donors	8.1	Interventions of Other Donors (recent/planned programmes)	Recent interventions are indicated and briefly described and pipeline projects listed.
	8.2	Evaluation of Anticipated Impact	Pipeline projects are evaluated in terms of potential impact. These are evaluated against similar risks set for the Poverty Reduction Strategy Paper for Guyana (PRSP) *i.e. national consensus; implementation capacity; availability of external resources; developments in the world economy; natural disasters*
9 Conclusions and Recommendations	9.1 9.2 9.3 9.4 9.5 9.6	Assessment of environmental factors and their link to poverty reduction Policy and institutional constraints and challenges Assessment of past and future trends Assessment of environmental indicators Overview of international cooperation Recommendations and guidelines for mainstreaming environmental concerns	The section summarises the main conclusions emphasising the link with the PRSP, indicating potential constraints and makes recommendations for mainstreaming environmental concerns into future economic programmes and projects.

2 State of the Environment

2.1 Current Status

Guyana possesses vast areas of interior that are still pristine; with untouched forests that are so diverse that they can present the entire spectrum of tropical rainforest. Guyana consequently possesses high biological diversity, due mainly to its location:

- At the edge of the Amazon basin;
- On the geologically-old Guiana Shield;
- On the Atlantic seaboard; and,
- Its low intensity of conversion of natural habitats.

Although an accurate inventory of Guyana's biodiversity is still an outstanding action, it is reasonable to anticipate that this biodiversity is largely intact, despite there having been no formal or institutional conservation programmes. The country's low population, its low level of industrialisation, and the technology applied in most sectors are factors which would have contributed to the security of this biodiversity. However, current increase in entrepreneurial activity in those sectors that use the natural resources will place increasing pressure on the resource base.

2.2 Pressures, Opportunities and Trends

Guyana has made significant progress in many areas including poverty alleviation, environmental management and capacity building. However, a major constraint to Guyana's successful achievement of sound environmental management and sustainable development goals continues to be financing. However, it is too simplistic to attribute the environmental pressures facing Guyana solely to a lack of finance. Pressures arising internally within the government, through slow administrative methods, exacerbate many, if not all the environmental issues.

The unnecessarily long gestation periods before legislation finally reaches the statute book coupled with the reluctance to apply the provisions therein, could be overcome with imagination and a change in attitude. In many cases, simple financing is neither a root cause nor a solution. Other pressures derive from the nature of the terrain, largely impenetrable forest is not easy to manage (e.g. illicit wildlife trade), from remoteness and the disparate nature of the resources (e.g. small-scale mining) and from artificially created situations (e.g. the coastal zone defended by the Conservancy Dyke and by the Sea Wall).

These "pressures" however, are simply the reverse face of the coin of opportunity. Legislation could be championed through in a couple of years and full implementation could be the rule. Basic environmental issues such as solid waste management could be dealt with fairly mechanistically, and be an opportunity to improve lives and be self-sustaining financially. The unique biological riches of Guyana are barely tapped; confused responsibilities, piecemeal legislation and lack of priority (despite the revenue earning potential) all contribute to the "pressure", yet attention to these matters would directly support the aims of the National Development Strategy and of the Poverty Reduction Strategy (see Section 2.4).

Despite the above, the trends ARE in the right direction. This can be demonstrated by the following:

- Drainage and irrigation tender packages are being let to address past failings and deliver appropriate upgrades to the current system;
- Public agencies are looking into private-public partnerships to address the issue of sole funding reliance on the Government.
- Solid waste management, seen as a key contemporary issue, is being addressed by donor agencies;
- Forestry certification programme is being effectively implemented on State Forest lands; and,
- NGOs in the country (see Section 5) are active and focussed.

2.3 Regulatory Context (national and international)

2.3.1 International Conventions and Treaties

Guyana's obligations relating to biological diversity derive from biodiversity-related conventions to which it is a signatory. Guyana is a party to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), which Guyana ratified in 1987 but had no permitting entity and no laws to meet the legal requirements mandated by CITES. Guyana is also a signatory to the International Plant Protection Convention and the Convention on Biological Diversity (CBD) in 1992 and the World Heritage Convention and the Convention on the Conservation of Migratory Species (Bonn Convention).

In addition to biodiversity related conventions, Guyana is also a signatory to the following:

- Kyoto Protocol;
- Rio Declaration on Environment and Development;
- Montreal Protocol (Guyana's obligations to phase out Ozone Depleting Substances);
- United Nations Convention on the Law of the Sea (ratified by Guyana in 1993);
- United Nations Framework Convention on Climate Change (UNFCCC) in June 1992, and ratified on August 1994;
- Convention concerning the Protection of the World Cultural and Natural Heritage (World Heritage);
- International Convention for the Prevention of Pollution (MARPOL 73/78) - Guyana acceded to this Convention on 10 December 1997;
- Vienna Convention for the Protection of the Ozone Layer;
- United Nations Convention to Combat Desertification; and,
- International Tropical Timber Agreement (ITTA).

Guyana participates in the following for which instruments of ratification are still being awaited (NEAP 2001):

- Convention on Wetlands (Ramsar) where the Rupununi Wetlands and Shell Beach have been proposed (2000);
- Convention for the Production and Development of the Marine Environment in the Wider Caribbean region and its Protocols (Oil Spill);
- Land Based Source Pollution;
- Basel Convention on the Control of Trans-boundary Movement of Hazardous Wastes and their Disposal; and,
- Special Protected Areas and Wildlife (SPAW).

2.3.2 Regional Programmes

Within the Caribbean and Latin America, Guyana is a member or official signatory to the following:

- Caribbean Planning for Adaptation to Climate Change (CPACC);
- Caribbean Conservation Association (CCA, 1967);
- Caribbean Environment Programme (CaEP, 1981) and its Specially Protected Areas & Wildlife Programme (SPAW, 1990);
- Latin American Network for Technical Co-operation in National Parks, Protected Areas & Wildlife (LAN-NPPAW);
- UNESCO's Man and the Biosphere Programme (MAB, 1972);
- FAO Tropical Forestry Action Plan (TFAP, 1985);
- Treaty for Amazon Co-operation (TAC, 1978);
- Member of the Guiana Shield Initiative (UNDP/IUCN funded); and,
- Cartegena Convention (protection of the marine environment of the Wider Caribbean Region). At present, Guyana has indicated its desire to accede to the Cartagena Protocol on Bio-safety and is in the process of developing its National Biosafety Framework, with funding from UNEP/GEF.

Of key importance to the above is that Guyana has officially adopted the region-wide methodology for Ecological Economic Zoning (EEZ) proposed under the Treaty for Amazon Cooperation. This now provides a common methodology for land use planning and use in the wider Amazon region based on biophysical (abiotic and biotic) and socio-economic variables. It aims to promote the integrated

use of these variables into a method of planning based on units called "Integrated Terrain Units" consistent with the ecosystem approach already adopted in the National Biodiversity Action Plan.

The national regulatory context is considered in detail within Section 5.

2.4 Environmental Performance

2.4.1 National Development Strategy (NDS)

The National Development Strategy (NDS) titled *" Eradicating Poverty and Unifying Guyana: A Civil Society Document"* has the following objectives:

(a) To attain the highest rates of economic growth possible;
(b) To eliminate poverty in Guyana;
(c) To achieve geographic unity;
(d) To attain an equitable geographical distribution of economic activity; and,
(e) To diversify the economy.

This strategy focuses on inclusive, participatory, accountable and transparent practices, as well as macro-economic policy and economic management through tax reforms; formulating an investment strategy and code; establishing a one-stop investment agency to expedite and facilitate the investment process in Guyana; enhancing the country's revenue collection agencies charged with procurement, and with their monitoring.

The NDS defines the need for environmental protection to be treated as a cross-sectoral matter and applied to all aspects of the developmental process.

Table 2.1 summarises the current implementation status of these policy intentions:

Policy Intention	Implementation Status	Example
Implement effective management of the natural environment, ensuring conservation, protection and sustainable natural resources use	Partial Implementation	National Biodiversity Action Plan (1999)
Co-ordinate environmental activities of all organisations and agencies	Partial Implementation	Memoranda of Agreement have been concluded with some agencies e.g. Guyana Forestry Commission and the Geology, Gold and Diamond Mining Commission
Prevent and control environmental pollution	Partial Implementation	Solid waste management and the land and water contamination that arises from that, remain a serious pollution challenge
Co-ordinate the preparation and implementation of the environmental components of cross-sectoral programmes	Partial implementation	Background papers on environmental indicators had been developed for mining and forestry but due to resourcing issues have largely been sidelined
Promote public participation in the integration of environmental concerns with development planning	Partial Implementation	Being undertaken by the Education, Information and Training Division
Co-ordinate a national environmental education and public awareness programme	Partial Implementation	Being undertaken by the Education, Information and Training Division

Table 2.1 Status of policy intention implementation

Based on the above and discussions with many government agencies, environmental performance is partly the responsibility of the EPA and partly that of sector-based agencies e.g. Guyana Forestry Commission and the Geology, Gold and Diamond Mining Commission.

Sometimes the layers of implementing administration appear to delay progress. Sometimes the designations of "implementing agency", "co-ordinating agency" and "responsible agency" appear to be singularly unhelpful (perhaps even a hindrance) in implementation. Unless a "co-ordinating agency" is committed to do some co-ordinating, unless a "responsible agency" is going to be responsible and unless an "implementing agency" is going to implement, then these layers of administrative are inhibitive.

Details on the institutional framework plus roles and responsibilities of all sectors are presented in Section 5.

2.5 Physical Environment

2.5.1 Physiography

Guyana consists of four main natural regions:

- Low coastal zone;
- Hilly sand and clay region;
- Interior savannahs; and,
- Forested highlands.

The coastal zone is a narrow, alluvial belt consisting mainly of clay and is about 2 m below sea level. The coast itself is under sea level by about 2 m. The flat narrow strip along the Atlantic coast was built up from centuries of sediment accumulation by the sea, giving rise to the fluvial type soil, which is mostly clay with varying properties along the coast. Today the processes of accretion and erosion are still very active. While the coast along the ocean is mostly clay, there are sections that are sandy, particularly near the river mouths. Mud flats off the shore are a common feature along the coast. Due to the shifting of sand banks, large-scale erosion along the coast is taking place threatening coastal ecosystems, particularly by pollution and exploitation of critical resources such as mangroves.

Just south of the coastal plain, in the north-east of the country, sandy rolling plains stretch inland. This region is gently undulating and altitudes vary from 5 m - 120 m above sea level, and vegetation types from savannah grasslands to forest. The white, sandy soil is permeable and low in nutrients, and forms the most vulnerable ecosystem in Guyana.

The hilly sand and clay region is found just inland of the coastal zone, and is mostly covered with vegetation. This zone is known for its bauxite reserves. The area takes up about 25% of the total area of the country and is sparsely populated. The major population centre is Linden a town of some 26,000 people.

The interior savannahs account for almost 11% of the country's area and are vegetated mostly by grasses, scrub and low trees. The savannahs extend in the west from the southern part of the sandy rolling plains to the Rio Branco savannahs of Brazil. The main grasslands are known as the Rupununi savannahs, characterised by intense dry periods. Two different savannah types may be distinguished within the Rupununi region: the north savannah, associated with a deep rift valley; and the south savannah, associated with the Pre-Cambrian plain, and interspersed with rock formations up to 900 m. The population there is largely made up of Amerindian peoples living mostly in remote villages. Lethem is the only town.

The forested highlands make up approximately 63% of the country's landmass. There are four major mountain ranges in this region; Kanuku, Pakaraima, Imataka and Acarai. The forested highlands, together with the savannahs, are of Pre-Cambrian age. The soils under the forests are heavily weathered laterite. The interior is very sparsely populated, principally by native Amerindian communities, which total around 5% of the population of the whole country.

These physiographical areas are discussed in greater detail in Chapter 2 of "Guyana – Population, Environments, Economic Activities" (Ramraj 2003).

2.5.2 Water Resources

Guyana is an Amerindian word reputed to mean, "Land of the Water". Numerous rivers flow into the Atlantic Ocean, generally in a northward direction. The Essequibo, the country's major river, runs from the Brazilian border in the south to a wide delta west of Georgetown. The rivers of eastern Guyana cut across the coastal zone, making east-west travel difficult, but they also provide limited water access to the interior. Waterfalls generally limit water transport to the lower reaches of each river. Estimates of surface water resources are not available over all of Guyana but there are data available from the main drainage basins.

The groundwater system reportedly comprises three aquifers. The "upper" sand is the shallowest of the three aquifers and its depth varies from 30 to 60 m, with thickness ranging from 15 to 120 m. It is not used as a source of water because of its high iron content (>5 mg/l) and salinity (up to 1 200 mg/l). Most potable water is obtained from the two deep aquifers. The "A" sand is typically encountered between 200 and 300 m below the surface with thickness ranging from 15 to 60 m. Water from the "A" aquifer requires treatment for the removal of iron. The "B" sand is found at about 300 to 400 m with thickness of between 350 and 800 m. Water from this aquifer has very little iron, a high temperature and a trace of hydrogen sulphide, which can be treated with aeration.

Water resources are discussed in greater detail in Chapter 3 of “Guyana – Population, Environments, Economic Activities” (Ramraj 2003).

2.5.3 Mineral Resources

Guyana is endowed with extensive and diverse mineral resources. These include gold, diamonds, semi-precious stones, bauxite, manganese, copper, molybdenum, tungsten, quartz, kaolin and other clays, and a range of aggregates (such as stones and silica sand). This gives the mining sector a prominent role in any development plan for the country.

Gold mining in Guyana is more than a century old, yet the country has only been minimally explored by conventional scientific techniques. Over the years, gold mining has been confined to small-scale producers who mined placer deposits on the banks of rivers, using quite primitive methods. More recently, there has been some improvement in technology since barges were introduced. The recovery of gold is therefore relatively small when compared to the vast potential of the gold reserves in the country.

With respect to some other minerals, there is a reserve base of high-quality bauxite that is extensive but bauxite production has been faltering badly in recent years for lack of investment, expertise and adequate technology. The mining of gem-quality diamonds started in 1887; since then some 4.5 million carats have been produced – all of this by small operators using primitive technology.

Extensive seismic work has been done in the Guyana basin, and on shore in the Takatu basin. All the seismic data indicate the presence of petroleum both offshore and onshore.

Mineral resources are discussed in greater detail in Chapter 10 of “Guyana – Population, Environments, Economic Activities” (Ramraj 2003).

2.5.4 Land Quality

Details on human impacts influencing land quality are covered in Section 2.7. The UNEP website (www.unep.net) indicates a number of land quality databases, a list of which is provided in Appendix E.

2.6 Atmospheric Environment

2.6.1 Climate and Air Quality

Guyana experiences an equatorial climate characterised by two wet seasons (May to mid- August and mid-November to mid-January) and two dry seasons (January to April and mid August to mid November). The average daily temperature is approximately 27° Celsius. Relative humidity is high with 80% or more on the coastal zone, approximately 70% in the savannah zone and 100% in the forested zone.

Climate is discussed in greater detail in Chapter 4 of "Guyana – Population, Environments, Economic Activities" (Ramraj 2003). The UNEP website (www.unep.net) indicates a number of air quality databases, a list of which is provided in Appendix E.

2.6.2 Natural Disaster Risks

Guyana is subject to drought and floods (most recently experienced in January 2005). Earthquakes and cyclones are not prominent and according to the UNDP Disaster Risk index, extremely rare. Guyana's topography renders it vulnerable to natural risks since most of the country's key investments are in low lying areas and are protected by sea defences. Frequent and uncontrolled breaches due to unanticipated high tides whether due to natural or anthropogenic causes will adversely affect sugar, rice and other agricultural production. Moreover, unfavourable weather, such as prolonged periods of heavy rainfall or prolonged periods of droughts (e.g. *El Nino* phenomena), as well as frequent fires in homes and businesses also jeopardise national agricultural production. These risks, if they occur, negatively impact on economic growth and poverty reduction.

2.7 Biological Environment

2.7.1 Habitats and Ecosystems

There is no ecological classification system that has been applied to Guyana and therefore there is no formal bio-geographical classification of the national territory. Informal habitat and ecosystem classification is as follows :

Forest ecosystems
- Moist lowland;
- Dry evergreen scrub;
- White sand forest;
- Brown sand forest;
- Swamp;
- Lower montane; and,
- Montane.

Agro-ecosystems
- Coastal.
- Riverine;
- Forest patch; and,
- Savannah – Berbice; Rupununi.

Inland Aquatic
- Riverine; and,
- Lacustrine.

Marine/Coastal
- Marine;
- Littoral;
- Estuarine;
- Mangrove; and,
- Palustrine.

Much of the original vegetation of the coast has been removed during the activities of colonizers who cleared and filled the land to make it suitable for cultivation. However, today numerous species of hardy wild plants abound. In addition, there are various trees that are both indigenous and introduced. The mangrove population is under threat as some coast dwellers view it as a source of firewood. It is also used in the leather tanning industry.

Habitats and species (forest, savannah and upland) are discussed in greater detail in the National Biodiversity Action Plan (1999). It is of interest to note that minimal text is granted to marine biodiversity in that document where there is a lack of inventory type data.

Forest types and distributions are also discussed in greater detail in Chapter 11 of "Guyana – Population, Environments, Economic Activities" (Ramraj 2003).

2.7.2 National Conservation Designation and Protected Areas

A range of different designated conservation areas is established in Guyana. Table 2.2 identifies these classified by designation.

Designation	Name
Anthropological Reserve	Konashen
Biological Reserve	Yopukari-Annai Savanna
Bird Reserve	Adelair - Upper Kuyuwini/Kassikaityu
	Kuyuwini-Kassikaityu
	Morabisi - Southwest Puruni
Conservation Area	Commonwealth
Ecological Station	Mabura Hill
National Monument	Orinduik Falls
National Park	Ayanganna Mt.
	Kaieteur
	Iwokrama
Nature Conservation Reserve	Kanuku Mt.
Other Areas	Berbice Savanna
	Iwokrama
	Main Stay Lake Tourist Facility
	Wakadanawa
Protected Landscapes	Shiriri Mt.
Resource Reserve	New River Triangle
Scientific Reserve	Wokomung Mt.
Wildlife Reserve	Dadanawa Ranch
	Kurupukari
Wildlife Sanctuary	Essequibo Islands
	Shell Beach

Table 2.2 Conservation related designated areas in Guyana. (From World Database on Protected Areas)

2.7.3 Rare, Endangered and Endemic Species

The country's wildlife is considered to be in its most critical state as there are thirty or more animals listed on the IUCN Red List for endangered species. The animals are threatened by human activities such as trafficking, mining, logging, settlement, and hunting. Animals such as the jaguar, leatherback turtle, harpy eagle, giant otter, caiman and manatee are all endangered, other animals also believed to be endangered are the Canjie pheasant and the Arapaima, the world's largest fresh water fish.

A list of some of the species listed on the IUCN's Red List is provided in Appendix E.

2.7.4 Biological Species of Cultural, Social or Economic Importance

Key faunal species of international economic importance include over 20 species of parrot (*P.sittacines*), toucans, songbirds, 38 species of non-CITES reptile species, yellow spotted river turtle, spectacled caiman, 6 species of frogs, primates, ornamental fish and arapaima. Within the internal economy an unregulated trade in bush meat is growing (i.e. labba, brocket deer, tapir, iguana and tortoise). More detail is provided in Andel *et al* (2003) “Commercial Non-Timber Forest Products of the Guiana Shield”.

There are some reports of co-activity of animal and drug trafficking, with drugs being placed in certain animals (anacondas are commonly cited in this regard).

2.8 Socio-Economic Environment

2.8.1 Population and Demographics

Ninety percent or more of the population live in the coastal area where most of the economic activity takes place. Agriculture is the most important sector – principally sugar and rice. A key challenge facing such farmers is the poor drainage and irrigation infrastructure. In the interior, mining includes: gold, diamonds, semi-precious stones, bauxite, manganese, copper, molybdenum, tungsten, quartz, kaolin and other clays, and a range of aggregates (such as stones and silica sand).

The indigenous peoples of Guyana (collectively known as Amerindians) inhabited the country long before the land was discovered by Europeans. They are also major inhabitants of the hinterland, forest, savannah, coastland and highland. They possess knowledge of the natural environment that enables them to survive as well as benefit from conditions that others would find marginal. There are nine remaining tribes left, the Wapishiana, Akawaio, Arekuna, Macushi, Carib, Warrow, Patamona, Arawak and the Wai Wai. The latter may have reached what some may see as something of a gene pool crisis, for there are few of the pure Wai Wai people left in the villages.

The country's population is aging. Since 1970, there has been a decline in the numbers of those in the youngest age groups (0 – 9years), which indicates a lowering of fertility rates. Additionally, the out-migration of Guyanese is also contributing to this phenomenon and remains a key concern for the future.

2.8.2 Agriculture

Agriculture in Guyana is historically the mainstay of many livelihoods. It began as a colonial activity with cultivation of tobacco, cotton, sugar cane and rice. The need to supply the estates with labour eventually resulted in the import of slave labour and later indentured servants. This was the beginning of the Guyanese population.

Many people in Guyana are employed in or depend indirectly on, the agriculture industry. The two major crops are monoculturally produced; mixed cropping is done on a smaller scale and involves cash crops. Fruit are grown on large tracts of land behind villages, as well as in private orchards. The main fruit crops include bananas, mangoes, cherries, watermelons and citrus. Pineapples and peanuts are significant crops cultivated in fields of sandy soil away from the coastal region. Non-traditional crops such as cashew nuts, coconuts, cocoa, other root crops and coffee are being encouraged in interior locations.

Agriculture is a major contributor to the Guyanese economy, especially the major crops - rice and sugar. Most of the cultivation is done on the coastland, which is most suitable, since it consists of fine clay soil. Private farmers cultivate rice, mainly on a medium scale, while the Guyana Sugar Corporation (GUYSUCO) cultivates most of the sugar. Other crops are cultivated on a relatively smaller scale and are mostly cash crops such as fruit and vegetables, as well as coconuts. Other agricultural activities include cattle rearing, rum/molasses, poultry as well as fish farming to a lesser extent. Poultry industry is growing and is a significant part of the livestock sector in Guyana.

In the 1980s, sugar and rice were the primary agricultural products, as they had been since the nineteenth century. Sugar was produced primarily for export whereas most rice was consumed domestically. Other crops included bananas, coconuts, coffee, cocoa and citrus fruits. Small amounts of vegetables and tobacco were also produced. During the late 1980s, some farmers succeeded in diversifying into specialty products such as heart-of-palm and asparagus for export to Europe. The extent of Guyana's economic decline in the 1980s was clearly reflected in the performance of the sugar sector. Production levels were almost halved, from 324 000 tonnes in 1978 to 168 000 tonnes in 1988. Sugar production for 1994 was 252 615 tonnes and was the major export commodity, contributing 28% to total exports. The rice industry has been leading growth (1993-96) with production and export earnings rising steadily. In 1995, rice production reached 350 000 tonnes. Farming households have a lower standard of living than non-farming households with almost no systematic government extension service for crop and livestock farmers.

Unfortunately, indigenous people sometimes find themselves in the midst of land use conflicts, where they find the lands they reside upon are granted as a concession to foresters, miners, resort developers or conservation areas. Some people who use their skill to harvest forest products, such as wildlife and non-timber products are also exploited - they are paid very little upon delivery.

Agriculture (Sugar and Rice industries) is discussed in greater detail in Chapter 8 of "Guyana – Population, Environments, Economic Activities" (Ramraj 2003).

2.8.3 Mining

In modern Guyanese history, minerals have been very economically important, often in the top three or four exports annually. Although production has fluctuated, the gold and diamond industries have enjoyed an almost constant streak of success, particularly since 1990. Many of the gold miners are small-scale miners called "port-knockers" who pan for gold along rivers and streams, while other more established miners have land or water dredges. There are also large international companies who operate in the interior. There are also diamond miners who operate on varying scales.

Bauxite is extracted on a fairly large scale involving large pieces of land. Quarrying is also done on varying scales and involves white sand extraction as well as stone. The bauxite industry is currently experiencing hard times, but the reorganisation of the industry should see positive returns (Ministry of Finance 2005).

In addition to the “big three” minerals, other operations take place which involve the mining or rock, sand and precious stones such as agate, topaz and zircon. Additionally there are vast deposits of shells, clay, kaolin and iron. Any significant manganese mining has ceased in the country.

Offshore oil exploration is gathering pace, though no oil is produced currently.

Mining as a sector is discussed in greater detail in Chapter 10 of “Guyana – Population, Environments, Economic Activities” (Ramraj 2003).

2.8.4 Forestry

The forestry sector is another major economic contributor to the national economy, bringing in a significant portion of the national gross domestic product. Forests cover over 16 million hectares of Guyana land surface but calls for development and exploitation of forest resources are leading to some degree (small) of deforestation. Forest products comprise only a comparatively small percentage (about four) of annual export earnings. In addition to their economic importance, Guyana’s forests are functional in many other ways including for habitat and food for native Guyanese.

Though exploitation of natural resources is necessary for economic growth, the methods used to extract them is the deciding factor in maintaining the health of the environment and ensuring sustainable development. In relation to forestry, there are ways which foresters can employ to extract timber from a forest while keeping adverse effects at a minimum. This will ensure that there are more trees for future extraction as well as keeping impacts to species of flora and fauna low, since these too help in the propagation and growth of certain species of trees.

One major non-timber product being harvested in Guyana is the heart of palm or the cabbage palm. It is harvested from the manicole palm that grows in the interior forests of the country. Foreign firms pay the indigenous people a meagre sum for every bundle of the harvest. This is a growing issue as the palm itself is listed on the IUCN Red List of threatened species.

Dramatic changes and reorganisation are taking place in the local timber industry, large segments of which are owned and controlled by international conglomerates.

Forestry as a sector is discussed in greater detail in Chapter 11 of “Guyana – Population, Environments, Economic Activities” (Ramraj 2003).

2.8.5 Socio-Cultural Conditions and Human Health

2.8.5.1 Unemployment

Unemployment is intrinsically related to poverty and remains a grave challenge for Guyana. A recent study supported by the National Commission on Women indicates that Guyana has an unemployment rate of 12.88%, compared to 9.1% in 1999. Generally, unemployment is higher among women (19.6%) than men (9.04%). There is also a geographic dimension to unemployment in Guyana. At the regional level, it is highest in regions 10, 4 and 6 respectively. Moreover, whereas men and women of Region 10 face this problem equally, more women face unemployment in both Regions 6 and 4 (see Figure 5.1 for Administrative Regions).

2.8.5.2 Life expectancy

Life expectancy increased slowly from the 1950s to the 1980s (52.3 years in 1950 to 60.7 years during 1975-1980). In 1985 it reached 70 years but declined dramatically to 65 years in 1990. This

has been attributed to economic stress. A life expectancy of 65.2 during the 1990-1995 period for the whole population was projected by the United Nations for 1991 (Ramraj 2003).

2.8.6 Public Health

2.8.6.1 Disease

Guyana has some of the worst health indicators in the hemisphere. Malaria is a major health problem in Guyana, and is largely endemic in the interior regions 1, 7, 8, 9 and 10. Sixty percent of all cases are found among the Amerindian population. According to the Malaria Plan developed by the Ministry of Health, *Plasmodium falciparum*, which causes severe morbidity and mortality, continues to be the dominant species.

The incidence of tuberculosis has doubled since 1990, reflecting the concomitant increase in HIV/AIDS in the population. In 1999, there were 407 reported cases per 100,000 people, with an incidence rate of 52.58. Case fatality rates are high (18%), and there are also high rates of non-compliance and low rates of completion of treatment. Originally, almost a third of all cases were found in the Amerindian population. However, there has been a shift to the general coastal population, primarily young males (peak incidence is in males aged 25-34), mirroring the HIV/AIDS epidemic.

The first case of HIV/AIDS was observed in Guyana in 1987. At the end of 2002, there were 2588 known AIDS cases in Guyana. However, the true extent of HIV/AIDS in Guyana is unknown, with up to 60% of the suspected infected population not reporting. The largest number of reported cases occurs among people within the 20–49 year old range, accounting for 75 % of cases in 2002. During 2002 were more male than female cases within all age groups except for the 20–24 year old age range.

2.8.6.2 Waste Water Disposal

Guyana has a high level of coverage for water supply in the capital city and coastal strip where the majority of the population resides. Although water resources are generally abundant, there are problems related to reliability of water services and water quality. With the exception of Georgetown, water is available for few hours a day typically, and water tests carried out in 1999 showed that, in many cases, water quality needs to be improved.

Sewerage services are supplied only to a limited number of households in Georgetown. The rest of the country relies on septic tanks and pit latrines. In addition, Guyana is faced with serious sanitation issues, such as poorly designed on-site sanitation, uncontrolled dumping of sludge from septic tanks, inadequate solid waste disposal and poor maintenance of surface drains.

2.8.6.3 Solid Waste Disposal

Solid waste disposal practices in Guyana have not kept pace with the demands posed by increases in population and waste generation. Municipal solid waste management in Georgetown, more than elsewhere, suffers from years of under-funding and public neglect. Presently solid waste disposal activities are undertaken without a full appreciation of the impact of these activities on human health and the environment. Disposal of collected waste is of tremendous concern in the city. Most available land adjacent to the city is either privately owned or earmarked for housing.

2.8.6.4 Hazardous Waste Disposal

At present there is no data on the generation of hazardous waste and Guyana does not have the capacity to dispose of hazardous waste. There is the need to inventory hazardous waste production, distribution, management and use.

2.8.7 Human Vulnerability to Disasters

As mentioned earlier, about 90% of the Guyana's population lives on a coastal belt that is 2 metres below sea level. In the last decade, in particular, extreme weather conditions were more frequent. Given the importance of the coast of Guyana and the services that are provided on this narrow strip, the potential adverse impacts due to sea level rise cannot be overstated. With most of the potable

water being provided by artesian wells whose water tables are susceptible to saltwater intrusion, increased salinity content of freshwater supplies, and the possible increase in costs to treat these, are real possibilities. Additionally, it is quite possible that given the archaic waste disposal systems in Guyana the potential for freshwater contamination and water-related illnesses will also increase.

Already, specific areas suffer from saltwater intrusion mainly due to the many drainage canals and water outlets, overtopping, and flooding resulting from heavy rainfall. Any rise in the sea level that will exacerbate this situation can only lead to further losses of million of dollars, due to further destruction of livelihoods, degradation in the quality of life and decline in land quality. Since the coast is critical to the economic development of the entire economy, the ripple effects are expected to extend further than the coastal regions of Guyana.

2.8.8 Access to Natural Resources and Commodities

Amerindian farmers use the traditional method of shifting agriculture that is best suited to the conditions of the forest. It was a method that has evolved over centuries of experience. It has been criticised as a wasteful means of land-use, however it has proven to be an effective means of cultivation without needing artificial fertilisers or pesticides. However times are changing and many farmers are remaining on one piece of land for a longer time because of land restrictions and other outside influences, thus necessitating modern techniques of artificial fertilisers and pesticides. This is a more traditional Amerindian farm where mixed cropping is practiced.

Traditionally, Amerindians use natural materials from their environment to construct their dwellings. The most common natural material used for the roofs is the leaf of the Truli Palm, and clay or wood is used to construct the walls. In recent years more and more dwellings are being constructed with some non-traditional material such as concrete and aluminium sheets.

Traditional materials once suited the nomadic lifestyle of the people, today, this lifestyle is largely abandoned, though many people still travel frequently across the borders of Brazil, Venezuela and Suriname.

2.8.9 Cultural Heritage, Values and Aspirations

2.8.9.1 Amerindians

Guyana has nine distinct indigenous groups comprising 7% of the population, who live mainly in remote communities in the interior, which mainly rely on subsistence farming, hunting and forestry. This isolation has helped to preserve many indigenous traditions, but has also placed these groups at the margin of Guyana's growth and development. Approximately 85% of the Amerindians are poor. One issue of primary concern among Amerindian communities is land rights. Only half of the communities hold clear title to their land, despite a land-titling programme in place since 1969. The existing 1976 Amerindian Act (see Section 4 for details), which was the vehicle for transferring land titles to communities, leaves considerable discretion in the hands of the Government. Since 2001, and following strong Amerindian participation in the PRSP consultations, there has been renewed attention to Amerindian issues resulting in the newly established Ministry of Amerindian Affairs (see Section 5). An Amerindian Development Fund has been set up and agreement has been reached on a process to revise the Amerindian Act (in process now).

2.8.9.2 Cultural Diversity

Guyana is well known for her outstanding cultural diversity. People from the several indigenous cultures, Europe, Africa, India and China have made their home in Guyana. Each of these indigenous cultures has been managing their environments and biodiversity for thousands of years. Each has an ancient tradition with an extremely profound relationship between humans and the natural resource base. Hence, they have long established perspectives and traditions for the conservation and sustainable use of biodiversity. These perspectives and traditions have a spiritual and moral basis, which are actually integrated into religion. They generally stress that actions will be rewarded or punished at the end of a given lifetime and that all forms of life are to be valued.

Modern society in Guyana has an extremely rich background to draw upon when managing the environment today. The country's cultural diversity creates excellent opportunities to integrate the best of eastern and western thinking, modern and ancient concepts and spiritual tools with economic, legal and scientific instruments.

Apart from its economic role, Guyana's biodiversity plays an important social role, as informal "bush" medicine on the coast and as part of the belief and therapeutic systems of Amerindian peoples. Biodiversity also plays a critical role in food security and is a major influencing factor in culinary practice in Guyana.

2.8.10 Recreational, Landscape and Visual Issues

National parks, botanic gardens and recreational areas are commonly situated close to the urban areas of Guyana. The National Parks Commission manages the National Zoo (Botanic Garden in Georgetown) and the National Park. The majority of the tourist activities are situated away from the city of Georgetown. Arrow Point and other nature-based resorts are becoming more popular in "get away from it all" style accommodation facilities, close to the Demerara River.

At Iwokrama Field Station, the construction of a Canopy Walkway is a sustainable mechanism that ensures non-intrusive enjoyment of the canopy vistas of the Iwokrama Rainforest. The elevation of the walkway (about 30 metres) protects fragile vegetation beneath while guaranteeing vantage viewing.

Guyana has developed an urban sustainability plan, which seeks to blend the interests of tourism with those of heritage conservation. The ongoing project designates specific zones in Georgetown as being of special heritage interest, and prescribes guidelines for developers and builders to seek conformity. It also makes recommendations regarding both architectural styles and designs, and building materials.

There are a number of ongoing nature-based tourism development projects (e.g. Surama and Saxacalli), where development of tourism takes place in accordance with developments in the community itself and at a pace that is comfortable for the community. Here, environmental clubs have been formed in the primary school, which has a predominantly indigenous population, and villagers are encouraged to harness timber and agricultural resources for long-term benefit.

3 Environmental Indicators and Quality Standards

3.1 Overview of environmental indicators and environmental quality standards

3.1.1 Environmental Indicators

Guyana is especially vulnerable to environmental pressures. Over three-quarters of the land area is forested and the ecosystem is generally fragile. The most populated area in the country, where 9 out of 10 Guyanese live, lies below sea level and is subject to flooding unless sea defences are maintained. In addition the economy is dependent on the exploitation of minerals and forest products, which carries with it the risk of environmental degradation.

To minimise this degradation, the Government of Guyana has set the following principal environmental policy objectives:

- To enhance the quality of life without degrading or contaminating the environment;
- Ensure sustainable use of natural resources for economic growth; and,
- Protect and conserve unique habitats, natural treasures and biodiversity.

Testing the achievements of these principal environmental objectives within Guyana is currently not possible, due to the lack of a suite of agreed environmental indicators.

Indicators are commonly used internationally to help audit and monitor progress on national sustainable development projects. Many donor agencies themselves have established a framework of "appropriate indicators" which can be adapted to suit national situations. However, the success of any environmental indicator depends greatly on the acceptance of the indicator by all environmental stakeholders and importantly, the appropriate link these can make with economic, social and political drivers.

Formal environmental indicators do not exist within the country. Instead, indicators are primarily focused on economic, financial and more recently social investments. Section 3.2 and 3.3 present some of the established indicators being used to evaluate performance and to help focus priority actions for the future.

Following the production of the Guyana National Biodiversity Action Plan (2000), the issue of indicators has been raised on a regular basis. In 2004, outcomes of Focus Group meetings from a UNDP funded initiative (Project GUY/02/002: Capacity Building for Environmental Management In the Sustainable Utilisation of Natural Resource) concluded that the Development of a Status of the Environment (SOE) Report incorporating the development of Green Indicators is a priority action.

A series of proposed biodiversity related indicators for specific theme sectors has been identified, though there have been limited attempts to integrate these into the economic and financial indicators already set for the country. Table 3.1 presents the types of indicators that have been initially proposed.

Sector Theme	Proposed Biodiversity Indicator
Natural Forest Conversion	• Annual forest conversion rate as a % baseline measurement. • Total extent (ha) of natural forest converted to non-forest land uses.
Forest degradation due to large scale logging	• Annual industrial timber production per species as a % of annual yield for the given species. • Extent and proportion of production forest logged under sustainability principles.
Unregulated and illegal logging from chainsaw operations	• Estimated number of unlicensed chainsaw operators as a % of baseline measurement. • Estimated annual log volume cut by unlicensed chainsaw operators.
Large scale mining activities	• Total extent of forest (ha) impacted by large-scale mines as a % of postulated baseline.
Unmanaged and unregulated exploitation of resources in Amerindian areas	• Percentage of Amerindian owned forests subjected to unmonitored commercial activity. • Logging.
Use of agro-chemicals	• Total annual use (tonnes) of agrochemicals as a % of baseline measurement.
Depletion of crop genetic pool	• Number of local cultivars/varieties as a % of baseline number. • Number of gene types lost.
Depletion of animal genetic pool due to out-breeding and substitution	• Number of local breeds as a % of baseline. • Number of gene types lost.
Loss of primary agricultural production land to urban land expansion	• Total area (ha) of primary agricultural land converted to urban land uses as a % of baseline measurement.
Water quality degradation from mining, soil erosion, agrochemical use, etc.	• % of inland waterways classified as swimmable and fishable (based on national water quality degradation criteria)
Introduction of exotic species for food, sport	• Total # of known introductions by category • List of most significant introductions with known or suspected adverse biodiversity impacts
Industrial scale over-harvesting of specific species	• Number of species under threat of over-harvesting/extinction
Poverty-based pressures at local levels	• Number and amount of protected, endangered, or threatened species being harvested for sale to traders
Perverse economic incentives	• Amount of direct and indirect incentives having a particularly adverse impact on wild fauna and flora

Table 3.1 – Proposed Biodiversity Indicators (taken from EPA 1999)

A separate exercise was carried out for the production of this Country Environmental Profile in 2005. The approach was tested to establish how new integrated indicators could be set. The complete findings are presented in Appendix B (Question 6).

In support of Table 3.1 above, Table 3.2 outlines a series of possible additional indicators of relevance:

Increase % re-growth in forested areas	Greater use of EIA
Reduce % conversion from forest to agriculture	Reduced TSS levels in rivers and creeks (mining areas)
Reduce % land being burned	Increased crop production – improved D & I
Reduce % levels of agro-chemicals in waterways	Reduced flooding – improved D & I
Increase % of farms adopting farm certification	Increase in agricultural exports
Increase % of re-vegetated logged areas	Decrease in imports of agro-chemicals
Increase in areal extent of mangrove forest	Increase in self-regulation by Amerindian communities
Decrease in agro-chemicals input	Increase in visitor facilities
Increase in maximum sustainable yield – fisheries	Increase in number of eco-tourist tour operators
Abandoned land put back into use - improved D & I	Higher % room occupancy in ecotourism lodges
Increase in repeat visit tourism	Decrease in siltation – improved D & I
Increase in number of fishing closed seasons	Greater % of energy generated by renewable sources
Reduced contamination (from river mining)	Reduced incidence of coastal flooding events (overtopping)
Number of local groups participating in environmental activities	

Table 3.2 – Possible Environmental Indicators (taken from CEP Workshop 2005)

3.1.2 Environmental Quality Standards

The Guyana National Bureau of Standards (GNBS) has a mandate to promote standardisation and quality systems in the production and importation of goods and services for the protection of the consumer and the advancement of local and foreign trade thereby improving the quality of life for the people of Guyana. Technical assistance is provided to organisations wishing to implement environmental management systems standards.

The GNBS has been tasked with the formulation of environmental standards.

The following environmental quality standards / regulations are in place within the country.

- Environmental Protection (Water Quality) Regulations 2000. These regulations form part of the Environmental Protection Agency's (see Section 5) Water Pollution Control Programme and are used to protect public health and the environment; the aim is to maintain high water quality in surface (rivers and creeks) and groundwater.

- Environmental Protection (Hazardous Wastes Management) Regulations 2000. These regulations aim to protect people and the environment from wastes/substances that are dangerous/hazardous to health.

- Environmental Protection (Noise Management) Regulations 2000. These regulations are used to protect people from loud noise that affect their comfort and health. They also cater for the safety of animals and property by guarding them against damage from noise.

- Environmental Protection (Air Quality) Regulations 2000. These regulations provide for a system to safeguard and manage air quality. This is done through a number of measures including setting limits to control air contaminants e.g. smoke, dust, irritant, corrosive and toxic gases.

- Pesticide and Toxic Chemicals Act and Regulations. The Pesticides and Toxic Chemicals Board is tasked with the formulation and implementation of these regulations for pesticide use, pesticide effluent discharge standards, storage, disposal and transportation requirements, among others.

- Guyana National Initiative on Forest Certification (GNIFC). With the assistance of the UNDP/GEF/EC through the Programme for Forests (PROFOR), as well as the WWF, Guyana has taken steps to advance the process of developing national standards for forest certification.

A good example of positive environmental certification is through the work of the Guyana Forestry Commission and the forestry sector in general. With the assistance of the UNDP/GEF/EC through the Programme for Forests (PROFOR), as well as the WWF, Guyana has taken steps to advance the process of developing national standards for forest certification. For example, a National Workshop on Forest Certification was held on 10-13 July 2000, to assess the role that certification could play to promote the viability and sustainability of the forest sector in Guyana; and an NGO, with financial assistance from WWF, has established the Guyana National Initiative on Forest Certification (GNIFC) to advance the process of certification.

Despite this positive example, it is evident that the recent flood events in Guyana in January 2005 exposed frailties in the actual implementation of environmental standards, particularly water quality. Muntz *et al* (2005) state that there appeared to be insufficient monitoring of potable water quality in the system particularly during times of flood when the risk is greatest. In addition, the flood illustrated the lack of professional engineering principles and standards applied to the construction and maintenance of roads, dams, and outfalls.

More details on the role and responsibilities associated in delivering these environmental quality standards are presented in Section 5.

3.2 Links with Poverty Reduction Strategy Paper (PRSP)

The Guyana Poverty Reduction Strategy states that in the short term, the Government will upgrade its indicators to monitor its poverty programmes while it implements its medium to long-term strategy to expand coverage and quality of data. Staff members are being trained and equipment provided to assist ministries to generate and improve the quality of the PRSP monitoring indicators.

Below are the key Policy Areas of the Poverty Reduction Strategy. Mapped onto these are possible environmental indicators as described in Table 3.2 above – demonstrating how environmental protection is consistent with, and can support, the requirements of the PRSP.

POLICY AREA	Possible Environmental Indicators
Enhance macroeconomic framework	• Abandoned land put back into use - improved D & I • Increase in repeat visit tourism • Reduced flooding – improved D & I • Increase in agricultural exports • Increase in visitor facilities • Greater % of energy generated by renewable sources
Regulatory and institutional framework	• Number of local groups participating in environmental activities • Increase in self-regulation by Amerindian communities
Expand the economic base to support the poor	• Abandoned land put back into use - improved D & I • Increase in repeat visit tourism • Increase in number of eco-tourist tour operators • Reduced incidence of coastal flooding events (overtopping)
Support private sector development	• Increase % of farms adopting farm certification • Increase in agricultural exports • Decrease in imports of agro-chemicals • Increase in self-regulation by Amerindian communities • Increase in visitor facilities • Increase in number of eco-tourist tour operators • Higher % room occupancy in ecotourism lodges
Improve good governance	• Number of local groups participating in environmental activities • Greater use of EIA • Increase in self-regulation by Amerindian communities
Improve infrastructure to support growth	• Increase in visitor facilities • Increase in number of eco-tourist tour operators • Higher % room occupancy in ecotourism lodges
Improve social conditions -	• Reduce % levels of agro-chemicals in waterways • Decrease in agro-chemicals input

POLICY AREA	Possible Environmental Indicators
Health	• Abandoned land put back into use - improved D & I • Increase in repeat visit tourism • Increase in self-regulation by Amerindian communities • Reduced TSS levels in rivers and creeks (mining areas)
Improve social conditions - Water	• Increase % re-growth in forested areas • Reduce % levels of agro-chemicals in waterways • Increase % of re-vegetated logged areas • Increase in areal extent of mangrove forest • Decrease in agro-chemicals input • Reduced contamination (from river mining) • Reduced TSS levels in rivers and creeks (mining areas) • Decrease in siltation – improved D & I • Reduced incidence of coastal flooding events (overtopping)
Improve social conditions - Housing	• Increase in repeat visit tourism • Reduced flooding – improved D & I • Increase in self-regulation by Amerindian communities • Increase in visitor facilities • Increase in number of eco-tourist tour operators • Higher % room occupancy in ecotourism lodges
Directly target the poor	• Abandoned land put back into use - improved D & I • Increase in repeat visit tourism • Increased crop production – improved D & I • Reduced flooding – improved D & I • Increase in self-regulation by Amerindian communities • Increase in visitor facilities • Increase in number of eco-tourist tour operators • Higher % room occupancy in ecotourism lodges
Target regions with extreme poverty	• Abandoned land put back into use - improved D & I • Increase in repeat visit tourism • Increased crop production – improved D & I • Reduced flooding – improved D & I • Increase in self-regulation by Amerindian communities • Increase in visitor facilities • Increase in number of eco-tourist tour operators
Improve policy analysis in ministries and agencies	• Number of local groups participating in environmental activities • Greater use of EIA
Ensure effective implementation of poverty reduction programs	• Abandoned land put back into use - improved D & I • Increase in repeat visit tourism • Number of local groups participating in environmental activities • Increase in agricultural exports • Increase in self-regulation by Amerindian communities

3.3 Links with National Development Strategy

The National Development Strategy (NDS) sets out priorities for the nation's economic and social development for the next decade. The draft document - which is made up six volumes - contains careful technical analysis of problems and future prospects in all sectors of the economy and in areas of social concern. The draft NDS was launched in January 1997.

The Macroeconomic Strategy (Volume 2) put forward in the NDS is directly concerned with economic growth, employment, distribution of income, inflation, poverty and sustainability in fiscal, environmental and institutional terms. A principal orientation of macroeconomic policy is to ensure that the population's basic needs are met and that the growth process contributes to a reduction in poverty, whilst ensuring that the growth path is sustainable in fiscal, environmental and institutional terms.

The following potential environmental indicators could support this orientation:

• Abandoned land put back into use - improved D & I	• Increased crop production – improved D & I
• Increase in repeat visit tourism	• Reduced flooding – improved D & I
• Increase in visitor facilities	• Increase in agricultural exports
• Increase in number of eco-tourist tour operators	• Decrease in imports of agro-chemicals
• Higher % room occupancy in ecotourism lodges	

The External Sector and Monetary Management - the principal objectives of the NDS in this area are to promote the growth of output and employment and to keep inflation at low levels.

The following potential environmental indicators could support this orientation:

• Decrease in agro-chemicals input	• Increased crop production – improved D & I
• Increase in maximum sustainable yield – fisheries	• Reduced flooding – improved D & I
• Abandoned land put back into use - improved D & I	• Increase in agricultural exports
• Increase in repeat visit tourism	• Decrease in imports of agro-chemicals
• Increase in number of eco-tourist tour operators	• Higher % room occupancy in ecotourism lodges

Fiscal Policy and the Public Sector -the NDS looks at appropriate policies relating to government spending and revenue, as well as at the problems faced in the public sector. The NDS recommends the prioritisation of expenditure on basic social needs for health, education, poverty alleviation and social infrastructure such as potable water and sewerage systems. Other priorities should be productive infrastructure (especially transport and electricity) and public sector salaries. In addition, the NDS recommends that subsidies and transfers should be well targeted on social priorities.

The following potential environmental indicators could support this orientation:

• Increase in maximum sustainable yield – fisheries	• Increased crop production – improved D & I
• Abandoned land put back into use - improved D & I	• Reduced flooding – improved D & I
• Increase in repeat visit tourism	• Increase in agricultural exports
• Increase in number of fishing closed seasons	• Decrease in imports of agro-chemicals
• Increase % of farms adopting farm certification	• Increase in visitor facilities
• Greater % of energy generated by renewable sources	• Increase in number of eco-tourist tour operators
• Higher % room occupancy in ecotourism lodges	

The NDS sees the private sector as the engine for growth, employment and higher incomes. It is recommended that the government focus mainly on assuring the provision of basic social services

and infrastructure, and that it strengthens its regulatory and monitoring role, especially in the areas of natural resource development and the financial sector. Above all, the government should ensure that the basic needs of the poorest groups in the population are met.

The following potential environmental indicators could support this orientation:

• Increase in agricultural exports	• Increase in visitor facilities
• Higher % room occupancy in ecotourism lodges	• Increase in number of eco-tourist tour operators
• Increase in self-regulation by Amerindian communities	• Decrease in imports of agro-chemicals
• Increase in repeat visit tourism	

The Social Sectors (Volume 3) - social policies are given a central place in the National Development Strategy. Social policies are crucial to satisfying the national objectives of poverty alleviation, satisfaction of basic social and economic needs, and sustainment of a democratic and fully participatory society. Despite recent improvements, poverty remains a critical issue for many people in Guyana. The NDS has four priorities for poverty alleviation:

- The need to promote rapid and sustainable economic growth in a labour-intensive manner
- The need to increase the productivity of the poor
- Reform of the institutional structure and operating procedures of social safety nets - with an important role for non-government organisations
- Policy reforms to replace generalised subsidies with ones that are targeted on the poor. Recognising that resources are not available for addressing all the problems of all groups immediately, the NDS suggests that priority be given to women and children, youth, senior citizens, the disabled, and the Amerindian communities

The following potential environmental indicators could support this orientation:

• Abandoned land put back into use - improved D & I	• Increased crop production – improved D & I
• Increase in repeat visit tourism	• Reduced flooding – improved D & I
• Increase in self-regulation by Amerindian communities	• Increase in agricultural exports
• Number of local groups participating in environmental activities	• Increase in number of eco-tourist tour operators
	• Increase in visitor facilities

Environmental issues affect the health, well-being and future of the people of Guyana. The environmental policies of the NDS intend to promote the sustainable management of natural resources and preserve a healthy environment in coastal, urban and hinterland regions. The NDS is strongly in favour of the Environmental Protection Agency as a body to focus on issues such as, the management of renewable resources, environmental degradation, agricultural and industrial pollution, public awareness and legislation. In coastland areas, the NDS calls for the rehabilitation and maintenance of the sea defences and irrigation infrastructure, as well as protection of the mangroves. In urban areas, the NDS recommends strategies to deal with waste management and pollution.
And for the hinterland, the NDS supports a National Forestry Code of Practice and a similar set of standards for the mining sector; the use of "environmental impact assessments" for forestry and mining operations; the development of non-timber uses of forests; the promotion of "ecotourism"; and the establishment of a system of protected areas to preserve Guyana's unique biological diversity.

All the above potential environmental indicators could support this orientation.

In terms of health policy, the objectives of the NDS are to improve the population's access to health care and the quality of that health care.

The following environmental indicators support this orientation:

• Reduced contamination (from river mining)	• Reduced flooding – improved D & I
• Reduce % levels of agro-chemicals in waterways	• Reduced TSS levels in rivers and creeks (mining areas)
• Decrease in agro-chemicals input	• Decrease in imports of agro-chemicals
• Decrease in siltation – improved D & I	

The NDS recommends the development by the University of Guyana of a long-term plan for establishing centres of excellence in areas such as tropical forestry and forest management, geology and mining, and fisheries management.

The following environmental indicators support this orientation:

• Increase % re-growth in forested areas	• Greater use of EIA
• Reduce % conversion from forest to agriculture	• Reduced flooding – improved D & I
• Reduce % land being burned	• Increase in maximum sustainable yield – fisheries
• Increase % of farms adopting farm certification	• Increase in agricultural exports
• Increase % of re-vegetated logged areas	• Number of local groups participating in environmental activities
• Increase in areal extent of mangrove forest	

Women, Gender and Development - this chapter of the NDS looks at the situation of Guyanese women in terms of poverty, employment, health, education, the household, and the media. Recommendations are made to tackle the higher incidence of poverty amongst women, the difficulties women face in the work place (such as low pay), the high incidence of domestic violence, and the specific health problems they face (including malnutrition and high maternal mortality).

The following potential environmental indicators could support this orientation:

• Increase % of farms adopting farm certification	• Reduced flooding – improved D & I
• Number of local groups participating in environmental activities	• Increase in self-regulation by Amerindian communities
• Increase in areal extent of mangrove forest	• Increase in visitor facilities
• Decrease in agro-chemicals input	• Increase in number of eco-tourist tour operators
• Increase in maximum sustainable yield – fisheries	• Increase % of re-vegetated logged areas
• Abandoned land put back into use - improved D & I	• Reduced contamination (from river mining)
• Increase in repeat visit tourism	• Greater % of energy generated by renewable sources
• Increase in number of fishing closed seasons	

The NDS seeks to tackle issues facing Amerindians in the areas of land, poverty and education.
The following potential environmental indicators could support this orientation:

• Number of local groups participating in environmental activities	• Increase in self-regulation by Amerindian communities
• Reduce % conversion from forest to agriculture	• Increase % re-growth in forested areas
• Reduce % land being burned	

Urban Development and the Housing Sector - the main objective is to improve access to housing, basic services and amenities in Guyana's cities. The sector faces a lack of adequate planning; human and financial resource shortages; a scarcity of land for housing; and poor water and sewerage systems.

The following potential environmental indicators could support this orientation:

• Decrease in siltation – improved D & I	• Reduced flooding – improved D & I
• Greater % of energy generated by renewable sources	• Reduced incidence of coastal flooding events (overtopping)

The objective of the NDS is to create a more decentralised framework of regional and local government. The following environmental indicators support this orientation:

• Number of local groups participating in environmental activities	• Greater use of EIA
	Increase in self-regulation by Amerindian communities

The Productive Sectors (Volume 4) - Agriculture is the single most important sector of Guyana's economy; more than 70% of Guyana's population live in rural households and are primarily dependent on income generated from agriculture and related activities.

The following potential environmental indicators could support this orientation:

• Reduce % levels of agro-chemicals in waterways	• Increased crop production – improved D & I
• Increase % of farms adopting farm certification	• Reduced flooding – improved D & I
• Increase % of re-vegetated logged areas	• Increase in agricultural exports
• Increase in areal extent of mangrove forest	• Decrease in imports of agro-chemicals
• Increase in maximum sustainable yield – fisheries	• Decrease in siltation – improved D & I
• Abandoned land put back into use - improved D & I	• Greater % of energy generated by renewable sources
• Increase in number of fishing closed seasons	• Reduced contamination (from river mining)

Non-traditional crops are labour intensive and generate substantial levels of foreign exchange. Promoting the output of this sector will, therefore, increase rural incomes, employment and foreign exchange earnings, and reduce rural poverty. The NDS recommends the development of land and infrastructure.

The following potential environmental indicators could support this orientation:

• Increase % re-growth in forested areas	• Reduce % conversion from forest to agriculture
• Reduce % levels of agro-chemicals in waterways	• Reduced TSS levels in rivers and creeks (mining areas)
• Reduce % land being burned	• Increased crop production – improved D & I
• Reduced contamination (from river mining)	• Reduced flooding – improved D & I
• Increase % of farms adopting farm certification	• Increase in agricultural exports
• Increase % of re-vegetated logged areas	• Decrease in siltation – improved D & I
• Increase in areal extent of mangrove forest	• Abandoned land put back into use - improved D & I
• Decrease in agro-chemicals input	

The forest industry represents vast economic potential for Guyana. The NDS makes recommendations to increase the economic benefits derived from the forests; improve the sustainability of the sector; and spread the benefits of forest-based development to Guyana's rural areas.

The following potential environmental indicators could support this orientation:

• Increase in maximum sustainable yield – fisheries	• Reduced TSS levels in rivers and creeks (mining areas)
• Reduce % conversion from forest to agriculture	• Increased crop production – improved D & I
• Reduce % land being burned	• Reduced flooding – improved D & I
• Reduce % levels of agro-chemicals in waterways	• Increase in agricultural exports
• Increase % of farms adopting farm certification	• Decrease in imports of agro-chemicals
• Increase % of re-vegetated logged areas	• Decrease in siltation – improved D & I
• Increase in areal extent of mangrove forest	• Reduced contamination (from river mining)
• Decrease in agro-chemicals input	• Increase % re-growth in forested areas

The NDS aims to maintain and improve the nutritional, social and economic benefits from the fisheries sector in a sustainable manner.

The following potential environmental indicators could support this orientation:

• Reduce % levels of agro-chemicals in waterways	• Increase in maximum sustainable yield – fisheries
• Increase in areal extent of mangrove forest	• Reduced TSS levels in rivers and creeks (mining areas)
• Decrease in agro-chemicals input	• Increase in number of fishing closed seasons
• Greater use of EIA	• Reduced contamination (from river mining)

The Productive Sectors (Volume 4) - *Non-Agriculture* -outside agriculture, there are various important productive sectors that are addressed in the NDS e.g. Mining and the manufacturing sector

The following potential environmental indicators could support this orientation:

• Reduced contamination (from river mining)	• Greater use of EIA
• Number of local groups participating in environmental activities	• Reduced incidence of coastal flooding events (overtopping)
• Reduced TSS levels in rivers and creeks (mining areas)	• Greater % of energy generated by renewable sources

Tourism - the NDS recommends a focus on high quality eco-tourism in controlled numbers that do not exceed scientifically determined carrying capacities of interior sites.

The following potential environmental indicators could support this orientation:

• Increase % re-growth in forested areas	• Greater use of EIA
• Increase in maximum sustainable yield – fisheries	• Increase in self-regulation by Amerindian communities
• Reduce % land being burned	• Increase in visitor facilities
• Increase % of re-vegetated logged areas	• Increase in number of eco-tourist tour operators
• Increase in areal extent of mangrove forest	• Higher % room occupancy in ecotourism lodges
• Reduce % conversion from forest	• Increase in repeat visit tourism

to agriculture	
• Increase in number of fishing closed seasons	• Number of local groups participating in environmental activities

The Infrastructure Sectors (Volume 5) is basic to the functioning of any economy, and crucial to the success of Guyana, given its geography and dispersed settlements. A growing economy requires a rapid expansion of capacity and improvements in efficiency in the areas of electricity generation and transmission; all modes of transportation; water supply and drainage; and sea defences. Guyana faces a number of bottlenecks in the infrastructure sectors, damaging the economy's ability to grow and the country's ability to compete on the world market.

The following potential environmental indicators could support this orientation:

• Increase % re-growth in forested areas	• Greater use of EIA
• Reduce % conversion from forest to agriculture	• Reduced flooding – improved D & I
• Reduce % land being burned	• Increase in agricultural exports
• Increase % of farms adopting farm certification	• Increase in visitor facilities
• Increase % of re-vegetated logged areas	• Increase in number of eco-tourist tour operators
• Greater % of energy generated by renewable sources	• Increase in self-regulation by Amerindian communities
• Increase in areal extent of mangrove forest	• Higher % room occupancy in ecotourism lodges
• Increase in repeat visit tourism	• Decrease in siltation – improved D & I
• Number of local groups participating in environmental activities	• Reduced incidence of coastal flooding events (overtopping)

The transport sector is critical to Guyana's economic development. The NDS looked at the areas of road, maritime, and air transport and made various recommendations.
The following potential environmental indicators could support this orientation:

• Greater use of EIA	• Higher % of EIAs undertaken

If Guyana is to realise its very considerable development potential, a reliable system of electricity generation and transmission is essential.

The following potential environmental indicators could support this orientation:

Greater % of energy generated by renewable sources	• Higher % renewable usage

Guyana's geography makes effective water management and flood control crucial.
The following potential environmental indicators could support this orientation:

• Increase % re-growth in forested areas	• Decrease in siltation – improved D & I
• Reduce % levels of agro-chemicals in waterways	• Reduced TSS levels in rivers and creeks (mining areas)
• Reduce % land being burned	• Increase in number of fishing closed seasons
• Increase % of farms adopting farm certification	• Reduce % conversion from forest to agriculture
• Increase % of re-vegetated logged areas	• Reduced flooding – improved D & I
• Increase in areal extent of mangrove forest	• Reduced incidence of coastal flooding events (overtopping)
• Reduced contamination (from river mining)	

The tables above may be used for initiate consultation on this topic area. They are not definitive environmental indicators for Guyana, though may represent early examples for wider stakeholder acceptance and development in due course.

4 Environmental Policy and Legislation

4.1 National Legislation and Policies

4.1.1 National Development Strategy

Section 2 has already outlined the objectives of the NDS and defines a need for environmental protection to be treated as a cross-sectoral matter and applied to all aspects of the developmental process. It represents the highest level of national planning. Whilst biodiversity is not among the subject areas treated in the NDS, an Environmental Policy is couched within it. This clearly sets out the vision to promote the sustainable management of natural resources and preserve a healthy environment in coastal, urban and hinterland regions. It states that:

- It is strongly in favour of the Environmental Protection Agency (EPA) as a body to focus on issues such as the management of renewable resources, environmental degradation, agricultural and industrial pollution, public awareness and legislation;
- Requests the rehabilitation and maintenance of the sea defences and irrigation infrastructure, as well as protection of the mangroves;
- In urban areas, the NDS recommends strategies to deal with waste management and pollution; and,
- For the hinterland, the NDS supports a National Forestry Code of Practice and a similar set of standards for the mining sector; the use of "environmental impact assessments" for forestry and mining operations; the development of non-timber uses of forests; the promotion of "ecotourism"; and the establishment of a system of protected areas to preserve Guyana's unique biological diversity.

The NDS also seeks to tackle issues facing Amerindians in the areas of land, poverty and education. Recommendations are made to tackle Amerindians' marginalisation in the development process:

- Reforms to secure Amerindian land rights. Those communities affected by resource development and extraction should share in the benefits;
- The expansion of the Amerindian Development Fund for community development projects and training;
- Increased investment in health facilities, schools and training centres;
- The development of more relevant curricula in schools; and,
- The strengthening of the Ministry of Amerindian Affairs.

4.1.2 The Poverty Reduction Strategy (PRS)

Section 2 has already outlined the objectives of the PRS.

Guyana's main challenges with regard to poverty eradication are to diversify the economic base, to improve the quality of jobs (the 1999 Living Conditions Survey showed that 83 percent of persons in the poorest quintile were gainfully employed), to stem the outward migration of the country's technical, managerial and professional personnel, and accelerate the pace of economic and political reform to facilitate participatory, self-directed approaches that engender empowerment.

Major constraints include, but are not limited to, the divisive nature of politics in Guyana, limited and in some cases lack of human capital, lack of adequate social services to the population, poor infrastructure, a socio-political climate that is not conducive to investment; as well as the acquisition of adequate financial resources to support the PRS in its struggle to eradicate absolute poverty; absence of an enabling environment for private sector led growth and the failure, to date, to sustain poverty reduction.

The main challenges posed by reduction of poverty are (a) to diversify Guyana's economic base, to improve the quality of jobs, (the 1999 Living Conditions Survey showed that 83 percent of persons in the poorest quintile were gainfully employed), (b) to stem the migration of the country's technical, managerial and professional personnel, (c) to accelerate the pace of reforming the economic and political structures to facilitate participatory, self-directed approaches which can result in genuine empowerment (d) building a socio-political climate that is conducive to investment (e) to acquire adequate financial resources to support the PRSP.

More details on the institutional framework to address these strategic documents are presented in Section 5.

4.1.3 Framework Environmental Legislation

The focal point of legislation that protects the environment in Guyana is the Environmental Protection Act, promulgated in 1996. This Act established the Environmental Protection Agency on June 5 1996, giving it overall responsibility for the management of the environment. The purpose of the Act is to provide for the management, conservation, protection and improvement of the environment, the prevention and control of pollution, the assessment of the impact of economic development on the environment and the sustainable use of natural resources.

If a proposed project is deemed to impact on the environment, the Environmental Protection Agency can enforce the completion of an Environmental Impact Assessment (EIA). The Environmental Assessment Board (EAB) then recommends whether EIAs are acceptable or not. The Agency also recognises the need for environmental education and public awareness of environmental issues. Currently there is no law requiring a Strategic Environment Assessment (SEA).

Land-use planning plays an important role in the conservation and wise use of natural resources by creating a suitable framework within which these uses can occur. A National Land Use Policy is in existence and provides the policy context for all land uses, including conservation land uses.

The Town and Country Planning Act (1948) provides a mechanism for physical development planning and land use control. Under this Act, development schemes may be prepared for cities, towns and other areas. Such schemes may provide for preservation of areas of natural beauty, forests, trees and plants and for regulation of waste disposal. Provisions are made in this Act for public participation in the planning process before any scheme is approved, however, Georgetown is the only area with an approved system. The Act also provides for the interim control of development in declared planning areas. To date, seven areas have been declared. Importantly, except for Georgetown and New Amsterdam (where elaborate building by-laws exist under the Municipal and District Council Act), no zoning by-laws or building codes exist. A notable omission within the law is the requirement for EIAs to be carried out for proposed developments (NEAP 2001).

Consequently, as there is no specific land use legislation in Guyana, a suite of other land use instruments are being used. These include:

- Lands and Surveys Commission Act (1999);
- National Parks Commission Act (1977) - *an Act to make provision for the establishment of a National Parks Commission, with responsibility for the maintenance of public parks;*
- National Trust Act (1972) – *an Act to make provision for the preservation of monuments, sites, places and objects of historic importance or national interest;*
- Forests Act *(grants concessionary and usufruct rights to Amerindians);*
- State Lands Act of 1903 *(grants concessionary and usufruct rights to Amerindians);*
- Amerindian Act of 1953 *(grants concessionary and usufruct rights to Amerindians); and,*
- Local Government Act (1945).

All these Acts govern and regulate access to and use of land and associated resources. Recent developments have brought into question the appropriateness of exemptions from liability and the wide usufruct rights to Amerindian communities, as these have been abused for commercial purposes, affecting protected species in some cases. Linked to this issue is the provision of incentives and alternatives, which can serve to curtail some of these threats. The Amerindian Act (1953), for example, is currently being re-drafted (through consultation with local groups) to address these issues. As currently defined in the outdated *Amerindian Act*, Amerindian communities are defined as those listed in the 1976 and 1991 schedules of the *Act.* Read literally, the Act thus excludes about half of the indigenous people of the country either because they live in communities, which are not mentioned in these schedules or because they no longer live in their settlements of origin.

An additional piece of important national environmental legislation is the Maritime Boundaries Act (1977), which provides for the making of regulations governing the living resources of the submarine and marine areas of Guyana. Currently, the Commonwealth Fund for Technical Cooperation (CFTC) is working on new maritime zones legislation in response to the GoG's request for a review and updating of this Act. The first draft Maritime Zones Bill is expected to be submitted to GoG by the end of March 2005 (Guyana Chronicle 14 March 2005). It would be of interest to establish, from this new Bill, whether a formal approach to considering the benefits of marine spatial planning for Guyana (i.e. extending Town and Country Planning Act offshore to assist in the appropriate management of offshore resources) will be considered.

4.1.4 Sectoral Policies and Legislation

The following text outlines briefly those legislative powers that have relevance to environmental matters in Guyana. It is not an exhaustive of all legislation present within that sector.

4.1.4.1 Agriculture

The main relevant legislation relating to agriculture in Guyana is as follows:

- National Agricultural Research Institute of Guyana Act (1984) – sets a specific policy to create the National Agricultural Research Institute (NARI);
- Plant Protection Act (1942) – sets policies to prevent, eradicate and control disease and pests affecting plants;
- Animal Diseases Act (1936) - addresses issues of animal disease, but due to its age, requires revision in order to address important recent developments in bio-safety;
- Pesticides and Toxic Chemicals Control Act (2002) – this acts sets policy to regulate the manufacture, importation, storage, sale, use and disposal of pesticides and toxic chemicals and to provide for the establishment of the Pesticides and Toxic Control Board and matters connected therewith; and,
- Guyana Rice Producers Association Act (1946) - established to form an association in Guyana that protects, promotes and advances the interests of rice producers in general.

4.1.4.2 Fisheries

The Fisheries Act (1957) is the key legislation dealing with regulating fishing in Guyanese waters. In this Act, fishing covers all freshwater, estuarine and marine fish, marine mammals, crustaceans, molluscans, and plant life. The Act considers licensing of fish catch, fees and charges for export, restrictions in licence numbers. It outlines the roles and responsibilities of fisheries offices and sets out the approach for penalising offenders. As the Act applies to all Guyanese territorial waters, the enforcement of this Act in practical terms is proving problematic.

A series of regulations linked to the Fisheries Act are in existence:

- Fisheries Regulations (1959);
- Fisheries (Pin Seine) Regulations (1962);
- Fisheries (Aquatic Wild Life Control) Regulations (1996); and,
- Maritime Boundaries Act (1977).

Draft new legislation, namely an Aquaculture Bill, the Fisheries Bill (revised) and revised fisheries regulations seek to help improve the legislative framework and expand the breadth of provisions for management of fisheries resources. The latter two pieces of legislation include aquatic wildlife (in the regulations) and constitute a significant upgrading of the current Act and regulations by addressing a number of important areas either previously not provided for, or inadequately so.

4.1.4.3 Wildlife

Current legislation of relevance to wildlife includes:

- Importation of Bees Act (1935) – *powers to restrict importation of bees*;

- Wild Birds Protection Act (1919) – *powers to enforce fines and penalties on people who willingly injure, harm or capture wild birds without consent*;
- Species Protection Regulations (2000); and,
- Aquatic Wildlife Control Regulations – provides some protection for manatee, arapaima, caiman and turtles.

Draft Wildlife Trade Legislation was prepared in 1987 to address Guyana's requirement under CITES but it was not adopted by Parliament. A moratorium was then placed on the wildlife trade, effectively banning all legal exports, from January to October 1987, while more comprehensive legislation was drafted and a new set of quotas devised. Again in February 1993 to November 1995 the trade was closed and the government did a thorough review. In 1999 CITES assisted Guyana to review its legislation and because of not passing the regulations on time was temporarily suspended for a short period.

There is no Wildlife Conservation Act currently in Guyana, though new Wildlife Management and Conservation Regulations (2000) are under consultation (Andel van 2003). The concern at present is that the current Wildlife Division (Office of the President) is not directly linked to its own legislation. In addition, the Species Protection Regulations (2000) are made under the Environmental Protection Act (1996), whilst the Wildbirds Protection Act (cited above) is under the jurisdiction of the Ministry of Agriculture. This Act is anyway very outdated, as it needs to refocus on conservation of the species rather than prohibitions regarding wounding, killing or sale of wild birds.

Consequently, there does not appear to be a clear policy mandate for wildlife in Guyana, which is disturbing in view of the increased illicit market in drugs and wildlife trafficking on a global scale.

4.1.4.4 Drainage and Irrigation

The Drainage and Irrigation Act (1941) grants responsibilities to establish the Drainage and Irrigation Board, clear declarations of drainage and irrigation areas, the construction of new works in these areas and prosecution details for law infringements.

4.1.4.5 Water Supply, Sewerage and Waste Disposal

The Water and Sewerage Act (2002) is an important recent piece of legislation that has enabled the delivery of the National Water Policy. Through this Act, a new legal, institutional and regulatory framework has been created through a new Water Bill, including the introduction of national water standards and a National Water Council, to direct water resource management policy. The act in addition deals with issues covering water supply and connection, water regulations, wastewater and sewerage matters, drought orders and all hydro-meteorological matters.

The delivery of local services in terms of drainage and irrigation works (within a designated drainage and irrigation area – see above), water supply and waste disposal (solid and liquid) is passed to the Municipality level under the Municipal and District Councils Act (1970). There is no separate Act dealing specifically with integrated waste management issues.

4.1.4.6 Coastal Management and Flood Defence

Whilst issues pertaining to flood defence are clear in Guyana, the legislative regime surrounding wider coastal management in Guyana represents a fragmented regulatory framework. This is because the coastal zone is managed in a fragmentary fashion in response to specific issues. The various pieces of legislation that govern the different issues are for example:

- Sea Defence Act (1933);
- Forests Act;
- Town and Country Planning Act (1948) (land use control);
- Municipal and District Councils Act (land use control);
- Public Health Act (land use control);

- State Lands Act (land use control);
- Housing Act – 1948 (land use control);
- Drainage and Irrigation Act;
- East Demerara Water Conservancy Act;
- Mining Act (1991);
- Geology and Mines, Petroleum (Exploration and Production) Act;
- Water and Sewerage Act (2002);
- Fisheries Act (1957); and,
- Maritime Boundaries Act (1977).

In addition, under the Municipal and District Councils Act (1970), any natural or artificial accretion of the foreshore will fall under the responsibility of the council area. Hence defence schemes that create extra foreshore or reduces foreshore area in an adjacent Municipality may influence on the extent of land under natural jurisdiction of a council.

In an effort to foster improved integrated coastal management, it is necessary to review and update pieces of legislation to remove the current piecemeal legislative structure. In light of the 2005 floods that hit Guyana, it is of interest to note that there is no legislation currently requiring professional engineering participation in flood defence structural design and construction, and life critical operations. Likewise, there is no legislation requiring the certification of engineers practicing in Guyana as such. The Guyana Association of Professional Engineers offers a voluntary service in developing professionalism among those practicing as engineers. Likewise, current "State of Emergency" legislation needs to be amended to better define emergency powers.

4.1.4.7 Mining.

There is a suite of mining related legislation in Guyana pertaining to specific aspects of the industry. The Mining Act (1991) remains the framework piece of legislation. Other Acts include:

- Blasting Operations Act;
- Petroleum (Exploration and Production) Act;
- Bauxite Nationalisation Act;
- Minerals Act;
- Mines Assistance Act; and,
- Guyana Geology and Mines Commission Act.

The Mining Act (1991), which includes the Guyana Geology and Mines Commission Act, has been updated to facilitate new mining investments, while promoting improved environmental management. This law represents a considerable environmental improvement, compared to the current legal framework. For example, the new law and implementing regulations provide a stronger legal basis for controlling the ongoing, often highly destructive informal placer mining (for gold and diamonds), such as by requiring settling ponds to keep sediment from degrading rivers. However, there is the risk that the new law seeks to attract new, large-scale mining by international companies to Guyana. The establishment of any such large new mines (and associated facilities, such as access roads, camps, and company towns) would require careful management to minimize and mitigate adverse environmental and social impacts.

Under Guyanese law, according to Section 6 of the *1991 Mining Act*, the State is the owner of all mineral resources. Using Section 6, the government asserts the right to issue mining permits anywhere in Guyana, including on Amerindian titled lands, although current regulations limit small- and medium-scale mining on titled lands. The government estimates that commercially mined minerals are found in some 5 to 10 per cent of the national territory.

4.1.4.8 Forestry

The original forestry law was enacted in 1953 and is outdated and relatively weak with respect to environmental issues. Guyana now has in place a Forest Act to enable the effective implementation of the Forest Policy and the National Forest Plan. In addition, a Code of Practice for Timber Harvesting has been developed and incorporated into the Environmental Management Plans of timber companies. The World Bank proposes passage of the new Forests Act as a prior condition for the PRSC-II. The Forestry Commission is carrying out stakeholder consultations, so as to improve the sense of ownership of the new law, both within the Government and civil society.

Other acts of relevance include the Timber Forest Export Act (1973) and the Timber Marketing Act (1974).

4.1.4.9 Energy

In recognition of the invaluable role of new, environmentally friendly and efficient energy supply in its drive for sustainable development, Guyana has formulated a National Energy Policy (NEP) that promotes the substitution of imported fossil fuels and the increased use of renewable sources.

4.1.4.10 Transportation

Guyana Shipping Act (1998) covers all matters of ship related transport, seaworthiness and contingency planning for collision events. No specific policies are set covering environmental management.

The Transport and Harbours Act (1932) focuses on controlling and regulating the use of harbours in Guyana. Any activities such as; dredging, sand-take or fishing within the bounds of the Harbours jurisdiction is not permitted without the consent of the General Harbour Master.

River navigation is covered within the River Navigation Act (1891). Of relevance here is that improvements can still be made to the navigation of a river if deemed of value by the Minister of Transport. It is uncertain whether any separate EIA has been undertaken to assess the flood risk and biodiversity implications of such actions in more recent times.

4.1.4.11 Tourism

The Guyana Tourism Authority Act (2002) has formally created the Guyana Tourism Authority (GTA) to spearhead tourism as a key market for the future. The GTA will be responsible for marketing and developing the tourism product through existing sales avenues and attempting to diversify the current tourism potential further, with a key focus on ecotourism.

4.1.4.12 Protected Areas

The principal legislation covering protected areas is:

- Kaieteur National Parks Act (1930); and,
- Iwokrama International Centre for Rain Forest Conservation and Development Act (1996).

Guyana has no land use policy or legislation in place to effectively establish national parks or protected areas. In practical terms, with no land use planning policy in effect, the legal framework offers little to protect the ecological integrity of a protected area or national park. The forthcoming World Bank funded Protected Areas Management Project is hoping to resolve this issue based on detailed consultation and participation on this matter.

4.2 Environmental Strategies and Action Plans

4.2.1 National Perspective

As a clear indication of its commitment to the path of sustainable development, Guyana has developed a number of sectoral policies, strategies and action plans. The vehicle to promote the NDS Environmental Policy (stated above) is the National Environmental Action Plan (NEAP) 2001–2005. Within this document, the Government of Guyana unequivocally declared its commitment to sustainable development including sustainable human development as major pillars of the country's socio-economic program. In this context, Guyana seeks to integrate economic, environmental and

social values during planning and to distribute benefits equitably across socio-economic strata and gender upon implementation. It also seeks to ensure that opportunity for continued development remains undiminished for future generations. This approach also defines the need for environmental protection to be treated as a cross-sectoral matter applied to all aspects of the development process.

The Environmental Policy states that the Government of Guyana will endeavour to, among other things:

- Assure all people living in the country the fundamental right to an environment, adequate for their health and well-being;
- Achieve a balance between the use and conservation of the nation's resources to meet the needs of economic development and improve standards of living;
- Conserve and use the environment and natural resources of Guyana for the benefit of both the present and future generations; and,
- Ensure prior environmental assessment of proposed activities, which may significantly affect the environment; ensure that conservation is treated as an integral part in the planning and implementation of development activities.

4.2.2 Sectoral Strategies and Action Plans

The following text outlines briefly a non-exhaustive list of relevant strategies and actions plans that have an impact (positive or negative) on the environment. These may be statutory or non statutory in their nature. While these sectoral strategies and action plans are designed to meet national priorities and sector based drivers, they are generally referenced to International and Regional Actions for Sustainable Development Planning such as Agenda 21 and the Barbados Programme of Action (see Section 2.3).

Where relevant, reference is made to the policies and strategies proposed in the NDS. More detailed information is available within each document.

4.2.2.1 Biodiversity and Conservation

The following represent the key environmental strategy documents or action plans that focus on the effective delivery of biodiversity conservation in Guyana.

- National Strategy for the Conservation of Biological Diversity;
- National Biodiversity Action Plan (NBAP) produced in 1999;
- National Environmental Education Strategy;
- National Mangrove Management Action Plan – produced in 2001;
- Poverty Reduction Strategy Paper (PRSP) – produced in 2002; and,
- Guyana Marine Turtle Conservation Strategy (2003).

4.2.2.2 Agriculture

The Ministry of Fisheries, Crops & Livestock (Quarantine Division) has prepared a Pest Forecasting Management Plan.

The NDS makes recommendations to promote rapid growth through improvements in the efficiency with which land resources are used, and to support poverty alleviation by increasing access to land for the landless and small rural farmers.

The strategies being proposed include the following:

- Improve leasing practices by, for example, developing clear selection criteria for approval and denial of leasing applications;
- Formulate a standard agricultural lease with provisions for 99 or 999 year limits; transferability after 5 years;
- Annually adjust land rental rates to market values, with special provisions made for the rural poor. The revenue generated by the new rent levels should be re-invested back into improved land administration and agricultural development;

- Promote better utilisation of freehold agricultural lands by eliminating unnecessary restrictions on land rental practices; and introducing a rural land tax (to discourage under-utilisation of land); and,

- Design a National Land Use Plan to define sustainable land use practices, targeting areas in need of reforestation or suitable for long-term agricultural development. The Plan should give special priority to benefiting the indigenous population, and deterring illegal occupancy of reservation lands.

4.2.2.3 Fisheries

The fishery sector is of critical importance to the economy and to social well being in Guyana. In 1996 the government drafted a new fisheries policy, which seeks to promote the conservation of fishery resources. A Fisheries Management Plan has now been developed in which action for fisheries development has been identified. There are, however, no official national fisheries.

The NDS aims to maintain and improve the nutritional, social and economic benefits from the fisheries sector in a sustainable manner. The following strategic recommendations are made:

- Support artisanal fishermen by improving cold-storage and processing facilities and the marketing system;

- Strengthen Guyana's fisheries management system (such as the Department of Fisheries and the Coast Guard) to promote a sustainable use of fish stocks; improve the enforcement of regulations; accurately assess current stocks; enhance the extension system; and improve quality control to strengthen export potential. It is suggested that the Department of Fisheries be reorganised and reinstated as an autonomous Guyana Fisheries Commission;

- Focus efforts more towards deep-water finfish, and introduce strategies to limit fishing of marine prawn and seabob to sustainable levels. Regulations for gear types should be introduced; and,

- Develop a policy for the long-term development of the aquaculture sector, which is the sub-sector of fisheries with the greatest potential for expansion of production, creation of employment, and generation of foreign exchange. Improvements in access to freehold land or secure leases of a reasonably long duration will be necessary. Expansion of aquaculture activities in shrimp production may be an important way to sustainable management of shrimp populations, and maximise their export potential. Currently no Aquaculture Management Plan is in existence.

4.2.2.4 Drainage and Irrigation

The NDS sets policy recommendations in the areas of drainage and irrigation and the delivery of the Hydro-meteorological Service. In general terms, these cover:

- The rehabilitation and maintenance of D&I works. Inadequate maintenance of drainage works reduces yields and keeps some agricultural land out of production;

- A review of legislation governing the management and operation of D&I;

- The institutional strengthening of the sector. The NDS calls for an institutional framework, which identifies clear policy objectives; ensures adequate supervision and co-ordination; prevents overlapping jurisdictions between agencies; and specifies clear roles for each agency. The NDS recommends that the national D&I Board take a lead in developing the new institutional structure; and,

- The encouragement of farmer participation in the development, operation and maintenance of an efficient D&I system, through local Water Users' Associations. The current lack of participation of users in decisions on maintenance has undermined the effectiveness of the drainage and irrigation systems. The NDS also calls for the strengthening of the Local Government Authorities to administer local D&I systems where farmers are satisfied with the current institutional arrangement.

In terms of the Hydro-meteorological Service, the NDS stated strategies and action relate to:

- The upgrade of existing stations; improved communication links to data collection centres; automation of stations; and staff training; and,

- The introduction of measures to strengthen the financial position of the Hydro-meteorological service, including the introduction of charges to users (such as airports and the media).

Primary water management is a national responsibility. The National Water Council is recognised as a guiding agency in delivering this. Municipalities want to see national leadership in the provision of the primary surface water management infrastructure – including primary canals, dams, seawalls and outfalls. In light of the recent flood events (January 2005) a clearer distinction of duties between stakeholders is critical as the Municipalities are prepared to renew their responsibilities to administer the secondary and tertiary drainage systems within their boundaries.

4.2.2.5 Water Supply, Sewerage and Waste Disposal

A Draft National Solid Waste Policy has been developed for Guyana. This document covers issues such as regulatory framework, institutional and operational framework, waste strategy, cost recovery, public awareness and education and monitoring and enforcement. The actual implementation of this Policy remains a challenge and has recently been exposed in its delivery as a result of the recent floods in January 2005.

With respect to the hinterland areas, there is a separate strategy which aims to provide the population with adequate services involving appropriate technology, community involvement and better organisation to achieve sustainable systems.

With regard to radioactive wastes, Guyana is currently working on regulations to govern the use, possession and import of radioactive substances. A project is being drafted to regulate the use of ionising radiation in Guyana with the additional aim of making employers, employees and other users aware of the risks associated with ionising radiation.

4.2.2.6 Coastal Management and Flood Defence

A Shorezone Management Programme (SMP) has been followed through IDB and EC funding. Two major background studies have been completed. One dealt with a feasibility and design study to formulate the overall programme needs and priorities to maximize the usefulness and sustainability of the SMP for Guyana. The second study was an institutional assessment of the agencies and their strengths and weaknesses with regard to sustainable management of the coastal zone. A study is currently under way to design a coastal-management training programme in support of a wider coastal zone management programme and delivery of the Integrated Coastal Zone Management Action Plan (2000).

The NDS sets clear policy actions for future improvements to the Sea Defence Board including:

- The rehabilitation of critical coastal protection structures, and the maintenance of the existing infrastructure;

- The reorganisation and strengthening of the Sea and River Defence Board. The NDS also suggests the establishment of a Shorezone Management Unit;

- The reduction of construction costs for sea defences. The NDS suggests examining means of reducing the costs of production and supply of rocks to sites, including a review of current designs; and,

- The protection of mangroves. The past failure to protect mangroves has contributed to the deterioration of the sea defences. The NDS calls for a gradual mangrove reforestation programme.

4.2.2.7 Mining.

The NDS makes several recommendations to deal with the constraints experienced in all sub-sectors of mining, and to ensure the continued growth of the mining sector as a whole:

- The enhancement of the mining policy so that it embraces a fiscal regime, marketing arrangements, policies on technology, security of titles, training, the environment, and an approach to social issues in mining communities;

- The encouragement of infrastructure development related to mining. The high cost of transportation and lack of essential services in the hinterland often deters foreign direct investment;
- A review of the fiscal regime. Specifically, the NDS calls for a review of royalties, export duties, and income taxes. It also suggests the introduction of fiscal incentives to encourage technology that is environmentally friendly;
- The replacement of the Guyana Gold Board with a system of licensed and bonded gold buyers who will be responsible for remitting royalties to the Government;
- The strengthening of the Guyana Geology and Mines Commission (GGMC). The GGMC needs to commission a national mineral resource inventory, continue to explore state of the art mining and milling technologies, and construct a modern integrated laboratory for relevant analysis and testing;
- The establishment of a commission to reconsider land rental policies; and,
- The development of a programme for the bauxite industry, including the privatisation of BERMINE and LINMINE.

4.2.2.8 Forestry

Currently, through the Guyana Forestry Commission (GFC), a Strategic National Forest Action Plan has been developed (2002-2006) in addition to an Area Management Plan for Guyana. The National Forestry Management Action Plan gives the framework and outlines programmes and activities that must be implemented in order to ensure implementation of the policy and compliance with the law.

This Plan provides a strategic planning framework for the State Forest Permission (SFP) areas. Moreover, the GFC has ongoing rapid appraisals (RAP) for SFP concessionaires so as to determine whether individual SFPs are adequately stocked to support current timber harvesting. It is worthy of note that results of the rapid appraisal guide the general framework of the Area Management Plan.

4.2.2.9 Energy

If Guyana is to realise its very considerable development potential, a reliable system of electricity generation and transmission is essential. The NDS makes policy and action plan recommendations to overcome the various constraints faced in the sector, and to create a system capable of dealing with the growing energy demands of an expanding economy, notably:

- The upgrade of the transmission and distribution system;
- The consideration of alternative energy sources, such as mini-hydro, wind and solar;
- The establishment of a Guyana Energy Agency for national energy planning, including the development of an energy conservation programme; and,
- The strengthening of the Public Utilities Commission's capacity to regulate the sector.

4.2.2.10 Transportation

A Transportation Master Plan is currently under preparation in Guyana using EC funds. This is focusing on current road transportation networks, international links (Lethem to Georgetown Road) and alternative methods of transport and access to the development of a deep-water harbour. This is seen as critical to support to the recommended Export Processing Zone, as well as the rapidly expanding exports of bulk goods, such as rice, sugar and new kinds of wood products.

4.2.2.11 Tourism

The National Tourism Policy Document (1998) sets out guidelines for a national tourism policy. In specific terms of biological diversity, it suggests and supports the development of a national system of protected areas as an essential step in the development of a national eco-tourism industry, and further, the development of a programme of environmental education and the “diffusion of the

conservation ethic". Further efforts to produce a robust Tourism Master Plan are required to be able to link together the ecotourism product (plus establishment of a National Tourist Board) with wider sustainable development.

4.2.3 Other Plans in Existence

Apart from the overarching strategies and sectoral policy plans mentioned above, the following non-exhaustive list outlines the range of social related strategies that have an influence on the environment. These include:

- National Trade Strategy for Guyana (in preparation);
- Poverty Reduction Strategy Paper (PRSP) – produced in 2002;
- Public Awareness Strategy;
- National Health Plan (2003-2007);
- National Policy Document on HIV/AIDS as well as a National Strategic Plan for 2003 – 2007; and,
- Ministry of Housing Ten-Year Development Plan.

4.3 Provision for Public Participation in Policy Decision Making

The process adopted for the development of National Strategies and Action Plans within Guyana ensured the involvement of all key stakeholders. Typically stakeholders and the public have had more than a single opportunity to contribute to the formulation of these documents as consultations were generally held at several stages in their development. For instance, the National Strategy for the Conservation of Biological Diversity (NSCBD), evolved out of several consultations at various phases of its formulation. Consultations were not confined to a few coastal locations but extended into hinterland regions where the country's biodiversity abounds. In these hinterland regions the consultations benefited from the input of indigenous people who live closely with forests, savannahs and the biodiversity they support. The same approach was used for the development of the National Biodiversity Action Plan (1999) and more recently for the Poverty Reduction Strategy Paper (PRSP – 2002).

The PRSP, for example, was produced following an extensive public consultation process, and involved approximately 8,400 participants. Over 200 consultations consisting of 109 community consultations and 98 target group consultations were conducted in all 10 regions of the country.

The National Environmental Action Plan was revised in December 2000 after a national consultation was convened with the aim of seeking inputs from a wide cross section of governmental and nongovernmental agencies. Those inputs were incorporated into a draft document that was circulated to key stakeholders, who after perusal of the document convened for a second consultation. Many actions set out on the NEAP, however, have yet to be achieved.

4.4 Enforcement of Environmental Policies and Legislation

Enforcement and compliance monitoring involves planning, developing and executing assessment programmes based on criteria and indicators, the collection and analysis of samples and the interpretation of data measurements.

Strong regulatory compliance monitoring and enforcement institutions require not only expenditure but also major financial resources to support the independence and integrity of those involved in the executing of these mandates. Enforcing policies, even with robust legislative backing, is only achievable if there is the sufficient human resource to administer the fines and bring perpetrators to a court of law. Neither of these is obviously apparent in Guyanese environmental management.

The absence of the necessary codes of practice, regulations, criteria and indicators impedes the implementation of enforcement systems to support environmental protection. It is somewhat predictable, however, that there appears to be direct Government intervention into environmental related issues if the outcome either influences the political stability of a situation, an area or when the decision may affect economic progress.

Indeed, there are some very important social implications of the various sectoral policies and plans mentioned above that are not being addressed. For example, the involvement of the Amerindian community, directly or indirectly into the development of the mining industry, where there is evidence

of sexual discrimination and abuse amongst local women on an increasing basis as foreign mining firms move into the interior (Colchester *et al* 2002).

The lack of enforcement, using mining as an example, impacts not only on the surrounding environment, but also, importantly, on the livelihoods of local communities. The increase in mining has led to an increase in the destruction of the environment, especially riverbeds and banks. Pollution of the rivers has become a major problem for communities. The fish population, the main source of protein for communities, has gone into decline; fish traps and spawning areas have been destroyed; clean water for drinking and for other domestic purposes is no longer available from the rivers and water has to be fetched from further away, some residents paddling for hours to find clean water. Complaints from illnesses such as malaria, vomiting and diarrhoea have all became common sicknesses in communities. Navigation has become almost impossible with evidence in some cases, of river width narrowing to a few feet between the sandbanks and riverbanks.

Therefore, the issue of legislation enforcement remains a critical one, and requires urgent attention if the sound sentiments and rhetoric presented in the NDS and NEAP are to have any meaning.

5 Environmental Institutional Framework

5.1 Institutional Structure Roles and Responsibilities

5.1.1 Public Agencies

Public Agencies have a duty to promote and facilitate the development of policies, programmes and plans relating to biological resources and ecosystems over which they have responsibility. These agencies (discussed in more sectoral detail in Section 5.1.3) are expected to take legislative and administrative steps to ensure that the environment and biodiversity conservation as an objective is met, and to facilitate the creation of an enabling environment for other parties to play their part. Public institutions also play an important role in the area of monitoring and enforcement.

Details of these Public Agencies are presented in Table 5.1.

5.1.2 National Coordination Mechanisms/Committees

Rather than creating a single organisation to address sustainable development issues in Guyana, the Government has established a number of mechanisms to achieve a similar goal. Chief among these, and at the highest decision making levels, are:

- The appointment of an Advisor to the Executive President on Sustainable Development; and,
- The establishment of (a) the Guyana Parliamentary Sector Committee on Natural Resources with responsibility for monitoring the operation of spheres of operations of ministries, as well as their administrative structures; and (b) a Cabinet sub-committee on Natural Resources and Environment which is chaired by the Head of the Presidential Secretariat.

The Cabinet sub-committee addresses issues regarding sustainable development, and specifically related to natural resources use, which require policy decisions.

At lower level, there exists a Natural Resources and Environment Advisory Committee (NREAC). The NREAC is a high-level committee comprising directors of natural resource institutions (for example, forestry, mining, water, agriculture, land use, energy) and the Guyana Environmental Protection Agency. This committee has been tasked with examining environmental and resource policy prior to submission to the Guyana Cabinet for approval.

Additionally, Guyana has established the following Committees to help coordinate environmental management across sectors:

- The National Biodiversity Advisory Committee whose function is to advise Government of Guyana (GoG) on issues related to Biodiversity Management and Research;
- The Integrated Coastal Zone Management Committee with responsibility for the development of an ICZM Plan and coordinating the activities of the various sectoral agencies with some involvement in management of coastal resources;
- The National Bio-safety Committee to review the Protocol on Bio-safety and develop guidelines, regulations, and recommendations on policy;
- The National Climate Committee;
- The Pesticides and Toxic Chemicals Board that is tasked with the formulation and implementation of the Pesticide and Toxic Chemicals Act and Regulations to register pesticide use, licence pesticide importers and manufacturers, monitor pesticide effluent discharge standards, storage, disposal and transportation requirements, and enforce the Act and regulations;
- Civil Defence Commission whose intended function is to establish early warning and rapid response to natural disasters; and,
- National Centre for Education Research and Development (NCERD) – provides technical support in developing research areas such as the incorporating environmental education into the curriculum.

At the regional administrative level, there exists the North Rupununi District Development Board that was legally established as an NGO in 1996, and has since become the 'voice' of, and the decision-making mechanism for, communities surrounding the Iwokrama Rainforest. This NGO also promotes people's participation and involvement and accesses financial resources for community development.

5.1.3 Regional and Local Government

Strategic decision making on the environment remains a "top down" approach in Guyana. Devolved environmental powers have not been provided to the ten Administrative Regions as yet. Education, social services and the delivery of health and local environmental health issues (i.e.: waste disposal) are granted a regional mandate through the Local Government Act. The implication of this is that the visibility of understanding strategic environmental management remains a head office "Georgetown" issue (see Figure 5.1).

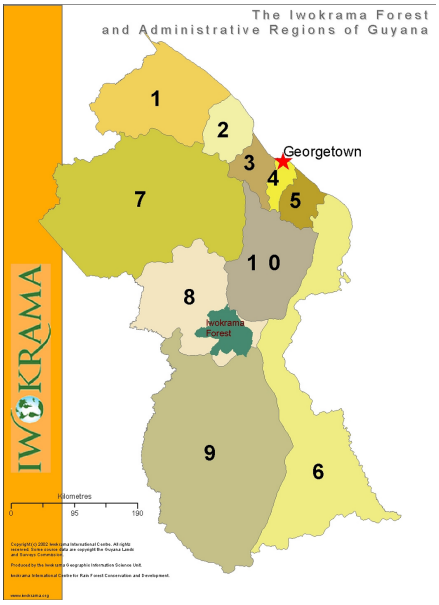

Figure 5.1 – Administrative Regions in Guyana (from Iwokrama Annual Report 2002/3)

The main activities of the Regions include:

- Local drainage (e.g. canals, trenches, kokers, and sluices);
- Solid waste collection and disposal is done outside municipal boundaries;
- Public Health (e.g. vector control, market inspections, abattoir inspections); and,
- Local roads outside municipal boundaries.

The NDS discusses the issue of setting up a more transparent decentralised framework of regional and local government. Recommendations include:

- The clarification of the structure, roles and responsibilities of the Regional Democratic Councils, the Neighbourhood Democratic Councils and the numerous other levels of local government;
- Various administrative and legislative reforms to give a greater degree of autonomy to regional and local government; and,
- The streamlining of the local government structure and the strengthening of regional and local agencies through staff training and improvements in the budgeting system.

Whilst the "environment" is not mentioned above, the issue of regionalisation of environmental management merits consideration.

5.1.4 Private Sector Organisations

The private sector pays a key role in delivering environmental management in Guyana. Sections of the private sector owe their existence in part to the living resources in the country. There are clear signs of interest from the Guyanese private sector in helping to deliver sustainable development. In mining, agriculture, forestry, drainage/irrigation, the water sector and in the growing tourism market, the role of the private sector could be critical in terms of helping towards financing, institutional and human resource capacity building, research-information and monitoring as well as incentive measure.

5.1.5 Non Government Organisations

The range of NGO groups in Guyana (large and small, international and nationally based) play a key role in promoting action (through public awareness measures) towards conservation and wider poverty reduction actions. Their role is critical in supporting GoG or non-governmental action, conservation advocacy and public awareness. Conservation International Guyana (CIG), World Wildlife Fund Guyana, Guyana Marine Turtle Conservation Society (GMTCS) and many more all play an important role in delivering the overarching environmental policy statement set by GoG in the NDS. Their role should not be to block progress on a specific issue (e.g. Ministerial policy of Amerindians) unless there is a clear case to halt current GoG policy on an issue on humanitarian or environmental grounds.

5.1.6 Public Participation

There is an apparent mix of environmental awareness amongst the general public, depending upon region. Local Amerindian groups and communities of the interior are, on average, more environmentally aware than urban populations in the coastal zone. Each citizen, however, has a role and responsibility to contribute to decisions on the sustainable use of environmental resources. The public is the largest stakeholder group and has a powerful voice that can be very effective in achieving the goal of conserving biodiversity.

5.2 Sectoral Institutional Frameworks

5.2.1.1 Biodiversity and Conservation

The Environmental Protection Agency (EPA) is the institution with the mandate for coordinating environmental management and provides for the management, conservation, protection and improvement of the environment, the prevention or control of pollution and the assessment of the impacts of economic development activities on the environment. The EPA created various mechanisms for action with respect to environmental management by adhering to the mandate it has, notably:

- To implement steps and systems for the effective management of the natural environment ensuring conservation, protection and sustainable natural resources use;
- To coordinate the environmental management activities of all persons, organisations and agencies;
- To prevent or control environmental pollution;
- To play a coordinating role in the preparation and implementation of the cross-sectoral programmes of environmental content;
- To promote public participation in the process of integrating environmental concerns in development planning ensuring sustainability; and,
- To coordinate a national environmental and public awareness programme.

The environmental monitoring capability of the EPA has been enhanced through the establishment of a laboratory facility to undertake monitoring of various chemical parameters and to determine their environmental effects. This was established through a private sector donation. Under the Executive Director, the EPA has four divisions associated with it. Currently, however, it has only 11 staff divided between the four divisions. Clearly the capacity to deliver measurable progress with such lack of resource remains a serious challenge.

In 1986 the Wildlife Services Division of the Ministry of Agriculture was established as the permitting agency to control the export trade in wildlife. In 1993 it was removed and placed under the Office of the President (OP), but was physically located close to the EPA at the University of Guyana (UG). In

2002, the Division was removed from the administration of the EPA and relocated under the OP. The Management and Scientific Authorities are now functioning, thus allowing the export trade. The Division's staff comprises of a Head, and three sections with supportive staff that deals mainly with the permitting and collection of levies (staff total of about 10). Animals that require health certificates are checked and certified as in good health before exports. Checks are also made at holding stations and counts are made at the close of the seasons.

5.2.1.2 Agriculture

The institutional framework for the agriculture sector is made up of various agencies ranging from the Ministry of Agriculture and the National Agricultural Research Institute (NARI) to the producer organisations and Neighbourhood Democratic Councils (NDC). The NDS makes a number of recommendations to deal with the constraints these agencies face, such as limited financial and human resources; weak linkages between national agencies; a weak policy review capacity; and a lack of decentralisation:

- The development of a plan by the Ministry of Agriculture for the future direction of agricultural support services, which would prioritise government functions and provide measures for the development of the small farm sector;
- The provision of financial support for the development of the small farm sector by, for example, targeting a proportion of the preferential gains from rice and sugar exports; introducing higher rentals of State land and taxes on freehold; and initiating a system of charges for larger farms for extension services;
- The strengthening of local level institutions, such as the Neighbourhood Democratic Councils, non-government organisations, and producer organisations. It is suggested that the Government grant NDCs greater scope in the determination of resource use, and provide technical training in legal issues, management, finance, budgeting and resource mobilisation; and,
- The introduction of Government incentives to encourage banks to locate branches in rural areas, and the consideration by banks of group lending schemes.

5.2.1.3 Fisheries

Although there is a Ministry of Fisheries, Guyana has no adequate institutional framework, national standards or codes of practice to govern the administration and management of the marine/fisheries resources of the country. A new aquaculture research station has been set up at Mon Repos in Georgetown in an attempt to diversify the industry based on robust research on shrimp and finfish stock cultivation. It is hoped that new avenues of finfish /shellfish cultivation will contribute to the growth of this sector.

5.2.1.4 Drainage and Irrigation

Overall responsibility for drainage and irrigation in Guyana is vested in the National Drainage and Irrigation Board (NDIB). The NDIB is mandated to provide drainage and irrigation services in Declared Drainage and Irrigation Areas (DDIA). All DDIAs are administered by the Regional Democratic Boards, except the Mahaica-Mahaicony-Abary system that is managed by an independent water authority. Regional Democratic Boards (RDB) are responsible for maintenance of the conservancies, water allocation from the conservancies, operation of the reservoirs, and maintenance of the dams and head regulators. The Regional Democratic Boards do not themselves collect the water users' share of costs; this is the responsibility of the local authorities. Local authorities are required by the Drainage and Irrigation Act to assess the level of the drainage and irrigation rates on DDIAs and levy charges on landowners.

5.2.1.5 Water Supply, Sewerage and Waste Disposal

The present administrative organization of Guyana's water resources has been in place for over a century. There are some fifteen agencies administering the legislation relating to water and their functions often overlap either directly or indirectly.

The Guyana Water Authority (GUYWA), under the policy direction of the Ministry of Public Works, Communications and Regional Development, historically provided water supply services for the whole country with the exception of Georgetown, New Amsterdam and Linden, where the systems are run by municipalities. Since 1984, responsibility for provision of water services belongs to the

RDBs. The Ministry of Health monitors water quality and has the responsibility for sewerage and sanitation activities. The municipalities are responsible for the construction, operation and maintenance of urban drainage systems.

GUYWA has been merged with Guyana Sewerage and Water Commission (GS & WC) to create a single national water entity. The new Guyana Water Inc. (GWI) has been issued a ten-year license that contains distinct targets to inform its daily operations. Also, a Management Services Contract has been let to Severn Trent Water International to manage GWI for a period of five years.

A National Water Council is established and, with the Public Utilities Commission, will assume responsibility for water regulation. The Ministry of Public Works, Communications and Regional Development has responsibility for establishing water sector policy. It is significant to note, however, that during the January 2005 flood event, no currently constituted agency is qualified under current law to provide full and clearly delegated leadership in the role of water and flood response management. There was no apparent evidence of the intervention of the National Water Council in coordinating flood mitigation measures (Muntz *et al* 2005). As part of a future Surface Water Management Strategy, NWC needs to assume, as soon as possible, the operation of all primary infrastructure related to surface water management, including all seawalls, headwater dikes, primary canals, kokers, gates, weirs, pumps and all related infrastructure and to regulate the quality of waters within its responsibilities.

The Hydrometeorology Service of the Ministry of Agriculture has the responsibility for the monitoring and assessment of surface and groundwater resources and for providing basic meteorological information.

With regard to solid wastes, the Ministry of Local Government, which has the responsibility for local town councils. In addition, the Guyana Advisory Solid Waste Management Association has been established though it appears that this is not currently operational.

Work is being done to establish a new landfill site at Haags Bosch, it is understood that EPA are to grant acceptance for this soon *(per com 2005*). In the rural areas solid waste is often collected by the household and is burned. Septic tanks and pit latrines are commonly used for sewage disposal and are approved by the regional Environmental Health Officer. Meanwhile, the Environmental Protection Act will help to ensure that requirements of Agenda 21 are carried out.

With regard to hazardous wastes, at present there is no data on the generation of hazardous waste and Guyana does not have the capacity to dispose of hazardous waste. There is the need for carry out inventories of hazardous waste production, distribution, management and use.

5.2.1.6 Coastal Management and Flood Defence

The Sea Defence Board has responsibility for management and maintenance of the nations sea defences. They have a joint responsibility (with GFC and EPA) for the management of mangroves and the delivery of the Mangrove Management Plan. ICZM is not being implemented officially in Guyana, despite the presence of an Integrated Coastal Zone Management Committee within the EPA (which meets sporadically though with no official mandate). The ongoing Shorezone Management Programme (SMP) is attempting to formalise data collection, capacity building and better integration of the disparate sectors covering ICZM.

The only visible NGO with a purely marine remit is the Guyana Marine Turtle Conservation Society (GMRCS).

5.2.1.7 Mining.

The Agency responsible for mining is the Guyana Geology and Mines Commission (GGMC). It is charged with the recognition of small mining claims and the distribution of medium-scale permits. Large-scale exploration, prospecting and mining agreements are prepared by the GGMC but negotiated by the Minister of Mines. There is no direct representation of Amerindian interests in the GGMC. Whereas the Guyana Gold and Diamond Miners Association is directly represented on the board of the Commission, Amerindian interests have only been represented on the Board, since 1999, through a nominee of the Ministry of Amerindian Affairs, who attends the Board meetings in an advisory capacity.

GGMC has recently signed a Memorandum of Understanding with the EPA, which will ensure that Environmental Management is integrated in mining activities. Thus all large-scale mining operations

are subject to an Environmental Impact Assessment as provided for under the Environmental Protection Act. The GGMC has also recognized that the regulation of small and medium scale mining is difficult because of the number and mobility of operations thus they have undertaken to implement an Environmental Management Agreement (EMA) for these operations. The EMA covers all aspects of mining including the use of equipment, sedimentation, control, vegetation removal, storage and disposal of chemicals and fuel handling and uses of mercury.

Details of the private sector groups involved in mining are presented in Table 5.1.

5.2.1.8 Forestry

The Guyana Forestry Commission (GFC) is responsible for the administration and management of the forest resources of Guyana under the Forest Act. The GFC has successfully collaborated with the EPA to implement and maintain strict environmental management and monitoring programmes of the forest resources of Guyana. To this end the GFC established its own Environmental Unit in 1995 to perform these functions. GFC is now working with other natural resources agencies to better co-ordinate all planning functions and strategies at a national level. The GFC has created buffer zones around Amerindian villages and has streamlined logging activities to prevent encroachment on these communities. Currently the commission is collaborating with the Ministry of Amerindian Affairs to demarcate Amerindian land boundaries. A Code of Practice for responsible forest management was worked out with the Forest Producers Association of Guyana during two years of consultation and was introduced to the industry for voluntary adoption in July 1996. The GFC and the EPA are working together to ensure its full acceptance by industry. The Commission has successfully introduced improved systems to ensure better collection of forest revenue and in 1996 the Government approved increases in Royalty and Acreage Fees to logging and Sawmill Operations.

5.2.1.9 Energy

The new energy legislation in 1997 (Guyana Energy Agency Act) paved the way for the establishment of a new Guyana Energy Agency with overall responsibility for coordination among various energy related departments and units. The Guyana Electricity Corporation (GEC) is responsible for the generation, transmission and distribution of electricity

5.2.1.10 Transportation

The Ministry of Public Works and Communications (Communications and Transport) and the Roads Division are the key GoG Departments tasked with delivering transport policy.

5.2.1.11 Tourism

The Ministry of Tourism, Industry and Commerce (MTIC) is responsible for delivering the National Tourism Development Strategy for Guyana. The Guyana Tourism Authority has the remit, through the Guyana Tourism Authority Act, to deliver this. Achievements to date include cooperation with the Iwokrama Field Station to construct a Canopy Walkway to help ensure non-intrusive enjoyment of the canopy vistas of the Iwokrama Rainforest.

5.2.1.12 Protected Areas

The National Parks Commission (NPC) is the overarching GoG organisation tasked with the management of Guyana's protected areas. Guyana is currently finalising a project document for the establishment of the Guyana Protected Areas System (GPAS), which is a component of the National Protected Area System (NPAS). This project has been undertaken in keeping with international initiatives in the area of conservation and management of biological resources and biodiversity. It has taken on a programmatic approach and has as its major component: capacity building and legislation. Moreover, a National Protected Areas Secretariat, comprising a small multi stakeholder group of agencies and bodies involved in the operation and management of protected areas, was established in August 2000. The Secretariat has been vested with the responsibilty to coordinate planning and implementation of a NPAS which includes the two legally designated protected areas in Guyana (Kaieteur National Park and Iwokrama Rainforest Reserve), as well as five other areas in Guyana. These have been identified as Shell Beach, Kanuku Mountains, Mount Roraima, Orinduik Falls and an area still to be defined in Southern Guyana

5.3 Key Stakeholders, Capacity and Financial Resources within each Sector

Table 5.1 has been prepared to identify (for each key economic sector) a non-exhaustive list of stakeholders (governmental or non-governmental), their responsibility or mandate (if known), their financial capacity and an indication of human resource capacity if known. An attempt is also made to identify the number of senior or technical staff in place within the organisation. This is done to provide an indication of the resource vulnerability of that sector should staff not be retained.

ECONOMIC SECTOR	KEY STAKEHOLDERS (G – GOVERNMENTAL) (NGO – NON GOVERNMENTAL (P –PRIVATE SECTOR)	RESPONSIBILITIES	FINANCIAL RESOURCES AVAILABLE TO STATUTORY BODIES (2005 BUDGET) (G – GOVT SUPPORT) (O – OTHER FUNDING STREAMS IF KNOWN) (NK – NOT KNOWN)	CAPACITY TO DELIVER RESPONSIBILITIES (STAFF NO'S IN 2005 – *SENIOR TECHNICAL STAFF IN ITALICS*) (NB: HEAD OFFICE STAFFING ONLY WHERE KNOWN)
Environment	Environmental Protection			
	Office of the President (Environmental Protection Agency) (G)	Biodiversity protection, environmental public awareness, environmental regulation and enforcement.	G$90,144,000 (G)	11 *(4 ?)*
	Office of the President (National Parks Commission) (G)	To preserve and conserve Guyanese national heritage.	G$103,799,000 (G)	*99 (*3)
	Ministry of Culture, Youth and Sports (Preservation and Culture – National Trust) (G)	Training and research in areas relevant to the development of the people and natural resources of Guyana	G$20,402,000 (G)	11 *(3)*
	University of Guyana (G)	Maintenance of a national collection of specimens, database management, taxanomic research, collection and analysis for identifying areas of conservation.	NK	
	Centre for the Study of Biological Diversity (G)	Research into the methods for the sustainable management of tropical rainforests and non timber forest products	NK	
	Tropenbos Guyana (NGO)	Research into the methods for the sustainable management of tropical rainforests. Specific programmes on sustainable human development.	NK	
	Iwokrama International Centre for Rain Forest Conservation (NGO)	Focal point for research, development and technology transfer.	NK	

ECONOMIC SECTOR	KEY STAKEHOLDERS (G – GOVERNMENTAL) (NGO – NON GOVERNMENTAL (P –PRIVATE SECTOR)	RESPONSIBILITIES	FINANCIAL RESOURCES AVAILABLE TO STATUTORY BODIES (2005 BUDGET) (G – GOVT SUPPORT) (O – OTHER FUNDING STREAMS IF KNOWN) (NK – NOT KNOWN)	CAPACITY TO DELIVER RESPONSIBILITIES (STAFF NO'S IN 2005 – *SENIOR TECHNICAL STAFF IN ITALICS*) (NB: HEAD OFFICE STAFFING ONLY WHERE KNOWN)
	Wildlife Division (G)	Registration, monitoring the legal export of animals and plants from Guyana (incl vet services)	G$147,991,000	
	Conservation International – Guyana (NGO)	CIG works with local communities and GoG to conserve biological diversity and ecological processes that support the people and preserve biological heritage of Guyana.		
	Environmental Health (incl waste management)			
	Ministry of Local Government and Regional Development (G)	To ensure the successful implementation of the Ministry's plans, policies and programmes in accordance with good governance, facilitating infrastructure and human resource development in the regions.		Varies across regions
Agriculture	Ministry of Agriculture (Crops and Livestock Support Services) (G)	To promote and support the growth and development of agriculture in Guyana through the provision of a range of technical and regulatory services to the Sector	G$627,650,000 (G)	157 *(25)*
	Ministry of Agriculture (Hydro-meteorological Services) (G)	To observe, archive and understand Guyanese weather and climate and provide meteorological, hydrological and oceanographic services in support of Guyanas national needs and international obligations	G$100,437,000 (G)	176 (*15)*
	Ministry of Agriculture (Pesticides and Toxic Chemicals Control Board) (G)	To promote and support the growth and development of agriculture in Guyana through the provision of a range of technical and regulatory services to the Sector	G$14,592,000 (G)	<20 *(4)*
	Ministry of Agriculture (Guyana School of Agriculture) (G)	As above	G$161,940,000 (G)	
	NARI (Nat.Agr.Research Inst)	Research and analytical services on soils and plants.	G$248,671,000 (G)	260 *(30*)

ECONOMIC SECTOR	KEY STAKEHOLDERS (G – GOVERNMENTAL) (NGO – NON GOVERNMENTAL (P –PRIVATE SECTOR)	RESPONSIBILITIES	FINANCIAL RESOURCES AVAILABLE TO STATUTORY BODIES (2005 BUDGET) (G – GOVT SUPPORT) (O – OTHER FUNDING STREAMS IF KNOWN) (NK – NOT KNOWN)	CAPACITY TO DELIVER RESPONSIBILITIES (STAFF NO'S IN 2005 – *SENIOR TECHNICAL STAFF IN ITALICS*) (NB: HEAD OFFICE STAFFING ONLY WHERE KNOWN)
Mining	Office of the Prime Minister (Guyana Geology and Mines Commission) (G) Office of the Prime Minister (Guyanas Gold Board) (G) Guyana Gold and Diamond Mining Association (P)	Recognition of small mining claims and the hand-out of medium-scale permits. Large-scale exploration, prospecting and mining agreements are prepared by the GGMC but negotiated by the Minister of Mines.	G$1,624,400,000 (G) G$8,457,410,000 (G) NK	
Fisheries	Ministry of Agriculture (Fisheries) Legal and Inspectorate Research and Development	To manage, regulate and promote the sustainable development of the nations fishery resources for the benefit of the participants in the sector and the national economy.	G$47,630,000 (G)	38 *(5)*
Energy	**Power Supply** Office of the President (Guyana Energy Agency) (G) The Guyana Electricity Corporation (GEC)	Coordination among various energy related departments and units. Responsible for the generation, transmission and distribution of electricity	G$58,759,000(G) NK	
Trade and Industry	**Sugar** Guyana Sugar Corporation (P) **Rice** Guyana Rice Producers Association (P)	GUYSUCO own and control the sugar industry through large plantations and associated factories Association representing Guyanese rice producers to promote growth of industry.	NK NK	
Infrastructure	**Drainage, Irrigation and Sea Defence** Ministry of Agriculture (National Drainage and Irrigation Board) (G) Sea and River Defence Board (Ministry of Public Works) (G)	To provide leadership in the Housing and Water Sectors and ensure the existence of relevant mechanisms and processes to achieve the outlined strategies and the Ministry's mission	G$790,000,000 (G) G$214,359,000 (G)	13 *(0* 8 *(3))*

ECONOMIC SECTOR	KEY STAKEHOLDERS (G – GOVERNMENTAL) (NGO – NON GOVERNMENTAL (P –PRIVATE SECTOR)	RESPONSIBILITIES	FINANCIAL RESOURCES AVAILABLE TO STATUTORY BODIES (2005 BUDGET) (G – GOVT SUPPORT) (O – OTHER FUNDING STREAMS IF KNOWN) (NK – NOT KNOWN)	CAPACITY TO DELIVER RESPONSIBILITIES (STAFF NO'S IN 2005 – *SENIOR TECHNICAL STAFF IN ITALICS*) (NB: HEAD OFFICE STAFFING ONLY WHERE KNOWN)
Transportation	**Roads and Bridges**			
	Ministry of Public Works and Communications (Public Works) (G)	To ensure the effective, efficient and safe design , supervision, construction and maintenance of civil works in Guyana	G$214,359,000 (G)	35 *(5)*
	Ministry of Public Works and Communications (Communications and Transport) (G)	To construct and maintain strategic Govt aerodromes in the hinterland region s and advice Govt on transport issues critical to the development of adequate, efficient and economical air, land and water transport countrywide.	$36,030,000 (G)	4 *(2)*
	Maritime Facilities			
	Ministry of Public Works and Communication (Transport and Harbours Department)	Responsible for activities pertaining to the running, operation and maintenance of harbours and ports in Guyana	G$1,270,000,000 (G)	
	Air Transport			
	Ministry of Public Works and Communication (Cheddi Jagan International Airport Corporation (G)	Responsible for activities pertaining to the running, operation and maintenance of Guyanas international airport.	G$506,076,000 (G)	
	Guyana Civil Aviation Authority (G)	Responsible for activities pertaining to the running, operation and maintenance of Guyanas internal and international aviation industry.	G$256,138,000 (G)	
	Ogle Airport Incorporated Company (P)	Small private sector partnership attempting to extend Ogle airport run way to encourage the development of a larger internal aircraft hub.	NK	

ECONOMIC SECTOR	KEY STAKEHOLDERS (G – GOVERNMENTAL) (NGO – NON GOVERNMENTAL (P –PRIVATE SECTOR)	RESPONSIBILITIES	FINANCIAL RESOURCES AVAILABLE TO STATUTORY BODIES (2005 BUDGET) (G – GOVT SUPPORT) (O – OTHER FUNDING STREAMS IF KNOWN) (NK – NOT KNOWN)	CAPACITY TO DELIVER RESPONSIBILITIES (STAFF NO'S IN 2005 – *SENIOR TECHNICAL STAFF IN ITALICS*) (NB: HEAD OFFICE STAFFING ONLY WHERE KNOWN)
Settlements	Ministry of Amerindian Affairs (G)	To promote the continued integration of the Amerindian Community into the Guyanese Society and to encourage self sufficiency, economic and social development in the hinterland regions.	G$90,044,000 (G)	41 *(4)*
	Office of the President (Guyana Lands and Surveys Commission) (G)	Responsible for the provision of land use maps and cartographic descriptions of Guyana, along with information of leases.	G$373,631,000 (G)	
	Ministry of Housing and Water (Settlement Development and Water Resource Management) (Regulation and Planning)	Housing and Water will provide settlements development, water resource management and regulation and planning, as well as leadership and policy support to the housing a water sectors.	G$354,629,000 (G)	
	Amerindian Peoples Association (NGO)			
Forestry	Ministry of Agriculture (Guyana Forestry Commission) (G)	To regulate, monitor and enforce the sustainable delivery of the national forestry industry as a key component of the Guyanese economy. Policy development and enforcement in the forestry sector.	G$391,200,000 (G)	45 (5)
	Burama (P)			
	Forest Producers Association (P)			
Tourism	Ministry of Tourism, Commerce and Industry (G)	To provide leadership in the Trade, Tourism and Industry sectors and ensure the existence of relevant mechanisms and processes in the public and private sectors to formulate the achievement of the sector strategies and the Ministry's Strategic Plan	G$273,392,000 (G)	57 *(5)*
	G Tourism Authority(G)			

Statistics taken mostly from the Ministry of Finance "Estimates of the Public Sector – Current and Capital Revenue and Expenditure for 2005" – Volume1 and 2.

Table 5.1 Key Stakeholders, financial resources and human capacity.

6 Integration of Environmental Concerns into the Main Economic Sectors

6.1 Identification of Environmental Issues/Concerns

Identification of environmental issues and concerns, coupled particularly with the attempts to integrate the environment within the economic sectors, was undertaken through extensive engagement with stakeholders. Following desk studies, face-to-face meetings, detailed "issues analysis" (see Appendix D), wide consultation and participation (in the form of a national workshop of key stakeholders), the following five cross-sectoral issues of environmental concern have been identified. These have all been ranked as under the heading of "Major" issues – that is, they integrate the environmental concern in to the economic context and potentially influence the delivery of both the NDS and the PRS in the future:

Table 6.1 Major Issue Titles and associated critical sub-components

MAJOR ISSUE TITLE	CRITICAL SUB COMPONENTS
Unregulated Management of Natural Resources (UMNR);	Minerals, agriculture, forestry, trade in wildlife, fisheries;
Climate Change and Vulnerability Assessment (CCVA)	Sea level rise, flood forecasting and warning;
Water Management (WM);	Water supply, distribution, wastewater disposal, drainage and irrigation;
Solid Waste Management (SWM); and,	Solid waste collection, disposal (landfill), recycling, environmental health/pollution; and,
Socio-economic Impacts of Land Use Change (SILC).	Agriculture change, demand for housing, development of ecotourism.

As stressed throughout this CEP, Guyana has two very notable strategies for the eradication of poverty faced by more than 60 % of the population. The National Development Strategy (NDS) and the Poverty Reduction Strategy (PRS) are now cross referenced with the selected Major Issues (above and from the Issues Analysis in Appendix D) to help integrate the environmental concerns into the main economic sectors. An attempt is made to reflect current financial and economic approaches stress in the recent GoG Budget Statement (Ministry of Finance - February 2005) into this exercise.

The following text outlines the specific issues (as raised by stakeholders) that comprise the Major Issue Titles presented in Table 6.1 and provide an indication of its means of implementation (under a generic Implementation Theme header) and an indication of its priority. These Implementation Theme headings are listed below and developed further in Section 9.

IMPLEMENTATION THEME HEADINGS
• Creating environmental accountability across all sectors; • Improving environmental governance; • Co-ordinating the delivery of environmental management; • Communicating benefits of sustainable development to end users; • Better engagement of all end users in the sector; and, • Ownership of the eventual environmental outcome.

Table 6.2 Implementation Theme Headings

6.2 Description of each Major Issue and its Prioritisation

6.2.1 Unregulated management of natural resources

Though exploitation of natural resources is necessary for economic growth, the methods used to extract them is the deciding factor in maintaining the health of the environment and ensuring sustainable development. The following identifies some of the key factors (and stakeholder sectors) associated with measures that extract natural resources that still require attention (NB: tourism is not included in this Major Theme area being a non "extractor" of a natural resource).

6.2.1.1 Mining

Although a clear mining policy and strategy has been published and is complemented by strict mining laws and regulations, the irresponsible actions of miners (sand, gold etc) have had a cumulative effect on land, water and air. Environmental degradation has adversely affected the social, economic, health and environmental conditions of local communities and indigenous peoples downstream by these activities. This situation also has the potential to prevent or stall investment in nature tourism and other recreational activities such as licensed hunting, fishing, bird watching and hiking unless actions are taken to dissuade:

- Land and river bank dredging operations which contribute to water discolouration, compromising hydrological and ecosystem functions through sedimentation, the flooding of back lands caused by altered river flow regimes leading to river navigation problems, water degradation resulting in the loss of domestic water quality for communities downstream, affecting the beauty of waterfalls and loss of biodiversity and biological resources as well as the damage of the landscape due to the failure to rehabilitate land sites after the conclusion of mining operations; and,
- The irresponsible handling, transporting, storage, use of mercury, cyanide, other noxious chemicals and explosive to process gold and other minerals and the haphazard disposal of chemical residual wastes, fuels, oils and lubricants. These materials contaminate and pollute surface and ground water and contribute to the loss of aquatic biodiversity.

The impact on the local indigenous communities involves many social issues such as sexually transmitted diseases and sexual harassment suffered by the local women. The latter is an issue that still needs more attention by the authorities. There are also ongoing issues of land use conflict. The critical issue currently is the management of small scale operations, the ability for the GGMC to enforce both codes of practice and the legislation which is imposed on them to deliver sustainable mining practice and finally, the social impact of mining on local Amerindian communities and the increasing levels of sexual abuse that these communities are facing. ***(Project No. UMNR1).***

6.2.1.2 Oil Exploration

Although Guyana has reserves of hydrocarbons, these have not been extensively exploited. Indications are that "black gold" is present in large quantities in Guyana's offshore zone in the Atlantic. Currently, the environmental and social concerns are, consequently, of a lower order of priority than those of mining, though the issue of managing offshore resources and the environmental impacts of such exploration need to be planned for accordingly, ideally as part of a marine spatial planning system ***(Project No.UMNR2).***

6.2.1.3 Agriculture

The impact of agriculture on the coastland has historically been notable. The introduction and widespread use of the now-banned pesticide, DDT, a few decades ago is believed to have caused a reduction in the population of certain birds such as the carrion crow and the chicken hawk. Intense

agricultural practices and careless farmers can cause a significant amount of pesticides and chemicals to be present in the surface waters that criss-cross the coastland in canals and drains. As a direct result of this, contaminated freshwater fish often consumed by humans can enter the food chain. With the introduction of new legislation and the establishment of the Pesticides and Toxic Chemicals Board, there has been a marked improvement associated with groundwater pollution and inappropriate pesticide use. The uncertainty for the future hinges on the impact of global economies dictating sugar / rice prices (for example) and the impact this could have on the agricultural landscape in Guyana (i.e. adaptation to marketing / growing new crops) and the cumulative impact on the socio-economic environment. ***(Project No. UMNR3).***

6.2.1.4 Fisheries

Guyana's rich marine/fisheries resources can be divided into two categories:

1. The rich resources of its Atlantic Exclusive Economic Zone; and,
2. The rich marine biodiversity resources of its near coastal waters and inland fresh water rivers, lakes, streams, wetland areas and recent development activities in aquaculture.

Although there is a Ministry of Fisheries, Guyana has no national fisheries policy and no adequate institutional framework, national standards or codes of practice to govern the administration and management of the marine/fisheries resources of the country.

Within its Atlantic Exclusive Economic Zone, threats to marine/fisheries resources come from (a) no patrolling, monitoring or protection of this economic zone to secure national sovereignty and economic interests, (b) illegal activities by foreign unlicensed fishing vessels, (c) over-harvesting of resources, especially of some 22 selected or target marine/fish species, (d) illegal or poor fishing practices which may be threatening other marine biodiversity, (e) the potential threats to ecosystems from climate change due to rising water temperatures, rising sea levels, and illegal dumping of ship waste.

Within the near coastal waters and inland fresh water rivers, lakes streams and wetland areas, threats to marine/fisheries biodiversity resources and ecosystems mainly come from pollution and contamination by (a) illegal destruction of coastal mangroves, irresponsible mining and logging practices, (b) unregulated and irresponsible use of pesticides and toxic chemicals by the agriculture, forestry and mining sectors, (c) the congregation of human settlements and activities along these waterways and (d) the impact of urban sprawl from the run off of poorly treated sewage and septic systems.

In relation to development activities in aquaculture threats to land use management and soil degradation come from (a) lack of operational standards for the sector (b) the introduction of exotic fish species and (c) the unregulated use of nitrogen fertilisers and the effect of greenhouse gas emissions. ***(Project No. UMNR4).***

6.2.1.5 Forestry

Guyana has made significant advances towards achieving Sustainable Forest Management (SFM) at the levels of National Policy, Strategic Planning, Legal Reform and Institution Capacity Building. To make further progress emphasis will continue to be focused on improving effective resource management and utilization at the forest stand or operational unit level – and the impact of human activity in the following areas:

- Land Use Management – the allocation of lands within the State 19 Forest Boundary for other uses than the forest resource including eco-tourism;
- Environment and Conservation Management – Encroachment, land clearing and illegal logging. The most serious damage associated with timber harvesting is soil disturbance and the canalisation of water caused by bad road and bridge designs and construction, poor log harvesting techniques and skidding practice and the loss of biodiversity and biological resources caused by irresponsible human intervention;
- Resource Utilisation and Management – Conversion technologies to increase log recovery. Unregulated chain saw operations that impact on ecosystems. Environmentally safe working conditions in the forests and at conversion centres, the management of secondary forests and degraded forest lands;
- Marketing – Sustainable forest management standards that satisfy the requirements of certified timber from sustainably-managed resources and which accepts independent third party market certification; and,

- Research – Resource and species dynamics for forest stand enrichment, water shed protection, forest conservation and natural habitat protection.

6.2.1.6 Trade in Flora and Fauna (Wildlife)

Wildlife is by far the most important commercial Non Timber Forest Product (NTFP) in Guyana and the country's wildlife exports are significant on a global scale. The annual revenue for legal exports varies between US$1.2 and 2million. Profits generated by illegal export of live animals and bush meat would add significantly to this estimate. It has been raised by Conservation International that easier transport routes through Guyana (e.g. the Lethem to Georgetown proposed road system) would exacerbate the situation of illegal trafficking and impact on new areas such as the Kanuku Mountains. There remains great opportunity in sustaining a profitable NTFP business in Guyana.

This should not be overlooked, but managed strategically as part of other GoG policy sectors in a strategic environmental assessment (SEA), particularly with regard to transport policies and programmes. ***(Project No.UMNR5)***

Sub Sector and Project Number	Implementation Theme Areas	Priority (H/M/L)
Mining ***(Project No.UMNR1)***	Communicating benefits of sustainable development to end users; and, Better engagement of all end users in the sector.	Medium
Oil Exploration ***(Project No.UMNR2)***	Improving environmental governance; and, Ownership of the eventual environmental outcome.	Medium
Agriculture, Fisheries and Forestry ***(Project No.UMNR3)*** ***(Project No.UMNR4)***	Co-ordinating the delivery of environmental management; and, Better engagement of all end users in the sector.	High
Trade in Flora and Fauna (Wildlife) ***(Project No.UMNR5)***	Creating environmental accountability across all sectors; and, Better engagement of all end users in the sector.	High

Table 6.3 Implementation Theme Areas to address Major Issue *"Unregulated management of natural resources"*

6.2.2 Climate change and vulnerability assessment

6.2.2.1 Sea Level Rise

90% of the Guyana's population lives on a coastal belt that is 2m below sea level. In the last decade, in particular, extreme weather conditions were more frequent. Given the importance of the coast of Guyana and the services that are provided on this narrow strip, the potential adverse impacts due to sea level rise cannot be overstated. With most of the potable water being provid ed by artesian wells whose water tables are susceptible to saltwater intrusion, increased salinity content of freshwater supplies, and the possible increase in costs to treat these, are real possibilities. Additionally, it is quite possible that given the archaic waste disposal systems in Guyana the potential for further freshwater contamination and water-related illnesses will also increase.

Already, specific areas suffer from saltwater intrusion mainly due to the many drainage canals and water outlets, overtopping, and flooding resulting from heavy rainfall. Any rise in the sea level that

will exacerbate this situation can only lead to further lost of million of dollars, due to further destruction of livelihoods, degradation in the quality of life and decline in land quality. Since the coast is critical to the economic development of the entire economy, the ripple effect is expected to be felt further than the coastal regions of Guyana.

The major constraints are limited institutional capacity in terms of trained professionals and research capability, the lack of and in some cases, low level of awareness of the sea level rise phenomenon and its consequences among the general public, inadequate budgetary allocations to public sector agencies relevant to the implementation of the conventions, lack of new and efficient technology, deficiencies in the current monitoring systems. ***(Project No. CCVA1)***

6.2.2.2 Flood Forecasting and Warning

At the present time, considerable donor attention is being placed on the post flood recovery exercise in Guyana (January 2005 flood event). No exact details of future actions were available at the time of this CEP, though of relevance to it is the mechanism for improving flood forecasting and warning and socio-environmental response to future natural disasters (including but not restricted to floods). Of relevance at the strategic level is the apparent lack of planning and linkages between meteorological or oceanographic data (i.e. – the time series data being compiled by the Hydro-meteorological Service) and short and longer term planning. The paucity of information in terms of helping to undertake flood risk assessments and the current inability to turn weather data into an integrated and meaningful flood forecasting and warning system, for local populations and also for longer term planning, would be of considerable benefit to Guyana. (***Project No. CCVA2)***

Sub Sector	Implementation Theme Area	Priority (H/M/L)
Sea Level Rise (***Project No. CCVA1)***	Communicating benefits of sustainable development to end users; and, Better engagement of all end users in the sector.	Medium
Flood Forecasting and Warning (***Project No. CCVA2)***	Ownership of the eventual environmental outcome; and, Co-ordinating the delivery of environmental management.	High

Table 6.4 Implementation Theme Areas to address Major Issue *"Climate Change and Vulnerability Assessment"*

6.2.3 Water Management

6.2.3.1 Water supply and distribution

In Guyana, there are several factors that contribute to scarce or degraded water resources, include uncontrolled demands from extended urban centres, rural communities, unplanned settlements, agricultural, industrial and mining uses. Ground water for domestic, industrial and commercial uses is sourced from the "A" and "B" sands aquifers. Between 1913-1993 excessive abstractions from the "A" sand aquifer has resulted in the head falling about 20 metres. Because the coastal belt is about 2 metres below sea level, the potential impact on water quality from saline intrusions is an obvious threat. Failure to maintain hydrological records since the 1960s, compounded by the inability to establish with certainty the recharging capabilities of these aquifers, has also cast doubt on the quality and potential sustainability of ground water resources to satisfy current and future needs.

Surface water, mainly for agriculture and mining is sourced from fresh water rivers, creeks and conservancies. Along the coastal belt and parts of the interior highlands, a system of drainage and irrigation canals feeds the conservancies, and contributes to water hydrology management. The use of missile dredges by miners has contributed to unsustainable land use, increased soil erosion and sedimentation and the loss of aquatic biodiversity, including in-land fisheries resources due to damaged ecosystems from altered flow regimes. These have imposed social, economic and health

hardships on indigenous and local communities. Further, due to inadequate maintenance, deterioration of drainage and irrigation systems have compromised hydrological and ecological functions including reduced conservancy capacities, the potential loss of sensitive wetland areas, accelerated water run-off, and less irrigation water to meet the needs of the agriculture sector which is very important to the national economy.

6.2.3.2 Waste water disposal

While access to potable water through house connections and public standpipes is quite widespread, the water and sanitation sector suffers from grave deficiencies due to the low quality of these services. There are three major water treatment facilities to produce drinking water, in Georgetown, New Amsterdam and Guymine.

Throughout the coastal belt there is the potential for increased surface / ground water contamination and pollution from untreated or partially treated sewage, the unregulated and intensive use of fertilisers, agricultural pesticides and industrial chemicals and regular flooding from sea breaches of non-functional drainage systems. All these factors contribute to poor sanitation, increased public health and environmental problems.

6.2.3.3 Drainage and irrigation

The vast majority of agricultural activities take place in the coastal plains. For more than 8 km inland the land is below sea level at high tide. Therefore, drainage and water control are major problems, and agricultural development has always been tied to the defence against water intrusion from the sea and from rainwater runoff. Drainage throughout most of Guyana is poor and river flow sluggish because the average gradient of the main rivers is only 0.2 0/00. Drainage by gravity is possible only when the tide is low because this form of drainage is subject to the effects of the shifting levels of the foreshore outside the sea defences.

Consequently, it has been necessary in many areas to resort to the expensive method of drainage by pumps. Land requires extensive drainage networks before it is suitable for agricultural use. Drainage canals occupy nearly one-eighth of the area of the average sugar cane field. The total length of the irrigation canals in Guyana is 485 km of main canals and 1100 km of the secondary canals. Similarly, the main drainage infrastructure is about 500 km in length while the length of the secondary drainage system is 1500 km.

Irrigated areas are concentrated between the mouth of the Pomeroon river and the Corentyne river. These are located in five out of the country's ten administrative divisions. All areas with fully developed drainage and irrigation facilities are classified as Declared Drainage and Irrigation Areas (DDIA). In addition, the sugar estates also have irrigation and drainage infrastructure.

The water supply for the DDIAs and sugar estates is derived from water conservancies in Region 2, 3, 4 and 5, and from the rivers through pumping in Region 6. Very few control structures exist along the main canals and distributor canals. Flows in the secondary canals are controlled by headgates, and farmers derive water from secondary canals normally by gravity. Minor drains are interspersed with secondary canals that drain directly to the sea through sluice gates (some are associated with pumping stations) or to a façade drain, which drains to the sea at regular intervals. Sluice gates are open twice a day at low tides. Irrigation canals within sugar estates have no slope and are often used for cane transportation.

Most irrigation infrastructure needs extensive rehabilitation, with the exception of some sugar estates and some infrastructure that is being maintained by large-scale farmers. The systems' state of disrepair contributes significantly to lowering Guyana's water use efficiency.

UK DFID is seeking to fund a significant Water Sector Reform programme for Guyana. Specific aspects of this exercise will need to be elaborated upon and separately funded. ***(Project No. WM1)***

Sub Sector	Implementation Theme Areas	Priority (H/M/L)
Water supply and distribution ***(Project No. WM1)***	Creating environmental accountability across all sectors	Medium
Waste water disposal ***(Project No. WM1)***	Improving environmental governance; and,	Medium

Sub Sector	Implementation Theme Areas	Priority (H/M/L)
	Ownership of the eventual environmental outcome.	
Drainage and irrigation ***(Project No. WM1)***	Co-ordinating the delivery of environmental management; and, Better engagement of all end users in the sector.	High

Table 6.5 Implementation Theme Areas to address Major Issue *"Water Management"*

6.2.4 Solid Waste Management

6.2.4.1 Solid waste collection and disposal

Many of the urban centres have key solid waste collection and disposal problems. This is true for all towns and cities in Guyana and in locations of commerce such as market places and locations occupied by vendors. These places need more up to date garbage collection methods and facilities. Location of garbage disposal sites is also an issue, the identification of land fill sites near or in the city is a standing issue between residents of the city and the authorities, which is coming to a resolution through the mediation of the Solid Waste Management Programme of IDB.

Georgetown itself has a high population density of 40.4 people per hectare. This is a result of many people moving into the city in the search for jobs and generally a better standard of living. The city itself was not designed for such a large population and has long begun to show signs of stress in its infrastructure, such as on the roads, sewerage systems, water and electricity supplies. This can be further extended to the overcrowded schools, and burdened hospitals and clinics. Also the level and volume of waste generated has increased thus putting added strain on the solid waste management facilities. The high population density has also put a strain on the land space in the city, more than one house being built on lots designated for single homes. This has resulted in severe overcrowding, and illegally constructed homes are functioning without the necessary connections to sewerage systems, as well as electricity and water supplies.

The solid waste management issue is further compounded by:

- No effective record keeping and statistical data on solid waste generated by domestic commercial, industrial, medical, agricultural, sea or air transportation;
- No national policy or strategy to effectively deal with integrated waste management;
- Poor infrastructure and services for collecting, transporting, treating and disposing of waste including special hazardous waste generated from ships or aircrafts and medical waste;
- Poor public health and safety compliance and enforcement mechanisms associated with integrated waste management and disposal; and,
- A lack of public awareness and education programmes.

IDB is currently funding a Solid Waste Management Programme, however, many sub aspects of this highly important Major Issue heading are likely to require focused attention for all international donor agencies. ***(Project No. SWM1).***

6.2.4.2 Recycling of waste,

There are no national programmes to deal with waste recovery, recycling and reusing activities. The aftermath of the recent flood events demonstrated clearly the amount of non biodegradable material present in ditches, yards and on streets. The impact this had on preventing natural drainage of flood waters through culverts and grates certainly played some part on the flood impacts on localised areas. A robust strategy of recycling (tested through pilot project initiatives to determine the best approach) is now critical. ***(Project No.SWM2)***

6.2.4.3 Environmental health/pollution

Environmental Health focuses on ensuring the safe maintenance of the social, physical and chemical environments, in order that any negative impacts on human health are marginalised. However, a safe environment may only be achieved with the total commitment of public agencies, the private sector, NGOs and the general population in preventative and public education programmes.

The potential for negative impact on the environment that can affect the quality of peoples lives is mainly through human activity and may be classified as follows:

- Economic production where the processes of extraction, conversion, fabrication, storage, transportation, distribution and residual disposal can generate acute and chronic health hazards, the degradation of the physical environment and ecosystem destruction;
- Altering the physical environment - building structures, unplanned settlements, paving roadways, exploitation of natural resources, damming and diverting surface waters, vector-borne diseases, polluting emissions, etc; and,
- Individual functioning where they relate to reproductive decisions, demand and consumption patterns, energy users, transportation practices, the disposal of biological, agricultural, chemical and product waste, personal responsibilities and capabilities to take health protective measures.

A better appreciation of the environmental health impact on local communities and Amerindian titled areas is required. The outcome of which would feed directly into updates and revisions of the PRS. ***(Project No. SWM3).***

Sub Sector	Implementation Theme Areas	Priority (H/M/L)
Solid waste collection/disposal, ***(Project No. SWM1)***	Creating environmental accountability across all sectors; Improving environmental governance; Co-ordinating the delivery of environmental management; Communicating benefits of sustainable development to end users; Better engagement of all end users in the sector; and, Ownership of the eventual environmental outcome.	High
Recycling of waste, ***(Project No. SWM2)***	Improving environmental governance; Co-ordinating the delivery of environmental management; Communicating benefits of sustainable development to end users; Better engagement of all end users in the sector; and, Ownership of the eventual environmental outcome.	High
Environmental health/pollution ***(Project No. SWM3)***	Creating environmental accountability across all sectors.	High

Table 6.6 Implementation Theme Areas to address Major Issue *"Solid Waste Management"*

6.2.5 Socio-economic impacts of land use change

6.2.5.1 Land Use Change from agriculture to housing

Land use conflict (in between Demerara and Berbice Rivers) is becoming a real twenty first century issue for Guyana. In the city, land use conflicts exist between land users with commercial, residential, recreational and industrial interests. One key issue is that of the squatters who reside upon city reserves and private land. Recently the problem has begun to receive attention from city authorities. There is also the issue of vendors occupying critical locations such as roadsides and pavements to set up their stalls and conduct business. This occupation has contributed to traffic congestion in the immediate and not so immediate locations. A critical issue that often is not addressed is linked to the cumulative impact of small-scale land use change.

On the face of it, the change of a small holding to housing may not appear significant in terms of environmental impact, however, when collectively assessed, the increased service provision, transportation networks, waste disposal issues, drainage implications and noise pollution possibilities all contribute to a changing and potentially damaging society.

An assessment of cumulative impacts and strategic environmental assessments of landuse change, coupled with robust information management at a national level and environmental indicator setting is required to assist national land use planning. ***(Project No.SILC1)***

6.2.5.2 Tourism

Ecotourism is a relatively new industry in Guyana. It is the country's alternative to the triple "S" package of its sister Caribbean islands of sun, sea and sand. Not possessing white sandy beaches and cobalt coloured sea, the country chooses to offer the sandy beaches that line many rivers and islands, and the tea-coloured creeks and rivers that carry dissolved minerals and folic acid from fallen leaves and vegetation.

The ecotourism industry is an economic opportunity for Guyana and, if carried out appropriately, will contribute to the conservation of the largely intact interior environment. Slowly the number of resorts and lodges increase will increase, offering adventure and eco-tourists an experience different from the beach and surf atmosphere of the typical island experience.

The fact that Guyana still has most of its forested areas intact, with 80% of the country under forest, with some parts still considered virgin jungle, sets the country apart from many other destinations offering eco-tourist visits. In addition to this, many of the flora and fauna are still around, though some are listed as endangered species.

Many people see the advent of the ecotourism industry as a possible alternative to more extractive forms of exploitation of the environment such as logging and mining. Ecotourism is viewed as an environmentally friendly way of utilising the natural environment as opposed to traditional forms of tourism as well as newer ones such as nature tourism and adventure tourism, which are not necessarily environment friendly.

Another important element in ecotourism is the consideration of the cultural sustainability and well being of indigenous communities in the various locations. The success of an eco-tourist destination depends heavily on the state of the surrounding ecosystem, therefore creating an incentive for the stakeholders involved to exercise more care with their physical environment. Iwokrama, Shell Beach, Arrow Point Nature Resort and others all pay testimony to the importance of preserving and conserving the surrounding natural appeal that attracts the visitor in the first place. It is also argued by some that on a long-term basis, ecotourism can generate more income than other economic activities in the areas such as logging or mining. A robust Tourism Master Plan is required to enable to potential of eco-tourism to become a reality***. (Project No.SILC2)***

6.2.5.3 Transportation

Guyana's transportation system is typical of developing countries and it is far from being developed to its full potential. Although there exists a fairly good road network in most densely populated areas of the coast, transportation needs still exist in all parts of the country. Rivers still provide an invaluable and crucial means of transport where roads are absent. The resurrection of the railway network could have significant environmental benefits in the urban areas. This is likely to be reviewed

as part of the recently commissioned EC study on transport and infrastructure across all sectors e.g. road, rail , sea and air.

A critical issue is being able to evaluate the environmental impact of a transport policy or programme. This can be done through the use of SEA. The Lethem to Georgetown road construction, for example, requires more than just an EIA, and should (at a top level) be able to assess its impact on social groups, economic development as well as physical impact at all scales. (***Project No.SILC3)***

Sub Sector	Implementation Theme Areas	Priority (H/M/L)
Land use change from agriculture to housing (***Project No.SILC1)***	Creating environmental accountability across all sectors; Co-ordinating the delivery of environmental management; Better engagement of all end users in the sector; and, Ownership of the eventual environmental outcome.	High
Tourism (***Project No.SILC2)***	Creating environmental accountability across all sectors; Co-ordinating the delivery of environmental management; Communicating benefits of sustainable development to end users; and, Better engagement of all end users in the sector.	High
Transportation (***Project No.SILC3)***	Creating environmental accountability across all sectors; Improving environmental governance; Co-ordinating the delivery of environmental management; and, Ownership of the eventual environmental outcome.	High

Table 6.7 Implementation Theme Areas to address Major Issue *"Unregulated management of natural resources"*

7 EC Co-operation

7.1 Review and Evaluation / Impact of Previous Interventions

The following projects outline the commitment and investment provide by the EC through technical assistance cooperation, loans and credit agreements.

	EC Projects/Loans in Guyana over the past 20 years	
Account No	**Title of Project**	**Date of Decision**
	INDICATIVE PROGRAMME ***FOCAL AREA: Rehabilitation of Economic Infrastructure***	
6.ACP.GUA.002	Sectoral Import Programme	4/6/87
6.ACP.GUA.003	River Ferry Services-Immediate Action Programme	10/24/86
6.ACP.GUA.006	Infrastructure Rehabilitation	7/30/87
6.ACP.GUA.014	Pre-Feasibility Study- Demerara Harbour Bridge	5/12/92
6.ACP.GUA.015	TA-New Amsterdam Water Supply Project	5/12/92
6.ACP.GUA.016	Lome IV Sea Defence Study	6/5/92
6.ACP.GUA.020	Pouderoyen Water Supply Project-Appraisal	11/2/94
6.ACP.GUA.023	TA-PEU Sea Defence Rehabilitation Programme	12/20/93
6.ACP.GUA.024	TA-Investigation in Sea Defences	9/19/96
6.ACP.GUA.025	TA-NAO's Office	12/16/96
6.ACP.GUA.028	Programme Appraisal/Prep. Financing. Prop. Sea Defence	1/6/98
6.ACP.GUA.029	TA- Low Income Housing (KAMPAX)	7/3/00
6.ACP.GUA.030	Elaboration Study for Sea Defences	1/1/03
	OUTSIDE OF FOCAL AREA	
6.ACP.GUA.004	TA-Oriental Fruit Fly	12/23/87
6.ACP.GUA.007	TA-Tourism Development	7/11/88
6.ACP.GUA.010	TA Rehabilitation of Toxicology Unit	4/11/89
6.ACP.GUA.011	Dairy Development Preparatory Study	7/3/89
6.ACP.GUA.013	Preparation of General Import Programme	12/14/90
6.ACP.GUA.018	TA- Establishment of Private Sector Centre	5/3/96
6.ACP.GUA.019	ID Study: Lome IV 2nd Financial Protocol	7/13/94
6.ACP.GUA.021	Small Business Credit Initiative (SBCI)	8/12/94
6.ACP.GUA.022	Study: Drug Traffic/Abuse	12/8/94
6.ACP.GUA.026	Mid Term Evaluation – SBCI	6/20/97
6.ACP.GUA.027	Study of HRD needs in Private Sector	11/25/97

EC Projects in Guyana - 7th EDF (grants): National Indicative Programme

Account No	Title of Project	Date of Decision
	INDICATIVE PROGRAMME	
	FOCAL AREA: Rehabilitation of Economic Infrastructure	
7.ACP.GUA.006	TA-Sea Defence Rehabilitation	5/18/93
7.ACP.GUA.007	New Amsterdam Water Supply (Phase 11)	7/14/92
7.ACP.GUA.011	Rehabilitation of Sea Defences	12/20/93
7.ACP.GUA.012	Rehabilitation of Demerara Harbour Bridge	7/14/92
7.ACP.GUA.017	Pouderoyen Water Supply Rehabilitation Project	11/21/94
	OUTSIDE OF FOCAL AREA	
7.ACP.GUA.002	TA-Setting up of Private Sector Centre	1/15/93
7.ACP.GUA.005	Development of Small Business Credit Initiative	12/18/92
7.ACP.GUA.014	TA-Establishment of Private Sector Centre	2/18/92
7.ACP.GUA.024	Technical assistance to the NAO's Office	12/16/96
7.ACP.GUA.025	Study- Economic Appraisal of Sea Defences	3/11/99
	TRANSFERRED FROM THE 5TH EDF	
7.ACP.GUA.008	East Bank Berbice culverts	3/19/81
7.ACP.GUA.016	Development of Small Business Credit Initiative	8/12/94
7.ACP.GUA.027	General elections 2001: Financial Needs assessment	1/25/00
	NON PROGRAMMABLE FUNDS	
7.ACP.GUA.003	General Import Programme 1	9/2091
7.ACP.GUA.015	General Import Programme 11	5/20/94
7.ACP.GUA.019	Support Structural Adjustment Programme/ GIP 111	10/27/95
7.ACP.GUA.020	Support Structural adjustment programme	10/27/95
7.ACP.GUA.026	Debt Relief (HIPIC)	12/16/99
	SYSMIN Operations	
7.ACP.GUA.009	SYSMIN	11/8/88
7.ACP.GUA.013	Feasibility study- Guyana/Brazil road	7/1/98
7.ACP.GUA.022	Ta- Examining SYSMIN request	5/15/96
7.ACP.GUA.023	Study- Economic Diversification of Linden	1/1/98
	LOANS FROM THE EUROPEAN INVESTMENT BANK	
7.ACP.GUA.004	Bauxite Rehabilitation	12/15/92
7.ACP.GUA.018	IPED Global loan	4/3/95
7.ACP.GUA.021	Rosehall Water Supply Rehabilitation	11/7/95

EC Projects/Loans - 8th EDF (grants): National Indicative Programme

Account No	Title of Project	Date of Decision
	INDICATIVE PROGRAMME	
	I ST AREA OF CONCENTRATION: INFRACSTRUCTURE	
8.ACP.GUA.005	Guyana Sea Defences	12/21/99
8.ACP.GUA.007	Guyana Sea Defences-ADK	1/1/00
	2 nd area of concentration: Private Sector Development	
8.ACP.GUA.003	ID Study: Human Resource Development Programme	7/15/98
8.ACP.GUA.006	Technical Assistance- Feasibility Study	9/21/99
8.ACP.GUA.008	Guyana Training Agency	1/1/00
8.ACP.GUA.010	Preparation of Country strategy paper for 9th EDF	11/30/00
8.ACP.GUA.013	Country support strategy	11/27/01
8.ACP.GUA.015	Low Income Housing Programme	12/10/02
8.ACP.GUA.016	Micro Projects Programme	10/4/02
8.ACP.GUA.017	Feasibility Study for BS Programme - 9th EDF	2/24/03
8.ACP.GUA.018	Elaboration Study for support to the NAO- 9th EDF	3/8/03
8.ACP.GUA.019	Transport Sector Study	3/17/03
	NON PROGRAMMABLE FUNDS	
8.ACP.GUA.001	Structural Adjustment Support IV	6/30/98
8.ACP.GUA.002	Structural Adjustment Support IV	6/30/98
8.ACP.GUA.004	Structural Adjustment Support V	1/1/99
8.ACP.GUA.009	Linden Economic Advancement Programme	10/27/00
8.ACP.GUA.011	IPED 11 Loan from EIB	12/22/00
	LOANS FROM THE EUROPEAN INVESTMENT BANK	
8.ACP.GUA.014	Rosehall Water Supply Rehabilitation	12/4/00
8.ACP.GUA.012	Power Project	7/24/01
	EC PROJECTS/LOANS - 9TH EDF (GRANTS): NATIONAL INDICATIVE PROGRAMME	
9.ACP.GUA.001	Micro-Projects Programme (** includes 1 m from uncommitted funds*)	1/1/03
9.ACP.GUA.002	Design & Tender Procedure - Guyana Sea Defences	1/1/03
9.ACP.GUA.003	Institutional Strengthening of the NAO's Office	1/1/04
9.ACP.GUA.004	Transport Sector Study	1/1/04
9.ACP.GUA.005	*Technical Cooperation Facility?*	*1/1/04*
	Sea Defences	
	Macro-economic support to the social sector (Housing, Health & Fin.)	
Account No	**REGIONAL PROGRAMMES**	**Date of Decision**
6.ACP.RPR.101	ST Ration Air Cargo Service	4/18/88
6.ACP.RPR.122	TA CARDI for CARIB. Agri Project	6/30/88
6.ACP.RPR.234	Study for the Guyana/Brazil road Link	6/22/89
6.ACP.RPR.239	Study for Telecom Guyana/ Suriname	7/26/89
6.ACP.RPR.479	CARICOM Regional Carib. Conference- Brussels	5/25/92

6.ACP.RPR.518	Mission of CARICOM's Secretary General	2/16/92
6.ACP.RPR.530	Guyana -Suriname Ferry Portconsult-operational Arrangement	12/2/85
6.ACP.RPR.556	Guyana -Suriname Ferry Portconsult-operational Arrange.-Extension	12/2/85
7.ACP.RPR.441	Regional Airport (Guyana's part only)	11/4/94
7.ACP.RPR.203	Guyana -Suriname Ferry (Guyana's part only)	12/2/85
8.ACP.RCA.002	Preparation of HIV/AIDA programme	10/1/98
8.ACP.RCA.010	Cariforum Radar Network system	7/9/99
8.ACP.RCA.016	TA Preparing 2nd Phase Caribbean Regional Airport Programme	10/18/99
8.ACP.RCA.022	TA for Preparation of Caribbean Telecommunications Union Programme	6/30/00
8.ACP.RCA.027	TA Preparing 9th EDF Caribbean Regional Support Strategy	5/10/01
8.ACP.RCA.028	TA - Joint Working Group for finalisation of Regional Support Strategy	11/13/01
8.ACP.RCA.030	Regional Airport Programme Phase II - Prep. Financial Proposals	12/20/01
8.ACP.RCA.032	Feasibility Study Rice in the Caribbean	3/1/02
8.ACP.TPS.125	Integrated Develop. Programme for Caribbean Rum (Guyana's part only)	12/14/01
9.ACP.RPR.006	Support to the Competitiveness of the Rice Sector in the Caribbean	10/31/03
9.ACP.RCA.001	Regional Weather Radar Warning System	10/23/03

In addition, the following reports on EC Assistance programs can be reviewed at the EC Delegation in Georgetown.

- Evaluation of the Environmental Performance of the EC Programmes in Developing Countries (B7-5091//95) Volume 1 – Executive Summary Dec 1997: Volume 2 Main Study;
- Technical Report: Guyana Environmental Management Project Preparation Mission – Institutional Design Consultancy – Sept 1995 ERM;
- Preparation Study for the Creation of a Protected Area in the Kanuku Mountains Region of Guyana – Final Report – August 1993 – Agriconsulting;
- The Multi-donor Mid Term Review of the Iwokrama International Centre for Rain Forest Conservation and Development – Draft Final Report – April 2001 – Environment and Development Group, Oxford, UK;
- EC Project B7-6021/98-02/VIII/FOR – Guyana – Conservation and Sustainable Utilisation of biodiversity in the Iwokrama Forest – Steven Devenish; and,
- Forestry Certification – a report to the EC (1996) International Institute for Environment and Development.

7.2 Risk Evaluation

It is of importance to be able to undertake a risk evaluation of all donor-funded initiatives. The EC separately undertakes evaluations on most of its projects. The following comments are made here on general findings and perceptions, both from discussions with the EC and with donor recipient agencies. One key conservation project is focused on in a little more detail to complement this task; the “Conservation and Utilisation of Biodiversity in the Iwokrama Forest” which received EC funds amounting to circa EUR1.5 million (Devenish 2003).

This was prepared to be of some use for the EC when planning future funding interventions.

7.2.1 Effectiveness

A common denominator in most donor-funded projects is lack of clarity. When setting or requesting a management plan (for example), these need to be practical, easy to use and understand and importantly, targeted to those groups who will be implementing them. Linked to this is the importance of appropriate information management. Data and information are critical aspects of effective decision making, and attention should be placed on the “management” of information to achieve the goals of the project, as opposed to setting up a system (e.g. a geographical information system) that is subsequently “hijacked” for research and interest purposes.

This appears to be the case regarding the situation for Iwokrama (EC Project B7-6021/98-02/VIII/FOR).

7.2.2 Relevance

On balance, the interventions have been relevant according to the environmental context (the habitats are worth conserving), and the community interest, wherein the actions are aligned with the NDS and the PRS. To gain total sustainability (environmental and financial) takes time. There are very few projects globally that have demonstrated evidence of sustainability in less than ten years. Therefore, whilst most EC assisted environmental projects in Guyana cannot genuinely advocate that their presence has contributed to the sustainability of the wider environment; this is far too ambitious. The good work that has been carried out now needs to be enshrined within a robust, governance plan for the GoG that provides confidence that future projects will continue to be relevant. With reference to Iwokrama (EC Project B7-6021/98-02/VIII/FOR), the design of the Project concept certainly supports its overall goals by aiming to develop management systems to protect the ecology and biodiversity of the wilderness preserve. The only outstanding question for this and other projects relates to whether the specific choice and design of each component actually contributed to the goals in a positive or negative way.

7.2.3 Efficiency

On balance, the individual costs of any given project cannot totally justify the benefits that they generated. This is because the implementation style of the government is unnecessarily unwieldy and long-winded. Further reform is necessary to capture all the project benefits. In the case of the Iwokrama project (EC Project B7-6021/98-02/VIII/FOR), project administration weighed heavily on the project and distracted staff working on technical implementation issues. Additionally, any technical work contracted out to specialist services should be restricted to as few as possible to maximise consensus and simplify implementation. The key lesson here is efficient planning (business and resource) at the start of a project. This needs to come from both the donor and recipient but also with assistance from a dedicated staff officer from the donor agency in country office. Failure to do this inevitably results is reduced efficiency towards the end of a project, thereby affecting the impact, sustainability, effectiveness and relevance of the project.

7.2.4 Impact

Undoubtedly the projects have contributed to the overall objectives of GoG regarding the NDS and the PRS. There has been, on the whole, good communication externally with stakeholders, however, the main issue relates to continuity of good practice once the project/programme funds expire. Another main impact is the lack of donor visibility in the project area. This has been raised on a number of occasions whereby the donor agency (e.g.: EC) does not appear to be present on the ground and helping to improve relations and communication pathways with the actual end user of the project/programmes outcomes. Attempts to address this could potentially have a positive impact on long-term relations between the end user and donor agency.

There are no obvious gender-related, environmental or poverty-related impacts that remain unaddressed by the projects. The case of Iwokrama (EC Project B7-6021/98-02/VIII/FOR) derived an important lesson in not being too over ambitious in setting tasks. In that instance, the issue of bio prospecting is long term and speculative which cannot be finalised in a three-year project. Too many of these over-expectations can leave a negative sense of impact after a project. Being able to set realistic outcomes, to improve the impact perception of a project, is a better approach to take.

7.2.5 Sustainability

The projects have been well supported and had considerable goodwill, though perhaps have lacked the visibility in the media that other donors' projects have attracted. There is often no financial sustainability at present and further EC support will be necessary during the next ten years to ensure that the project benefits and outcomes are not lost. Even the presence of a robust financial business plan (which should be a pre-requisite of receiving initial funds) may not necessarily be fully operational until after donor money has finished (after three years).

The technical contributions of the projects have fitted well with existing needs, culture and traditions, however, guaranteeing sustainability is a long term-commitment. Assessing the sustainability results after a project (e.g.: for Iwokrama (EC Project B7-6021/98-02/VIII/FOR)), is more likely than not, going to give a negative message of lack of financial and social sustainability. In the case of Iwokrama, it was believed (Devenish 2003) that project objectives and expected outcomes were over ambitious within the timescale provided.

The absence of agreed environmental indicators for Guyana needs to be addressed (see Section 3) to help pave the way for better decision-making and adaptive planning over the medium to long term.

8 Co-operation Funded by Other Donors

8.1 Interventions of Other Donors (recent/planned programmes)

8.1.1 Financing and Investment for Sustainable Development

In addition to the EC, other key international donors operating in Guyana include:

- UNDP (United Nations Development Programme);
- UNEP/UNESCO/UNICEF;
- WWF;
- World Bank (GEF);
- DFID (Dept for International Development – UK);
- IDB (Inter-American Development Bank);
- CDB (Caribbean Development Bank);
- DFID (UK Department for International Development);
- CIDA (Canadian International Development Agency);
- USAID (US Agency for International Development); and,
- VSO (Voluntary Services Overseas) – staff assistance instead of donor assistance.

A selection of relevant environmental related or social improvement (excluding health specific projects/programmes) are provided in Table 8.1 below:

Project / Programme	General Goals	Institution/s Responsible for Investment
A Comprehensive Disaster Management Programme	To develop a Comprehensive Disaster Management Strategy	UNDP-Guyana; PAHO
Capacity building for Environmental Management in the Sustainable Utilisation for Natural Resources (particularly, biodiversity, renewable energy and pollution prevention)	To promote sustainable utilisation of natural resources with specific reference to biodiversity, renewable energy and pollution prevention and control.	UNDP
GREEN FUND	To provide financial resources for community based initiatives and some technical report related to environmental enhancement and protection	UNDP-Guyana
Review and Assessment of Existing Mechanisms for Harmonization of Bio-safety related Legislation in Guyana (2005)	Assessment of legal instruments and improvements to the current legal system in Guyana on bio-safety.	UNEP/EPA
Survey of the Existence of National or Regional Risk Assessment/Management Capacities and Recommendations for Mechanisms for Harmonization in countries of the Latin America and Caribbean sub region. (2005)	Promote integrated measures to propose for more effective environmental risk management that may be adopted across the Caribbean and Latin American region for direct benefit to Guyana.	UNEP/EPA
Caribbean Renewable Energy Development Programme	To develop the necessary financial mechanisms to promote investment into renewable energy projects and a pipeline of renewable energy projects	GEF/GTZ
Regional Caribbean Planning for the Adaptation to Climate Change (CPACC) and Mainstreaming Adaptation to Climate Change (MACC)	To assist member countries to prepare for adaptation to climate change and to improve capacity of implementing agencies at the national and regional levels	OAS WB/GEF
Public Management Modernisation Program (US$5M)	LOAN	IDB
Georgetown Solid Waste Management Project	To contribute to the improvement of the environment and consequently the quality of life of the Georgetown and environs population, through better solid waste management	IDB
Environmental Management Programme Phases 1 and II	To consolidate a sustainable environmental management system and to develop sector –wide capacity for the implementation of environmental programme	IDB
Citizens Security Program (US$10M)	LOAN	IDB
Rural Transportation Program (US$10M)	LOAN	IDB
Georgetown to Diamond Road Program (US$26M)	LOAN	IDB
Support for Competitiveness Sector Program (US$37M)	LOAN	IDB
Agriculture Diversification Program (US$5M)	LOAN	IDB
Justice Sector Strengthening Program (US$5M)	LOAN	IDB
Preparation of a Justice Sector Reform Program (US$300 000)	TECHNICAL COOPERATION	IDB
Guyana Poverty Assessment and Public Expenditure Review Program (US$250 000)	TECHNICAL COOPERATION	IDB
Local Government Institutional Strengthening in view of Decentralisation Policies Program (US$150 000)	TECHNICAL COOPERATION	IDB
National Solid Waste Master Plan (US$150 000)	TECHNICAL COOPERATION	IDB
Diagnostic and Design of Citizen Security Interventions Program (US$150	TECHNICAL COOPERATION	IDB

Project / Programme	General Goals	Institution/s Responsible for Investment
000)		
Strengthening of National Pension Systems (US$300 000)	TECHNICAL COOPERATION	IDB
INDES (US$1M)	TECHNICAL COOPERATION	IDB
Youth Employment (US$150 000)	TECHNICAL COOPERATION	IDB
Linden-Lethem Road Upgrade Project, Pre-Feasibility Study (US$150 000)	TECHNICAL COOPERATION	IDB
Community Engagement Study of Social Impacts of Proposed Roads Upgrade (US$150 000)	TECHNICAL COOPERATION	IDB
Increase Access to Primary Health Care for Amerindian Communities (US$750 000)	TECHNICAL COOPERATION	IDB
Poverty Assessment in Vulnerable Populations (US$70 000)	TECHNICAL COOPERATION	IDB
Access to Wireless and Telecoms by indigenous Populations (US$40 000)	TECHNICAL COOPERATION	IDB
Poor Rural Community Support Services programme	To enhance support services in poor rural communities	CDB
Technical Vocational Educational Training (TVET)	LOAN	CDB
Establishment of a youth training program	TECHNICAL COOPERATION	CDB
Diagnostic Study for the Computerisation of the Ministry of Home Affairs	TECHNICAL COOPERATION	CDB
Establishment of a Coastal Management System – EPA	TECHNICAL COOPERATION	CDB
Institutional Strengthening of the Ministry of Finance	TECHNICAL COOPERATION	CDB
Development and Implementation of a Training Program for the Guyana Revenue Authority	TECHNICAL COOPERATION	CDB
Market Demand for Tourism	TECHNICAL COOPERATION	CDB
Greenhouse Gases Emission Reduction Related to the Rice and Wood Industries in Guyana	To reduce Greenhouse Gases emitted from the rice and wood industries in GY	CIDA
Guyana Environmental Capacity Development in the Mining Sector (GENCAPD) (CND$3.95m)	To develop educational materials with regards to the use of environmentally friendly technology in the mining sector	CIDA
Iwokrama Project Assistance (CND$2.1m)	Support to Iwokrama (end 2004)	CIDA
UNICEF Sustainable Amazon Project	To promote sustainable improvement in health and well-being in Amazon programme Communities through improved water supply and improved sanitation.	UNICEF
Local Systems for Integrated Child Protection	To improve sanitation through hygiene education and the construction of Ventilated Improved Pit Latrines (VIPs)	UNICEF
World Heritage Poverty Alleviation programme	To rehabilitate an Old Railway Station For use as a market for indigenous products, as well as a training venue for young entrepreneurs.	UNESCO
Guyana Marine Turtle Conservation Strategy	To facilitate the establishment and effective management of the proposed Shell Beach Protected Area	WWF-Guyana's Forests and Environmental Conservation Project
Biological Diversity Conservation	To develop management plan for selected species to protect biological diversity	WWF-Guyana's Forests and Environmental Conservation Project
Environmental Impact Monitoring/Gold Mining Project	To monitor the impacts of mercury pollution in selected bodies of the Mazaruni Basin in Guyana	WWF-Guyana's Forests and Environmental Conservation Project

Project / Programme	General Goals	Institution/s Responsible for Investment
SIMAP III AND BEAMS	To develop a system by which environmental issues will be integrated within the SIMAP project cycle for Phase III activities	SIMAP and BEAMS
Guyana Water Sector Programme (GUYWASP) (£13m)	To provide sustainable universal access to safe and affordable water for the population of Guyana through sector aid and supported by a multi-donor group (Current)	DFID
Guyana Education Access Project (GEAP) (£12.8m)	Establishing an improved secondary education system in two impoverished areas which can be replicated nationally.	DFID
Education Strategic Development Plan (£92k)	To assist GoG in meeting the targets stipulated under the Education Strategic Development Plan within the framework of the Fast Track Initiative (FTI)	DFID
Assistance to Guyana Lands and Surveys Commission (GLSC) – Phase 2 (£4.8m)	To improve sustainable livelihood options for all lad users, especially poor and vulnerable groups through support to the development of GoG land policy, land tenure and capacity building of GLSC	DFID
Improving Social Cohesion, Security and Governance in Guyana (£633k)	Support to join UNDP/CIDA/DFID to progress towards improved social cohesion and effective mediation; enhanced security and access to justice for citizens.	DFID
Poverty Reduction Strategy Support (PRS) (£300k)	Technical fund to support GoG in managing the PRS.	DFID
Iwokrama Core Support (£112k)	Support for core running costs to assist Iwokrama in the promotion of the conservation and sustainable and equitable use of tropical moist forests in a manner that leads to lasting ecological, economic and social benefits.	DFID
Flood Relief Support (£789k)	Technical Assistance	DFID

Table 8.1 Relevant environmental related or social improvement projects/programmes)

8.2 Evaluation of Anticipated Impact

Figure 8.1 shows how the main development partners are engaged in supporting the PRSP priority areas in Guyana. The IDB is by far Guyana's largest donor. With disbursements averaging US$40-50million over the past few years, the IDB outranks the next largest donor, the EC by a factor of nearly five (according to 2000 compiled statistics). IMF and USAID both have higher budgets than the World Bank.

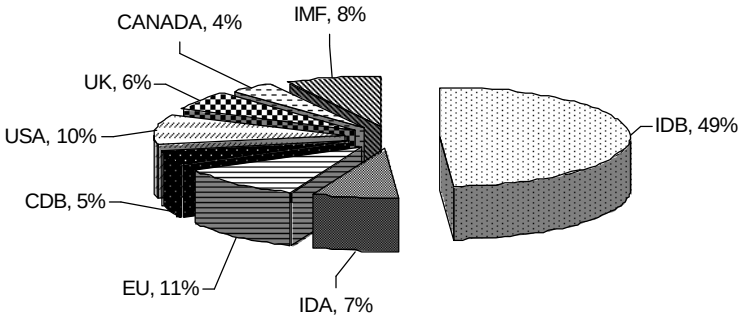

Fig. 8.1 Guyana: Distribution of Official Assistance Flows (disbursements) 2000 (adapted from World Bank, 2002)

Table 8.1 indicates significant commitment by the international donor community to the GoG and its people. What is really needed in order to optimise the benefits of these projects is energetic civil reform and a budget line that places sustainability at the heart of government action. It will be essential that the GoG responds to the above projects by encouraging the counterpart ministries, departments, divisions to pick up where the projects leave off (after the project funds finish).

The PRS adhered to the following risk assessment headings to address a number of internal and external factors that could put the success of a strategy at risk. Some of these can be influenced by GoG and by other forces in society; others are exogenous to the domestic situation. These headings are mirrored here to help evaluate the possible impact of many identified programs highlighted in Table 8.1.

8.2.1 National Consensus

Any international contribution must be founded on a national need and general consensus. The consultation process of the civil society (as part of the PRSP) has had a breadth and depth never seen before in Guyana, establishing a positive momentum for a process of dialogue that can continue to be consolidated and strengthened as a mechanism for examining and finding solutions to the environmental challenges that face Guyana. Avoiding political disagreements on environmental programme decisions is paramount and must be avoided at all costs. Gaining a national consensus (as far as feasibly possible) is the best way to evaluate an anticipated programme impact on local and national society.

8.2.2 Implementation Capacity

There is some concern amongst sections of civil society and the international donor community regarding the country's capacity to fully implement a rigid environmental programme over a sustained period. This concern is based on Guyana's historically limited implementation capacity, which reflects a number of factors including inadequate human trained resources and a weak legal and institutional framework. To counter this, significant and well focused investments to train the necessary human capital to take environmental management well into the twenty first century are needed.

8.2.3 Availability of External Resources

For many years, Guyana will continue to depend largely on international aid to finance a rapid and sustained process of social and economic development and poverty reduction. Twinned with this should be consideration of the environment. The GoG need to ensure good communication with donors in order to secure resources for the implementation of a robust and workable sustainable development programme that delivers to all levels of society (eg: wildlife trade, setting up strategic environmental assessment etc).

8.2.4 Developments in the World Economy

Globalisation presents both new opportunities and threats to Guyana. Full participation in the world economy is an essential element for achieving PRS targets. The risks to the environment are that, given the openness of the Guyanese economy, participation also means that the domestic economy must face several risks, such as world recessions, which could be disastrous for the environment and landscape of Guyana. A significant drop in one commodity's global price (eg: sugar) may result in extra effort being placed on an alternative natural resources extraction or a complete change of land use policy.

8.2.5 Natural Disasters

The topography of Guyana renders it vulnerable to natural risks. Most of the country's key investments are in low lying areas and are protected by intricate systems of sea defences. Frequent and uncontrolled breaches due to unanticipated high tides will adversely affect sugar, rice and other agricultural production. In addition, unfavourable weather such as too much rain or drought can affect agricultural production. These risks, if they occur, will negatively impact on growth and poverty reduction targets. A joint international donor response to this issue is required.

9 Conclusions and Recommendations

9.1 Assessment of environmental factors and their link to poverty reduction

Section 3 has presented, in some detail, a range of possibilities for assessing environmental factors against the objectives of the PRS. The Government is intending to upgrade its indicators to monitor its poverty programmes and its staff members are being trained to assist ministries to generate and improve the quality of the PRSP monitoring indicators. What is needed now is a set of environmental indicators to demonstrate how environmental protection is consistent with, and can support, the requirements of the PRS. Table 3.2 suggested some possible indicators which could be adopted and which were proposed during the Mission Workshop.

Some of the proposed indicators targeted the poor and therefore are directly important to poverty reduction. These are specifically repeated below for ease of reference (Table 9.1).

POLICY AREA	Possible Environmental Indicators
Improve social conditions - Housing	• Increase in repeat visit tourism • Reduced flooding – improved D & I • Increase in self-regulation by Amerindian communities • Increase in visitor facilities • Increase in number of eco-tourist tour operators • Higher % room occupancy in ecotourism lodges
Directly target the poor	• Abandoned land put back into use - improved D & I • Increase in repeat visit tourism • Increased crop production – improved D & I • Reduced flooding – improved D & I • Increase in self-regulation by Amerindian communities • Increase in visitor facilities • Increase in number of eco-tourist tour operators • Higher % room occupancy in ecotourism lodges
Target regions with extreme poverty	• Abandoned land put back into use - improved D & I • Increase in repeat visit tourism • Increased crop production – improved D & I • Reduced flooding – improved D & I • Increase in self-regulation by Amerindian communities • Increase in visitor facilities • Increase in number of eco-tourist tour operators
Ensure effective implementation of poverty reduction programmes	• Abandoned land put back into use - improved D & I • Increase in repeat visit tourism • Number of local groups participating in environmental activities • Increase in agricultural exports • Increase in self-regulation by Amerindian communities

Table 9.1 Specific potential environmental indicators that could support the PRS directly

Given the significant level of donor support being provided to Guyana in respect of the environmental concerns, it would seem quite appropriate for the GoG to consider and incorporate environmental indicators, which expressly demonstrate and address the links between poverty reduction and environmental protection or enhancement e.g. solid waste management, improved drainage and irrigation, eco-tourism development.

9.2 Policy and institutional constraints and challenges

The intention of the National Environmental Policy to integrate economic, environmental and social values during planning and distribute benefits equitably across socio-economic strata and gender during implementation is well versed, though unfulfilled. Enforcement issues of laws and regulations in particular remain the weak links. As stated in the NEAP (2001), the enactment of a comprehensive legal framework and regulations to govern environmental conservation and protection is fundamental and essential to establishing and supporting strong and independent institutions that are mandated or assigned responsibilities for ensuring compliance ad enforcement of environmental regulations and standards.

As presently configured, the laws of Guyana (that address environmental issues) are fragmented and not holistic. There is a need for Strategic Environmental Assessment (SEA) to assess the environmental implications of GoG policies, plans and programmes as a first step and to inform the more localised EIA requirements that are currently being pursued. Limited assessment of the cumulative impacts of plans, programmes or policies has been undertaken. This must be addressed.

A number of laws and regulations address specific aspects of environmental administration and management (e.g. mining, petroleum, forestry, etc) whilst collectively these laws are inadequate to satisfy the legal demands and requirements of modern environmental legislation. In addition, it is apparent that that the speed taken to transpose a Bill into an actual Act of Parliament takes time and is often a stumbling block towards progress. Nevertheless, there are many good examples of adaptation in the country. The Drainage and Irrigation Board is a good example of a sector that placed environmental issues at the forefront of their policy and regulation setting (leading to the new revised Bill being passed by Parliament) as a precursor to gaining international donor funds. It however has taken ten years to get the Drainage and Irrigation Bill transposed into an Act.

Guyana has signed up to an array of international conventions and protocols, which demonstrates good will and represents a good commitment to the future, however, the implementation vehicle to support its signed commitments is missing. For example, there is:

- Limited capacity for the establishment of functioning committees or units to be able to respond in a timely manner to global issues.
- Limited capacity on the technical aspects to update national inventories;
- Inadequate resources to introduce, develop and apply appropriate technologies;
- Capacity to promote and market the benefits of conservation of terrestrial and marine ecosystems;
- Inadequate capacity to implement adaptation plans for the adverse impacts of climate change on coastal zone management, water resources and agriculture;
- Inadequate resources to promote public awareness, education and to include all stakeholders; and,
- Inadequate capacity to extend the research and data collection needed to support the international effort and strengthen local efforts to prepare appropriate responses (e.g. to climate change).

Finally, Guyana's rich natural resource base and economic export market base have inevitably resulted in a sectoral approach to management. This is reflected in the array of specific environmental strategies and action plan documents produced to date. Consequently, each strategy has had varying success in being implemented to date. Success is commonly linked to the supporting regulatory capacity, resources (human and technical – see Section 5) and political will.

Whilst there is a loose common vision of sustainable development amongst all these strategies, one key fact is that there is no demonstrable common objective to deliver and coordinate integrated and effective environmental management (between all sectors) for Guyana at all levels (bottom up). It is without question that Guyana's environment is vulnerable with respect to economic and financial drivers as well as natural disasters (as recently demonstrated during the floods of January 2005) and the apparent absence of a national land use planning process that incorporates environmental risks criteria remains a critical stumbling block to success.

Whilst the link with NGOs and the private sector in the country is positive, on the whole, it is apparent that GoG does not acknowledge achievement. Funding streams into NGO environmental projects (outside of donor funded initiatives) remain small.

Engagement of the general public depends on local willingness to be involved and an inherent awareness of the environmental issues. It appears that participation during national initiatives, such as the recent consultation rounds on the Poverty Reduction Strategy and the update to the Amerindian Act, is good which is encouraging. However, this is perhaps predictable when national issues may be influencing local daily life. What appears of major concern is the lack of social responsibility for environmental good practice, acutely demonstrated by the garbage seen on every street in Georgetown.

Guyana is learning several lessons in implementation or establishment of national sustainable development mechanisms and sustainable development policies. Chief among these are the following:

- Enhancing institutional capacity, and in particularly, human resource capacity is critical to effective and efficient implementation of the legal mandates of sectoral agencies;
- Partnerships are needed to be enforced among the government, private sector, NGOs;
- Strong political will and support is critical to success, in addition community support, education and an aggressive public awareness strategy are prerequisites to its achievement;
- There is need to increase efforts at linking the environment with economic diversification. There has been little evidence of this so far in the country. Linked to this is the need to improve its support services (for example, roads, electricity, and storage facilities) and the quality of its products;
- Guyana must have, at all times, a strategy to strengthen its participation at both the regional and international levels;
- More attention to be given to the post – project implementation phase of projects and not merely requesting good environmental practice during the course of a programme or project;
- Appropriate and affordable technology must always be considered as a critical element of maintenance; and,
- The key constraint posed to the development of renewable energy projects in Guyana is financing. Nonetheless, Guyana has made a number of incentives available, especially to the private sector, in an effort to promote and develop the country's vast renewable energy resources.

9.3 Assessment of past and future trends

The following assessment of past and future environmental trends was attained through consultation with key stakeholders in preparation of the CEP.

ISSUE	ISSUE CAUSE	ISSUE STATUS	ISSUE CONSEQUENCE
Large scale logging, wood collection, unregulated chainsaw operations	Inadequate monitoring and law enforcement Economic pressure	Worsening but improving regulation will help	Forest destruction Loss of livelihoods/resources Effect on wildlife Affect on export market (quality of wood)
Conversion of forest to agriculture and other	Not a major issue	Stable. Maybe worsening at	Increased logging Loss of productive capacity and

ISSUE	ISSUE CAUSE	ISSUE STATUS	ISSUE CONSEQUENCE
uses, construction of infrastructures in forest areas		community level in mining areas	wood for fuel Needs proper monitoring
Unregulated and unmanaged exploitation of forest resources in Amerindian communities	Illegal logging No regulation or monitoring (no demarcation of land). Exploitation by coastlanders or outsiders getting Amerindians to trap animals on their behalf Lack of technical expertise	Not widespread but worsening	Loss of community resources. Impact on local way of life. Pressure on wildlife populations
Indiscriminate burning in savannahs	Agricultural practice (land clearing method)	Worsening but localised.	Disturbance to natural resources Destruction of soil fertility. Reduced land productivity
Use of agro-chemicals	Improved crop protection and production (regulations on imports)	Improving – reduced pollution	Disposal of containers, health issues, residues in fish
Soil erosion	Agriculture River bank dredging and vegetation removal	Worsening	Disturbance to natural resources
Land and river mining	Enforcement on illegal miners	Worsening	Large scale pollution
Potentially damaging trade on exotic species	Economic demand from foreign countries	Demand for certain species keeps increasing	Increased no. of endangered species
Over-harvesting of mangle (mangrove vegetation)	Economic - Need for fuelwood	Worse in the past but is continuing	Damage to sea defences
Excessive fishing of certain marine species	Illegal fishing and unregulated catch monitoring	Worsening	Destruction of species and marine biodiversity
Water contamination from solid and other wastes causing poisoning of fish	Unregulated waste disposal Public education and lack of waste disposal facilities	Worsening	Less fish to catch Degradation of landscape/resource
Abuse of exemption of Amerindians from related legislative provisions,	Lack of legislation Lack on monitoring and capacity	Getting better	Loss of productive land Disturbance to natural resources
Poverty and affluence related pressures	Economic - Access to education/training Unemployment Low wages	Improving	Unregulated exploitation of natural resources. Crime, under-use of trained persons
Climate Change and greenhouse gas emissions	Minimal regulation. Damage to ozone layer Remove forest cover	Worsening but more awareness on topic	Georgetown flooded Droughts Increased cost to maintain sea defences
Ecotourism and tourism in general	Unlicensed tourism	Not serious	Damage to growth of this sector
Irrigation and drainage management	Regulatory Heavy rainfall and litter blocking drains No rigid SWM system in place	Serious and worsening (well done)	Movement of Georgetown to higher ground. Increased frequency of flooding/soil erosion. Increase in vermin

The conclusions derived suggest that trends in specific sectors are improving (such as exemptions of Amerindians), though other issues such as solid waste management, climate change adaptation and irrigation and drainage are certainly worsening with time.

9.4 Assessment of environmental indicators

Whilst the primary environmental policy goal is endorsed both in the NEAP and the NDS, the lack of integrated environmental indicators (see Section 3) clearly poses challenges in being able to demonstrate progress in this area. This should be seen as a matter of urgency. Without agreed environmental indicators, the capacity of regulators and decision makers to be able to plan over the long term is in serious jeopardy.

There are a number of critical issues in selecting appropriate environmental indicators. These include being able to obtain consensus on indicator setting, ensuring that the indicator focuses on outcomes and not delivery mechanisms, appreciating rate of change over time, ownership of the eventual environmental outcome and having the appropriate regulatory and enforcement backing to rectify the current outcome that an indicator is recording. Currently, due to a lack of systematic and integrated environmental information management system in Guyana, most of these important criteria are not being recorded or effectively monitored.

The long-term accountability of environmental success in Guyana ultimately hinges on the selection and monitoring of these indicators when eventually set.

9.5 Overview of international cooperation

Government and international donor programmes in all sectors appears to mainstream poverty alleviation with considerable focus on the social sector. GoG has promoted access to social goods and services and the removal of inequity in accessing such goods and services. Good governance has seen a growing interest in environmental concerns that initially led to the promulgation of the Environmental Protection Act and the EPA. Attention now needs to be focussed on the creation of protected areas, and on setting up the framework to deliver the existing action plans for ICZM, mangrove management and the NEAP.

The immediate requirement for international cooperation is to encourage and support energetic civil reform and a budget line that places sustainability at the heart of government action. GoG needs to demonstrate appropriate governance now to respond to the ongoing international funding support by encouraging the counterpart ministries, departments, divisions to pick up where the projects leave off (after the project funds finish).

9.6 Recommendations and Guidelines for mainstreaming environmental concerns

Further to the Main Issues selected in Section 6, and subsequent Implementation Themes identified (to help with the mainstreaming of environmental concerns into the economic agenda), the following outlines possible project areas for further discussion. Table 9.2 presents a list of possible project areas each under the generic Implementation Theme heading areas already produced in Section 6.

9.6.1 Creating environmental accountability across all sectors

Main Issue Title and Code (from Section 6)	**Unregulated Management of Natural Resources (UMNR5)**		
Potential Project Title and Description	<u>Environmentally and Economically Sustainable Trade in NTFP industry</u> Wildlife is by far the most important commercial Non Timber-Forest Product in Guyana and the country's wildlife exports are significant on a global scale. There remains great opportunity as well in sustaining a profitable NTFP business in Guyana. This should not be overlooked, but though managed strategically as part of other GoG policy sectors within a strategic environmental assessment (SEA), particularly with regard to transport policies and programmes.		
Non EC Donor Agencies	IDB/UNDP/WWF		
Priority and Timescale	High	**Cost to be determined by EU in due course**	

Main Issue Title and Code (from Section 6)	**Solid Waste Management (SWM2)**		
Potential Project Title and Description	Recycling Waste Project - There are no national programmes to deal with waste recovery, recycling and reusing activities. The aftermath of the recent floods, demonstrated the amount of non- biodegradable material present in ditches, yards and on streets. The impact this had on preventing natural drainage of floodwaters through culverts and grates certainly played some part of the flood impacts on localised areas. The need to be a robust strategy of recycling (tested through pilot project initiatives to determine the best approach) is now critical.		
Non EC Donor Agencies	IDB		
Priority and Timescale	High - immediate	**Cost to be determined by EU in due course**	

Main Issue Title and Code (from Section 6)	**Water Management (WM1)**		
Potential Project Title and Description	Water Sector Reform Complementary Action - DFID is seeking to fund a significant Water Sector Reform programme for Guyana. Specific aspects of this exercise will need to be elaborated upon and separately funded.		
Non EC Donor Agencies	DFID		
Priority and Timescale	High - immediate	**Cost to be determined by EU in due course**	

Main Issue Title and Code (from Section 6)	**Solid Waste Management (SWM1,2 and 3)**		
Potential Project Title and Description	Assistance to Solid Waste Management Plan - IDB is currently funding a Solid Waste Management Programme, however, many sub aspects of this highly important Major Issue heading are likely to require focused attention for all international donor agencies. EU focus on Project SWM2 may be appropriate here. A useful project would be a better appreciation of the environmental health impact on local communities and Amerindian titled areas is required (Project SWM3). The outcome of which would feed directly into updates and revisions of the PRS.		
Non EC Donor Agencies	IDB/World Bank/CIDA		
Priority and Timescale	High - immediate	**Cost to be determined by EU in due course**	

Main Issue Title and Code (from Section 6)	**Socio-economic Impacts of Land Use Change (SILC1 and 3)**		
Potential Project Title and Description	Strategic Environmental Assessment for Guyana - An assessment of cumulative impacts and strategic environmental assessments (SEA) of land-use change, coupled with robust information management at a national level and environmental indicator setting is required to assist national land use planning. A critical issue is being able to evaluate the environmental impact of a transport policy or programme. This can be done through the use of SEA. The Lethem to Georgetown road construction, for example, requires more than just an EIA, and should (at a top level) be able to assess its impact on social groups, economic development as well as on physical impact at all scales.		
Non EC Donor Agencies	IDB		
Priority and Timescale	Medium (2007)	**Cost to be determined by EU in due course**	

Main Issue Title and Code (from Section 6)	**Socio-economic Impacts of Land Use Change (SILC3)**		
Potential Project Title and Description	Tourism Master Plan for Guyana - A robust Tourism Master Plan is required to enable to potential of eco-tourism to become a reality.		
Non EC Donor Agencies	IDB		
Priority and Timescale	Medium (2007)	**Cost to be determined by EU in due course**	

9.6.2 Improving environmental governance

Main Issue Title and Code (from Section 6)	**Unregulated Management of Natural Resources (UNMR2)**		
Potential Project Title and Description	Marine Spatial Planning for Guyana - Although Guyana has reserves of hydrocarbons; these have not been extensively exploited. Indications are that "black gold" is present in large quantities in Guyana's offshore zone in the Atlantic. Currently, the environmental and social concerns are, consequently, of a lower order of priority than those of mining, though the issue of managing offshore resources (including fisheries) and the environmental impacts of such exploration need to be planned for accordingly, ideally as part of a marine spatial planning system.		
Non EC Donor Agencies	IDB		
Priority and Timescale	Medium (2008)	**Cost to be determined by EU in due course**	

Projects WM1, SWM1, SWM2 and SILC3 (raised in Section 9.6.2) also fall within this Implementation Theme header.

9.6.3 Co-ordinating the delivery of environmental management

Main Issue Title	**Unmanaged Regulation of Natural Resources (UNMR3)**		
Potential Project Title	Impact of Global Economies on the Agricultural Sector - The uncertainty for the future hinges on the impact of global economies dictating sugar/rice prices (for example) and the impact that this could have on the agricultural landscape in Guyana (i.e. adaptation to marketing/growing new crops) and the cumulative impact on the socio-economic environment.		
Non EC Donor Agencies	IDB/World Bank		
Priority and Timescale	Medium	**Cost to be determined by EU in due course**	

Main Issue Title	**Climate Change and Vulnerability Assessment (CCVA2)**		
Potential Project Title	Better Flood Forecasting and Warning Systems linked to Flood Risk Management At the present time, considerable donor attention is being placed on the post flood recovery exercise in Guyana (January 2005 flood event). No exact details of future actions were available at the time of writing this CEP, though of relevance to it is the mechanisms for improving flood forecasting and warning and socio-environmental response to future natural disasters (including but not restricted to floods). Of relevance at the strategic level, is the apparent lack of planning and linkages between meteorological or oceanographic data (.e – the time series data being compiled by the Hydro-meteorological Division) and short term and longer term planning. The paucity of information in terms of helping to undertake flood risk assessments and the current inability to turn weather data into an integrated and meaningful flood forecasting and warning system, for local populations and also for longer term planning, would be of considerable benefit to Guyana.		
Non EC Donor Agencies	IDB/World Bank		
Priority and Timescale	High	**Cost to be determined by EU in due course**	

Projects WM1, SWM2 and SILC1 (raised in Section 9.6.2) also fall within this Implementation Theme header.

9.6.4 Communicating benefits of sustainable development to end users

Main Issue Title	**Climate Change and Vulnerability Assessment (CCVA1)**
Potential Project Title	Local Emergency Response Plans - In light of the recent devastating flood events, there is considerable interest amongst all international donors on how best to coordinate an effective strategy for recovery. Municipalities and Regional Development Councils must undertake local emergency preparedness plans. Five of the six municipalities are in the lowland coastal areas of Guyana. Appropriately, municipalities want to take a leadership role in co-ordinating and preparing for emergency response within their communities. The EC should seek to broaden the remit of such plans to consider the institutional needs to improve the ownership of other environmental issues which are perhaps best delivered at the RDC level. It is recommended that funding be channelled towards helping municipalities to develop appropriate environmental code of practices that reflect the local

	need. This can help to address issues dealing with local pollution spill events or flood emergencies which establish clear lines of funding and accountability for emergency preparedness.		
Non EC Donor Agencies	IDB/World Bank/CIDAUNDP		
Priority and Timescale	High	**Cost to be determined by EU in due course**	

Projects SWM1, SWM2 and SILC2 (raised above) also fall within this Implementation Theme header.

9.6.5 Better engagement of all end users in the sector

Main Issue Title	**Unmanaged Regulation of Natural Resources (UNMR1)**		
Potential Project Title	Socio-cultural Impacts of Mining on Amerindian Communities - The impact on the local indigenous communities involves many social issues such as sexually transmitted diseases and sexual harassment suffered by the local women. The latter is an issue that still needs more attention by the authorities. There are also ongoing issues of land use conflict. The critical issue currently is the management of small scale operations, the ability for the GGMC to enforce both codes of practice and the legislation which is imposed on them to deliver sustainable mining practice and finally, the social impact of mining on local Amerindian communities and the increasing levels of sexual abuse that these communities are facing. The existing CIDA funded GEMCAPD project should be developed further to find solutions to these problems.		
Non EC Donor Agencies	CIDA		
Priority and Timescale	Medium	**Cost to be determined by EU in due course**	

Main Issue Title	**All (though with direct link to ref to UMNR4)**		
Potential Project Title	Public Awareness Campaigns **-** Developing an environmental public information programme that informs and advises citizens how to be prepared to better anticipate and mitigate environmental problems would be very beneficial. This will include public service agencies that have a stake in environmental accountability at a individual level. A focus could be placed on specific sectors: e.g. in relation to development activities in aquaculture threats to land use management and soil degradation come from (a) lack of operational standards for the sector (b) the introduction of exotic fish species and (e) the unregulated use of nitrogen fertilisers and the effect of greenhouse gas emissions are all areas of concern.		
Non EC Donor Agencies	CIDA		
Priority and Timescale	High	**Cost to be determined by EU in due course**	

9.6.6 Ownership of the eventual environmental outcome

Main Issue Title	**All (though with key ref to WM1)**		
Potential Project Title	Surface Water Management Strategic Action Plan - There is an acute need for a Surface Water Management Strategy. This has become apparent following the January 2005 floods. NWC needs to assume, as soon as possible, the operation of all primary infrastructure related to surface water management, including all seawalls, headwater dykes, primary canals, kokers, gates, weirs, pumps and all related infrastructure and to regulate the quality of waters within its responsibilities.		
Non EC Donor Agencies	DFID		
Priority and Timescale	High	**Cost to be determined by EU in due course**	

9.7 Indication of the challenges and constraints to implementation of the CEP

With its natural resource endowments, proximity to North America and areas of outstanding beauty, the challenges that Guyana remain considerable. The weakness of democratic institutions, combined with the ethnic-based patterns of voting that characterise Guyanese politics, leave the country vulnerable to an escalations in political and social instability. The environment often falls "between these two stools" and is often damaged as a result. A range of recent reforms and initiatives, including the NDS and PRSP, promises to contribute to the complex process of building national consensus around environmental governance and sustainable development issues. Sustained growth in this area demands strong and enlightened leadership from politicians and civil society.

Decades of poor economic performance has led trained Guyanese to emigrate in search of opportunities abroad. This outflow of skills continues and is particularly hard felt in the environmental sector. As a result, human resources available to the country, and particularly to the public sector, where wages are low, are limited. Moreover, weaknesses in the systems, procedures and principles also undermine environmental efficiency, transparency and accountability (i.e. the Implementation Themes adopted for this CEP in Section 6).

Given the scale of the environmental challenges outlined above and in this CEP, the risks to the delivery of the PRSP are certainly not negligible. The key risks are highlighted below:

- Political instability and policy commitment – Guyana continues to be in a transition from current politically divisive atmosphere towards one of greater national consensus on sustainable development issues. The possibility of escalating political instability remains high and with it, the loss of focus on the environment.

- Implementation capacity – decades of outward migration, limited budgetary resources and outdated government processes and systems have left the public sector ill-equipped to deliver against its key environmental policy and objectives.

- Donor Partnership Risks – environmental management and sustainable development requires a partnership approach not only from GoG, but also from the private sector and from the international donor agencies. There is a significant risk that the success of delivering effective environmental management in Guyana could be adversely affected by either duplication of effort (e.g. lots of solid waste management projects getting in the way of a concerted approach) or implementation delays of the part of the donors.

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Appendix A: TERMS OF REFERENCE

A.1 BACKGROUND

The European Commission requires a Country Environmental Profile within the framework of the ongoing follow-up of country strategies and indicative programmes for Guyana.

No previous environmental country profiles had been undertaken by the Commission in Guyana. A National Biodiversity Action Plan has been prepared in 1999 based on the Country Study of Biological Diversity of 1992, which provides the only consolidated documentation on the country's biological diversity. Since then no overall environmental assessment has been prepared.

According to the plan, Guyana's rich biological diversity and high endemism are due to four factors: (i) its location at the edge of the biologically outstanding Amazon basin (ii) its overlying position on the geologically old Guiana shield (iii) its position on the Atlantic seaboard of south America, and therefore its marine/coastal environment, and (iv) its history of low incidence and intensity of conversion of natural habitats. The true extent of Guyana's biodiversity is still, however, a matter of conjecture. The Country Study of Biological Diversity of 1992 provides the only consolidated documentation on the country's biological diversity. This document is now out of date, since several initiatives have been taken to inventory the country's biota, which has provided additional data that has substantially updated the information available. The study's current utility is that it can be used as a baseline and, seen against the backdrop of the rich biodiversity of the region, indicates that there is a substantial amount of work to be done in cataloguing the country's share of that richness.

Even with the limited knowledge of the country's biodiversity richness, it is safely suggested that this biodiversity has been reasonably well preserved, despite that there have been no formal or institutional conservation programmes. The country's low population, its low level of industrialization, and the technology applied in most sectors, are factors, which would have contributed to the preservation of this biodiversity. However, current increase in entrepreneurial activity in the natural resources sectors places pressure on the biological resource base and raises real possibilities of increased threat to biodiversity.

The Amazon region, of which Guyana is a part, covers 7% of the earth's surface but its tropical forests are estimated to contain about one-half of all species found on the planet. The following figures have been generally accepted for the Amazon region: 60,000 species of higher plants, 2,500,000 species of arthropods, 2,000 fish species, 2,750 species of reptiles and amphibians, and 300 mammalian species.

In the last decade or more biodiversity has come under increasing threat both at the global and national levels. The loss of biodiversity globally occurs mainly as a consequence of certain activities of man, including habitat fragmentation and destruction, over-harvesting of resources, settlements and cattle production, mining and pollution, and the introduction of alien species into habitats.

In respect of Guyana, it is not known that any species has become nationally extinct, this presumably due to low human interference, but the ever-increasing need to utilize resources could well lead to extinction of species if appropriate precautions are not taken. There are, nevertheless, certain practices that threaten biodiversity in Guyana. For example, it is inferred that the absence of the Sun Parakeet from the Rupununi Savannas, which was once a natural habitat for the species, is an indication both of it having become extinct in that part of the country and the result of over harvesting.

This inference is based on the fact that the bird was native of those savannas and that its natural host (the Ité Palm) is still fairly abundant in the moist areas of the savanna.

The identified environmental pressures include:

- Large scale logging, wood collection, unregulated chainsaw operations
- Conversion of forest to agriculture and other uses, construction of infrastructures in forest areas
- Unregulated and unmanaged exploitation of forest resources in Amerindian communities
- Indiscriminate burning in savannahs
- Use of agro-chemicals
- Soil erosion
- Land and river mining
- Potentially damaging exotic species
- Over-harvesting of mangle (mangrove vegetation)
- Excessive fishing of certain marine species
- Water contamination from solid and other wastes thus causing poisoning of fish
- Abuse of exemption of Amerindians from related legislative provisions, and unconditional usufruct rights
- Poverty and affluence related pressures
- Undermining of local breed characteristics and varietal gene pools due to out-breeding and substitution.

A.1.1 EC Assistance

Since the Lomé I Convention to the Lomé IV bis Guyana has been allocated €262 million under the various funding mechanisms. The EC assistance program to Guyana under the NIPs has concentrated on:

- Sea Defences: rebuilding of critically damaged and destroyed sections
- Transport infrastructure: developing trans-coastal communication in the form of rehabilitating roads, ferries and bridges (some of the activities have been covered in the regional fund)
- Social infrastructure: Improvement of water supply systems
- Private Sector development: Providing funding to Private Sector Commission, and skills training through the Guyana Training Agency.
- Support to good governance and democracy at the elections
- Use of SASP funds to give budgetary support to the Social Sector, mainly in Health and Education.

The European Investment Bank has focused under the 3rd and 4th Lome Conventions on the bauxite sector, support to investments to small and medium scale enterprises through global loans and water supply.

The EDF Committee approved the Country Support Strategy in September 2002. The indicative amounts allocated are: A-allocation €34 million and B-allocation €14 million. The B-envelope includes 4.9 MEURO from the 8th EDF SYSMIN resources and these funds can be programmed for with the A-envelope. A further €0.7 million will be transferred from A – envelope to B – envelope in the context of the mid-term review. As a result the amount of 39.6 MEURO can be programmed immediately. The CSS identifies two focal sectors:

(a) Infrastructure: €19 million for Sea Defences (after re-allocations €19.7 million)
(b) Macro-economic support: €14.9 million for social sectors (housing / health).

Also an indicative amount of 5 MEURO has been reserved for the following purposes:

- Micro-projects (€3 million), later increased to 4 MEURO
- Institutional strengthening of the NAO (€1 million).

In October 2002, the Government applied for Guyana to be considered for funds under the FLEX provisions from the B-envelope. In January 2003, the EC approved the allocation of €8.4 million from the B-envelope under the FLEX provisions to be disbursed as part of the Budgetary Support Programme, thus bringing the total of this programme to €23.3 million.

A.2 OBJECTIVE

A.2.1 Study objective

The objective of a Country Environmental Profile is to identify and assess environmental issues to be considered during the preparation of a Country Strategy Paper, which will directly or indirectly influence EC cooperation activities.

The Country Environmental Profile will provide decision-makers in the partner country and in the European Commission with clear information on the key environmental challenges and actors, as well as strategies and programmes designed to address them. This information will ensure that the EC cooperation strategies systematically integrate environmental considerations into the selection of priority focal areas and also establish the necessary environment safeguards for all cooperation activities undertaken in the Country.

The Profile will establish the key linkages between the environment and poverty reduction. It will constitute an important source of baseline information and contribute to focusing political dialogue and cooperation with the Country on key areas of concern such as sustainable development as well as raising awareness among policy-makers.

A.3 Results

The assessment will deliver the following results:

- An assessment of the environment identifying key environmental factors influencing the Country's development and the responses to these.
- An assessment of national environmental policy and legislation; institutional structures and capacity, and the involvement of civil society in environmental issues.
- An assessment of past and anticipated future trends of environmental indicators.

- An overview of past and ongoing international cooperation in the environment sector, especially with the EC.
- Recommendations and, as far as possible, guidelines or criteria for mainstreaming environmental concerns in priority development areas. These recommendations should support the preparation of the next Country Strategy Paper and, as far as possible, include guidelines or criteria to be used for environmental mainstreaming in subsequent phases of the operation cycle.

A.4 Issues to be assessed

The consultants will assess the following issues:

A.4.1 The state of the environment

Including key issues (current status, pressures and trends) and environmental performance in meeting objectives/plans and targets in the following areas:

- **Physical environment** including climate (and climate change issues), air quality, water quality and resources (including the marine environment), land quality and resources and natural disaster risks.
- **Biological conditions, biodiversity, ecology and nature conservation** including rare, endangered and endemic ecosystems, habitats and species, and biological resources of cultural, social, or economic importance.
- **Socio-economic conditions, socio-cultural conditions and human health**, especially socio-economic conditions in relation to environmental issues (public health, vulnerability to disasters, access to natural resources and commodities); other issues should include, as relevant, archaeology and cultural heritage, values and aspirations, recreational, landscape and visual aspects.

Reference should be made to local and internationally recognised environmental indicators and quality standards to establish a consistent basis for comparison of environmental and sustainable development performance. The indicators selected should facilitate future monitoring and evaluation of the extent of environmental integration and be useful for future environmental assessments. Particular attention should be paid to the rate of change of indicators where information is available.

The causes of the environmental situation and trends and their consequences on human well-being and sustainable development should be presented. If appropriate, the information could be organized according to eco-geographical subdivisions with the scale (regional, national, local) of the issues indicated.

A.4.2 Environmental policy and legislation

A brief description and a review of strengths and weaknesses of the following:

- National policies, environmental strategies and action plans

- Legislation, current and in preparation, by the National Institutions covering development control, requirements for EIA/SEA, environmental auditing, sustainable use or conservation of natural resources, pollution control, land tenure and land reform. The effectiveness of legislation enforcement. The provision for public participation in environmental planning and public access to environmental information.

- National approaches to key international or regional environmental conventions such as those concerning climate change, biodiversity and desertification.

A.4.3 Environmental institutional framework

- The institutional structure and responsibilities of the authorities dealing with environmental issues in policy making, legislature, planning, environmental protection, monitoring and enforcement;

- The capacity and financial resources of authorities responsible for environmental management.
- The extent and quality of protected areas (and, if relevant, other land use measures).

A.4.4 Integration of environmental concerns into the main economic sector

The assessment should examine the integration of environmental concerns in the following sectors:

- Industry, mining and oil exploration;
- Transport and infrastructure;
- Agriculture, fisheries and forestry;
- Services including transport, utilities (power, energy and water).

A.4.5 EC cooperation with the country from an environmental perspective

This should cover experience relating to interventions with specific environmental objectives as well as the integration of environment into other programmes, including the application of environmental assessment procedures. Where information is available the environmental impacts of EC cooperation or potential risks should be identified for the benefit of future programmes. Lessons should be drawn from the existing evaluations.

A.4.6 Cooperation funded by other agencies from an environmental perspective

This should cover involvement of other funding agencies and their experience in the Country and include a list of recent and planned projects/programmes, with an environmental focus or anticipated impact.

A.5 Conclusions and recommendations

The key aspects of the environment in the Country including policy and institutional constraints and challenges should be clearly stated. This should be presented in a matrix, crossing environmental concerns and sectors (or sets of activities).

Base on a comprehensive assessment of available information and consultation with stakeholders recommendations on how best to address environmental issues should be elaborated. Individual recommendations should be clearly articulated, justified and grouped according to types.

The relative priority of the recommendations and an indication of the challenges to their implementation should be given.

Recommendations are likely to cover direct interventions as well as the provision of environmental safeguards for other sectors.

The constrains to preparing the profile caused by limited information should be described, and an evaluation of the need for additional studies, such as Strategic Environment Assessment or others, should be made.

A.6 Work plan

The work plan should include but not necessarily be limited to the following activities:

- Consultation with EC country desk officers and other relevant officials, EC Delegation in the country, a selection of national and local authorities, key international funding agencies operating in the Country, plus key national and international civil society actors operating in the environmental field.
- Review of the Country Strategy Paper and National Indicative Programme; evaluation reports with respect to environmental issues on development and economic co-operation produced by government, EC or other agency sources.

- Review of environmental literature, evaluation reports, environmental policy and legislation framework, legislation and regulations and enforcement relating to environmental issues, action plans, and progress in implementation.
- Review of environmental performance indicators selecting appropriate indicators from those suggested by organisations such as EEA/OECD/Eurostat.
- Field visits to sites of key environmental concern and (if possible) the organisation of a national workshop that national authorities, donors, experts and civil society representatives should be invited with the aim of identifying and attempting to obtain a consensus on key environmental concerns.

On the basis of the proposed work plan and time schedule outlined in this Terms of Reference, the consultants must detail their work plan for the Country Environmental Profile study in their offer.

A.7 Expertise required

The proposed mission is to be conducted by a team of two experts who should have the following profile:

- Expert level I or II with at least 10 years wide experience in environmental issues, including institutional aspects; international environmental policies and management; environmental assessment techniques and experience in rapidly assembling, assessing information and developing recommendations. He/she would be the team leader.

- Expert level II with 10 years experience with an environment background complementary to the team leader.

In addition:
- Previous working experience in the Caribbean or South America is requested for at least one team member.
- Experts should have an understanding of the EC environment and development policies.
- Experience in undertaking environmental analysis and preparation of development programmes would be an asset.
- Familiarity with Commission guidance on programming, country strategies, PMC, policy mix and integration of environmental issues into other policy areas is desirable.
- Experience of participatory planning process would be an advantage.

The experts should have excellent skills in English. English will be the working language and the final report must be presented in English.

A.8 Reporting

The study conclusions must be presented in the Country Environmental Profile report in the format given in Appendix 1. There should also be an inception report presented at the briefing meeting with the Delegation.

The draft report in 15 copies is to be presented for comments to the Delegation of the European Commission two weeks after the mission at the latest. The Delegation of the European Commission, the National Authorising Officer and other organisation will then have 4 weeks to comment on the draft in writing.

20 copies of the final report (maximum 40 pages excluding appendices) and an electronic copy with all annexes are to be submitted to the EC Delegation three weeks after the reception of the comments.

A.9 Presentation of the offer

The consulting firms should present their offer by providing the two CVs of the experts (not more than 4 pages each setting out the relevant qualifications and experience), and the proposed methodology (not more than 4 pages). The offer shall also include the allocation of tasks and responsibilities of the experts.

A.10 Time schedule

	Expert I	**Expert II**
Briefing in Brussels – January 2005	1	1
Desk analysis	1	2
Field phase including travel, briefing meeting (with the Delegation) and possible workshop	21	21
Report Finalisation	4	4
Debriefing in Brussels – not later than mid-February 2005	1	1
Final report end March 2005	3	2
Total days	**31**	**31**

Appendix B: WORKSHOP FINDINGS

COUNTRY ENVIRONMENTAL PROFILE
GUYANA
WORKSHOP FINDINGS OVERVIEW

The following represents the actual statements made by delegates attending the above Workshop event on 9 March 2005 in Georgetown. The views of the 20 delegates who attended the event are represented below in no particular order. No evaluation of the findings is carried out in this Appendix.

The attendees and replies to the questionnaire ranged from the following disciplines and sectors:

- *Donor agencies (EC, UNDP, CIDA,DFID, IIDB)*
- *EPA*
- *Tourism (Govt sector)*
- *Media (tv and journalists)*
- *Ministry of Finance*
- *Lands and Surveys (Ministry of Public Works)*
- *Hydrometeorological Dept (Dept of Agriculture)*
- *Guyana Geology and Mines Commission*
- *Sea Defences Board*
- *NGOs (Flora and Fauna International/Marine Turtle Conservation Society)*
- *Pesticide and Toxic Chemical Board (Min of Agriculture)*
- *Dept of Fisheries (Min of Agriculture)*
- *Wildlife Division (Office of the President)*
- *EU NAO Task Force.*

Question 1 From your discipline perspective (e.g. tourism/drainage *etc*), please rank in the right hand box the following identified environmental pressures in terms of their impact on the Guyanese environment (1 = major; 2 moderate; 3 = low):

ISSUE	RANK
Large scale logging, wood collection, unregulated chainsaw operations	1 2 2 1 2 1 2 3 2 2 1 1 1 1 1 2 1
Conversion of forest to agriculture and other uses, construction of infrastructures in forest areas	2 2 2 3 1 2 2 3 3 2 3 2 1 2 1 2 3 2
Unregulated and unmanaged exploitation of forest resources in Amerindian communities	2 2 1 1 2 1 1 2 2 2 2 2 2 2 1 2 1 1
Indiscriminate burning in savannahs	3 2 1 1 3 2 1 1 3 3 3 2 1 3 2 1 2 2
Use of agro-chemicals (disposal of containers)	2 2 2 1 2 2 1 2 1 1 2 2 2 2 3 2 2 3
Soil erosion	3 2 1 3 3 3 3 2 3 1 1 2 2 2 2 3
Land and river mining	1 1 1 2 1 1 1 2 2 1 1 3 1 2 2
Potentially damaging trade in exotic species	2 2 1 1 2 2 2 3 3 2 2 2 3 1 1 3 1
Over-harvesting of mangle (mangrove vegetation)	2 1 1 2 2 3 3 3 3 2 1 1 3 1 1 1 2 2
Excessive fishing of certain marine species	1 1 3 2 2 2 3 2 2 1 3 1 1 3 2
Water contamination from solid and other wastes causing poisoning of fish	1 1 2 1 2 1 2 3 2 2 2 1 1 1 1 2 2
Abuse of exemption of Amerindians from related legislative provisions	2 3 2 3 1 2 3 1 2 1 2 1 1 1 2
Poverty and affluence related pressures	1 1 1 2 1 1 1 2 2 1 1 2 3 1 1 2 2
Undermining of local breed characteristics and varietal gene pools due to out-breeding and substitution (Biosafety)	3 3 2 3 3 3 3 2 2 3 3 1 2 3
Adapting to Climate Change and greenhouse gas emissions (ODS)	2 2 1 1 2 2 2 1 1 1 1 2 1 3 3 1 1 2
Ecotourism and tourism in general	2 3 3 1 2 3 3 3 2 2 3 2 3 3 1 2
Irrigation and drainage management	2 1 3 1 1 1 1 1 3 1 1 1 2 1 1 1

Additional issues not cited included:

Unregulated management of natural resources	
Water management (as part of wider land use change)	1 1 1
Solid Waste Management (land contamination)	1 1 2 3 1 1 1 1 1
Socio-economic impacts of housing (land use change and waste	1 1 1 1 1
Noise Issues	3 2 2 1
New roads (transportation and infrastructure)	1 1 1 1
Port development	1
Health and safety issues	2 2 2 2
Flood warning and management system (linked to sea level rise etc	1 2 1 2 2 1 1

Question 2 For your issues ranked as 1 or 2 above, state what are the causes of the environmental situation, is it getting worse (issue status) and its consequences on human well-being and sustainable development?

ISSUE	ISSUE CAUSE	ISSUE STATUS	ISSUE CONSEQUENCE
Large scale logging, wood collection, unregulated chainsaw operations	Inadequate monitoring and law enforcement Economic pressure	Getting worse but improving regulation will help	Forest destruction Loss of livelihoods/resources Effect on wildlife. Affect on export market (quality of wood)
Conversion of forest to agriculture and other uses, construction of infrastructures in forest areas	Not a major issue	Stable. Maybe getting worse at community level in mining areas	Increased logging Loss of productive capacity and wood for fuel. Needs proper monitoring
Unregulated and unmanaged exploitation of forest resources in Amerindian communities	Illegal logging No regulation or monitoring (no demarcation of land). Exploitation by coastlanders or outsiders getting Amerindians to trap animals on their behalf. Lack of technical expertise.	Not widespread but getting worse	Loss of community resources. Impact on local way of life. Pressure on wildlife populations.
Indiscriminate burning in savannahs	Agricultural practice (land clearing method)	Getting worse but localised.	Disturbance to natural resources Destruction of soil fertility. Reduced land productivity.
Use of agro-chemicals	Improved crop protection and production (regulations on imports)	Getting better – reduced pollution	Disposal of containers, health issues, residues in fish.
Soil erosion	Agriculture River bank dredging and vegetation removal.	Getting worse	Disturbance to natural resources
Land and river mining	Enforcement on illegal miners	Getting worse	Large scale pollution
Potentially damaging trade on exotic species	Economic demand from foreign countries	Demand for certain species keeps increasing	Increased no. of endangered species
Over-harvesting of mangle (mangrove vegetation)	Economic - Need for fuelwood	Worse in the past but is continuing	Damage to sea defences
Excessive fishing of certain marine species	Illegal fishing and unregulated catch monitoring.	Getting worse	Destruction of species and marine biodiversity.
Water contamination from solid and other wastes causing poisoning of fish	Unregulated waste disposal Public education and lack of waste disposal facilities.	Getting worse	Less fish to catch Degradation of landscape/resource.
Abuse of exemption of Amerindians from related legislative provisions,	Lack of legislation. Lack on monitoring and capacity	Getting better	Loss of productive land. Disturbance to natural resources
Poverty and affluence related pressures	Economic - Access to education/training Unemployment Low wages	Improving	Unregulated exploitation of natural resources. Crime, under-use of trainers persons.
Undermining of local breed characteristics and varietal gene pools	Not important		

ISSUE	ISSUE CAUSE	ISSUE STATUS	ISSUE CONSEQUENCE
Climate Change and greenhouse gas emissions	Minimal regulation. Damage to ozone layer Remove forest cover,	Getting worse but more awareness on topic	Georgetown flooded Droughts Increased cost to maintain sea defences.
Ecotourism and tourism in general	Unlicensed tourism	Not serious	Damage to growth of this sector
Irrigation and drainage management	Regulatory Heavy rainfall and litter blocking drains No rigid SWM system in place.	Serious and worsening	Movement of Georgetown to higher ground. Increased frequency of flooding/soil erosion. Increase in vermin

Question 3 At what scale is the issue of importance? (i.e. regional, national, local, national leading to regional)

ISSUE	SCALE (R, N, L, N-R)
Large scale logging, wood collection, unregulated chainsaw operations	N R N N N R N N N N N
Conversion of forest to agriculture and other uses, construction of infrastructures in forest areas	R L N R L N N N L L R-N N
Unregulated and unmanaged exploitation of forest resources in Amerindian communities	L N N R N N L N L L N N
Indiscriminate burning in savannahs	L N N R L N L L L R N
Use of agro-chemicals	N R N N N N-L N L L-N N
Soil erosion	L N L L N N N L N-R N
Land and river mining	N R R N N N L-R N
Potentially damaging exotic species	N N R N R N L N N
Over-harvesting of mangle (mangrove vegetation)	L R N N R N N N N
Excessive fishing of certain marine species	N R R R N N R N N-R N
Water contamination from solid and other wastes causing poisoning of fish	N N N N N N L-N N N R N-R N
Abuse of exemption of Amerindians from related legislative provisions	N N N N-R N L-R L N N-R N
Poverty and affluence related pressures	N L-N N N N N N N N N-R N
Undermining of local breed characteristics and varietal gene pools due to out-breeding and substitution	N R N L L R R N
Climate Change and greenhouse gas emissions	R N RR R R-N R N N R N
Ecotourism and tourism in general	L N N R R R N-R N R R N
Irrigation and drainage management	N N N N N N N N N N N

- In general, common belief that the Issues have national implications though may start out as local issues.
- Some specific aspects (mining) have a regionalised impact in addition to a national impact
- Without an appreciation of the sectoral regulation, it is difficult to rank.

Question 4 From your perspective, what are the obstacles to delivering effective environmental management in Guyana?

- Legislation and enforcement to support effective management
- Lack of capacity and political will to develop and enforce regulaios.
- Inadequate resources – relevant agencies need capacity to be able to manage natural resources.
- Inadequate public awareness programme
- Developmental and commercial pressures
- Technical appreciation
- Networking , collaboration and cooperation
- Roles and responsibilities need to be more clearly defined.
- Adequate and continual monitoring
- Lack of environmental education and information
- Project restrictions
- Non existent land use policy linked to SEA
- Availability of funds and better financial main-steaming to the right people.
- Lack of technical solutions that are affordable, economically and environmentally sustainable.
- Promulgation, enforcement and evaluation of regulations.
- Training and education of operators.
- Land ad resource use conflicts
- Being able to agree on national solutions for issues framed in a global context (eg:climate change).
- Inadequate deterrents in terms of penalties or environmental poor performance.
- Lack of any revision to existing legislation or implementation of new laws.
- No environmental indicators in place to be able to audit performance
- No “stick” to force inter-agency cooperation (lack of networking and coordination)
- Definition of policies and an easy route to prosecuting offenders.
- Investment in environmental management is not ranked high on the political agenda (seen as an obstacle to development)
- Strong personality conflicts and strong political pressure.
- Lack of middle management to monitor and enforce

Question 5 From your technical/business sectors perspective, what opportunities, pressures and threats are the driving challenges that face successful implementation of sustainable development in Guyana? Consider you answers under the following 3 main sub headings:

- **Physical environment** including climate (and climate change issues), air quality, water quality and resources (including the marine environment), land quality and resources and natural disaster risks.

Opportunities	Threats / Pressures
Atmospheric and water resources	Low topography
Hinterland development	Natural disasters
Fertility of land	Increased coastal erosion
Freshwater supply (vast natural supply)	Demand for water resources
Renewable energy (wind)	Pollution
Fertility of land	Capacity to harness natural energy
Hydroelectricity generation – development of an adequate power grid based on sustainable energy sources.	90% of population live in "at risk" areas to flooding.
Increased export of crops	Accessibility to areas in hinterland (high potential capital cost)
Availability of pristine forests.	Huge start up costs for renewable energy.
Opportunistic disaster response	Availability of technical capability to sustain implementation (eg: flood forecasting)
	Insufficient information on physical system.
	Climate change may adversely affect habitats and thus faunal assemblages and diversity.

- **Biological conditions, biodiversity, ecology and nature conservation** including rare, endangered and endemic ecosystems, habitats and species, and biological resources of cultural, social, or economic importance.

Opportunities	Threats / Pressures
Management of biodiversity	Unknown stock assessment (inventory and economic value)
Non timber products	Logistics of getting around the interior.
Non traditional products	Wildlife poaching (bio-piracy)
Amerindian culture	Pollution of rivers from mining activities of various scales (esp local scale).
Protected areas	Continued sectoral management approach rather that being integrated.
Fisheries (food and ornamental)	Protected area threats (forestry)
International trustees	Sustainable exploitation (illegal hunting trade in rare species)
Expanded eco-tourism industry	High level of poverty in rural areas
Value added use of agriculture and forestry (eg: preserved fruits, furniture – economic returns)	Land issues linked to Amerindian titled areas.

Sustainable use of forest resources. Collaboration for sectors to work together (mining/forestry etc) Potential for conservation of non traditional uses.	Lack of trained capacity at all levels on biodiversity management. Increased littering and noise in the interior from tourism Land quality and natural disaster risks. Lack of baseline data to back up decisions. National policies governing international conventions Better education and awareness. Concentration of marketable species in clusters. Poverty, culture to own land Mining impasse on land-use and sequence – legislation on sub-surface rights. Potential for corruption in a decentralised system

- **Socio-economic conditions, socio-cultural conditions and human health**, especially socio-economic conditions in relation to environmental issues (public health, vulnerability to disasters, access to natural resources and commodities); other issues should include, as relevant, archaeology and cultural heritage, values and aspirations, recreational, landscape and visual aspects.

Opportunities	**Threats / Pressures**
Empowering communities as rangers/monitors Renewable energy Recycling of waste Opportunistic disaster response Mining and poverty reduction Preserve Cultural heritage/ ecotourism (high cultural diversity) Reduced crop losses through better forecasting Landscape beauty for recreation (Shell Beach/Kaieteur Investment opportunities (private sector) Tapping into financial and technical resources from international instruments and assistance. Build resilience, awareness and empowerment Opportunity to re-invent/redesign uses. Waste as a resource for energy?	Low population Racial insecurity and political instability Access to natural resources and commodities (public health/vulnerability to disasters) Lack of trained resource (and technology for information management/monitoring system) Demographic change Lack of local involvement Inadequate marketing Impact of small scale mining on landscape Disposal of solid waste Quantification of resources Insufficient infrastructure. Poverty Lethem/Georgetown Road pressures Associated solid and liquid waste disposal Local demand for bush meat

Question 6 Environmental Indicators of Success

For each of the issues raised in the table below, what appropriate indicators of success could be established to help deliver future sustainable development?

Attendees proposed a suite of possible environmental indicators from their own sector.

- % re-growth in forested areas
- % conversion from forest to agriculture
- % land being burned
- % concentration of agro-chemicals in waterways
- % of farms adopting farm certification Programs
- % of re-vegetated logged areas
- Use of EIA
- TSS levels in rivers and creeks (mining areas)
- Increased crop production (D&I)
- Reduced flooding (D&I)
- Increase in agricultural exports
- Decrease in imports of agro-chemicals
- Increase in areal extent of mangrove forest.
- Decrease in agro-chemicals input
- Increase in maximum sustainable yield for fish stocks
- Abandoned land put back into use (D&I)
- Increase in repeat visit tourism
- Reduced incidence of coastal flooding events (overtopping)
- Reduced contamination (river mining)
- Number of local groups participating in environmental activities.
- Increased self regulation from Amerindian communities
- Increase in visitor facilities
- No. of eco-tourist tour operators in existence.
- % room occupancy in ecotourism lodges.
- Decrease in siltation (D&I)
- % of energy generated by renewable sources.
- No. of fishing closed seasons

Question 7 Integration of environmental concerns into the main economic sector

Provide good and bad examples of how the integration of environmental concerns is currently taking place in Guyana within the following sectors:

Sector	Example of Policy Integration (good/less good)
Industry, mining and oil exploration	Tax on waste and plastic (money goes to the consolidated fund but lost in treasury and should be put back towards funding solid waste management. Development of mining regulations and need for industrial estates for EIA (good eg) Implementation of environmental laws into the industry (good) Generally good. Regulations, technical solutions, training and awareness (multisectoral approach).
Transport and infrastructure	EIA required here by IDB – poor post project maintenance of roads. Env permits sought and designs amended Implementation of environmental laws into the industry (less good) Need all weathered roads to access areas (less good) Generally less good Development of roads (good) – post construction performance is not good.
Agriculture, fisheries and forestry	Env management introduced into forestry Use of agrochemicals and over fishing is less good. Forestry certification (good) Healthier foods due to less use of pesticides (good). Iwokrama – good dev of sustainable forest model. Env permits sought, certification Establishment of ICZM Committee (good). Implementation of environmental laws into the industry (good) Generally good Recycling of fish, poultry waste to make chicken feed for agr sector.
Services including transport, utilities (power, energy and water)	Provision and collection and disposal of waste in Georgetown getting better but still poor (system of collection and disposal). Improvement in landfill facilities is good – however, lack of visible sustainability in selected solutions leading to increased costs long term). Culture of litter in the city and environs (bad) Penalties for littering enforcement. Env permits sought Implementation of environmental laws into the industry (less good) Most concentration is mainly on the coast. Need to focus on the interior region of Guyana (less good). Generally less good
Irrigation and drainage management	Water Act 2002 requires better EPA input. Poor D&I maintenance programmes (re: recent floods) Budgetary allocations. Implementation of environmental laws into the industry (less good) Very poor esp in the D&I areas where most of the agr farm lands are found (less good). Generally less good

Question 8 EC cooperation with the country from an environmental perspective

Provide an example or experience where the integration of environment into other programmes has worked well/badly (including the application of environmental assessment procedures). For example, have you ever set integrated objectives for an environmental or sectoral programme (e.g. agriculture)?

- EC developed a project in Agriculture – Rice Mills and Aquaculture forms.
- Requirements for Environmental Assessments.
- The construction of the Lethem – Georgetown Road was put on hold because of EC intervention in that the environment and the Amerindians were not considered in the feasibility study.
- Forestry and Mining – Code of Practice for forestry and mining environmental regulation was done with all stakeholders – Guyana Initiative on Forest Certification – collaborative approach was good.
- Infrastructure sector – IDB request an EIA for all developments.
- Guyana Sea Defences, EPA and GFC worked closely in the design of an inventory for Mangroves to allow for consolidated monitoring.

Question 9 Cooperation funded by other agencies from an environmental perspective

What good/bad practice examples can be provided regarding the involvement of non-EC funding agencies and their outcomes? Are you aware of recent and planned projects/programmes, with an environmental focus or anticipated impact? If so please list below.

- LEAP Project Funding
- IDB – EM Project Phases 1 and 2
- EC Shorezone Management Project
- CIDA – GENCAPD Project
- UNDP – Capacity Building for EPA and Natural Resources; Env Education at EPA.
- CDB – CZMS project at EPA (pending).
- Proposed Landfill Site (IDB – Haag Bosch)
- Bauxite operation – Berbice expansion.
- Establishment of Env Division in GGMC (CIDA?) – encouragement of self regulation in extractive industries.
- There is better awareness of the need for environmental management in mining. Solutions have been applied to reduce turbidity from mining operations but these were not sustained. Training has not been institutionalised and is not sustainable. Skill levels collapse when people leave the job. CIDA Guyana Environmental Capacity (Mining) Project GENCAPD.
- WWF Gold Mining Pollution Abatement Project.
- UNDP – Pollution Abatement.
- Good example is the IDB implementation of the Pesticides Act
- IDB – Laboratory establishment for min of Agriculture (Pesticides and Toxic Chemicals)
- CITES sponsored some surveys to determine population status and used as a basis to establish quotas (good example).

Question 10 Constraints and Opportunities – please consider (within your sector) any change to current national environmental policy and legislation that would improve the delivery of effective environmental management *(complete list below from participants)*

- Current legislation is scattered eg: Species Protection Regulation, Wild Birds Protection Act etc. Need legislation to encompass all aspects of wildlife management such as exports, internal trade, harvest, bush meat trade etc. Legislation needs to be more robust as currently there are too many loopholes.
- Decentralise environmental management by adopting a co-management approach at Regional and community levels.
- Pesticides Board is part of te National Environmental Policy. This legislation and Regulation is effected. The fees should be allocated to the Regulator to make the Board sustainable.
- Exploration and characterisation of mining reserves being worked by SME mining operators – would lead to better mine planning, regulation, technology and environmental management.
- Need to have a Minister of Environment.
- Education of environmental management in schools.
- The EP Act (1996) should be changed to reflect the setting up of an “Environmental Court”.
- Implementation of ICZM and NBAP
- Need for SEA to aid sector level Env land use planning, awareness of judiciary, incl capacity at decentralised level.
- Mainstream relevant aspects of the Convention on Biological Diversity Work Programmes into other natural resource areas (eg: forestry, agriculture, mining).
- Increase fines, penalties and enforcement of environmental laws.
- To have agencies included in environmental issues/related issues from the beginning of projects.
- Integrated Shorezone Management System where one should consider the impacts of action that may affect sea defences and hence civil safety.
- Better protection of mangal will reduce the need for sea defences – since these represent great monitoring expense, granting of new lands permission for use in areas requiring sea defence structures should only be done if this cannot be done outside of low lying coastal areas.
- Provision of trained human resourced autonomous body.
- Enforcement of existing national environmental policy and legislation regarding GSD.
- De-link responsibility for solid waste management from specific geographical areas.
- Establish a national Solid Waste Management Authority to impact upon SWM in Guyana.
- Establish a Ministry of Environment or a Ministry assigned the responsibility for environment with responsibility for environmental planning and policy delivery.
- Opportunity to build on good progress set by the Water Act already.

Question 11 In your sectoral area (e.g. agriculture) please identify three improvements to current institutional structures and capacity or how to better improve the involvement of civil society in environmental issues *(complete list below from participants)*

- Publicise EC budget lines.
- Hydromet capability to improve forecasting skills (accuracy) to seasonal forecasts (longer lead time)
- Training/staff development.
- Automation
- Civil Society education to have a level platform for employment
- Representation (e.g. sub offices) of key agencies e.g. EPA at regional levels (admin offices).
- More opportunities created for civil society engagement (e.g. public presentation of reports /studies/research findings.
- A state of para-state institution to impact on services in Guyana structured in such a way that citizens groups in every region participate in a programme or project.
- To set up/construct regional disposal systems.
- Improve consultation
- Provide a detailed environmental assessment of civil works (Guyana Sea Defence) during the process of developing engineering designs.
- Ensure contractors and site monitors adhere to environmental safety rules and regulations.
- Establishment of a Steering Committee or Task Force with the main stakeholders within the sector to address environmental issues and policy.
- Establish a new Dept responsible for environmental affairs at all levels.
- Encourage participation in EIAs and make them more transparent.
- Formal (legal) lines of inter-agency cooperation.
- More active and independent Shore Zone Management Team.
- Better coordination of Transport and Infrastructure policy among the Caribbean Region plus Latin American countries.
- More capacity building and education awareness opportunities.
- Offer incentives through environmental projects.
- Advertise or make civil society aware of EC budget lines which are available to civil society for environmental funding.
- Annual updating of a “State of the Environment” report.
- Acquisition of middle management staff and technical staff.
- Willingness of other sectors to cooperate (inter-sectoral collaboration).
- Monitoring and regulating self, civil society.
- Better environmental reporting. Creation of training manuals.
- Empowering the public with tools on best management practice at the individual level.
- More educational programmes on the environment and place environment on the school curriculum.(brochures etc)
- Clean up campaigns that are properly organised.
- Harsher penalties for the laws that have to be enforced.
- Revision of legislation
- Increased training and public awareness.
- Encourage competitions with rewards for best community cleanliness.
- Increased allocation of resources to enforcement agencies.
- Establish robust Codes of Practice.

- Working formalised relationship with private sector (e.g. Guyana Gold and Diamond Miners Association as well as working with all other stakeholders (GFC, NARI, Ministry of Amerindian Affairs)
- Establishment of a pesticide laboratory.
- Sustainability of Pesticide Board.
- Accession to International Conventions (Rotterdam).
- Food and Safety Awareness Training.
- Inward opportunities for capacity building at all levels (human and financial resources needed to achieve this).

Question 12 - Provide two examples (where possible) of how Guyana could seek to mainstream environmental concerns in priority development areas. What guidelines or criteria could be used for environmental mainstreaming in subsequent phases of the operation cycle (e.g. Strategic Environmental Assessment techniques etc). ***(complete list below from participants)***

- Mainstream environmental conscience through better education and awareness programmes.
- Develop better monitoring guidelines and evaluation programmes.
- Introduce and develop a better integrated land use policy.
- Strengthening the EPA to help it deliver and adopt a co-management approach at the community level.
- Provision and successfully implement better financial regulations
- Robust environmental Monitoring and Evaluation programme is imperative.
- Strategic Environmental Assessment with appropriate mitigation measures (being able to link policy, strategy and programmes across all sectors).
- Develop implementation of monitoring programmes and reporting procedures for operators, regulators and communities.
- Applied research and development (to support Govt and NGO work).
- Improved EIA procedures and EMPs
- Devise stringent legislation and make sure regulations can be enforced.
- Affiliation to international commitments and fulfilling them.
- Better environmental planning across all sectors.
- Appropriate research and development.
- Better environmental reporting.
- Robust environmental auditing procedures.
- EMS for all sectors (linked to Risk Assessments).
- Environmental education and awareness programmes for all sectors including in all schools. Create a “mind change” making next generation more environmentally conscious.
- Public environmental reporting on environmental indicators.
- Better focus and management (delivery) of Inter-agency planning committees
- Better information management and “hubs” for database management. Central database for linking and analysing various sectors by creating direct (legal) links and outlining clear, measurable objectives for each sector.
- Maintain proper records of current guidelines and integrate that into each sector policy (done via integration of EPA into other sectors – ie: a Ministry of Environment).
- Development of Environmental Standards or adapt existing international standards (e.g. air quality control guidelines and water quality control guidelines (WHO).
- Insist on prior EIA on mining operations and all planned infrastructure developments.
- Annually update the Country Environmental Profile noting positive and negative progress in that year (ie: annual State of the Environment reporting).
- Incorporate environmentally aware NGOs into programme appraisal early on.
- Risk and hazard assessments for development projects (e.g. housing, industry)
- Integration of disaster management for development planning.

Question 13 National Biodiversity Action Plan (BAP) – Progress since 2000

Nine Programme Areas were identified for phased consideration and implementation within the above National BAP. In the table below, place a 1 (effectively implemented), 2 (partially implemented) or 3 (no action taken) in the column next to the Programme Area title.

Programme Area Title	Status in 2005
1. Mobilisation of Financial and Technical Resources	2 2 3
2. Human Resources and Institutional Capacity Building	2 2 3
3. Research and Information on Biodiversity	2 2 3
4. Consolidation of the political, legal and administrative system	2 3 3
5. Public Awareness and Education	1 2 3
6. *In situ* and *ex situ* conservation of biodiversity	2 3 3
7. Incentive measures and economic alternatives	1 3 3
8. Measures for the sustainable use of biodiversity	2 3 3
9. Monitoring and Evaluation of the above	2 2 3

Appendix C: STAKEHOLDERS CONSULTED

STAKEHOLDER ORGANISATION	NAME AND POSITION
EC Delegation	Ritva Sallmen Regional Co-ordinator
NAO Task Force	Felix Giread, John Townend -Team Leader/TA Expert
Environmental Protection Agency	Dr Indiajit Ramdass
Environmental Protection Agency	Eliza Florendo
Environmental Protection Agency	Doorga Persaud – Executive Director
Ministry of Tourism	Joseph Singh Permanent Secretary
Ministry of Labour & Human Services	Bibi Shadeek - Minister
Guyana Tourism & Hospitality Assoc	Capt. Gerry Gouveia President
Ministry of Finance (IIDB)	Diego Dorado, Sattie Sasenarine – Internat. Tech. Co-ordin.
Guyana Association of Municipalities	Hamilton Green & Robert Williams (Mayor & Deputy Mayor)
DFID	Hilary Grimes - Infrastructure Advisor
Ministry of Amerindian Affairs	Caroline Rodrigues - Minister
British High Commission	Malcolm Kirk - Deputy High Commissioner
Iwokrama International Centre	Dr David Singh - Acting Director General
Lands and Surveys Commission	Andrew Bishop - CEO/Commissioner
Guyana Forestry Commission	James Singh - Commissioner of Forests
Conservation International of Guyana	Maj Gen [Rtd] Joseph Singh - Executive Director
Hydrometeorological Service	Dilip Jaigopaul - Chief Hydrometeorological Officer
Ministry of Public Works (Sea Defences)	George Howard - Chief Sea and River Defence Officer
Fauna and Flora International	Shyam Nokta – Guyana Project Officer
Min. Agriculture - Pesticide & Toxic Chem. Bd.	Basudeo Dwarka – Secretary/Registrar
Iwokrama International Centre	Joan McDonald – Tourism Coordinator
Ministry of Agriculture – Fisheries	Dr Dindyal Permaul - Permanent Secretary
Office of the President	Dr Coby Frimpong - Poverty Reduction Strategy
IDB Environment	Rafael Galvan - Natural Resources Specialist
World Bank	Lucia Hanmer - Country Representative
UNDP	Patsy Ross - Programme Analyst (Environment)
CIDA	Anna Iles – CIDA Program Officer
NARI	Cudho Homenauth -Director
Private Sector Commission of Guyana Ltd	Bal Parsaud -Executive Director
Guyana Geology & Mines Commission	Robeson Benn - Commissioner
Ministry of Agriculture (Drainage and Irrigation)	Ravi Narine
Ministry of Agriculture (Wildlife Division)	Alona Sankar (Head)
Mon Repos Aquaculture Station	Tejnarine Geer (Senior Fisheries Officer)
Guyana Marine Turtle Conservation Society	Annette Arjoon - Managing Director

Appendix D: ISSUES ANALYSIS

Issues Analysis and Evaluation Response

Many issues in environmental management, by their very nature are cross-sectoral in terms of their cause and effect. The following table, populated directly from knowledge obtained from the consultation process, is designed to identify, classify the cross sectoral response and from this, how guidelines for mainstreaming environmental concerns can then be devised (see Section 9).

For Sector relevance, the following abbreviations have been used. *(E – environmental protection and health; A – agriculture; F – forestry; M – mining; Fi – fisheries; E – energy; TI – trade/industry; I – infrastructure; T – transportation; S – settlements; To – tourism)*

Cross Sectoral Programme Response Abbreviations – BCM - Biological Diversity and Conservation Management incl protected areas; VAMA – Vulnerability Assessment Mitigation and Adaptation; NRLUM – Natural Resources and Land Use Management; ICZM – Integrated Coastal Zone Management; IWRM – Integrated Water Resource Management; EH – Environmental Health; EP – Environmental Pollution; IWM – Integrated Waste Management; PTCC – Pesticides and Toxic Chemicals Control.

ISSUE DESCRIPTION	**Sector Relevance**	Possible Cross Sectoral Programme Response to address issue
Scale of the environmental problem - Tropical forest largely untouched – main critical environmental issues are focused on the coastal regions and Georgetown where the population numbers are high.	F S E	**VAMA NRLUM ICZM IWRM EH EP IWM PTCC**
Ownership of the Environmental Outcome - Upgrading existing road for exports from northern Brazil to Georgetown port (new outer harbour proposed)- strategic environmental impact of various economic plans and programmes (eg: transport)	T E	**NRLUM ICZM EH EP IWM**
Ownership of the Environmental Outcome - Delivery of the Protected Area Network (World Bank funded work) - is the concept capable of implementation?	E	**BCM NRLUM**
Improving Environmental Governance - Capacity - EPA is under-resourced and very bureaucratic suffering from micromanagement	E	**BCM VAMA NRLUM ICZM IWRM EH EP IWM PTCC**
Financing the delivery of environmental management - Conservation Concessions – option for a forest credits. Environmental tax doesn't go to EPA - Belief that EPA could stand in the way of progress. Consequently EPA is reactive as often decisions are made first and the environmental considerations brought in later. Investors should pay for EIA and the real technical costs of EPA related to their application	E F M	**BCM NRLUM**
Role of NGOs (such as Conservation International) in assisting delivery of environmental management - series of MOUs with various parties e.g. Rupununi Development Board. NGOs have put forward most of the effort and commitment in getting Guyana recognised on the international scale (e.g.: Ramsar) – GoG needs to help and be more proactive.	E S F M	**BCM IWRM ICZM**
Better Education – need to integrate education into environment particularly at university level	TI E A F M Fi E I T S To	**BCM VAMA NRLUM ICZM IWRM EH EP IWM PTCC**
Sustainable financing – efforts should be made to introduce schemes where investors fund for the admin costs of managing an EIA. Previous efforts to set up a Trust Fund for the Environment to finance overhead costs should be reconsidered to help arrest staff losses and provide elements of security in the sector.	To F M A E	**BCM VAMA NRLUM ICZM IWRM EH EP IWM PTCC**

Improving Environmental Governance - No mechanisms in place from GoG to actually turn international commitments into action in terms of delivering effective conservation on the ground.	TI E A F M Fi E I T S To	**BCM VAMA NRLUM ICZM IWRM EH EP IWM PTCC**
Improving Governance and environmental responsibility – whilst NGO links with GFC is good, GFC are under pressure to free up state forests for industrial development.	TI F	**BCM NRLUM ICZM**
Improving Environmental Governance - GoG needs to consider and reappraise its institutions and the composition of the Natural Resources Association Committee within Parliament (which currently is toothless). Members should be democratically elected and accountable to the environment sector instead of personal gain (if from the private sector).	TI E A F M Fi E I T S To	**BCM VAMA NRLUM ICZM IWRM EH EP IWM PTCC**
Communicating the benefits of sustainable development - Need to get Parliamentary Committees out to the locals seeing the environmental issues at first hand.	TI E A F M Fi E I T S To	**BCM VAMA NRLUM ICZM IWRM EH EP IWM PTCC**
Scale of the environmental problem - Concern that all protected areas/national parks are in remote areas away from areas of most population and use.	E S	**BCM NRLUM**
Ownership of Environmental Management - Guyana Geology and Mines Commission (GGMC) has a separate Environmental Unit (led by Karen Livan) funded from licence fee funds and mining royalties as opposed to the over reliance on GoG capital budget funds which has repeatedly caused problems for EPA.	M E	**EP NRLUM IWRM**
Paucity of legal regulation drafters in Guyana – speed of legal turn around is very slow, which reflected the commitment that GoG places on environmental issues. Often there is no or limited attention from senior policy makers on environmental issues.	E T S TI E A F M To	**BCM VAMA NRLUM ICZM IWRM EH EP IWM PTCC**
The environment is often too donor-driven and consequently staff are constantly looking out for the next project to fund their salaries often resulting in a loss of staff and rapid turn over of senior staff.	TI E A F M Fi E I T S To	**BCM VAMA NRLUM ICZM IWRM EH EP IWM PTCC**
Ownership of eventual environmental outcome - There is a need to have clearer responsibility links and ownership delivery mechanisms between those commissions who have their own environmental units (e.g.: GFC and GGMC) and the EPA that is government backed directly. Drainage and Irrigation Board is a positive example of a division placing the environment at the forefront of its policy making.	F M E	**IWRM ICZM NRLUM EP**
Scale of the environmental problem - local environmental "hot spots" of mercury in mining activity in areas downstream areas are often hidden or not detected by an already high level of mercury in fish (bioaccumulation). Communities that did not eat fish recorded very low levels in mercury in their blood and hair.	M Fi	**EP EH IWRM**
Scale of environmental problem – often the small mining operation (1or 2 people has the main impact depending upon techniques being used for excavation)	M E	**EP EH IWRM**
Adapting to a changing society - Problem associated with the incursion of Brazilian miners – cross border issues and impact on environment	M E	**NRLUM**
Coordination and Delivery of environmental management - Capacity of in staff international donor organisations to provide effective project support and end user confidence that outcomes will actually be delivered (often staff capacity is small and overstretched).	TI E A F M Fi E I T S To	**BCM VAMA NRLUM ICZM IWRM EH EP IWM PTCC**
Strategic environmental assessment of projects/programmes on transportation (Roads and Bridges) needs to be a key focus – Rural Transportation Programme (IDB funds) is supported by separate EC funded pre-feasibility studies.	T E	**NRLUM**
Cumulative impact of large-scale logging, wood collection, unregulated chainsaw operations is unknown. This issue is monitored by GFC who then report to EPA – frequency of reporting uncertain.	F E	**BCM EH EP**
Creating Environmental Accountability - Conversion of forests to agriculture and then into housing - resulting construction of infrastructures in these areas needs more planning and consideration of cumulative and strategic impacts	A F E	**NRLUM BCM**

Creating Environmental Accountability - Unregulated and unmanaged exploitation of forest resources in Amerindian communities	S F E	**NRLUM**
Creating Environmental Accountability - Indiscriminate burning in savannahs – cumulative impacts?	A E	**BCM EP EH**
Ownership of the environmental outcome - Environmental monitoring and indicator setting is sporadic and reactionary in general and this is due to finance and capacity. Often only large industries are monitored (eg: Guyana Sugar Co.)	TI E A F M Fi E I T S To	**BCM VAMA NRLUM ICZM IWRM EH EP IWM PTCC**
Scale of the environmental problem - Drainage and irrigation, long term management of the Conservancy Dyke needed over the long term.	I E	**ICZM IWRM IWM NRLUM**
Coordinating the Delivery of Environmental Management – Drainage and Irrigation Board are a good example of a sector that placed the environmental issues at the forefront of their policy and regulation setting (leading to the new revised Bill being passed towards Parliament and the precursor to gaining international donor funds.	I E AS	**ICZM IWRM IWM NRLUM**
Scale of environmental problem Use of agro-chemicals – relatively low impact on groundwater pollution (residue) levels being recorded.	A E	**PTCC**
Scale of environmental problem Soil erosion – geographic spread of erosion is related to land use change	A	**PTCC ICZM NRLUM**
Scale of environmental problem Over-harvesting of mangle (mangrove vegetation) - 500m erosion recorded where mangroves have been cut.	I E	**ICZM VAMA**
Ownership of the environmental outcome - Sewage outfall and impacts on marine environment and biodiversity – untreated sewage is pumped off from Georgetown though not far offshore / flood events bring pollution problems.	E I S	**IWRM ICZM BCM**
Improving environmental governance - Lack of trained professionals in natural protected area management	TI E A F M Fi E I T S To	**BCM**
Creating environmental accountability - Staff and rangers in the NP are empowered by the Act to monitor and control activities. However, enforcement powers are weak (Amerindian Act and traditional rights *etc*) and the fact that the KNP is so remote and movement around the park is difficult (no roads) and so has to be done by boat.	E S	**BCM**
Creating environmental accountability - concern that some National Parks are "Paper Parks" - Kaiteur NP has lots of gold prospecting in the area and whilst mining for commercial gain is not allowed without prior consent this still happens.	E S	**NRLUM BCM**
Financing the delivery of environmental management - Iwokrama is a good example of successful international donor assistance, however the return time of cost recovery and income generation is proving to be slow.	E	**BCM NRLUM**
Communicating the environmental product to all peoples - Aim is to get local people to visit NP and not just the tourists therefore there is a great need to improve the efforts of getting locals out into seeing the NPs and what they offer. Through a series of outreach programmes.	E S	**BCM**
Improved Donor communication - common concern that end users on most donor funded projects are the last to get involved in the design of a project outcome.	TI E A F M Fi E I T S To	**BCM VAMA NRLUM ICZM IWRM EH EP IWM PTCC**
The influence of the media on Guyanese society - influence of the US is stronger in Guyana than any South American nation (i.e.: TV/radio). Likewise the US lifestyle is closely adhered to. However the supporting environmental credentials and requirements cannot be matched by Guyana, hence the purchase of US style fast food within separate packagings cannot be recycled as in US. Guyana is not forced to practice environmental discipline like the US.	TI E A F M Fi E I T S To	**IWM**
Financing the delivery of environmental management - Environmental Tax - Guyana Customs Dept levy this tax on certain imports to the country, but the benefit of this is not filtered down to the municipalities to deliver effective	TI E A F M Fi E I T S To	**BCM VAMA NRLUM ICZM IWRM EH EP IWM PTCC**

sustainable practice. This issue must be resolved as monies are available but loopholes in the governmental system hinder the flow of this money for environmental projects.		
Coordinating the delivery of effective environmental management - Disposal of solid waste is the city is a major problem, currently, all waste (incl abattoir wastes and hazardous wastes) are taken to landfill. Issues of recycling – often more expensive to consider recycling in Guyana than to build a new landfill site.	E S	**IWM EH EP**
Coordinating the delivery of effective environmental management - Impact of EC Programmes altering the agricultural sector (eg: sugar export prices to be reduced by 37% for all ACP countries). What is the Strategic Environmental Assessment of such an EC policy on establishing alternatives?	A E TI	**BCM VAMA NRLUM ICZM IWRM EH EP IWM PTCC**
Adapting to a changing society – Need for direct intervention of funds - Request for EC to consider funding projects linking through to actual delivery of effective solid waste management	E S	**IWM**
Adapting to a changing society - Cost of weekly garbage pick up and transport to landfill - Georgetown Municipality has set up an MoU with 14 other regional municipalities to help integrate solid waste collection. The problem is that whilst MoUs are in place, most of the 14 Municipalities cannot afford the transportation costs of waste removal to the city landfill. GoG should seek to subsidise transport costs – this is not confirmed as yet. This should be fast tracked as the other 14 municipalities burn and bury solid waste and have no regulated disposal. The lessons from the recent floods indicate the need for remedial and long term approaches to better waste disposal on environmental health grounds.	E	**IWM NRLUM EH**
Coordinating the delivery of effective environmental management - The deficiency of a sewage management system is a critical issue across the populated regions of Guyana. Only two Areas have underground sewage systems, the rest rely on septic tanks and pit latrines (18000 septic tanks in the city currently lead directly to the drainage canal system as raw sewage). Result is that any flood event is a consequent major health hazard. A new offshore disposal pipe is needed for Georgetown to go further offshore. Renovation of old sewage pumps is also needed.	E S	**IWRM ICZM EH EP**
Adapting to a changing society - Squatter Settlements – the current geographic spread of squatters is mainly close to the current canal systems	S	**NRLUM EH EP**
Communicating the benefits of sustainable development - Communications and Public Relations is central to the debate on the environment and this needs improving particularly from the position of international donors	TI E A F M Fi E I T S To	**BCM VAMA NRLUM ICZM IWRM EH EP IWM PTCC**
Adapting to a changing society - Public amenity sanitary conditions need to be improved in parks and recreational areas (where people congregate) as more than 50000 people come in from outside of Georgetown each day out of a total pop of 150000. This creates environmental impact and needs to be considered.	E S	**EH**
Diversification of the forestry market - currently exploit 30+ species out of 1000+ species but requires attitudinal shift to accept new species; also requires more international marketing.	F E	**BCM NRLUM**
Diversification of the forestry market - Forestry sector lack of forward progress is lack of re-investment (resulted in reduction in 2005 GDP contribution). Sector contributes < 5% GDP – 66% of forest is State forest. Timber yards and sawmills often work at 50% productivity.	F	**NRLUM**
Need for improved Information Management - GFC would like to do a forest inventory with a management plan for no charge with an Amerindian representative – but no community has responded. GFC has already done an inventory of all forest lands except for those areas in titled lands. GFC has a GIS but not networked to those of other Depts. Metadatabase is run by Lands and Surveys (ie: have a common platform – maps easy to obtain upon request.	F	**BCM NRLUM**
Delivery of Donor training proposals – often there is a lack of trained human resources to take up research monies available (Guyanese trained staff)	TI E A F M Fi E I T S To	**BCM VAMA NRLUM ICZM IWRM EH EP IWM PTCC**

Marketing Sustainable Development - Forest Producers Association are not pushing the marketing approach as much as they should.	F	**NRLUM** **BCM**
Creating environmental accountability - GFC are looking for an inter-agency approach to monitoring the specific problems of local communities within titled lands. A Forest Management Plan will be offered to groups free of charge, in return groups need to nominate a representative leader – no take up of this so far from Amerindian groups.	F A E M	**BCM** **NRLUM**
Coordinating the delivery of effective environmental management - Role of private sector in environmental management in Guyana is under used and needs to be increased.	TI E A F M Fi E I T S To	**BCM VAMA NRLUM ICZM** **IWRM EH EP IWM PTCC**
Coordinating the delivery of integrated environmental management - whilst the EPA Act is in place, there appears to be no synergy between plans, policies and programmes across all the sectors.	TI E A F M Fi E I T S To	**BCM VAMA NRLUM ICZM** **IWRM EH EP IWM PTCC**
Diversifying the environmental product - Guyana does not market itself as a tourism destination though possesses great potential as a ecotourism main stream resort – demand for greater budget.	To E	**NRLUM** **BCM**
Environmental Certification - Arrowpoint Eco-resort is the only resort that has attained EPA certification. Others have been encouraged to follow suit, but there is no actual requirement for this set by EPA	To E	**BCM** **NRLUM**
Hotel Certification - GTA is inviting all hotels in Guyana to register themselves with GTA and then to encourage them to become certified to regional standards (e.g. Caribbean Hotel Association standards)	To	**NRLUM** **IWRM** **IWM**
Strategic Environmental Assessment of increased air transport (access) - Development of Ogle Airport delayed due to recent floods. Separate Ogle Airport Incorporated Company established as a private company to progress the development	T TI	**NRLUM**
Strategic Environmental Assessment - Georgetown – Lethem Road (Brazil to Guyana) road scheme – currently a trail – though with potential for being an economic conduit for future economic development country.	T E	**NRLUM**
Re-settlement of trained Guyanese overseas – need to create an economic environment to encourage people to stay (incentive schemes)	S	**BCM VAMA NRLUM ICZM** **IWRM EH EP IWM PTCC**
Better information Needs - Improved research into the use of local endemic plants for medicinal purposes	A E	**BCM ICZM EH**
Links and knowledge sharing between all international donor projects – eg: EC Delegation National Transport Strategy – GOPA Consultants in Germany are undertaking an environmental assessment	T	**NRLUM**
Disaster Response Contingency Planning - during floods, waste trucks unable to pick up garbage and there was no place to dispose of human excrement as pits could not be dug and waste could not be burnt. Disaster Preparedness Report is being compiled for Municipality of Georgetown	TI E A F M Fi E I T S To	**VAMA** **IWM** **ICZM** **EH**
Common aims and objectives - all municipalities are embarking on an agreed vision (through a business plan) to improve sharing of knowledge on all issues around the country.	TI E A F M Fi E I T S To	**BCM VAMA NRLUM ICZM** **IWRM EH EP IWM PTCC**
Involving end users early in the project process – concern that International donors do not consider the end users earlier enough in the participation process	TI E A F M Fi E I T S To	**BCM VAMA NRLUM ICZM** **IWRM EH EP IWM PTCC**
Financial sustainability of environmental projects - Generation of revenue and cost recovery in environmental projects – a more innovative or effective "green tax" collection system to be considered in future donor projects	TI E A F M Fi E I T S To	**BCM VAMA NRLUM ICZM** **IWRM EH EP IWM PTCC**
Flooding and solid waste management - Problems during floods of plastic bottles blocking grills – integrated approach needed.	E S I	**VAMA** **IWM** **EH EP**
Communicating Flood Risk - Need for Public Flood Evacuation Plans and Contingency Plans that involve key players	TI E A F M Fi E I	**VAMA**

on a regular basis to instil trust	T S To	**ICZM IWRM**
Instilling the environment into long term planning - Need to avoid the environment as being a "three year project" from international donors – it should be instilled into all sectors initiatives as a common aim (forestry, transport, tourism *etc*)	TI E A F M Fi E I T S To	**BCM VAMA NRLUM ICZM IWRM EH EP IWM PTCC**
Waste recycling - There is no national recycling policy – only cardboard and bottle on sale and return. There is a need for plastics to be recycled or a pay return fee to encourage recycling for the local people. Organic matter is sometimes used for recycling onto land as a fertiliser. Currently, there is no incentive in the country to recycle	E I	**IWM EH**
Capacity and Training on landfill management - There is limited or no training on landfill management or solid waste management in Guyana	E I	**IWM EH**
Lack of science training opportunities - Hydromet suffers from particular training problems as there are few training opportunities available in country. The Caribbean Meteorological Organisation in Barbados is the only centre for training.	TI E A F M Fi E I T S To	**VAMA IWRM NRLUM ICZM**
Strategic Flood Risk Management - A project to help land use planning at a strategic scale is needed – farmers need to be aware of better forecasts along with being better prepared for flood episodes.	A E I	**VAMA ICZM IWRM**
Flood Warning and Response - Need to balance irrigation and flood water response for the future maintenance of the Conservancy Dyke therefore a win-win project would be one that seeks to develop an effective strategy for flood warning and response. An audit trail of projects from forecast to response to long term strategic planning currently does not exist. Role of the Drainage and Irrigation Board and their approach to involving the private sector (Water Users Association) and attempts to decentralise the implementation of actions in the regions is a positive approach. Flood warning and response could model itself on this approach.	A E I S	**VAMA IWRM ICZM**
Investing in weather prediction systems - Donor investment in meteorology is not a priority, only one loan from World Bank received after the El Nino of 1998 when a small loan (USD 100K) was received. EC funded a radar from 1998.	A F E	**VAMA**
Coordinating the delivery of environmental management - A common alliance to sustainable development needs to be demonstrated by all GoG Ministries and Departments as currently, the emphasis is overburdening the EPA to deliver this. The responsibility should be spread between departments and this should be more transparent.	TI E A F M Fi E I T S To	**BCM VAMA NRLUM ICZM IWRM EH EP IWM PTCC**
Community Involvement - Bina Hill is a sound example of sustainable community involvement	E S	**NRLUM BCM**
Networking of Forest Areas (Guyana Shield Initiative) – concept idea to be developed for biodiversity implementation. Link to a Collaborative Management Agreement with Iwokrama Forest.	E S	**BCM**
Diversification of economic development - It is believed that agriculture in the country will not be the mainstay of the economy, though will remain propped up by GoG as a service. Traditional forestry will continue but the future focus is through ecotourism, by being able to provide an environmental service to the rest of the Caribbean	F To I TI E	**NRLUM**
Long term management of the coastal zone - 90% of population live in this coastal zone – ICZM is to become critical in the future. Long-term assessment of the sustainability of defending populations in current locations needs to be addressed.	TI E A F M Fi E I T S To	**ICZM**
Mangrove Management - Mangroves are threatened through cutting – where narrow strips of mangrove occur, rehabilitation is often improbable. Existing implementation of Mangrove Management Plan needs to be evaluated.	A F E	**ICZM**
Integrated donor assistance - Country would benefit from integrated approach to donor assistance	TI E A F M Fi E I T S To	**BCM VAMA NRLUM ICZM IWRM EH EP IWM PTCC**

Creating self sufficiency in the environmental sector - Organisational strengthening through a business plan and phased HR commensurate with income-generating activities. What is needed are activities to help ministries to be self sufficient and a list of ways in which to generate revenue streams to help be more independent from GoG. Also help to retain staff.	TI E A F M Fi E I T S To	**BCM VAMA NRLUM ICZM IWRM EH EP IWM PTCC**
Improved training of farmers - need to learn optimum pesticide usage for plant densities;	A E	**PTCC NRLUM**
Impact on environment of changing agricultural practices/types – potential increase in poultry and beef farming as a tend (private sector driver)	A TI	**NRLUM EP**
Improved environmental governance – need for government institutions to change – GoG needs to foster better market opportunities and help the private sector to improve the procedures for net exporting of goods (currently red tape hinders progress).	TI E A F M Fi E I T S To	**BCM VAMA NRLUM ICZM IWRM EH EP IWM PTCC**
Future role of organic farming - Organic farming is slow in Guyana but growing as an industry. – Guyana Sugar Corporation is good (600 hectares currently in operation), though the QA procedures needed to ensure standards are met are high and costly	A E TI	**NRLUM BCM**
Bottom Up Environmental Assistance - Recommendation that EPA should consider looking and providing help to small enterprises rather than just focusing on regulatory activities of larger industrial sector companies (e.g. Guyana Sugar)	A TI E	**BCM VAMA NRLUM ICZM IWRM EH EP IWM PTCC**
Communicating good social practice - Good example of local community involvement and self sufficiency is found at St. Ignatius (Rupununi) where local groups have now established libraries and nurseries to allow women to work and earn	S E	**BCM**
Social Pressures and increased suicide - Assistance needed for Region 2 and in Region 6 where male suicide is a problem	S	**BCM VAMA NRLUM ICZM IWRM EH EP IWM PTCC**
Integrating Govt and NGO sectors on social issues - There is not a good rapport with local NGO groups in Guyana,	S	**BCM**
Pressures facing Amerindians - health and education are key. Education issues are improving but community centres are very scattered across the Regions. Absence of qualifications in Amerindian communities is hindering development.	S	**BCM VAMA NRLUM ICZM IWRM EH EP IWM PTCC**
Improving dialogue with local communities - Ministry of Amerindian Affairs are attempting to encourage community sustainable resource use through dialogue and no enforcement is possible (advice only).Environmental dialogue with local groups often is sporadic except for good example at Iwokrama.	S E	**BCM**
Self financing Schemes for Communities - Need to identify alternative revenue generating activities for local groups to save unsustainable practices of forestry from becoming worse. Examples include establishing Heart of Palm plantations (e.g.: NW Guyana) where the initiative (part of a public private partnership with a French firm). Other examples are planting organic pineapples. Trying different farming techniques is being experimented with to bring new revenue streams to communities	S E	**BCM NRLUM**
Top Down Environmental Management **-** The World Bank Guyana Protected Areas project (5 years) is an example where issues are imposed from above onto local communities. Here, international NGOs not knowing the local situation on ownerships and rights, attempted to impose protected area status on lands which were not title lands, thus very difficult to implement.	E S	**BCM NRLUM**
Strategic Environmental Assessment - Georgetown to Lethem Road - The new Brazil to Guyana road link project could be the economic driver for the country but at what cost to the communities? Donors need to be transparent in demonstrating that the money is going to the end users that really need it as well as demonstrating value for money for the donor country taxpayer. Participation of local counterpart organisations, within an international team, is of paramount importance.	E T	**BCM NRLUM**

Generation of revenue and cost recovery in environmental projects – a more innovative or effective "green tax" collection system to be considered in future donor projects	TI E A F M Fi E I T S To	**BCM VAMA NRLUM ICZM** **IWRM EH EP IWM PTCC**
Monitoring Environmental Progress - No environmental indicators exist for the country	TI E A F M Fi E I T S To	**BCM VAMA NRLUM ICZM** **IWRM EH EP IWM PTCC**
Communicating the benefits of sustainable development - National environmental standards need to be better communicated to all national stakeholders in public and private sector.	TI E A F M Fi E I T S To	**BCM VAMA NRLUM ICZM** **IWRM EH EP IWM PTCC**
Delivering Sustainable Development - In Guyana there is a high correlation between economic growth (use of bauxite, agriculture, forestry etc) and poverty reduction. What needs considering is how to achieve the balance between the correlation and sustainable development that does not detrimentally affect the environment and still allows locals access to their natural resource needs.	M F A E	**BCM VAMA NRLUM ICZM** **IWRM EH EP IWM PTCC**
Sea Defence Maintenance - There is a need for better income raising opportunities to help fund defence maintenance, monitoring and construction. The commercial advertising on the current sea wall is one opportunity to raise money, at present the SDB received none of this money even though SDB is legally responsible for maintaining all defences.	I E	**ICZM**
Managing Natural Change - SDB found that mudshore erosion comes in cycles of 25 -40 year periods. Where mangrove stands are narrow, then rehabilitation is unlikely and in these places, the efforts to bolster or improve sea defence standards of service are focused upon.. Where mangrove stands are robust, then re-planting and rehabilitation efforts are targeted.	E I	**ICZM**
Planning for Sea Level Rise - No real understanding of land subsidence and sea level rise in the country.	E I	**ICZM VAMA**
Effective implementation of Biodiversity Action Plan – expectations at outset were too high	E	**NRLUM BCM**
Supporting community livelihoods - (help to Min of Amerindian Affairs). Amerindian lands are not covered by national legislation. The new Act will mean that local communities will have to produce their own management plans for land. UNDP is supporting this process with help from FFI and Iwokrama.	S E	**BCM**
Communicating good practice - North Rupununi District Development Board has become a "flagship" and is attracting automatically many adjacent communities who wish to prepare their own management plans that follow the Iwokrama model as it works and local groups can easily see the benefit. Region 1 (Shell Beach) has many Amerindian communities who are part of an exchange programme with communities and rangers in Region 9 in Iwokrama. Therefore, in terms of the largest groupings of Amerindians, there is already a good linkage system in place	S E	**BCM**
Coordinating the delivery of environmental management - Coordination of effort in the environmental sector is missing, though is critical to success.	TI E A F M Fi E I T S To	**BCM VAMA NRLUM ICZM** **IWRM EH EP IWM PTCC**
Creating environmental accountability - too much uncoordinated legislation and subsequent sectoral regulations that do not communicate a common vision. All ministries have own regulations, though no clarity over which regulation takes precedent – what is the hierarchy of legislation? (prosecutions are therefore impossible as a defendant could claim an action under a separate act or regulation)	TI E A F M Fi E I T S To	**BCM VAMA NRLUM ICZM** **IWRM EH EP IWM PTCC**
Communicating the benefits of sustainable development to end users - Communication of environmental issues to Parliament is diluted by an ineffective Natural Resources Sub-Committee of Parliament	TI E A F M Fi E I T S To	**BCM VAMA NRLUM ICZM** **IWRM EH EP IWM PTCC**
Improving environmental governance - Lack of environmental lawyers and there is a lack of trained lawyers able to draft environmental law	TI E A F M Fi E I T S To	**BCM VAMA NRLUM ICZM** **IWRM EH EP IWM PTCC**
Improving certification and environmental accountancy – issues linked to forestry certification should be communicated to all sectors.	F E	**BCM VAMA NRLUM ICZM** **IWRM EH EP IWM PTCC**
Agri-biodiversity – UNDP proposed projects reviewing the potential for improved agri-biodiversity (for economic gain)	A E	**BCM**

		NRLUM
Disaster Management (droughts and floods) - link with Community Management Plans – need to be incorporated as part of planning based on recent experiences from flooding (in Region 9, rivers rose by 30ft during floods).	E I	**VAMA**
Data and Information Management (lack of baseline data with appropriate response agency at times of need e.g.: flood episode).	TI E A F M Fi E I T S To	**VAMA** **ICZM**
State of Civil Service Reform – institutional change is vital and a reformed Civil Service needs to take place.	TI E A F M Fi E I T S To	**BCM VAMA NRLUM ICZM** **IWRM EH EP IWM PTCC**
Improving environmental governance - The mode of Government in Guyana is highly centralised and most issues have to go through the Office of the President. No attempt is made to decentralise power and authority to the regions. The best example of attempts to decentralise and regionalise issues is the work of the Drainage and Irrigation board who incorporate the work of the Water Users Association to implement the running of the water business in the regions.	TI E A F M Fi E I T S To	**BCM VAMA NRLUM ICZM** **IWRM EH EP IWM PTCC**
Capacity Building - Migration and retention of staff. Poor working conditions and pay result in high staff turnover	TI E A F M Fi E I T S To	**BCM VAMA NRLUM ICZM** **IWRM EH EP IWM PTCC**
Financing the delivery of environmental management - Need to implement new financial revenue streams across Govt. GFC as an example and Guyana Geology and Mines Commission (GGMC) have mechanisms through licensing to establish themselves as an independent agency by recovering fees to pay for staff training and salaries *etc*. Consequently, GFC and GGMC can command a different pay structure outside of that dictated by the Civil Service.	M E	**BCM VAMA NRLUM ICZM** **IWRM EH EP IWM PTCC**
Imposing legislative change when not needed - "Guyana Natural Protected Areas Project (Phase 2)" likely to start May 05. Lots of lessons learnt from the Phase 1 project, now any legislation change is to be proposed at the end of the project at not at the beginning (Amerindian Act originally imposed on the project which was incorrect).	E S	**BCM** **NRLUM**
Ownership of the eventual environmental outcome – GGMC and GFC have separate Environment Units – MoUs are set up with EPA whereby GGMC/GFC undertake the compliance monitoring and ensure all documentation for EIA is in place. The EPA role is a strategic overview of findings.	F M E	**NRLUM**
Scale of the Environmental problem - Concern over environmental impact of small scale mining activities and the change to hydraulic mining. Soils in interior have a high clay content and this is washed into creek and river systems during hydraulic operations.	M E	**NRLUM** **BCM**
Creating Environmental Accountability at all scales of operation - GGMC asking small scale miners to set up settling ponds and recycle ponds to allow settling to occur before waters are despatched into the river system to reduce impact on the environment. Silt screen projects are hoped to be set up to help local miners – donors could get involved in that exercise?	M E	**NRLUM** **BCM**
Enforcement of permits (mineral take)- this is difficult to impose and police as the problem is often habitual with no regard to the environment. The impact is however quite localised.	M E	**NRLUM** **BCM**
Communicating the benefits of sustainable development - For raw gold mining, GGMC have a 5% royalty fee on all permit takes, the GoG impose a 2% tax. GGMC considering a 1% credit rebate (duty free commission) for those mining operations that clearly demonstrate good environmental practice coupled with a clear demonstration of permitted extraction amounts.	M E	**NRLUM**
Ownership of the Environmental outcome – there are no official standard environmental indicators for the country. These need to be integrated and accepted by all sectors (eg:indicators may be linked to the quality of discharged mine waste waters to rivers - clear, turbid etc). Noise pollution indicators should also be set.	TI E A F M Fi E I T S To	**BCM VAMA NRLUM ICZM** **IWRM EH EP IWM PTCC**
Adapting to societal change - Plastics in rural areas in increasing (especially last three years). In general people in the	E S	**EH**

interior are more environmentally friendly and aware.		**EP** **IWM**
Environmental education is the key – NARI informally link with Min of Education though helping with school trips – may train teachers on pesticide management. There is no Masters training programme on sustainable agricultural practice.	A	**NRLUM**
Diversification of the Environmental Product - Min Fisheries (Aquaculture) sub-station at Mon Repos looking at diversification of the aquaculture product and specific studies into integration of rice cultivation and fish farming (coordination to keep down pest related problems).	A Fi E	**NRLUM** **EH EP** **IWRM ICZM**
Improving Environmental Governance – findings of the 1995 ERM study on financial independence of EPA were not taken forward by GoG – a feeling that EPA is a block to development	E	**BCM**
Solid waste management**:** perhaps the key environmental problem and has been for up to 10 years now.	E	**IWM**
Scale of the Environmental Problem - Large scale logging, wood collection, unregulated chainsaw operations are all quite small scale as a problem due to improved technology and issue is often localised.	F E	**NRLUM**
Coordinating the delivery of environmental management - conversion of forest to agriculture and other uses, construction of infrastructures in forest areas – farm land to housing is a key issue.	F A E S	**NRLUM** **IWM**
Coordinating the delivery of environmental management - Unregulated and unmanaged exploitation of forest resources in Amerindian communities (setting up buffer zones)	S F	**NRLUM**
Coordinating the delivery of environmental management - burning in savannahs – relatively minor issue	A E	**EH NRLUM EP**
Scale of the environmental problem - use of agro-chemicals – not so much a problem now and local scale impact.	A E	**EH EP**
Scale of the environmental problem - Soil erosion - Really only related to mining – improved; local scale	M A	**IWRM**
Communicating the Benefits of Sustainable Practices - Issue is that the individual or two man operation cause more environmental impact through release of tailings from hydraulic mining into nearby water courses (turbid)	M E	**EP EH**
Adapting to a changing society - forms of capture, holding, smuggling of drugs/corruption – this is becoming more of an important issue with time (cross border monitoring and enforcement).	E	**BCM**
Ownership of the environmental outcome - Over-harvesting of mangle (mangrove vegetation) – is this a Sea Defence Board or GFC issue? (resulting in shoreline erosion and mudshore depletion.	E I	**ICZM**
Adapting to a changing society - Poverty and affluence related pressures	S	**BCM**
Improving environmental governance - once sustainable forestry and mining practices are sorted (on the right track at present) it is likely that all other aspects (except solid waste management) have a localised impact. The cumulative impact of these local scale impacts needs consideration though.	F M E	**NRLUM** **IWM**
Communicating the Benefits of Sustainable Development - environmental education is weak and needs backing by GoG. EPA did champion this and success was evident, this needs refocusing following the aftermath of the floods.	TI E A F M Fi E I T S To	**BCM VAMA NRLUM ICZM** **IWRM EH EP IWM PTCC**
Creating environmental accountability - Environmental Management in Guyana needs a "Champion" and a series of success stories to launch it on an international platform.	TI E A F M Fi E I T S To	**BCM VAMA NRLUM ICZM** **IWRM EH EP IWM PTCC**
Improving Environmental Governance - Capacity of the Wildlife Division is stretched. Only 10 present (3 in Head office incl the Head; 2 vets; 3 in the Trade Section working on permits and regulations; 3 in Accounts. Enforcing the regulations and remits that are imposed on them via the EP Act are thus difficult.	E Fi TI	**BCM**
Creating Environmental Accountability - Key species of trafficking are birds (macaws and parrots). Reptiles are used to smuggle drugs overseas.	E Fi TI	**BCM**
Key Issue is there is not the resource to place enforcement officers at airports or ports to physically check import/export	E Fi TI	**BCM**

of wildlife. ***Ownership of the Environmental Problem*** - With no baseline stocktake information on wildlife resources, it is difficult for the Division to determine what is the carrying capacity of a certain species for export. To help communicate issues on the ground within the interior, links with Amerindian Affairs needs to be improved. ***Coordinating the Delivery of Environmental Management*** - Division needs a "holding station" for wildlife captured either as poaching or prior to export at the airport – no facilities are in place at present – maybe a better link with the National Parks Commission and the Georgetown Zoo. ***Financing the Delivery of Effective Environmental Management*** - Value of known trade (licences) – net income is circa G$45-50 million per year (gained from levies, health certificates and licence etc). Financial contribution of an improvement to the current management approach of the Division is unknown though likely to generate considerable returns. Aquarium trade – this issue has been taken over from the Fisheries Division – concern though that at present so detailed spot checks are carried out on the numbers of fish - only a "catch all" licence rate per box. New quota system is needed.	E Fi TI E Fi TI E Fi TI	**BCM** **BCM** **BCM ICZM**

Appendix E: SELECTED SOURCES OF ENVIRONMENTAL INFORMATION

E.1 AGRICULTURAL QUALITY

NB: all information from this Appendix is for Guyana and is taken from www.unep.net

1. Agricultural Production Index - Total (Net Production Index Number (PIN) base 1989-91, 1961-2000)
2. Arable and Permanent Crops - Percent of Land Area (Percent of Land Area, 1961-1999)
3. Arable and Permanent Crops - Total (Thousand Hectares, 1961-1999)
4. Arable Land (Thousand Hectares, 1961-1999)
5. Average Calorie Supply from Animal Products - per Capita (Kilocalories, 1961-1997)
6. Average Total Calorie Supply - per Capita (Kilocalories, 1961-1997)
7. Cereals - Area Harvested (Hectares, 1961-2000)
8. Cereals - Production (Metric Tons, 1961-2000)
9. Cereals - Yield (Hectograms per Hectare, 1961-2000)
10. Fertilizer Consumption (Metric Tons, 1961-1999)
11. Fertilizer Production (Metric Tons, 1961-1999)
12. Forests and Woodland - Percent of Land Area (Percent of Land Area, 1961-1994)
13. Irrigated Land (Thousand Hectares, 1961-1999)
14. Land Area (Thousand Hectares, 1961-1999)
15. Land in Permanent Crops (Thousand Hectares, 1961-1999)
16. Meat Production - per Capita (Kilograms per Person, 1961-2000)
17. Meat Production - Total (Metric Tons, 1961-2000)
18. Permanent Pasture - Percent of Land Area (Percent of Land Area, 1961-1999)
19. Pesticides Consumption - Fungicides, Bactericides ans Seed Treatments (Metric Tons, 1990-1998)
20. Pesticides Consumption - Herbicides (Metric Tons, 1990-1998)
21. Pesticides Consumption - Insecticides (Metric Tons, 1990-1998)
22. Pesticides Consumption - Mineral Oils (Metric Tons, 1990-1998)
23. Pesticides Consumption - Plant Growth Regulators (Metric Tons, 1990-1998)
24. Pesticides Consumption - Rodenticides (Metric Tons, 1990-1998)
25. Total Area (Thousand Hectares, 1961-1999)

E.2 AIR QUALITY

1. Carbon Dioxide Emissions - per Capita (UNFCCC-CDIAC) (Metric Tons of CO_2, 1989-2000) Consumption of ODS: Carbon Tetrachloride (Ozone Depleting Potential (ODP) Tons, 1989-2000) Consumption of ODS: Chlorofluorocarbons (Ozone Depleting Potential (ODP) Tons, 1986, 1989-2000)
2. Consumption of ODS: Hydrochlorofluorocarbons (Ozone Depleting Potential (ODP) Tons, 1989-2000)
3. Consumption of ODS: Methyl Chloroform (Ozone Depleting Potential (ODP) Tons, 1989-2000)
4. Consumption of ODS: Other fully Halogenated CFCs (Ozone Depleting Potential (ODP) Tons, 1989-2000)
5. Consumption of Ozone-Depleting CFCs - per Capita (ODP Kilograms per Thousand People, 1986, 1989-2002)
6. Consumption of Ozone-Depleting CFCs - Total (ODP Metric Tons, 1986, 1989-2002)
7. Emissions of CH_4 - from Agriculture (UNFCCC) (Gigagrams of CH_4, 1990-1998)
8. Emissions of CH_4 - from Fugitive Fuel Emissions (UNFCCC) (Gigagrams of CH_4, 1990-1998)
9. Emissions of CH_4 - from Waste (UNFCCC) (Gigagrams of CH_4, 1990-1998)
10. Emissions of CH_4 - Total Anthropogenic (UNFCCC) (Gigagrams of CH_4, 1990-1998)
11. Emissions of CO_2 - Anthropogenic Emissions and Removals from Land-Use and Forestry (UNFCCC) (Gigagrams CO_2, 1990-98)
12. Emissions of CO_2 - from Cement Production (CDIAC) (Thousand Metric Tons of CO_2, 1960-2000)
13. Emissions of CO_2 - from Fossil Fuels - Total - per Capita (CDIAC) (Kilograms of CO_2 per Person, 1960-2000)
14. Emissions of CO_2 - from Fossil Fuels - Total (CDIAC) (Thousand Metric Tons of CO_2, 1960-2000)
15. Emissions of CO_2 - from Fuel Combustion (UNFCCC) (Gigagrams of CO_2, 1990-1998)
16. Emissions of CO_2 - from Gas Flaring (CDIAC) (Thousand Metric Tons of CO_2, 1960-2000)
17. Emissions of CO_2 - from Gas Fuel Consumption (CDIAC) (Thousand Metric Tons of CO_2, 1960-2000)
18. Emissions of CO_2 - from Industrial Processes (UNFCCC) (Gigagrams of CO_2, 1990-1998)
19. Emissions of CO_2 - from Liquid Fuel Consumption (CDIAC) (Thousand Metric Tons of CO_2, 1960-2000)
20. Emissions of CO_2 - from Solid Fuel Consumption (CDIAC) (Thousand Metric Tons of CO_2, 1960-2000)
21. Emissions of CO_2 - from Transport (UNFCCC) (Gigagrams of CO_2, 1990-1998)
22. Emissions of CO_2 - Total Anthropogenic (UNFCCC) Excluding Land-Use Change and Forestry (Gigagrams of CO_2, 1990-1998)
23. Emissions of CO_2, N_2O, HFCs, PFCs and SF6 - Aggregated (UNFCCC) Excluding CO2 from Land-Use Change and Forestry (Gigagrams Equivalent of CO_2, 1990-1998)
24. Emissions of CO_2, N2O, HFCs, PFCs and SF6 - Aggregated (UNFCCC) Including CO_2 from Land-Use Change and Forestry (Gigagrams Equivalent of CO_2, 1990-1998)
25. Emissions of HFCs, PFCs and SF6 - Aggregated (UNFCCC) (Gigagrams Equivalent of CO_2, 1990-1998)
26. Emissions of N_2O - from Agricultural Soils (UNFCCC) (Gigagrams of N_2O, 1990-1998)
27. Emissions of N_2O - from Agriculture (UNFCCC) (Gigagrams of N_2O, 1990-1998)
28. Emissions of N_2O - from Fuel Combustion (UNFCCC) (Gigagrams of N_2O, 1990-1998)
29. Emissions of N_2O - from Industrial Processes (UNFCCC) (Gigagrams of N_2O, 1990-1998)
30. Emissions of N_2O - Total Anthropogenic (UNFCCC) (Gigagrams of N_2O, 1990-1998)
31. Precipitation - Cubic Kilometers (Cubic Kilometers per Year, 1961-90)
32. Precipitation - Millimeters (Millimeters per Year, 1961-90)
33. Production of ODS: Carbon and Tetrachloride (Ozone Depleting Potential (ODP) Tons, 1989-2000)
34. Production of ODS: Chlorofluorocarbons (Ozone Depleting Potential (ODP) Tons, 1986, 1989-2000)
35. Production of ODS: Hydrochlorofluorocarbons (Ozone Depleting Potential (ODP) Tons, 1989-2000)
36. Production of ODS: Methyl Chloroform (Ozone Depleting Potential (ODP) Tons, 1989-2000)
37. Production of ODS: Other fully Halogenated CFCs (Ozone Depleting Potential (ODP) Tons, 1989-2000)

E.3 VULNERABILITY TO DISASTER

1. Droughts - Affected People (Number of People, 1975-2000)
2. Droughts - Killed People (Number of People, 1975-2000)
3. Droughts - Total Number (Number of Droughts, 1980-2000)
4. Earthquakes - Affected People (Number of People, 1975-2000)
5. Earthquakes - Homeless People (Number of People, 1975-2000)
6. Earthquakes - Injured People (Number of People, 1975-2000)
7. Earthquakes - Killed People (Number of People, 1975-2000)
8. Earthquakes - Total Affected (Number of People, 1975-2000)
9. Earthquakes - Total Number (Number of Earthquakes, 1975-2000)
10. Extreme Temperatures - Affected People (Number of People, 1975-2000)
11. Extreme Temperatures - Homeless People (Number of People, 1975-2000)
12. Extreme Temperatures - Injured People (Number of People, 1975-2000)
13. Extreme Temperatures - Killed People (Number of People, 1975-2000)
14. Extreme Temperatures - Total Affected (Number of People, 1975-2000)
15. Extreme Temperatures - Total Number (Number of Extreme Temperatures, 1975-2000)
16. Floods - Affected People (Number of People, 1975-2000)
17. Floods - Homeless People (Number of People, 1975-2000)
18. Floods - Injured People (Number of People, 1975-2000)
19. Floods - Killed People (Number of People, 1975-2000)
20. Floods - Total Affected (Number of People, 1975-2000)
21. Floods - Total Number (Number of Floods, 1975-2000)
22. Forest Fire Extent - Annual Average (Thousand Hectares, 1990-00)
23. Natural Disasters - Affected People (Number of People, 1975-2002)
24. Natural Disasters - Homeless People (Number of People, 1975-2000)
25. Natural Disasters - Injured People (Number of People, 1975-2000)
26. Natural Disasters - Killed People (Number of People, 1975-2002)
27. Natural Disasters - Total Affected and Killed People (Number of People, 1975-2002)
28. Natural Disasters - Total Affected People (Number of People, 1975-2002)
29. Natural Disasters - Total Number (Number of Natural Disasters, 1975-2000)
30. Slides - Affected People (Number of People, 1975-2000)
31. Slides - Homeless People (Number of People, 1975-2000)
32. Slides - Injured People (Number of People, 1975-2000)
33. Slides - Killed People (Number of People, 1975-2000)
34. Slides - Total Affected (Number of People, 1975-2000)
35. Slides - Total Number (Number of Slides, 1975-2000)
36. Volcanic Eruptions - Affected People (Number of People, 1975-2000)
37. Volcanic Eruptions - Homeless People (Number of People, 1975-2000)
38. Volcanic Eruptions - Injured People (Number of People, 1975-2000)
39. Volcanic Eruptions - Killed People (Number of People, 1975-2000)
40. Volcanic Eruptions - Total Affected (Number of People, 1975-2000)
41. Volcanic Eruptions - Total Number (Number of Volcanic Eruptions, 1975-2000)
42. Waves/Surges - Affected People (Number of People, 1975-2000)
43. Waves/Surges - Homeless People (Number of People, 1975-2000)
44. Waves/Surges - Injured People (Number of People, 1975-2000)
45. Waves/Surges - Killed People (Number of People, 1975-2000)
46. Waves/Surges - Total Affected (Number of People, 1975-2000)
47. Waves/Surges - Total Number (Number of Waves/Surges, 1975-2000)
48. Wild Fires - Affected People (Number of People, 1975-2000)
49. Wild Fires - Homeless People (Number of People, 1975-2000)
50. Wild Fires - Injured People (Number of People, 1975-2000)
51. Wild Fires - Killed People (Number of People, 1975-2000)
52. Wild Fires - Total Affected (Number of People, 1975-2000)
53. Wild Fires - Total Number (Number of Wild Fires, 1975-2000)
54. Wind Storms - Affected People (Number of People, 1975-2000)
55. Wind Storms - Homeless People (Number of People, 1975-2000)
56. Wind Storms - Injured People (Number of People, 1975-2000)
57. Wind Storms - Killed People (Number of People, 1975-2000)
58. Wind Storms - Total Affected (Number of People, 1975-2000)
59. Wind Storms - Total Number (Number of Wind Storms, 1975-2000)

E.4 FISHERIES

1. Aquaculture Production - Total (Metric Tons, 1970-1999)
2. Crustaceans and Molluscs Catch - Marine (Metric Tons, 1970-1999)
3. Fish Catch (Metric Tons, 1970-1999)
4. Fish Catch - Marine (Metric Tons, 1970-1999)
5. Fishery Production - Marine (Metric Tons, 1960-1999)

E.5 LAND QUALITY

- Agricultural Production Index - Total (Net Production Index Number (PIN) base 1989-91, 1961-2000)
- Arable and Permanent Crops - Percent of Land Area (Percent of Land Area, 1961-1999)
- Arable and Permanent Crops - Total (Thousand Hectares, 1961-1999)
- Arable Land (Thousand Hectares, 1961-1999)
- Average Calorie Supply from Animal Products - per Capita (Kilocalories, 1961-1997)
- Average Total Calorie Supply - per Capita (Kilocalories, 1961-1997)
- Cereals - Area Harvested (Hectares, 1961-2000)
- Cereals - Production (Metric Tons, 1961-2000)
- Cereals - Yield (Hectograms per Hectare, 1961-2000)
- Fertilizer Consumption (Metric Tons, 1961-1999)
- Fertilizer Production (Metric Tons, 1961-1999)
- Forests and Woodland - Percent of Land Area (Percent of Land Area, 1961-1994)
- Irrigated Land (Thousand Hectares, 1961-1999)
- Land Area (Thousand Hectares, 1961-1999)
- Land in Permanent Crops (Thousand Hectares, 1961-1999)
- Meat Production - per Capita (Kilograms per Person, 1961-2000)
- Meat Production - Total (Metric Tons, 1961-2000)
- Permanent Pasture - Percent of Land Area (Percent of Land Area, 1961-1999)
- Pesticides Consumption - Fungicides, Bactericides and Seed Treatments (Metric Tons, 1990-1998)
- Pesticides Consumption - Herbicides (Metric Tons, 1990-1998)
- Pesticides Consumption - Insecticides (Metric Tons, 1990-1998)
- Pesticides Consumption - Mineral Oils (Metric Tons, 1990-1998)
- Pesticides Consumption - Plant Growth Regulators (Metric Tons, 1990-1998)
- Pesticides Consumption - Rodenticides (Metric Tons, 1990-1998)
- Total Area (Thousand Hectares, 1961-1999)