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COUNTRY ENVIRONMENTAL ASSESSMENT

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FINAL REPORT

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ABBREVIATIONS AND ACRONYMS

	ENGLISH NAME	DUTCH NAME
ABS	General Bureau for Statistics	Algemeen Bureau voor de Statistiek
ACT	Amazon Conservation Team	
ADEKUS	Anton de Kom University of Suriname	Anton de Kom Universiteit van Suriname
ATM	Ministry of Labor, Technological Development and Environment	Ministerie van Arbeid, Technologische Ontwikkeling en Milieu
BIZA	Ministry of Internal Affairs	Ministerie van Binnenlandse Zaken
BOG	Bureau of Public Health	Bureau voor Openbare Gezondheidszorg
CBL	Central Bureau for Aerial Mapping of NH	Centraal Bureau Luchtkartering van NH
CELOS	Center for Agricultural Research in Suriname	Centrum voor Landbouwkundig Onderzoek in Suriname
CMO	Environmental Research Center	Centrum voor Milieuonderzoek
DBK	Department of Soil Survey	Dienst Bodemkartering
D&D	See RO	zie RO
DEF	Ministry of Defense	Ministerie van Defensie
DWT	Newspaper: De Ware Tijd	De Ware Tijd
EEZ	Exclusive Economic Zone	
EIA	Environmental Impact Assessment	Milieueffect Rapportage
FAO	Food and Agriculture Organization	Voedsel en Landbouw Organisatie
FIN	Ministry of Finance	Ministerie van Financiën
GB	Government Gazette	Gouvernementsblad
GDP	Gross Domestic Product	Bruto Nationaal Product
GIS	Geographical Information System	
GLIS	Land Registration and Land Information System for Suriname	Grondregistratie en Land Informatie Systeem voor Suriname
GMD	Department of Geology and Mining	Geologisch Mijnbouwkundige Dienst
GOS	Government of Suriname	Surinaamse Overheid
HARPRO	See ROM	zie ROM
HI	Ministry of Trade and Industry	Ministerie van Handel en Industrie
HKV	Wood-cutting license	Houtkapvergunning
IDB	Inter-American Development Bank	Inter-Amerikaanse Ontwikkelingsbank
ICZM	Integrated Coastal Zone Management	
ILO	International Labor Organization	Internationale Arbeidsorganisatie
JP	Ministry of Justice and Police	Ministerie van Justitie en Politie
LBB	State Forest Service	Dienst 's-Lands Bosbeheer
LVV	Ministry of Agriculture, Animal Husbandry and Fisheries	Ministerie van Landbouw, Veeteelt en Visserij, v/h Ministerie van Landbouw, Veeteelt, Visserij en Bosbouw (LVV&B)
METEO	Meteorological Service of OW	Meteorologische Dienst van OW
MINOV	Ministry of Education and Human Development	Ministerie van Onderwijs en Volksontwikkeling
MUMA	Multiple-Use Management Area	Bijzonder Beheersgebied

	ENGLISH NAME	DUTCH NAME
NARCOMS	Natural Resources Concession Management System	
NARENA	Natural Resources and Environmental Assessment (Department of CELOS)	
NB	Nature Conservation Division	Afdeling Natuurbeheer
NGO	Non-Governmental Organization	Niet-Gouvernementele Organisatie
NH	Ministry of Natural Resources	Ministerie van Natuurlijke Hulpbronnen,
NIMOS	National Institute for Environment and Development of Suriname	Nationaal Instituut voor Milieu en Ontwikkeling van Suriname
NTFP	Non-Timber Forest Product	Bosbijproduct
OW	Ministry of Public Works	Ministerie van Openbare Werken
PAHO	Pan American Health Organization	Pan-Amerikaanse Gezondheidsorganisatie
PLOS	Ministry of Planning and Development Cooperation	Ministerie van Planning en Ontwikkelingssamenwerking
RO	Ministry of Regional Development	Ministerie van Regionale Ontwikkeling
ROB	Council for the Development of the Interior	Raad voor de Ontwikkeling van het Binnenland
ROM	Department of Spatial Planning and Environment of SPS, formerly HARPRO	Onderdirectoraat Ruimtelijke Ordening en Milieu van SPS, v/h HARPRO
SB	State Gazette	Staatsblad
SER	Social and Economic Council	Sociaal-Economische Raad
SBB	Foundation for Forest Management and Production Control	Stichting Bosbeheer en Bostoezicht
SBW	Surinamese Civil Code	Surinaams Burgerlijk Wetboek
SLMP	Suriname Land Management Project	
SO	State Oil Company NV	Staatsolie Maatschappij Suriname NV
SOZA	Ministry of Social Affairs and Public Housing	Ministerie van Sociale Zaken en Volkshuisvesting
SPD	Urban Planning Department of OW	Stads Planologische Dienst van OW
SPS	Foundation National Planning Office of PLOS	Stichting Planbureau Suriname of PLOS
STINASU	Foundation for Nature Conservation in Suriname of NH	Stichting Natuurbehoud Suriname van NH
SVS	Foundation for Public Housing Suriname	Stichting Volkshuisvesting Suriname
SWI	Foundation for Scientific Information	Stichting Wetenschappelijke Informatie
TCT	Ministry of Transportation, Communication and Tourism	Ministerie van Transport, Communicatie en Toerisme
UN (VN)	United Nations	Verenigde Naties
UNCED	UN Conference on Environment and Development	
UNDP	UN Development Program	Ontwikkelingsprogramma van de VN
UvS	(Anton de Kom) University of Suriname	(Anton de Kom) Universiteit van Suriname
VD	Fisheries Department	Visserijdienst
VGZ	Ministry of Health	Ministerie van Volksgezondheid
WHO	World Health Organization	Wereld gezondheidsorganisatie

EXECUTIVE SUMMARY

Suriname continues to possess a unique environmental heritage, partly due to limited population growth and historically rather limited development pressure. It is endowed with substantial environmental resources in terms of land, water, forests, minerals, marine and terrestrial biodiversity¹. However, this rich natural resource base is increasingly coming under pressure from economic development and urban expansion, resulting in reduction of natural resource stocks, land degradation, water pollution, and loss of biodiversity. At present, an adequate management of these pressures is not feasible given Suriname's existing environmental legislation, regulations and land rights, the limited resources for prevention and monitoring of environmental impacts, and the low level of public environmental awareness.

This summary presents key information on Suriname's geography and demography, key economic trends and social conditions, the rights of Indigenous peoples and Maroons, Suriname's environment and natural resources, the overall administrative and legal context for environmental protection, as well as environmental awareness and public participation in environmental issues. It concludes with a set of recommendations for priority environmental and social actions in Suriname.

KEY FACTS

Per Capita GNP	US\$ 1,804
Real GDP Growth	5%
Major economic drivers	Mining (bauxite, gold), Oil, Timber, Agriculture, Fishing
Total Population [Annual growth rate]	481,146 [1.3%]
Urban Population (% of total)	75.4%
Population of Indigenous Peoples and Maroons	14.1%
Population Below National Poverty Line (% of total)	70% (2002 est.)
People living within 30km of Coastline (% of total)	85%
Major Natural Disaster Hazards	None
Area of Declared Protected Areas	16,040 km ²
Net Gain (Loss) in Tropical Rainforest Cover	Net Loss (no exact data)
Net Gain (Loss) in Coastal Habitats and Wetlands	Net Loss (no exact data)
Budget of Environmental Authorities	Low (no exact data)
Progress toward MDB #7 (Environmental Sustainability)	<i>No data</i>

A. SURINAME'S GEOGRAPHY, PEOPLE AND NATURE

The Republic of Suriname is located on the North coast of South America, between 2-6° Northern latitude and 54-58° Western longitude. The country has a total land area of 166.000 km², has a 370 km long coastline along the Atlantic Ocean in the North, and borders the Republic of Guyana in the West, the Federative Republic of Brazil in the South, and the French "Département Guyane" in the East.

¹ As mapped in: The National Planning Office of Suriname. *SURINAME PLANATLAS*. OAS, Washington, D.C. 1988.

Suriname is endowed with a rich human diversity, including East Indians, Creoles, Indonesians, Maroons, Indigenous people, Chinese, and Brazilian immigrants. With a population of 481,146, or about 2.9 persons per square kilometer, the country is sparsely populated (ABS, 2005). And, as emigration has equaled natural population increase, the total population of Suriname has not experienced significant growth in recent decennia. However, population growth rates may be increasing as the country has witnessed increasing in-migration rates, primarily from China and Brazil. The national language is Dutch but more than 16 other languages are spoken, including Sranan Tongo (the national Creole) and languages specific to various ethnic groups.

About 85% of Surinamers live on the 30-km wide Northern coastal plains. And 75.4% of the total population live in urban areas, primarily in the capital city of Paramaribo. By 2001/2002, it was estimated that 64% of the urban population and 70% of the total population lived under the national poverty line. The remainder of the population lives primarily in the forested Interior region, which is the ancestral home and traditional territory of several Indigenous peoples and Maroon communities (tribal peoples of African descent). The Maroons, in particular, live in small villages along the major rivers.

Suriname is also rich in natural resources. Relatively intact tropical rainforest covers about 80% of its landmass (163,265 km²). The rich biodiversity of this area includes at least 50 rare and endemic plant species and several endangered species of wildlife. In 1998, 1.6 million ha of pristine forest received protected status as the Central Suriname Nature Reserve. A large share of the coastline is protected and provides nesting habitat for various bird species. Near the mouth of the Marowijne River, the Galibi Nature Reserve (4,000 ha) is an important nesting beach for marine turtles.

However, Suriname is particularly rich in subsoil resources, with minerals being the country's primary source of foreign exchange. The bauxite industry alone accounts for more than 15% of GDP and 70% of export earnings. The opening of a large-scale gold mine in January 2004 and ongoing exploration activities by national and foreign mining companies forecast an increasing importance of the mining sector to the Suriname economy in the near future. Meanwhile small-scale gold mining provides an income to several thousands of Brazilians and Maroons. Typically performed informally and illegally, small-scale mining supports a large share of poor households and substantially maintains the economy in part of the interior. Additional local industries include lumbering and plywood manufacturing. Agriculture, which accounts for 13% of GDP, is primarily practiced at the coastal plains area and the river valleys. The main cash crop is paddy rice. Other commercial crops include bananas, palm kernels (for oil), coconuts, plantains, peanuts, and citrus fruits. In addition small-scale producers farm a variety of vegetables and fruits for the local market. Shrimp fishing and shrimp farming are expanding along the coast. Thus, Suriname's economic development and social well-being are almost exclusively dependent on the extraction or exploitation of natural resources.

B. ECONOMIC DRIVERS, PUBLIC HEALTH AND THE ENVIRONMENT

After about two decades of political and economic instability following independence from the Netherlands in 1975, Suriname's economic outlook has improved under the 2000-2005 Venetiaan presidency. Currency exchange rates have stabilized, the Gross Domestic Product increased by 39.2% between 1999 and 2003², and consumer prices and consumer prices "only" increased 9.6 % between June 2003 and June 2004. Indeed, with a per capita GNP of 5050 SRD (US\$ 1,804) and a real GDP growth of 5%, Suriname ranks positively among other Caribbean and South American countries. (Also, the official GNP-figure is likely an underestimate because it excludes earnings from informal gold mining and trade,

² GDP in market prices, incl. informal sector, expressed in US\$ (ABS 2004. Statistical Yearbook 2003, Paramaribo, Suriname)

other informal jobs earnings, remittances (mainly from the Netherlands), drug-related money, and other unrecorded sources of income.)

Today, both the public and private sector in Suriname are increasingly turning their attention to participating in regional integration initiatives, such as the CARICOM Single Market and Economy, and in international trade with Europe, Asia and North America. In particular, major expansionary investments are in process or proposed in the sectors of bauxite mining/aluminium production, gold mining, palm oil production, rice and banana farming, forestry and fishery.

This improved macroeconomic stability is affecting environmental management in two opposing ways. On the one hand, newly attracted industrial investors, mainly in the mining sector, place increasing pressure on the country's natural resources base. The main environmental concerns associated with this economic development are over-fishing, the degradation of the coastal zone (estuaries, mangrove forests, shoreline), uncontrolled deforestation, the impacts of the proposed hydroelectric dam in West Suriname, land degradation and harmful pollution from small-scale and large-scale mining operations, and inadequate resource management in the Interior region. The already significant environmental impacts and public health risks associated with these threats are compounded by the lack of an adequate legislative, regulatory and institutional framework (see below).

On the other hand, Suriname's improved macroeconomic stability may offer a valuable opportunity. As Suriname has stabilized in terms of its political, monetary and fiscal situation, the framework conditions have been created for promoting important investments in other important areas of development, specifically those related to the Millennium Development Goals (MDGs). The careful management of the environment and of natural resources will be a critical component of reaching the targets that Suriname has set itself through the MDGs, since the reduction of poverty and the improvement of public health are intricately linked to the incisive management of water, land and other environmental services.

C. LAND RIGHTS FOR INDIGENOUS PEOPLES AND MAROONS

Approximately 12,750 Indigenous people and 54,750 Maroons - the descendants of run-away African slaves who established independent communities starting in the 17th century - live in the Suriname Interior region, representing respectively 2.7% and 11.4% of the Suriname population (IDB, 2004). Their approximate living and usufruct areas are presented in Figure 7 (p. 28). However, according to Suriname law, all land and subsoil resources within the territory of Suriname belong to the State. And traditional tribal regulations provide no legal power to contest large-scale logging and mining concessions that are granted or exploitation activities that take place in the communities' living- and usufruct areas. Human rights lawyers have contested Suriname land laws based on historic treaties between European colonists and the various Indigenous and Maroon groups, as well as on Suriname's ratification of international conventions, including the United Nations and Organization of American States declarations on the rights of indigenous peoples (Kambel and MacKay, 1999). Recently (2000), the Saramacca Maroons submitted a complaint to the Inter-American Commission on Human Rights, which is under consideration.

This absence of individual and group property rights for Indigenous people and Maroons is not only a source of resource conflicts. It is also an obstacle to sound environmental management, because the overt threat that their lands may be sold or granted to third parties at any point leaves Maroon and Indigenous communities with little incentive to effectively manage and conserve their lands. As a potential first step to improving the current situation, the Council of Ministers approved the **Land Policy Directives** on March 17, 2005. These policy directives aim to address land management challenges in four key areas, namely Land Use Policy & Planning, Land Titling Regimes, Allocation & Valuation of State Land and Land Markets & Tenure Security for Inhabitants of the Interior Region.

D. ADMINISTRATIVE AND LEGAL CONTEXT FOR ENVIRONMENTAL PROTECTION

Institutional responsibilities for environmental management and nature resource conservation are shared by a number of Government organizations. Environmental management and protection are the responsibility of the *National Council for the Environment* (Nationale Milieuraad – NCE), the *Ministry of Labour Technological Development and Environment* (Ministerie van Arbeid, Technologische Ontwikkeling en Milieu – ATM), created in 2002, and the *National Institute for Environment and Development in Suriname* (Nationaal Instituut voor Milieu en Ontwikkeling in Suriname – NIMOS), established in 1998. In addition, a number of agencies and departments in sectoral ministries hold responsibilities in environmental protection, such as enforcing existing environmental regulations and contributing to the Ministry of ATM's environmental planning activities (see Figure 3, p. 21 for details). Responsibility for natural resource exploitation and management rests with the *Ministry of Natural Resources* (Ministerie van Natuurlijke Hulpbronnen – NH). Within the NH, the *Suriname Forest Service* (Dienst's Lands Bosbeheer) and specifically the *Nature Conservation Division* (Afdeling Natuurbeheer) of the Forest Service, is the agency responsible for managing natural reserves and parks, except for the Brownsberg Nature Park, which is held in leasehold and managed by the *Foundation for Nature Conservation in Suriname* (Stichting Natuurbehoud Suriname – STINASU).

With respect to a national legal framework for environmental management, improvements in the areas of legislation, regulation and enforcement are pivotal for managing the above mentioned increasing pressure on the country's natural resources base due to economic investments.

In terms of legislation, Suriname currently lacks an over-arching environmental law that promotes sustainable economic development and the systematic application of environmental management tools, such as environmental impact assessments, environmental management plans, and pollution control measures. Also, despite the fact that Suriname has ratified fifteen major international environmental conventions and protocols (see Figure 2, p.7), the majority of the commitments made under these conventions are not yet reflected in corresponding national legislation. To remedy the lack of an over-arching legislation, an environmental law was drafted in 2001 (see Section 2.B.1 for details). An amended version of this law continues to be reviewed by the Ministry of ATM.

In addition to approving this pivotal environmental law, there is an urgent need to adopt and implement corresponding environmental regulations. In particular, existing EIA draft regulations should be aligned with the environmental law, finalized and applied immediately, criteria and guidelines must be devised to provide better environmental management and monitoring of development projects, and specific regulations are required to address Suriname's obligations under the various international environmental conventions to which it is a Party.

The enforcement of existing legal provisions tend to be insufficient due to limited human and material resources within ATM and NIMOS, as well as within the sectoral ministries that have environmental responsibilities. As a result, illegal logging, mining, and fishing have virtually no oversight or regulation, and licensed individuals and companies frequently ignore the restrictions of their licenses. For example, gold miners may work outside the boundaries of their concession area and shrimp fishermen may fish in the shallow waters that form breeding and production grounds.

E. ENVIRONMENTAL AWARENESS AND PUBLIC PARTICIPATION

Public awareness about environmental issues and risks is low, and observations suggest limited citizen concern with environmental pollution. For example, a recent study among students in the ages 16-30

found that only 20% of college youth possessed a level of environmental knowledge that could be classified as reasonable or good (Van der Kooye, 2003). Knowledge was especially lacking in the area of waste management, water, agriculture and pesticides, oil pollution, and environmental organizations. Moreover, unregulated garbage dumping, home waste burning, and irresponsible oil disposal also occur on a daily basis. And while a recent World Wildlife Fund study found that Maroon communities affected by small-scale mining were concerned about water pollution and malaria, their knowledge of mercury pollution related to small-scale mining was very poor.

In light of this low level of environmental awareness among Surinamers, it is important to note that the amended version of the environmental law that is currently under review by the Ministry of ATM, contains weak provisions for public participation. While the original draft of that law guaranteed the participation of civil society, NGOs, the private sector, and other stakeholders in environmental management, in the revised draft, these sections have been removed. Yet, given public environmental awareness in Suriname, it is particularly important that the opportunities for public participation are not curtailed. On the contrary, every effort should be made to promote environmental awareness and public participation in environmental decision-making as part of the legal and policy framework.

F. RECOMMENDATIONS FOR PRIORITY ENVIRONMENTAL ACTIONS

Chapter 7 provides a detailed set of recommended priority actions for environmental management, based on the assessment of the existing framework for environmental management, the current state of the environment, and the potential impacts of development activities sponsored by the Government and/or key donors. Suffice it at this point to highlight four areas of action that are pre-requisites for any sound economic, social and environmental development in Suriname:

- Adopt and implement modern environmental legislation and regulation, including an overarching environmental law, the legal provisions for EIA requirements, implementation and enforcement, an environmentally sound Mining Law, and the proposed Forest Policy.
- Improve coordination among and capacity of institutions with environmental responsibility
- Promote adequate resource management in Interior through the implementation of the recently approved Land Policy Directives, increased involvement and legal recognition of local communities' rights, and support of activities to control illegal trade in wildlife.
- Assess the economic, environmental & socio-cultural feasibility of major planned investment projects, including the proposed hydroelectric dam in West Suriname

In addition, this assessment suggests a number of specific actions, including a number of actions that are particularly suited for IDB participation. However, the four areas mentioned above have the highest priority with respect to their importance and urgency, as they provide the foundation for supporting sustainable development in Suriname. As such, it is recommended that the IDB strongly support the Government of Suriname in their efforts to create this strategic, legal and institutional foundation.

1. INTRODUCTION

The Country Environmental Assessment (CEA) is designed to support preparation of the IDB's Country Strategy for Suriname and to identify areas in which the Bank can support the country in its objective of reaching sustainable growth. In addition, the assessment is meant to provide an important analytical tool for both the Country and the Bank in their evaluation of development projects.

The report consists of eight chapters and a series of annexes. Chapter 2 analyzes the legislative, regulatory and institutional framework that is currently in place to manage the environment of Suriname and identifies important gaps in the framework. It presents a review of relevant national legislation and related regulations regarding environment, natural resource use, indigenous peoples and maroons' land rights, and ratified international agreements, as well as of the institutional responsibility and capacity available to govern environmental issues in Suriname.

Chapter 3 describes Suriname's physical environment, its biological conditions, biodiversity, ecology and nature conservation; critically contaminated areas; deforestation rates, trends and areas; mining activities and areas; quality of inland and coastal waters; groundwater quality and quantity; socioeconomic conditions, socio-cultural conditions, and human health.

Chapters 4, 5 and 6 focus on Suriname's development activities in the short and medium term and their potential environmental and social impacts. The analysis in Chapter 4 presents Government's development priorities by physical region. The analysis, which is based on the Country's Five-year Plan and discussions with the Ministry of Planning, highlights the connection between Suriname's major economic drivers and the environment, and is intended to provide the basis for a more detailed assessment of the planned activities' environmental impacts during execution of the various project.

Chapter 5 in contrast presents an analysis of donor-funded development activities by funding agency. A considerable number of project and programs are currently underway or planned by international donors and Non Governmental Organizations in Suriname. The purpose of the analysis in Chapter 5 is to provide the basis for effective co-ordination among and, where possible, creating of synergies between the various programs, projects and donors.

Chapter 6 discusses the potential environmental – and to some extent social – issues, impacts and opportunities associated with Suriname's various development activities. Based on the main actions associated with major development projects, the chapter analyzes the areas that will be directly or indirectly affected, the likely positive and negative impacts of the development and related environmental and social risks and opportunities.

On the basis of the diagnosis of the current and planned situation presented in previous chapters, Chapter 7 recommends priority actions for environmental management in Suriname. The Environmental Action Strategy summarizes critical environmental and social issues, recommends priority environmental and social actions and identifies areas where the Bank can support Suriname in its objective of reaching sustainable growth. Chapter 7 is the most important chapter for supporting the Country Strategy process, as it provides specific strategic recommendations for Bank action in the short- and medium term. All new project activities in Suriname, when financed by the IDB, will be subject to the Bank's Environment and Safeguards Compliance Policy and the Indigenous Peoples Policy and Strategy, which are currently being finalized. Once these policies enter into force, project or parts of projects financed by the IDB, including any of the actions recommended in the Environmental Action Strategy, must be implemented within the overall framework of these policies. Chapter 8 presents a brief overview of these

policies, and an indication of their increasingly importance in IDB-financed project preparation and implementation.

Last but not least, we gratefully acknowledge the comments and contributions made to this report by numerous people. In particular, we would like to thank the individuals and organizations in Suriname that provided valuable inputs during the preparation of this assessment, including during a public workshop held in Paramaribo on February 24, 2005. Their names are listed in Annexes B and C. We would also like to thank Buursink International Consultants in Environmental Management, especially Iara Verocai (Environmental specialist), Dr. Marieke Heemskerk (Social scientist), Gwen Emanuels-Smith (National environmental expert), Sylvia Ang (National policy analyst), H. Schar (Economist), Dr. Barry Haack (Geographer) and Dr. John Buursink (Senior environmental advisor) for their expertise and assistance. Finally, this report benefited from the advice of several IDB staff, in particular Kristyna Bishop, Jose Manuel Cabra, Dora P. Currea, Henrik Franklin, Rafael Hernández, Alvaro Llosa, Hector Malarín, Juan Carlos Pérez-Segnini, Laura Profeta, Ricardo E. Quiroga, Romina Soria, and David Wilk.

2. LEGISLATIVE, REGULATORY AND INSTITUTIONAL FRAMEWORK FOR ENVIRONMENTAL MANAGEMENT

This chapter analyzes the legislative, regulatory and institutional framework that is currently in place to manage the environment of Suriname and identifies important gaps in the framework. This analysis focuses on the framework available for managing Suriname's main environmental concerns, namely over-fishing, the degradation of the coastal zone (estuaries, mangrove forests, shoreline), uncontrolled deforestation, the impacts of the proposed hydroelectric dam in West Suriname, land degradation and harmful pollution from small-scale and large-scale mining operations, and inadequate resource management in the Interior region. The chapter presents a review of relevant national legislation and associated regulations, of ratified international agreements, of occupational health and safety laws and regulations, as well as of the institutional responsibility and capacity available to govern environmental issues in Suriname.

<u>KEY DATES</u>	
Inclusion of Natural Protection and Ecological Objectives in Constitution	1987
Draft of National Environmental Action Plan	1996
Creation of NCE (Advisory body on environmental policy)	1997
Creation of NIMOS (Environmental management agency)	1998
Draft of Environmental Policy and Management Bill [under review]	2001
Draft of Environmental Impact Assessment (EIA) Procedures [under review]	2001
Creation of Environmental Division of Ministry of ATM	2002
Approval of Land Policy Directives by Council of Ministers	2005
<u>KEY DATA</u>	
Number of Ratified Multilateral Environmental Agreements (MEAs)	15
Number of MEAs being implemented on national level	6
Budget of National Council for the Environment (NCE)	US\$ 0
Number of NCE members (by appointment)	6 – 11
Budget of Environmental Division of Ministry of ATM	US\$1.5M
Number of staff in ATM's Environmental Division	7
Budget of National Institute for Environment & Development (NIMOS)	<i>No data</i>
Number of NIMOS staff	10
Number of formal citizen complaints regarding environmental problems	3/month
Capacity for environmental data collection and analysis	Poor

The creation and stimulation of conditions necessary for nature protection and maintenance of an ecological balance is one of the objectives included in the 1987 revision of the Constitution of the Republic of Suriname. After several line ministries had undertaken isolated activities regarding the use and protection of natural resources, the starting point for an *integrated* environmental planning and management system was the preparation of the National Environmental Action Plan (NEAP) in 1996³. NEAP has never been formally approved, yet two of its main components have been accomplished: the

³ This plan was elaborated by the Institute for Development Planning and Management (IDPM) of the University of Suriname, with financial and technical assistance from the Organization of American States (OAS) and the IDB.

creation of the *National Council for the Environment* (Nationale Milieuraad – NCE) in 1997, and the *National Institute for Environment and Development in Suriname* (Nationale Instituut voor Milieu en Ontwikkeling in Suriname – NIMOS) in 1998. In addition, the 1998 Environmental Management Technical Cooperation (ATN/SF-5941-SU) granted NIMOS US\$ 2.24 million from the IDB, the European Union, and the Government of Suriname for the purpose of institutional capacity building and the development of the national environmental legislation. More recently, in the multi-year plan for 2000-2005, the Government of Suriname asserts protection, conservation, improvement, and rehabilitation of environmental quality as overall policy goals in the country. In the same document, an efficient and effective approach is proposed for the solution of current environmental problems. However, Suriname's environmental management system continues to require strengthening with respect to creating, implementing and enforcing appropriate legislation and regulation, as well as with respect to developing the required institutional capacity.

A. LEGISLATIVE AND REGULATORY FRAMEWORK

1. Current Environmental Management and Natural Resource Use Provisions

At present, several isolated statutes are in force, dealing with a number of environmental issues, such as industrial pollution, water management, protection and use of natural resources, and wildlife (see Figure 1). In addition, Suriname has existing legislation related to land use tenancy and planning, the preservation of the cultural heritage, water use and supply services, trade, public health, safety, and labor.

Industrial pollution is governed by the 1972 Hindrance Act, which intends to prevent damage from industrial development through permit requirements for industrial projects. Traditionally, permits are issued after review and consultation by the Ministry of Public Health, the Labor Inspection Department, the Fire Department, or the District Commissioners. Recently, NIMOS staff has also been consulted by the District Commissioner on matters specifically related to pollution control. The responsibility for enforcing permit requirements lies with the district authorities. However, implementation and enforcement of the Hindrance Act have been hindered by the lack of specific regulations and pollution standards, as well as by the shortage of human resources for monitoring inspections.

With respect to pollution regulation, the IDB funded a study in 2003 to develop a **pollution inventory** and draft environmental pollution regulations for Suriname. Study outputs, however, were below expectation. Although the final report contains useful information on the effects of pollutants in health and the natural environment, the pollution inventory was limited to visits to twelve industrial facilities and the proposed standards merely consisted of a translation of the Brazilian permit system regulations. These standards are poorly adaptable to the policy and environmental context in Suriname.

Environmental aspects of Suriname's key **mining and extraction activities** are governed primarily by sectoral legislation, including the 1986 *Mining Decree* (Decreet Mijnbouw), the 1989 *State Decree on Mining Installations* (Besluit Mijnbouwinstallaties, 1989) the 1990 *Petroleum Act* (Petroleumwet) and the 1981 *Harbor Decree* (Haven Decreet). However, since regulation and control of both formal (mostly foreign) and informal (mostly small-scale) mining – as well as logging – activities is inadequate and ineffective, few companies abide by environmental, labor, and other national laws. Moreover, the lack of an *integrated* environmental management statute has in practice been a barrier to environmental protection. For instance, under the State Decree on Mining Installation, several large-scale mining companies have conducted environmental impact assessments, yet, while providing some guidance for impact mitigation measures and monitoring, in practice these reports have had little impact on the decision-making process, the approval of sites or the development of concessions. For one, there are

currently no criteria against which to evaluate the EIA for a given project, nor are there procedures for how to incorporate its findings meaningfully into the decision making process.

Two additional points are worth noting in this context. First, a new mining law has been drafted, albeit without consultation of Maroon and Indigenous peoples' communities, who are strongly affected. Second, a proposal for Environmental Impact Assessment Procedures was prepared and submitted to the Government in 2002. It continues to be under review.

Forest exploitation and conservation is governed by the 1992 *Forest Management Act* (*Wet Bosbeheer*). Criteria concerning logging, deforestation, and related sector activities, such as primary processing, export of wood and other forest products have been established and enforced through a series of regulations issued by the Ministry of Natural Resources. In addition, the Foundation for Forest Management and Production Control within the Ministry of Natural Resources developed a series of regulations in 2000 to control the value of the logged products, and provides loggers with guidance on their reforestation activities through statistics on logging and export.

Land rights and land use by forest peoples and international investors are among the most contentious issues confronting Suriname development and environmental policy today. Customary law of the various Indigenous peoples and Maroon communities assign user rights to land and natural resources based on group, clans, and family membership. These tribal laws and regulations are well known to, and generally respected by, all members of the ethnic group. However, by national law, Indigenous people and Maroons have no formal title to land in the interior. The law provides for user rights, but these can be – and frequently are - overruled for reasons of national interest. As a result, large-scale mining and logging concessions are granted on tribal lands without effective consultation or information of tribal people. Logging concessions currently affect 60% of Indigenous peoples and Maroon communities. Mining concessions overlap with nearly 40% of Indigenous peoples and Maroon communities. In 2000, the Saramaka Maroons submitted a petition to the Inter-American Commission on Human Rights (Petition 12.228) to protest the violation of their rights by the Government of Suriname. In 2002, the Commission requested that Suriname "take appropriate measures to suspend all concessions, including permits and licenses for logging and mine exploration and other natural resource development activity on [Saramaka] lands..." The Commission has held several hearings with Saramakaners and Government representatives. If the parties cannot come to an agreement, the case can be brought to the Inter-American Human Rights Court.

However, as a potential first step to improving the current situation, the Council of Ministers approved the **Land Policy Directives** on March 17, 2005. These policy directives aim to address land management challenges in four key areas: i) land use policy and planning, ii) land titling regimes, iii) allocation and valuation of State Land and iv) land markets and tenure security for inhabitants of the Interior region.

Also important is the Nature Conservation Act (*Natuurbeschermingswet*, 1954), which provides for **wildlife protection** and the **establishment and management of nature conservation areas**. The Act prohibits any activity that might affect soil, fauna, flora, and natural features within protected areas, exempting only those activities of scientific, educational, or cultural importance, such as fishing and hunting by Maroons and Indigenous peoples. Thus far, eleven nature reserves, one national park, and one multiple-use management area have been established by the President of Suriname (mainly on land owned by the Government). Four other conservation areas have been proposed but not yet been established. In order to be protected, natural areas have to be the object of specific legislation (a decree or a law), comprising the area and restrictions on the use of natural resources; there are no provisions for the protection of sensitive ecosystems outside legally designated conservation areas. However, currently, protection is not guaranteed even in those areas that are legally designated conservation areas due to the limited human and material resources available for enforcement.

Figure 1 **Legislation related to Environmental Management**

Law; Decree	Year	Subject	Environmental Scope
<i>Hinderwet</i> (Hindrance Act,)	1930 1944 1972	Prevention of damage caused by industries (noise, air pollution); permit requirements for industrial development projects	Industrial pollution control
<i>Natuurbechrningswet</i> (Nature Conservation Act)	1954	Wildlife protection; establishment and management of protected areas	Requirement of management plans for protected areas and multiple-use management areas (MUMA)
<i>Brokopondo Overeenkomst</i> (Brokopondo Agreement)	1958	Agreement between the Government of Suriname and Suralco L.L.D. concerning the development of the hydropower potentials	No provisions for environmental protection
<i>Planwet</i> (Planning Act)	1973	Provisions for national and regional planning	Procedures to the establishment of special and multiple-use management areas (MUMA)
<i>Haven Decreet</i> (Harbours Decree)	1981	Provisions for harbour activities	Prevention of waste discharges in the sea, public waterways, and harbour facilities
<i>Decreet Mijnbouw</i> (Mining Decree)	1986	Exploration and exploitation of mineral resources	Compliance with ecosystem protection regulations Reclamation of the mined area and adoption of environmental protection measures at the decommissioning phase
<i>Besluit Miynjouwinstallaties</i> (State Decree on Mining Installations)	1989	Provisions for mining installations placed on or above the sea area	Environmental protection measures as required based on UNCLOS, SOLAS, MARPOL conventions
<i>Petroleum wet</i> (Petroleum Act)	1990	Provisions for the exploration and exploitation of hydrocarbons	Petroleum activities are performed in such a manner as to prevent adverse consequences for the environment and natural resources
<i>Wet Bosbeheer</i> (Forest Management Act)	1992	Framework for forest management; establishment of conservation forests	Criteria for logging, deforestation, exploitation of forest products, and sustainable use of forest resources
<i>Gross Rosebel Overeenkomst</i> (Gross Rosebel Agreement)	1994	Agreement between the Government of Suriname, Grassalco N.V. and Golden Star Resources Limited for mineral exploration and exploitation	Requirement of environmental impact assessment of the company activities, including the implementation of environmental management plans

Source: State of the Environment (2001)

2. Ratified Multilateral Environmental Agreements

In addition to its national laws, Suriname has committed itself formally to a series of international agreements concerning biodiversity and endangered species, wetland conservation, marine protection and pollution prevention, climate change and the ozone layer. In total, the Government of Suriname has ratified fifteen international agreements specifically relevant to environmental management (see Figure 2). This commitment should influence future development activities, however, to date, further action has been taken with respect to only six of the agreements⁴.

Figure 2 Relevant International Agreements Signed by Suriname

Agreement	Subject
Convention on the International Trade of Endangered Species of Wild Fauna and Flora	Biodiversity
United Nations Convention on Biological Diversity	Biodiversity; climate; land use; protected areas
Convention on Nature Protection and Wildlife Preservation in the Western Hemisphere	Protected areas
United Nations Convention to Combat Desertification	Land use; land degradation; biodiversity
Wetlands Convention	Biodiversity; protected areas
United Nations Convention on the Law of the Seas (UNCLOS)	Water pollution; seawater quality; territorial jurisdiction
Convention on the High Seas	Waste management; water pollution; seawater quality; territorial jurisdiction; biodiversity
International Convention for the Prevention of Pollution from Ships	Waste management; water pollution; seawater quality
Convention on the Prevention of Marine Pollution by Dumping of Wastes (MARPOL)	Water pollution; seawater quality
International Convention for the Safety of Life at Sea (SOLAS)	Seawater quality; pollution control
International Convention for the Prevention of Pollution of the Sea by Oil	Water pollution; seawater quality
International Convention relating to Intervention on the High Seas in Cases of Oil Pollution Casualties	Water pollution due to oil spills
United Nations Framework Convention on Climate Change	Air; climate; biodiversity
Montreal Protocol on Substances that Deplete the Ozone Layer	Air; climate; public health
Vienna Convention for the Protection of the Ozone Layer	Air; climate

Source: State of the Environment (2001)

⁴ The “Development of the National Biosafety Framework for Suriname” report (2005) is the information source for the present situation of international agreements.

- The **Convention on the International Trade of Endangered Species of Wild Fauna and Flora** (CITES) was ratified in 1980, but when the Suriname Forest Service began to issue permits for wildlife trade in 2001, little attention was paid to its implementation. In 2002, the government passed new Game regulations in order to comply with CITES requirements. Also, training activities for customs controllers on CITES and related trade regulations are part of the “Guianas Sustainable Forest Resource Management Projects” carried out by WWF in Suriname.
- In 1996, the Government of Suriname ratified the **United Nations Convention on Biological Diversity**. The first Government action was the development of a draft National Strategy for the Sustainable Use and Conservation of Biodiversity to serve as a framework for the preparation of a National Biodiversity Action Plan by NIMOS. Although the draft strategy is waiting for approval by the government, NIMOS has been consulting with UNDP and ATM on how to proceed with the action plan and completion is expected by end of 2005.
- The **United Nations Convention to Combat Desertification** was ratified in 2000 and the respective National Report was submitted in 2002. The Government has taken no additional initiative on the matter.
- Suriname is in the process of complying with the **United Nations Framework Convention on Climate Change** (ratified in 1996 and in force since 1998). The First National Communication report is being conducted by NIMOS/ATM with the financial support of UNDP/GEF, including the survey of greenhouse gas sources in the country and the identification of their potential negative impacts and mitigation measures. In addition, the Ministry of ATM is currently developing a project on climate change with the support of the Dutch government. The country is in the process of ratifying the Kyoto Protocol.
- Although Suriname acceded to the **Montreal Protocol on Substances that Deplete the Ozone Layer** and the **Vienna Convention for the Protection of the Ozone Layer** in 1997, the respective subsequent amendments have not yet been ratified. In November 2003 a Country Program and Refrigerant Management Plan to be started in January 2004 was presented to the Ozone Secretariat for funding purposes. The program includes a survey on consumption of ozone-depleting substances and an action plan to reduce consumption of ozone-depleting substances. Program funding, however, will probably depend on the ratification by the country of at least some of the Montreal Protocol amendments.

3. Toward an Integrated Environmental Management Framework

Currently, Suriname lacks an over-arching environmental framework (including both legislation and associated regulations) that promotes sustainable economic development and the systematic application of environmental management tools, such as environmental impact assessments, environmental management plans, and pollution control measures. As a first step towards remedying this state of affairs, NIMOS conducted the IDB-funded Environmental Management Technical Cooperation program from 1997 to 2003. Two of the program’s main outcomes were:

- a **comprehensive environmental policy and management bill** (referred in its English version as Environmental Act), that specifies a framework for environmental protection and planning, pollution control, environmental and social impact assessment, public participation and consultation with governmental institutions, NGOs, and the private sector. In addition, it details current responsibilities of line ministries to approve and monitor infrastructure and development

projects, and directives for regulating the responsibilities of the Ministry of ATM and NIMOS and rearranging Suriname's environmental management institutional framework.

- the drafting of **environmental impact assessment (EIA) procedures**.

In 2002, the bill was dispatched to the recently formalized *Ministry of Labour, Technological Development and Environment* (Ministerie van Arbeid, Technologische Ontwikkeling en Milieu – ATM), in order to be presented for approval by the National Assembly of Suriname. In January 2004, a commission composed of representatives from NIMOS, ATM and NCE was appointed to review the bill and incorporate new policy directives regarding environmental management and institutional arrangements. The review had not been completed by end of 2004.

Moreover, ATM officers recognize that it is unlikely that the National Assembly will approve the bills in the near future, because revisions are still being made. Delays on the administrative procedures to move both bills forward may have a negative effect on the development of Suriname in general and specifically on the implementation and enforcement of any environment-related policies incorporated into sectoral legislation.

4. Next Steps

A number of modifications have been made to the environmental policy and management bill presented to the Ministry of ATM in 2002. Three of these are particularly important from a strategic perspective. First, the original policy and management bill has been divided into two separate bills, an **Environmental Management Act** and an **Institutional Arrangements Act**. However, it is essential that both bills are approved at the same time, as they complement each other. One establishes the instruments and procedures for environmental management, and the other establishes the institutional capacity and responsibilities to implement them. Technical and political support is important to foster their approval by the National Assembly. ATM and NIMOS can make a valuable contribution to environmental protection by working towards rapid completion and governmental approval of the final versions of both bills.

Second, **NIMOS' roles and competences** (now covered by the Institutional Arrangements Act) have been changed compared to the original text. Under the new proposal, the Ministry of ATM is responsible for environmental policy making. NIMOS, as the environmental authority, will play a more technical role, focusing on areas such as research, data collection and monitoring. A clear, efficient and appropriate division of tasks between NIMOS and ATM's Environmental Division is critical for effective environmental management – an issues that will be discussed in more detail in Section 2.B.1.

Third, in contrast to the proposed bill, the revised version places limited emphasis on **public participation** in the environmental impact assessment process. For example, the involvement of other Government institutions and the public through stakeholder meetings has been reduced to participation through written proposals. However, given public environmental awareness in Suriname, it is particularly important that the opportunities for public participation are not curtailed. On the contrary, every effort should be made to promote environmental awareness and public participation in environmental decision-making as part of the legislative and regulatory framework.

In addition, appropriate **environmental regulations** must be developed. To support approval and implementation of the draft EIA procedures, NIMOS has already formulated and proposed draft regulations that address EIA administrative and public participation procedures, requirements for EIA's, scoping, and review, and project implementation monitoring. At this point, guidelines for the assessment of projects in key economic development sectors and for the implementation of environmental audits

should be formulated, and appropriate environmental regulations should be developed for environmental quality, waste management, and air, soil and water pollution control to sustain better decisions with respect to Suriname's environmental heritage.

Finally, the implementation of the recently approved **Land Policy Directives** through the Suriname Land Management Program (SLMP) and through the creation of a Suriname Land Management Agency (SLMA) is pivotal, as much from an environmental, as from a social and economic perspective.

B. INSTITUTIONAL FRAMEWORK

Suriname's institutional framework for environmental management, like its corresponding legislative and regulatory framework, are in the process of being defined. However, as proposed in the 2001 draft for the Environmental Management and Institutional Arrangements Bills, responsibility for integrated environmental and natural resources would lie primarily with the National Council for the Environment (NCE), the Environmental Division of the Ministry of Labour Technological Development and Environment (ATM) and the National Institute for Environment and Development in Suriname (NIMOS). In addition, certain environmental responsibilities related to policy implementation and enforcement, nature conservation, environmental planning, EIA procedures, and pollution control would be shared, under the coordination of ATM and NIMOS, with several key ministries and other governmental institutions. For instance, Ministries with responsibilities for the approval of infrastructure or economic development projects might participate in EIA guidelines preparation, and enforcement and monitoring of environmental impact mitigation, while District Commissioners would continue to be responsible for issuing environmental permits for industrial activities. Figure 3 synthesizes the roles and institutional responsibilities for environmental management in Suriname

1. Overview of Key Ministries and Agencies

This section provides a brief introduction to the key ministries and agencies with environmental responsibilities in Suriname. The next section will focus specifically on the interaction between NCE, ATM and NIMOS, given that these three institutions will be central for achieving an integrated environmental management framework in Suriname.

The **National Council for the Environment** holds the mandate to advise the Government of Suriname on the formulation of national environmental policies and follow up policy implementation. One of the main NEC actions was the proposal to ATM, in 2003, of a national environmental policy. (To date, this proposal has not resulted in concrete policy actions.) The NCE is composed of six to eleven members, appointed for a three-year mandate by the President of Suriname: a chairperson; five members from the Surinamese Government with expertise in social issues, planning, economy, biodiversity, and sustainable development; and up to five other members with experience in environmental management, representing the private sector, labor unions, consumers rights, Indigenous people, and Maroons. Since 1988, when the first meeting was held, some difficulties concerning the fulfillment of NCE responsibilities have been observed, such as the lengthy delays in the appointment of members and fewer annual meetings than proposed in the Council's legislation. Moreover, no budgetary resources have been assigned to support NEC activities.

The **Environmental Division of the Ministry of ATM** is in charge of supporting the Ministry's environmental responsibilities, which consist of the formulation of policies and legislation, as well as the coordination and monitoring of both national environmental policy and international agreements. ATM is thus also responsible for the coordination of the sectoral ministries' environmental impacts related to the

use of natural resources, biodiversity conservation, health, and regional development. Current tasks of the Division include the revision of the Environmental Management Act, the Institutional Arrangements Act and the EIA procedures, the completion of the National Environmental Report; the planning of the next phase project on climate change; participation in the formulation of the Biodiversity National Action Plan and other action plans and project proposals on mining pollution, mercury contamination, persistent organic pollution, marine pollution, and ship waste management, as well as a number of other activities developed by NIMOS and other agencies. To accomplish these tasks, the Environmental Division relies on merely seven civil servants, only two of whom have a university degree, although most officers have been trained in several environmental areas, including oil pollution control, desertification, environmental economics, law, and environmental education.

The **National Institute for Environment and Development in Suriname** (NIMOS) is the main environmental management agency of Suriname. It was originally created by Presidential Decree as an institution subordinated to the President's office, but in 2001, NIMOS' institutional dependency was formally transferred to the Ministry of ATM. However, NIMOS financial management and technical performance are controlled by the Supervisory Board, an administrative group of three to five members appointed by the President. NIMOS was created to advise the government on the implementation of environmental policies, to propose and implement environmental legislation, to prepare and implement environmental norms and procedures, and to coordinate and monitor environmental compliance. As such, NIMOS' responsibility include the executive support to the NEC. NIMOS' staff is composed by 10 professionals: three in the Monitoring and Enforcement Office, one in the Social and Environmental Assessment Office, one in the Public Education and Outreach Office, two in the Administration Office, two in Legal Services, and one in the General Director's office. Their qualifications include the disciplines of law, public administration, geology, environmental sciences, and chemical engineering. Two key positions are currently vacant: the General Director position (having been vacant since 2000 (Fraser 2003), the position is being assigned on a temporary basis to a member of the Supervisory Board) and the position of Head of the Administration Office.

In addition to the Supervisory Board, NIMOS' work was also intended to be guided by the **Inter-Ministerial Advisory Committee** (IMAC). This Committee, chaired by NIMOS' General Director and composed of sixteen representative from key Ministries, is supposed to oversee coordination and cooperation among NIMOS and the Ministries, as well as the implementation of environmental management activities by the sectoral ministries. However, IMAC has never been fully implemented. Thus, in order to facilitate institutional coordination, NIMOS has signed Memoranda of Understanding with the Ministry of Public Health, the Ministry of Regional Development, the Ministry of Natural Resources, the Ministry of Public Works, the Ministry of Planning and Development, and the Ministry of Social Affairs. This initiative has had positive results, such as the joint development of environmental training programs with the Ministry of Social Affairs, the establishment of an environmental unit for the control of mining in the Geological and Mining Department, and completion of a forest sector environmental assessment, both with the Ministry of Natural Resources. The importance of the IMAC becomes clear, when considering the extent of environment-related activities under the purview of the sectoral ministries and associated agencies, described next.

The **Ministry of Natural Resources** (Ministerie van Natuurlijke Hulpbronnen – NH) oversees exploitation and management of all natural resources except fisheries. It grants concession for the use of state owned lands, soil, forests, groundwater, and drinking water supply, for mining of bauxite, gold and other minerals, for extraction of hydrocarbons, and for development of hydropower (potential) and other forms of energy supply, and it controls the trade in wildlife. Within the NH, the **Foundation for Forest Management and Production Control** (SBB), established in 2001, is responsible for forest management and monitoring of logging activities, advising the Ministry of Natural Resources on wood concession and approving wood products.

Figure 3 Institutional Responsibilities for Environmental Management

Environmental management issues	Institutions						
	Sectoral Ministries	NIMOS	ATM	STINASU	SCF	District Commissioners	Nature Conservation Division ⁵
Nature conservation and management				Natural Park (Brokopondo) and Galibi Nature Reserve	Central Suriname and Sipaliwini Nature reserves		Creation of new protected areas, management and control
EIA procedures	Approval of development projects Enforcement	Studies guidance and reports review ⁶	Final decision on environmental requirements				
Industrial pollution		Technical advise Enforcement				Permit approval Enforcement	
Monitoring	Implementation	Supervision Enforcement					Implementation
Environmental planning (Environmental management plans)	Participation in design and plan implementation	Coordination of design and plan implementation	Approval				Participation in design and implementation
Environmental regulations	Enforcement	Drafting and stakeholders consultation	Approval				
Forest development							Permits Approval and control of forest management plans

⁵ Division of Suriname Forest Service in the Ministry of Natural Resources

⁶ In red: responsibilities as stated in the proposed environmental legislation.

The **Nature Conservation Division** (Afdeling Natuurbeheer) of the **Suriname Forest Service** (Dienst 's Lands Bosbeheer - LBB) is the agency responsible for managing Suriname's natural reserves and parks, including the Central Suriname Nature Reserve and Sipaliwini Nature reserves. However, the Brownsberg Nature Park is an exception, given that it is held in leasehold since 1970 and managed for recreational and educational purposes by the **Foundation for Nature Conservation in Suriname** (Stichting Natuurbehoud Suriname – STINASU). The Nature Conservation Division is composed of four major groups (Management, Licensing, Research and Education), and employs around 36 permanent staff members, among whom approximately 20 are active as game wardens. The division performs its tasks from seven permanent posts (at Matapica, Galibi, Boskamp, Bigipan, Kaboeri, Coesewijne, and Raleighvallen), with each post housing a post manager, who is usually a game warden. Other personnel may vary seasonally. For example, during the sea turtle hatching period, the Galibi post hosts two game wardens, two boat drivers, and two field workers. In addition to the permanent posts there is a mobile unit, consisting of about three game wardens, an assistant, and a driver. This team patrols the road to Apura and regularly checks on illegal wildlife transportation at the Zorg and Hoop regional airport in Paramaribo. (The Suriname border police checks on transboundary wildlife transports.) In practice, however, the available staff and resources are insufficient to patrol, monitor, and research the vast stretch of forest that falls under the Division's responsibility.

The **Ministry of Agriculture, Animal Husbandry and Fisheries** (Ministerie van Landbouw, Veeteelt en Visserij – LVV) oversees agricultural activities, both with respect to production and research, the management of land and water used for agricultural purposes, the control of agrochemicals, and the management of fish resources. Within the LVV, the **Water Distribution Service** operates water supply systems in cities outside the Paramaribo urban areas.

The **Ministry of Public Health** (Ministerie van Volksgezondheid) oversees health management, including the control of infectious diseases, food quality, drinking water quality, and the establishment of water, soil, and air quality standards as related to human health. Within the Ministry, the **Direction of Environmental Affairs** is in charge of ensuring hygiene in public places and of the maintenance of canals and ditches in Paramaribo and in parts of the Wanika District (directly west of Paramaribo).

The **Ministry of Public Works** (Ministerie van Openbare Werken Ministry of Public Works – OW) oversees hydraulic operations, including water cycle and water quality measurements, as well as town planning and development. With the OW, the **Solid Waste Management Division** provides sewerage services and solid waste collection and disposal in Paramaribo.

The **Ministry of Planning and Development Cooperation** (Ministerie van Planning en Ontwikkelingssamenwerking – PLOS) oversees the coordination of donor-financed development planning, programming, and project implementation, as well as studies regarding production sectors, macro-economy and physical planning. The Government's planning process is historically coordinated by the **National Planning Office** (*Planbureau*), a foundation linked to the PLOS, which is responsible for preparing the Multi-Annual and Annual plans (see Ch. 6). However, since the *Planbureau* has not been adequately functioning, PLOS is coordinating project and program planning, as well as the activities of the various donors through a "Donor platform". Also, there is currently no one dealing with environmental issues at the *Planbureau*, so it relies on NIMOS for coordination for environmental management. The Government is adopting a new planning strategy, which foresees the development of a plan for the main sectors (agriculture, health, education, housing, governance, and environment), with a strong coordinating role for the Ministry of Planning. This new approach was catalyzed by the sector-oriented planning methodology adopted by the Dutch Government, the main donor to Suriname, for the development of its aid priorities. To support the approach, planning capacity at PLOS and other ministries will be strengthened through a program funded by IDB and UNDP.

The **Ministry of Regional Development** (Ministerie van Regionale Ontwikkeling – RO) oversees integrated government actions regarding regional development and the improvement of living conditions for the population in the rural areas. However, sanitation, waste collection, and cleaning services outside Paramaribo are managed by the **District Administrations**.

2. Institutional Capacity for Integrated Environmental Management

Created in 2002, the **ATM's Environmental Division** may be considered in its first institutional development stage. To accomplish its current tasks and respond to future demands for policy formulation and coordination, the Division's staff would benefit from technical support to strengthen its institutional capabilities. Specifically, ATM might benefit from a strategic planning process that would identify the main environmental policy objectives and goals to be pursued, set priorities, and help organize the work programs now in progress. Moreover, the institutional role of the ATM's Environmental Division should be better defined, in order to avoid some of the present overlaps with NIMOS activities. For instance, activities related to the implementation of biodiversity and climate change, international agreements, and participation in projects and commissions created for implementation and monitoring are currently duplicated between ATM and NIMOS. To address the first issues, a project proposed in the Biodiversity Action Plan (financed by UNDP) contemplates, among other activities, to provide technical support for strengthening the Environmental Division's institutional capabilities. With respect to an effective distribution of tasks between ATM and NIMOS, the careful review, approval and implementation of the Institutional Arrangement Act (see Section 2.A.4) is of crucial importance.

NIMOS has already benefited from certain capacity building activities through the Environmental Management Technical Cooperation program, executed from 1999 to 2003, with financial support from the IDB and the European Union. The program's main objectives were i) the strengthening of NIMOS, ii) formulation of environmental legislation and respective regulations, and iii) the development of studies on environmental planning and institutional organization. As a result, NIMOS has been provided with office equipment and vehicles and more than 200 professionals from the government and key stakeholders have been trained on the basics of environmental management, EIA, pollution control, environmental audit, monitoring, conflict resolution, and environmental law. In addition, the program provided NIMOS with crucial documents to fulfill its responsibilities, including drafts of an environmental management framework law, EIA regulations and an EIA Manual (see also Section 2.A.), as well as numerous strategic documents, including an Environmental Awareness Plan, a Laboratory Survey, the Greenstone Belt Regional Assessment and Strategic Plan, the Forest Sector Environmental Assessment and Management Plan, an Inventory of Suriname Legislation, and a feasibility study of developing a GIS system for NIMOS. Moreover, NIMOS staff has demonstrated its capacity of managing the proposed EIA process and regulation by applying it to three test cases in priority development sectors (mining and oil exploitation) during the program's implementation phase⁷ (Fraser, 2003).

Currently, NIMOS, through its five offices (Administration, Environmental and Social Assessment, Environmental Monitoring and Enforcement, Public Education and Outreach, and Legal Services), continues with the activities for which the staff has been trained. For example, NIMOS staff have contributed to studies and projects related to the national implementation of multilateral environmental agreements (see Section 2.A.2). The Monitoring and Enforcement Office has been assisting district commissioners with the review of industry permit applications and responding to citizens' complaints concerning environmental problems (an average of three complaints are forwarded to NIMOS every month), as well as participating in a committee of civil servants in charge of surveying the

⁷ EIAs of Gross Rosebel gold mining, State Oil extension of an on-shore oil exploitation, Kabalebo dam, and bauxite mining were reviewed during the program implementation period.

implementation of Gross Rosebel gold mining project. The Legal Service Office has been supporting NIMOS staff in matters related to the resolution of formal opinion on development projects, solution of environmental conflicts, and human resource management. In 2004, the Public Education and Outreach Office hired a professional who developed environmental education activities through public media and school, and implemented a library and documentation center. NIMOS has also provided environmental expertise to other governmental institutions and programs, including on an environmental management training program for district civil servants, as a part of the IDB funded Decentralization and Local Government Strengthening Program (DLGP).

However, despite the progress achieved under the Environmental Management Technical Cooperation program, further institutional capacity strengthening is needed to prepare NIMOS for an effective implementation of the Environmental Act, once it has been approved. Hence, since the Program concluded, NIMOS has been working on a second phase project proposal, to be submitted to the IDB, for further technical and financial support, for example, for additional staff, training, and support equipment.

One additional aspect that deserves attention is the available **capacity to collect and analyze environmental data**. The originally proposed Environmental Planning and Information Office within NIMOS, which would manage environmental information in a systematic manner, has not yet been created. Furthermore, as was concluded in the Laboratory Surveys in 1997, 2001, and 2003, laboratories do limited measurements on the environment. For instance, no physical measurements are taken (noise, air, water), whereas other parameters are measured only on an occasional basis. In addition, laboratories in Suriname have problems with adequate personnel, maintenance, standards, and safety. Efforts are being undertaken, in collaboration with FAO, to upgrade the main testing laboratory (Central Laboratory of the Bureau of Public Health) to support both health and environmental testing. In addition, the Environmental Management Technical Cooperation program produced the Greenstone Belt Regional Assessment and Strategic Plan, the Forest Sector Environmental Assessment and Management Plan and a feasibility study of developing a GIS system for NIMOS. However, at this point, the lack of systematically collected and analyzed data in key areas, including, for example,

- Environmental quality of key resources,
- Environmental institutions and national expenditures related to the environment,
- Indicators of compliance and enforcement,
- Indicators toward Millennium Development Goals targets,
- Indicators of environmental degradation and the associated economic costs, and
- Environment-related public health issues

represents a challenge to effective environmental management.

Finally, as mentioned above, the coordination and cooperation among NIMOS and those ministries with environment-related activities was supposed to be managed by the **Inter-Ministerial Advisory Committee (IMAC)**. However, IMAC has never been fully implemented, leaving the tasks involved in managing institutional coordination primarily to NIMOS. This places an additional demand on NIMOS' already limited staff and resources.

3. Key Environmental NGOs ⁸

Among international environmental NGOs active in Suriname are Conservation International (CI), the World Wildlife Fund (WWF) and the Amazon Conservation Team (ACT), who all have their headquarters in Washington DC but a strong presence locally. In addition, there are a few national NGOs

⁸ Several multilateral donor organizations have environmental units that are active in Suriname, such as the Unit of Sustainable Development and Environment of the Organization of American States (OAS) and the United Nations Development Program (UNDP). These are described in Chapter 6.

that are engaged either specifically in environmental issues or in issues related to environmental management in Suriname. The following section gives a brief overview of these organizations and their work.

Conservation International's priority is biodiversity conservation, which it aims to promote through the creation and management of protected areas. In addition, outside protected areas, CI supports projects aimed at improving the sustainability of Indigenous natural resource management. For example, CI hopes to counter the local depletion of wildlife and bird populations in South Suriname by supporting the development of alternative income generation strategies, such as ecotourism, for the local Trio population. CI also is involved in capacity building, curriculum development, and training at local elementary and high schools and the university, among other educational projects. In addition, several Conservation International programs will help raise awareness, including support for the development of a new curriculum for high-school biology and geography teachers; environmental capacity building among university and teacher education students; and support for changes in the elementary school nature education program.

The **Amazon Conservation Team** is concerned with environmental, health and cultural conservation in the larger Amazon region. One of its main activities is training in environmentally sustainable resource use, with projects on food security, agricultural technology (e.g. composting), Non-Timber Forest Product processing, and land management. ACT is also involved in mapping of Indigenous and Maroon usufruct areas and the preservation of medicinal knowledge. Recently, ACT has been working with the OAS on a project proposal with Trio Indigenous communities directed towards cultural preservation and nature conservation.

The **World Wildlife Fund** focuses on the conservation of wildlife and its natural habitat. Its *Guianas Sustainable Forest Resources Management Project* encompasses four components; Sustainable Forestry Management, Gold Mining Pollution Abatement, Protected Areas Effective Management, and Regional Integration, Collaboration, and Networking. WWF is playing an important role in management of the sea turtle nesting beaches and the Brownsberg nature park. Moreover, WWF views the lack of environmental awareness as one of the greatest barriers to wildlife conservation in Suriname. Hence, it has planned a direly needed environmental awareness campaign among small-scale gold miners and communities affected by mining. After completion of the baseline studies (2003), however, not much has happened.

WWF and CI has joined several other organizations, including STINASU, NIMOS, ACT and the Nature Education Department of the Forest Service (LBB), to form the **Nature Web** (Natuurweb). The Nature Web is planning to develop an Information and Awareness Center for Sustainable Development in a shopping mall in the center of Paramaribo (Kersten Mall). The aims of this center will be to help students conduct environmentally related research (e.g. for papers and class projects) and to hold expositions on current environmental topics.

In addition, the **Suriname Conservation Foundation** (SCF), an NGO supported by international cooperation agencies and the Government, conducts and finances research and development in Suriname's protected areas.

The most important and active local NGO is the **Foundation for a Clean Suriname** (Stichting voor een Schoon Suriname - SSS), which focuses on education and environmental awareness. This organization works with three target groups: schools, companies, and neighborhood organizations. An example of work with the schools is the project "milieu brigadiertjes" (little environmental officers). Grade five children in the 50 participating schools are trained to operate as environmental guardians, who call on their fellow students when they pollute the school environment (e.g. by throwing garbage outside of the garbage bins). In some schools, these little environmental officers also are taking care of the natural

vegetation around the school and working in the city center to educate the general public. SSS works with students and teachers to publish a bi-weekly environmental page in the main local newspaper *De Ware Tijd* and to produce short environmental documentaries for television. Other projects include; ISO certification of the high school level technical institute, NATIN; a migratory bird project with STINASU; a project aimed at improving consumer environmental awareness with the *Consumer Bond* and the *Organization for Food and Environment*; an oversized garbage collection project with neighborhoods; and curriculum development at local schools.

Ecosystem 2000 takes a holistic approach to the development of more sustainable agriculture and (adult) education. In West Suriname, Ecosystem 2000 is training two Amerindian communities in the use of composting, organic production, and techniques to sustain permanent fields rather than shifting cultivation. Similar projects have been developed elsewhere in Suriname. NGOs with related interests include the **Stichting Voeding en Milieu** (Association for Food and Environment) and the **Stichting Ecologische Productie Suriname** (Association for Ecological Production Suriname).

Other environmental NGOs do exist, but for most it is not clear what their objectives are, and to what extent they are still active. In fact, environmental knowledge and attitudes among the general public in Suriname is relatively low. A survey among young urban Suriname adults (18 to 30 years of age) found that almost half (45%) of respondents could not name any environmental organization in Suriname; 93.8% of young adults did not know what NIMOS stands for; and 92% could not name a single international environmental organization or treaty. One activity to enhance awareness would be to develop the Environment House, a historic building in the center of Paramaribo and the home of Suriname's main environmental organization NIMOS. The ground floor of this building has been designated to host permanent and temporary exhibitions about environmental matters relevant to Suriname. To date this plan has not materialized. However, NIMOS has recently launched an environmental awareness campaign, funded by the Dutch Government (Euro 40,000) and executed by the small private communications bureau Thera's Publications. The campaign includes television documentaries, radio documentaries, and newspaper articles about water, oil, waste management, and other timely issues that influence the potential for sustainable environmental management and development in Suriname. The program has a projected life span of six months but will probably be extended.

Indigenous peoples and Maroons are organized in a variety of groups, including the **Organization of Indigenous Village Leaders in Suriname** (Vereniging van Inheemse Dorpschoufden in Suriname, VIDS), the **Organization of Indigenous Peoples in Suriname** (Organisatie van Inheemsen in Suriname, OIS), and the **Chairmen Advisory Committees to Maroon Granmans** (Voorzitters Adviesraden Marron Granmans). None of these groups has been organized specifically around environmental issues. Nevertheless, in their concern about the rights of Indigenous peoples and Maroons, they do address gold mining, logging, waste management, poor sanitary facilities, and other problems affecting livelihoods and natural resources in the interior.

4. Next Steps

The foregoing analysis reveals the importance of achieving progress in several key areas related to Suriname's institution framework:

First, both ATM and NIMOS would benefit from **institutional strengthening**. Both organizations will be pivotal in the proposed integrated environmental management system, yet both are also relatively young and still in a process of formation and solidification.

Second, the implementation of the originally proposed **Environmental Planning and Information Office** within NIMOS continues to be indispensable for two key reasons⁹. On the one hand, there is a clear need for coherent environmental planning. In fact, the lack of an environmental planning unit at NIMOS may have been the main reason why urgent actions proposed in the Greenstone Belt Regional Assessment and Strategic Plan and the Forest Sector Environmental Assessment and Management Plan have not yet been presented to potential donors for financial aid. On the other hand, environmental information – to the extent that it is collected at all – is currently dispersed among various institutions and/or reports, such as EIA studies. The Environmental Planning and Information Office would manage information systems, as well as coordinate the design and implementation of the National Environmental Management Plan and other specific programs, as stated in the proposed environmental management bill. The implementation of the Environmental Planning and Information Office will require additional staff and capacity building, as well as a network of information sources, such as laboratory that gather environmental information.. However, the environmental information management system itself can build on the Geographic Information System (GIS) feasibility study that has already been completed.

Third, **coordination and cooperation between the various organizations with environmental responsibilities** has to be well managed. To this extent, a clear definition (through the Institutional Arrangements Act) of the respective roles of ATM and NIMOS is required. Moreover, the revitalization of NCE and IMAC is needed in order to improve coordination between NIMOS and the sectoral ministries, and thereby to orient all institutions involved towards the same environmental policies, objectives and procedures. In addition, training of environmental enforcement officers from various organizations and agencies, including for example the relevant sectoral ministries, district authorities and fire departments would also be helpful to achieving more effective coordination and cooperation.

Fourth, there is a general need to increase environmental awareness and **public participation** in environmental decision making. Several efforts have already been made with respect to environmental awareness, including the completion of an Environmental Awareness Plan, WWF's environmental awareness campaign, CI's and the Foundation for a Clean Suriname's educational projects, NatureWeb's Information and Awareness Center for Sustainable Development, as well as the Dutch-funded awareness campaign conducted by NIMOS. To develop these efforts further, institutional capacity for public consultations and public participation in environmental decision making should be developed in the medium term. However, in the short-term, a functioning environmental management system, including modern environmental statutes and regulations as well as the institutional capability to implement and enforce them, is a pre-requisite for meaningful public participation and for sound environmental management in general.

⁹ Two other offices that were originally proposed (Environmental research and Environmental funding & investment) are no longer a priority, given that environmental research functions have been delegated to the University of Suriname and other research centers, and environmental funding and investment functions have been assigned to the Administration Office.

3. STATE OF THE ENVIRONMENT

This chapter provides a diagnostic of Suriname's physical environment (including its ecology and nature conservation, critically contaminated areas, deforestation trends, the state of inland, coastal and groundwaters) and its relation to economic sectors, specifically mining, fisheries, forestry and agribusinesses, and socio-economic factors, including population pressures, land use, income level and distribution, provision of water and sanitation, solid wastes collection, education, literacy, and public health. With respect to both its ecology, as well as its economic and social characteristics, Suriname can be divided into four zones: **(1) Marine and coastal zone (2) Coastal plain/savanna belt, (3) Interior, (4) Paramaribo urban area.** The analysis of the state of the environment (and that of donor-funded activities) is based on these zones.

KEY DATA

Export value of fisheries (2003)	US\$ 32.7 mill
Budget of MAS for enforcing fishing license requirements	<i>No data</i>
Legal & institutional basis for environmental mgmt. of oil exploitation	Weak
Cost of loss of environmental services: natural shoreline protection	<i>No data</i>
Area covered by freshwater wetlands in Young Coastal Zone	7% of land area
Health of wetland ecosystems in Young Coastal Zone	<i>No data</i>
Area negatively impacted by extractive activities (bauxite, gold, sand & oil)	<i>No data</i>
National Forest Policy developed (year)	2003
National Forest Policy Strategic Action Plan developed (year)	In progress
Area allocated to logging concessions	40% of land area
Amount of timber extracted in 2004 (not including illegal extraction)	150,000 m ³
Statistics on commercial wildlife trade (exotic pet and bush meat trade)	<i>No data</i>
Amount of mining sediments annually discharged into rivers & creeks	<i>No data</i>
Mercury released annually by small-scale miners (estimate)	10-20 metric tons
Statistics on major air pollutants in Paramaribo area	<i>No data</i>
Statistics on quality of water & sanitation system in Paramaribo area	<i>No data</i>

A. MARINE AND COASTAL ZONE

Key Issues

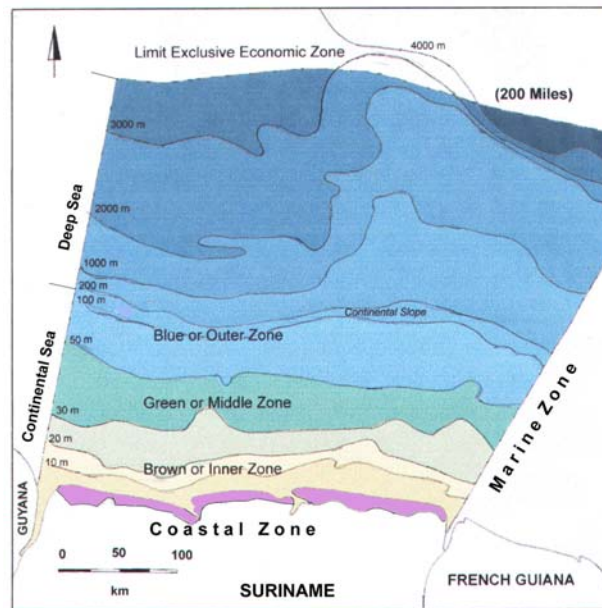
- Depletion of fish and shrimp populations due to over-fishing
- Fisheries management hampered by lack of resources, enforceable control mechanisms and data
- Increasing off-shore oil exploration (potential for high impact during exploitation)
- Loss of natural protection along coast line due to erosion and degradation of mangroves

Suriname's Exclusive Economic Zone (EEZ) extends to 370 km offshore from the coast.

The main economic activity in the **marine zone** is fishing for shrimp, catfish, and several other commercial fish species. This economic sector provides an annual export value of US\$ 32.7 million (2003), contributes up to 5% to the GDP, and provides employment to approximately 5000 people. The EEZ is subdivided into the Deep Sea Zone, the area of industrial fisheries, and the Continental Sea Zone,

the area dominated by small-scale fisheries (see Figure 4). Within the Continental Sea Zone (65.000 sq. km), which is characterized by its shallow contour and clearly delineated blue, green and brown waters, the Brown Water Zone (20.000 sq. km) is of particular importance. The mudflats of this zone, which derives its name from the Northeast flowing Guiana current that carries large amounts of sediment from the Amazon River, play a pivotal role in the estuarine nursery of economically important marine and fish species.

Figure 4 Marine and Coastal Zone



Since 1996, over-fishing is depleting fish and shrimp populations. Hard data are lacking, but observations from local fishermen are alarming. It has been noted that shrimp populations fail to recover (or cycle up) after the fishing season. There appear to be two main proximal causes. First, license holders do not abide by the regulations set forth in their licenses. By using dragnets in shallow waters, for example, they are harming shrimp breeding and production grounds. Second, illegal boats, mostly from Guyana and Venezuela, fish without licenses. Confronted with a declining catch, fishermen are exploring alternatives, such as other shrimp species in deeper waters. It is unknown if this activity will merely shift the problem to another location.

More effective management of Suriname's fishery is currently hindered by lack of enforceable control mechanisms and lack of data. The Marine Authority Suriname (MAS) does not have the resources to stop violators and there is no efficient reporting center or number other agencies or citizens may call in case they witness misbehavior. Also, a lack of data makes it impossible to accurately monitor fish stock and document the impact of certain fishing techniques. The last biomass research was conducted in 1988.

The *Ministry of Agriculture, Animal Husbandry and Fisheries* (Ministerie van Landbouw, Veeteelt en Visserij – LVV) is planning to introduce a modern vigilance system in 2005. This system is to combine the forces of the Department of Fisheries with those of the Ministry of Defense, the Ministry of Justice, and Police with a satellite surveillance system (estimated cost of US\$500,000). The plan calls for the installation of a national coast guard and a consultation board with members from the LVV and the industry. In addition, the Department of Fisheries is working to set up a modern laboratory for processing and research with the assistance of the Japan development fund (estimated cost of US\$ 6 million).

Potential future conflicts with fishermen can occur when offshore oil drilling starts. In 1999, the State Oil Company (Staatsolie – NV) has signed an agreement with a consortium of international oil companies (Repsol and Maersk) to conduct seismic studies. It is expected that added momentum will be created by offshore exploration under this agreement. Offshore oil exploitation will depend on the exploration results. It must be stressed that this kind of exploitation has a high environmental and social impact and risk potential and should be preceded by a detailed environmental impact assessment. A sound database should be available and appropriate legislation should be in force to ensure impact mitigation and monitoring. At present, both conditions are missing in Suriname, although the Petroleum Act of 1990 provides for the prevention of adverse environmental impacts of oil exploitation activities. State Oil, the main project promoter, has stated the intention of preparing environmental impact assessments for any future offshore exploitation activity.

Because most of the shoreline consists of swamps and mangrove forest, few people live in the **coastal zone**. Only in the East, at Galibi beach, is there a large concentration of coastal Kalina or Carib Indigenous peoples. Nevertheless, the coastal zone has both economic and social importance due to its fishing areas and the protection it affords for the low-lying coastal plains where most of Suriname's population lives.

Eco-tourism & Conservation. Shell beaches occur along the Eastern shoreline and are largely protected. Near the mouth of the Marowijne River, the Galibi Nature Reserve (4,000 ha) is an important nesting beach for marine turtles such as the green turtle (*Chelonia mydas*), the threatened olive ridley (*Lepidochelys olivacea*), and the hawksbill (*Eretmochelys imbricate*). In addition, one of the world's largest viable populations of leatherback turtles (*Dermochelys coriacea*) nests on Galibi beach. The nesting and hatching of these turtles are popular tourist attractions. Management activities for the conservation of the turtle nesting grounds have been successfully performed by STINASU for more than a decade. Notwithstanding, poaching of turtle eggs, trawling and seine-net fisheries, and bi-catch fisheries continue to harm turtle populations. Marine turtle conservation is one of the main priorities of WWF-Guianas in Suriname, and its support has successfully reduced poaching on the beaches of Galibi and Matapica.

Eco-tourism attracted by sea turtle nesting grounds provides an important source of income for the Indigenous villages near Galibi. In addition, coastal Indigenous peoples rely on fishing, subsistence farming, and petty trade. These Amerindian groups, who are the original inhabitants of the area, have expressed concern and frustration about their lack of power in decisions about local land management, including the establishment of nature parks.

Fisheries. In the estuaries at the confluences of the Courantyne and Nickerie rivers (near the Guyanese-Surinamese border), the Coppename and the Saramacca Rivers (west of Paramaribo), and the Suriname and Commewijne Rivers (east of Paramaribo), fishnet fisheries and bottom long-line fisheries are practiced year around. In the accessible parts of coastal freshwater swamps, fisheries are concentrated around trenches and ditches, and also in especially constructed freshwater canals (also known as fish holes). Fishermen along the downstream parts of the rivers specialize in dragnet-fisheries. Further upstream, in areas inhabited by Amerindian communities, several traditional fishing techniques are used.

In the early 1990's, several private enterprises started aquaculture farms. Two of the successful ones are located at the right bank of the Commewijne River. One company focuses on intensive culture of the brackish water Red Tilapia fish (*Oreochromis red hybrid*), the other one on the brackish water shrimp (*Litopenaeus vannamei*), both species introduced to Suriname. Yet, shrimp fishing has little impact on the mangrove forests, as fishers tend to be active at some distance from the shoreline.

Natural Protection. Mudflats are slowly moving along the coastal line in the Western direction with an average yearly speed of 1.5 km. This may lead to extreme coastal erosion at certain places as is currently seen in the district of Coronie. The mangrove forests that used to provide natural protection of the shoreline against erosion have been partly degraded in this district, as well as in the district of Commewijne and at the Weg naar Zee area (District of Paramaribo). In Coronie the government proposed to construct a dyke to prevent further erosion; however, this dyke will never fully control the natural coastal processes. The dyke in the district of Commewijne, in the Nieuw Amsterdam area near the shoreline, is being rehabilitated every year.

It is worth emphasizing that Suriname is not subject to any major natural disaster hazards. Although land in several of the Coastal Provinces is regularly flooded by seawater, particularly in the rainy season, the flooding is currently not sufficiently serious to damage houses or destroy crops. However, a potential environmental concern is that rising sea levels will affect Suriname's coastal zone and its inhabitants (Climate Change Country report, 2004). Suriname has no water defense system, nor an adequate plan to deal with this threat.

Water Quality. No studies have yet been conducted to determine the quality of sea water along the coast of Suriname. However, the high sediment content of the coastal waters facilitates the transportation of micro-organisms. Especially near Paramaribo and in Western Suriname, fecal micro-organisms from the sewage system are likely to pollute the water. In addition, garbage from coastal communities, motor-oil from boats, and ballast water from large vessels affect water quality.

Also, agrochemicals associated with rice production may produce an impact along the Western shoreline. In Nickerie and Saramacca, residues of agricultural chemicals applied near fresh and brackish water systems have been toxic to fish and birds. A pesticide management strategy is being prepared at the agricultural field station of the Ministry of Agriculture, Animal Husbandry and Fisheries (LVV). As part of this plan, the Ministry and importers of pesticides have agreed on a pesticide sales registration system. A recent adjustment to the Pesticides Law (*Bestrijdingsmiddelenwet*) should provide legal backing to the proposed management strategy. However, the Directory of Agricultural Planning and Development of LVV does not have an environmental section or personnel trained to deal with environmental issues.

It is worth mentioning, that the IDB has approved a technical cooperation in late 2004 (ATN/NP-8928-SU; US\$ 100,000) whose objective it is to analyze coastal zone issues and perspectives, review all legislation pertinent to use, conservation and institutional management of the coastal zone, draft terms of reference for the development of a comprehensive Integrated Coastal Zone Management (ICZM) plan, and develop relevant coastal zone pilot projects in natural resource use and management. The project is currently in execution.

B. COASTAL PLAINS AND SAVANNA BELT

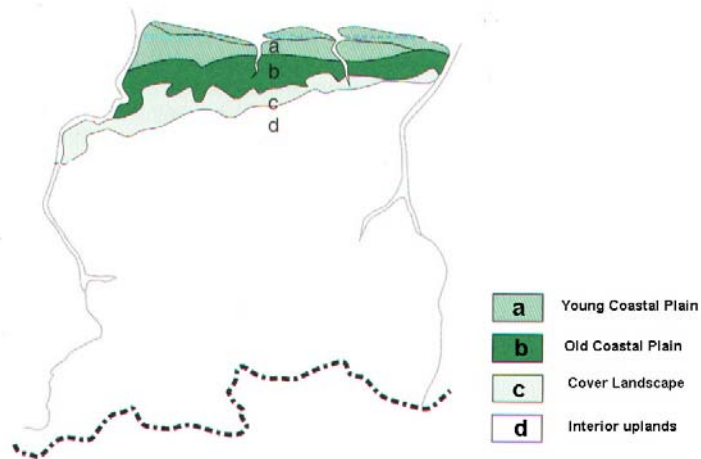
Key Issues

- Increasing degradation of coastal lands due to conversion to agriculture and urban areas
- Integrated watershed management is urgently needed in rice sector areas
- Environmental impacts of extractive industries (bauxite, gold, sand and oil) are poorly managed

The Coastal plains comprise 18% of Suriname's territory and are geographically divided into the Young and Old Coastal Plains and the Savanna Belt (Cover Landscape) as shown in Figure 5. The Young Coastal Plain varies in altitude from sea level to 2m and extends along the entire coast of Suriname at a

width of 10 to 40 km. With various soil types, including sand, clay, and peat; the Young Coastal Plain is characterized by alluvial deposits that are mainly found along the coastline, intersected by shell beaches. The Old Coastal Plain varies in altitude from 4 to 11m above sea level and forms a continuous belt of approximately 20 km in width (6% of total land surface). It consists of eroded sand ridges (and hence relatively poor soils) in the North, yet the silt loams and silt clays, especially in the terraces along the rivers in the South, are fertile and suitable for cultivation. The Savanna Belt extends across the width of Suriname and is approximately 5 to 10 km wide in the East and 60 to 70 km in the West (6% of total land surface). Characterized by a hilly landscape with elevations between 10 and 50 m, the belt is composed of largely infertile soils that range from unbleached and bleached sand to sandy loams. Nevertheless, the Savanna region supports some agricultural production of pineapple as well as forestry.

Figure 5 Coastal plains and the savannas



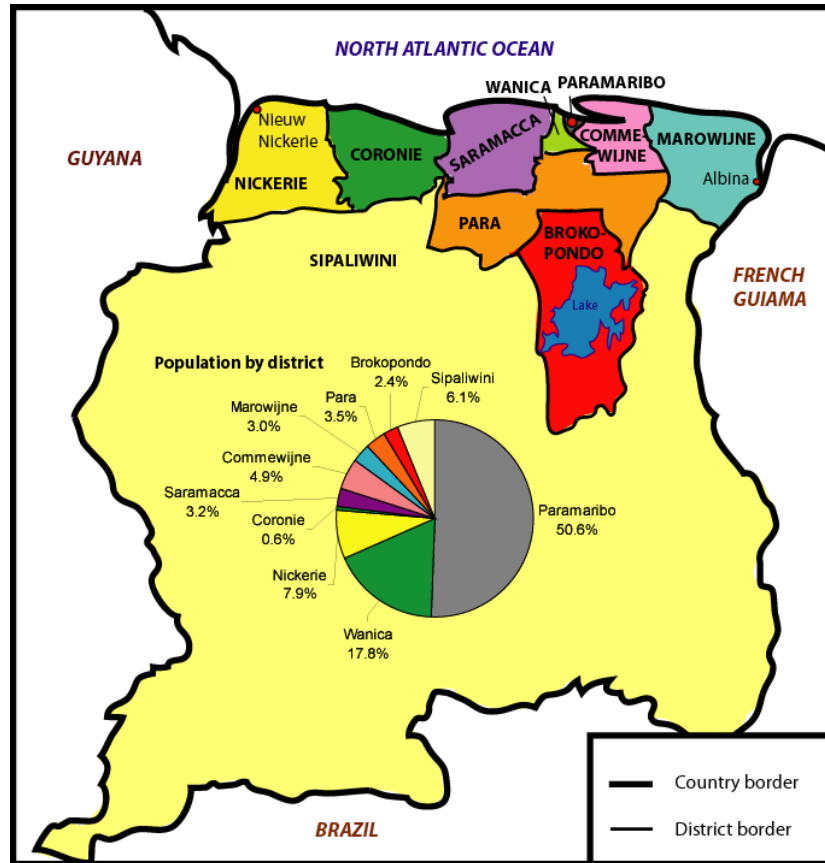
Geo-politically, the Northern Plains are divided in the districts of Nickerie, Coronie, Saramacca, Wanica, Para, Commewijne, and Marowijne (Figure 6). Together, these districts contain 40.8 percent of the total population of Suriname (196,564 people).

The original inhabitants of the Northern Coastal Plains are the Caribs and Lokono (Arawaks) Indigenous peoples, who continue to inhabit this area. They live primarily along the main roads and rivers. Many villages have their own headman, called *kapitein*, but there is no larger political structure governing the Carib and Arawak ethnic groups. Other groups that inhabit the Northern Coastal Plains in significant numbers are Maroons, Creoles, Javanese, and Hindustani.

Maroons are tribal people of African descent; their ancestors were brought as slaves to Suriname, yet throughout the 17th and 18th centuries, slaves managed to escape to the dense tropical forest of the Interior, and eventually settled as more stable societies along the coast and in the Interior region. Today, coastal Maroons mostly live on the savannas and plains East of Paramaribo, in the district of Marowijne. Many work in the extractive industries (bauxite, lumber), in addition to subsistence agriculture, hunting, fishing, and petty trade. Some informally sell fruits, vegetables, and bush meat along the main road to the east; others bring their produce to the Central Market in Paramaribo. The main village of Albina, on the border with French Guiana, is an important transport hub for Maroons traveling from the villages along the Marowijne, Lawa, and Tapanahonie Rivers in the Interior to the coast, as well as for travelers between Suriname and French Guiana. With 3,200 inhabitants and many more daily travelers, yet without an adequate waste management system in place, Albina has problems with solid and liquid waste disposal.

Creoles (31% of the Suriname population) are the descendents of African slaves and people of mixed African heritage. Creoles in the coastal area frequently live on the old plantations and rural lands obtained by their families after the abolition of slavery, mostly in the districts of Para, Wanica, and Coronie. In the past decades, a significant share of lands in the district of Coronie has become brackish and unsuitable for agriculture due to the failing sea defense system. This event has forced many small-farmers in this district out of business, and many have left for the city. Today, Creoles primarily work as public servants and laborers in extractive industry (bauxite, timber) and other resource-based industries, such as fisheries, coconut and banana plantations, and bee farming.

Figure 6 Districts of Suriname and their population distribution



Javanese (15% of the Suriname population) are the descendents of indentured laborers from the Indonesian island of Java who came to Suriname between 1890 and 1939 to work on the plantations after the abolition of slavery. They continue to inhabit the rural areas surrounding Paramaribo, primarily in the districts of Saramacca, Wanica, and Commewijne. Their main economic activity is small-scale agriculture of fruits and vegetables, which are sold at the Paramaribo markets.

Hindustani people (37% of the Suriname population) are the descendents of indentured laborers from former East India, who came to Suriname between 1873 and 1918 to work on the plantations. They dominate the rice farming industry in Western Suriname, in the districts of Nickerie and Coronie. The main urban centre of the rice districts, with 11,100 inhabitants, is Nieuw Nickerie, on the border to Guyana.

Lebanese (less than 3% of the Suriname population) tend to be active in the textile industry and own many of the clothing and fabric stores in Paramaribo. Since the 1980s, Brazilian small-scale gold miners, called *garimpeiros*, have come to work in the gold mines in the interior of Suriname. In their footsteps came families and merchants, who settled in the city and today comprise around 5 % of Suriname's population. They mostly cater to the gold mining sector, running hotels, mining equipment stores, telecommunication centers, restaurants and bars, and Brazilian supermarkets. Chinese represent 3% to 5% of the Suriname population and dominate merchandising (operating an estimated 90% of small supermarkets).

1. Environmental Services

The Young Coastal Plain in particular provides a number of valuable environmental services. Specifically, it serves as an important reservoir for agricultural irrigation, a natural barrier against the sea, a pivotal nesting ground for more than 90% of the local saltwater fish species, important breeding grounds and habitat for bird populations, aquatic mammals, and other species, and an area that is rich in freshwater fish due to the convergence of Suriname's major rivers.

The Young Coastal Plain is mainly covered with lowland forest and freshwater wetlands (7% of Suriname's land surface) that consist of herbaceous swamps, swamp woods and swamp forest. Several of these wetlands serve as a reservoir for agricultural irrigation, especially Nani swamp and Coronie swamp. Other significant water sources are the confluences of the major rivers, and the salt and brackish water lagoons. All rivers and creeks have tidal flows, with high water from May to July and a low water level around November.

Several regions in the coastal zone have received a status of international importance or of a protected area¹⁰ as breeding grounds and habitat for bird population, aquatic mammals, and other species. Protected areas include the Coppename-monding Nature Preserve (12,000 ha), the Wia Wia Nature Reserve (36,000 ha), and the Bigi Pan Multiple Use Management Area (67,900 ha). The Coppename-monding Nature Reserve received the RAMSAR Convention Status of Wetland of International Importance and all three areas received the status of Hemispheric Reserve within the Western Hemisphere Shorebird Reserve Network (WHSRN).

Many studies have been conducted for management purposes on environmental impacts on the coastal zone¹¹. These studies have helped in preventing potential environmental impacts from agricultural and industrial developments in the Young Coastal Plain. Still, the area experiences several environmental pressures. Particularly, wildlife enforcement officers report a sharp decline in waterfowl, ibis and wood storks due to hunting pressure in the coastal region. Sport and subsistence hunting and fishing are putting increasing pressure on the local fauna, such as the muscovy duck (*Cairina moschata*), which is currently over-hunted. Another threat to coastal wildlife populations comes from pollution of marine waters and coastal wetlands (see also Section 3.A.). Moreover, coastal lands are increasingly being converted to agricultural and urban areas. The degradation and conversion of the Young Coastal Plains diminishes its ability to render its valuable environmental services.

¹⁰ Hertenrits Nature Reserve, Bigi Pan MUMA, North Coronie MUMA. Coppename-monding Nature Reserve, North Saramacca MUMA, Wia Wia Nature Reserve, North Commewijne-Marowijne MUMA, Galibi Nature Reserve.

¹¹ Environmental impacts studies on the construction of drainage diversion dams, polder construction, pesticide use, oil field development, and urban development have added to the knowledge of the functioning of estuarine ecosystems.

2. Natural Resources & Resource Based Industries

The Coastal Plains are the center of much of Suriname's major economic activity, including rice and banana production, commercial mining activities (bauxite/aluminium, gold and sand), on-shore oil exploitation and commercial timber extraction.

The **rice sector** is the most important agricultural sub-sector, representing 60% of agricultural land and labor. A recent feasibility study on the rice industry sponsored by the European Union concluded that the sector directly needs reorganization and enhanced efficiency. The IDB also funded a TC study entitled "Preparation of an Action Plan for the privatization of Agroindustries", completed in November 2003. Rice producers are troubled by rising production expenses (e.g. fuel, interest rates) and falling prices of rice. Many paddy-farmers have gone out of business, while others are on the verge of bankruptcy and heavily indebted. Their lack of capital prevents investment in more efficient and cleaner production techniques and machinery. Another problem is year-round access to fresh water. In the district of Coronie, a water reserve built by a large rice farmer is preventing the flow of fresh water to the coast. As a result, sea water is entering the streams that people use for their gardens and household purposes. An action group (*Laat het water stromen*) was created to draw public attention to and solve this problem, but the government has not yet responded adequately. Also, a planned large-scale aquaculture project in the West Southdrain area (1500 ha of Monodon NV) will impact the water distribution pattern in the rice fields. Hence, there is an urgent need for appropriate integrated watershed management in the rice areas.

Banana production is another large-scale agricultural activity in the Northern Coastal Plains. In 2002, state-owned banana producer Surland closed its doors due to its inability to meet payroll expenses. With support from the European Union (Euro 20.57 million over 5 years) and the Government of Suriname (US\$ 7.3 million), a cooperative by the name of Foundation Preservation Banana Sector Suriname (*Stichting Behoud Bananensector Suriname – SBBS*) revived the banana industry. The first boxes of bananas were exported to Europe in March 2004. Although no environmental impact assessment has been prepared, an extensive team of foreign and national consultants is providing technical assistance for monitoring the plant, which should minimize possible environmental impacts.

With respect to **mining activities**, the Northern Plain is extensively used by the joint venture of Suralco and BHP Billiton companies to mine bauxite and process alumina in the area of Paranam and Lelydorp. Although there have been many attempts for rehabilitation of mined areas, they have not yet been successful. In addition, large-scale gold mining activities in the Old Coastal Plain are expanding, and ongoing medium-scale sand mining (to supply urban areas) is generating landscapes of large craters filled with standing water.

Activities within the **exploration and exploitation of oil** in the Tambaredjo field, Saramacca are also expanding. Petroleum is increasingly becoming a major source of energy in Suriname, and crude oil production has grown steadily from about half a million barrels in the early years of the decade to over 3 million barrels in 1996 and nearly 4.4 million barrels in 2000. The ongoing activities have disturbed the natural water flow and minor oil spills have occurred close to important agricultural areas. As a result, nearby rice fields and mangrove forests are negatively impacted by the petroleum exploration and exploitation.

Finally, the Old Coastal Plain and the Savanna Belt are key location for **commercial timber extraction** by Chinese and Surinamese companies. The Old Coastal Plain is mostly covered with lowland forests (open rain forest, swamp wood and swamp forest) and 7,000 ha of pine plantations. Large areas of these forests are used for selective logging and effectively controlled by the Forest Management and Production Control Unit. The Savanna Belt is particularly noteworthy for its high number of plant species per area unit (e.g. more than 20% of the flora in 1% of the land surface). Fortunately, alteration of the savanna

forests has so far resulted in its transformation into different succession stages, rather than in clear-cut, bare land. Nevertheless, environmental impact on savannas can be threatening to their floral and faunal inhabitants. For instance, the South American rattlesnake (*Crotalus durissus*), which is used for its venom, recently disappeared from the ecosystem.

C. INTERIOR

Key Issues

- Conflicting demands from industrial and traditional uses of environmental resources in region
- Management of natural resource extractions inadequate and with limited local consultation
- Pollution of freshwater bodies through mining activities and inadequate waste/effluent disposal

Approximately 80% of Suriname's land surface belongs to the Interior Upland, a Precambrian Guiana Shield, which is a deeply weathered formation of a crystalline basalt complex, characterized by its hilly and mountainous appearance with elevations ranging from 50 to approximately 1230m above sea level. Above the metamorphosed rock exists a relatively thin layer (one meter at slopes and several meters in valleys) of soil that consists of reddish brown and yellow coarse sandy loam to sandy clay and is intersected by coarse sand, sandstones, and gravel. These soils are rich in minerals, are generally well drained, but have little capacity to bind micronutrients.

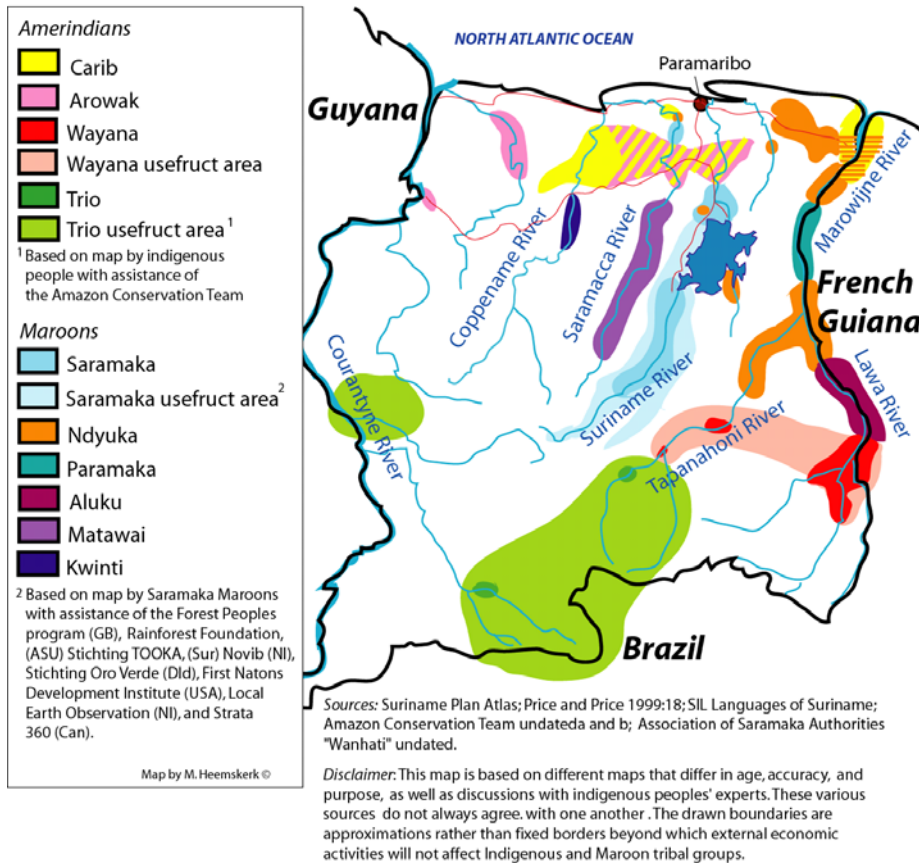
The Interior region is rich in natural resources, biodiversity and cultural diversity. It is mostly covered with highly diverse tropical rainforest, includes the Central Suriname Nature Reserve (1,600,000 ha), is crossed by an extensive pattern of rivers and creeks that flow from the Interior region to the coast, contains valuable gold and bauxite deposits, and has been inhabited by several indigenous peoples for more than 10,000 year and by Maroons since the 17th century. The demands placed on the environmental resources in the region, however, are not always compatible, especially where industrial and traditional uses of the resources overlap, as they do in large parts of the Interior.

1. Indigenous Peoples and Maroon Communities in the Interior

Today approximately 12,750 Indigenous people and 54,750 Maroons live in the Suriname interior, representing respectively 2.7% and 11.4% of the Suriname population (IDB, 2004)¹². Indigenous people in the Interior include Trio, Wayana, Carib and Arawak. Six ethnically and culturally distinct Maroon groups occupy different territories in the Suriname interior: Saramaccaners (also: Saramakaners), Ndyuka (also Djoeka, Aukaners, or Okanesi), Matoeari (Matawai), Paramaccaners (Paramakaners), Kwinti, and Aluku or Boni. Figure 7 shows Indigenous people and Maroon living and usufruct areas in the Greenstone Belt Region. There is little strife over territorial boundaries between these groups, and people from one group freely cross the territory of others. Nevertheless, mixed villages and, to a lesser extent mixed marriages, remain rare.

Indigenous people and Maroons live in permanent villages and temporary settlements (*kampus*) along the major rivers that traverse the rainforest. These rivers form the most important, and for many people only, form of transportation and access to goods, information, and people from outside. In addition, interior inhabitants rely on the rivers for food (fish, turtles, turtle eggs, caiman, manatees, and river dolphins), an essential source of protein in their diet. At low water level, some rivers may fall dry and hamper transport to and from the interior causing short-term food shortages.

¹² More accurate figures will be available in July 2005, when the results of the seventh Suriname census will be made public.

Figure 7 Indigenous peoples and Maroons in Suriname

An increased orientation toward the city over the past two decades has brought increasing amounts of inorganic products to interior villages, including plastic soda bottles, tins, plastic bags, synthetic clothes, and plastic tools and utensils. This trend has been facilitated by access to faster means of transportation. The introduction of TV and video have further stimulated a taste for modern goods. Plastic bowls and metal spoons are preferred over kitchen tools fabricated of calabashes, which now are seen as old-fashioned or even backward. In the absence of a waste disposal system, people usually dispose of garbage either on heaps in the village, where it is burned, or straight into the river. Both disposal methods present environmental hazards.

2. Uses of & Impacts on Environmental Resources in the Interior

The **tropical rainforests** in Suriname's Interior are part of the highly biodiverse Guiana Shield. Indigenous people and Maroons rely on the forest for housing materials, food, medicine, ritual ingredients and other aspects of their daily lives, although Maroons tend to depend to a greater extent than Indigenous people on industrial products, such as shotguns, plastic ware, and canned and processed food. The largest share of Indigenous and Maroon food comes from shifting or "**slash and burn**" agriculture. The main staple foods are cassava (manioc) and rice. In addition, forest gardens contain a wide variety of tubers, vegetables, and fruits, including maize, sweet potatoes, yams, squashes, taro, arrowroot, peppers, beans, peanuts, bananas, plantains, and sugar cane. Medicinal and ceremonial plants such as gourds, calabashes, cotton, tobacco, and a wide variety of herbs, are both domesticated and collected in the wild. Since tropical soils are rapidly exhausted, agricultural plots will only provide viable yields for one or two years, after which they are traditionally left to fallow for some time.

However, changing lifestyles are affecting the sustainability of this system. Most Indigenous people have been encouraged by missionaries to adopt a sedentary, agriculture-based lifestyle, and there are now large mixed communities in the Interior, such as Kwamalasumutu with approximately 1500 inhabitants. These communities may provide better access to education and modern health care services, yet settlement in larger villages combined with rising life expectancies also places pressure on natural resources. Similar changes are occurring among the Maroons, in particular along the Upper Suriname River. Indigenous people and Maroons stress that they now have to travel longer distances from their home villages to find land that is suitable for agriculture. Another modern problem is the increased use of pesticides both on the fields and around the houses (e.g. to prevent wood lice from penetrating the home). The application of aggressive chemicals typically occurs without the appropriate measures to protect human health and the natural environment. The majorities of women, who perform most agricultural work, are illiterate and hence cannot read the user instructions. Moreover, most do not have the money to invest in protective gear such as mouth caps, socks, and gloves.

In addition to agriculture, **hunting** of a variety of game (birds, monkeys, sloth, deer, tapir, peccaries, armadillos, anteaters, rodents, agoutis, etc) provides an important traditional food source. However, Indigenous people and Maroon hunters are noticing that they need to go further to find bush meat, and that the animals they catch are smaller. Many older villagers comment that there were many more wild animals around the villages when they were young. To protect their food sources, several tribal leaders are successfully enforcing traditional conservation strategies. For example, some years ago, Ndyuka Granman (chief) Matodya Gazon ordered a ban on *ponsu* (the use of a poisonous root or vine to stun the fish). This practice was only reintroduced in 2003, when it was observed that the fish stock had recovered. The same Granman banned hunting in certain areas during the 2004-hunting season to protect local wildlife populations. In addition, hunters from all tribal groups typically obey year-round hunting restrictions, such as the prohibition to kill a pregnant female. Yet, tribal leaders are not invariably primarily focused on conservation strategies. The (ex)Granman of the Matawai Maroons, for example, holds title to a large gold mining exploration concession on Matawai territory. He sub-leases parts of this concession to small-scale gold miners, who pay him 10% of their earnings in gold. This Granman does not enforce any type of environmental regulation on his concession, and hence allows for the pollution of tribal lands, rivers, and wildlife.

In addition to subsistence hunting, people from both the forest villages and the city are entering the forest for **recreational and commercial hunting**. Hunted species include the white-lipped and collared peccary, agouti, deer, and the iguana as well as its eggs. Hunters frequently enter along the road from Paramaribo through West Suriname to the Amerindian village of Apura, which borders Guyana. Observations suggest that **bush meat trade** is increasing and likely to threaten wildlife populations in popular hunting spots. Without numbers, however, it is difficult to quantify this threat. To date there has been no systematic monitoring of commercial hunting, though WWF-Guianas has made an effort to change this. The organization has provided training in monitoring of game activities to game wardens from *Natuurbeheer* (Nature Conservation Division of the National Forest Service), and has funded the acquisition of trucks and other materials. These materials include copies of the 2002 legislation, which are handed out to hunters encountered during the patrols. In addition, WWF-Guianas recently closed an agreement with the University of Suriname to support two students who would monitor the bush meat market in town.

Traditional land uses in the Interior overlap with **commercial forestry** concessions. Logging concessions – primarily held by foreign companies – cover more than 40% (2.2 million ha) of Suriname's land mass, and 60% of the Indigenous peoples and Maroon communities live within the lands allocated for concessions. A lack of consultations with the affected communities and other stakeholders, combined with poor regulation and control, are a source of tension and conflict over forest user rights. In the absence of Government control, foreign lumber companies frequently ignore the limits to their permits.

Many operate beyond their concession boundaries; pay local people to provide timber from outside; and extract lumber at rates well beyond the prescribed cutting limits. Such illegal practices make exact figures about the area affected by timber extraction difficult to determine. To date, it appears that the lumber industry has affected less forest than mining, energy generation, and agriculture. This may change if, as the Government is planning for 2005, national lumber production is increased from 150,000 to more than 500,000 m³ per year. It is estimated that the lumber industry and dependent activities – logging, wood processing, institutional, research- employ 5% of the labor force.

In 2004, the Government of Suriname signed an agreement with China Zhong Heng Tai for the establishment of a **palm oil plantation** near the village of Moengo. Profits from lumber extraction from the designated 40,000 ha of forest are to be re-invested in the palm oil industry. The government granted permission without an assessment on the potential impacts on the environment, which may include erosion, soil compaction and surface water pollution. A steering committee from the Suriname government is monitoring this project, although NIMOS has not been invited to participate despite requests made by the NIMOS Director General.

About 435,000 ha of the forests in concession are in a communal *Houtkapvergunning* (HKV) area. The original purpose of the HKV was to provide the timber needs of interior populations – Indigenous people and Maroons. Since 1992, commercial timber extraction in these areas has been permitted, and about 25,000 ha are being logged commercially every year. That village heads are titleholders of the HKV has been a source of conflict and abuse. For example, some tribal village heads have sold their exploitation rights to third parties without consulting their communities or sharing the profits equitably with them. The national forest policy that was developed in 2003 with support of the IDB has still not materialized into a strategic action plan. This is planned for 2005, as well as the institution of a forest and nature management authority.

Another resource, but a fragile one, offered by Suriname's rainforest in the Interior region is its high level of **biodiversity**. The species richness in the Suriname rainforest is estimated at 6,100 plants, 600,000 - 1,000,000 invertebrates and 2,040 vertebrates. Threatened species in the interior are the bleu-poison frog (*Dendrobatus azureau*) that lives in small forest islands and has been smuggled by pet-traders, the harpy eagle (*Harpia harpyja*) that has been hunted by Indigenous peoples for its feathers, and the large-billed seed-finch (*Oryzoborus crassirostris*), a popular songbird. The forest systems in the higher mountains are extremely vulnerable to the impacts of extractive activities, such as logging and gold mining.

In addition to the bush meat trade mentioned earlier, wildlife populations are also threatened by the national and international **demand for exotic species** as pets. The legal trade in live CITES species, particularly primates, has slowly declined since 1997 due to more restrictive regulations in importing countries, stricter enforcement of CITES regulations in Suriname, the refusal of many commercial passenger and cargo airlines to transport wildlife, and the recent adaptation of captive breeding programs in zoos. However, illegal trade continues to flourish and may even have increased. The export of wildlife is regulated since 1986 by a voluntary quota system for commercial exporters, residents and non-residents. However, limited human and material resources hamper effective law enforcement by the National Forest Service. The high prices that collectors pay for exotic pets have motivated some interior groups to catch and sell (singing) birds, reptiles, and sometimes even mammals. Most animals are smuggled out of the country to the United States and Europe, where large sums for them.

For example, two species of song birds, *Oryzoborus crassirostris* (Large-billed finch or twatwa) and *Oryzoborus angolensis* (Lesser seed finch or Picolet), are caught to compete in singing contests with cash prizes, and top birds are valued at up to several thousands of US dollars. Surinamese believed that only birds caught in the wild make for good singers. Similarly, though their export is forbidden, singing birds are regularly smuggled out of the country in personal baggage to the Netherlands. Today they are

threatened with local extinction in southern Suriname, particularly around the village of Kwamalasumutu. Other popular species for smuggling include various species of parrots (including scarlet macaws and blue and green macaws), parakeets, and rare frogs and other reptiles. Again, without data on the number of species trapped and sold, it is difficult to prove that wildlife trade is causing the observed diminishing numbers. Conservation International is implementing several projects to improve wildlife management and conservation in this area.

On the other hand, Suriname has a high, yet underdeveloped **nature tourism potential** (120 million US\$, 2003). Various local tour-operators are active in the sector, offering trips to Maroon and/or indigenous communities and the surrounding forests, though the focus on environment and environmental education varies. (Many so-called eco-tourism activities are not ecologically oriented.) However, the services and facilities that (higher-end) international tourists demand are lacking. For example, many tourist camps lack adequate sanitary facilities, balanced meals, a comfortable bed, and an English-speaking guide. Other challenges to sector growth include the relative isolation of Suriname and its interior, as well as high domestic and international travel prices.

Efforts to remedy these problems are ongoing. The European Union recently funded an Integrated Tourism Development Program (Euro 2.15 million), that has focused on hotel and restaurant training, legal and institutional development, and several localized projects. WWF also funds a variety of tourism enhancing projects, including new eco-lodges at the Brownsberg Nature Park and an ecotourism project, in the Wayana village of Apetina. The organization is planning to expand its ecotourism activities to include Brownsberg, Galibi, Boven-Coesewijne, Apetina, and possibly Kaburi. Conservation International Suriname supports the development of ecotourism in different areas as a venue for alternative income. It has developed an ecotourism project in Kwamalasumutu, and with STINASU in the Raleigh falls and its vicinity. The IDB recently approved a technical cooperation on Sustainable Tourism Development (ATN/ME-8977-SU), whose objective is to develop, promote and disseminate tourism products and sanitation conditions in the Raleighvallen area of the Central Suriname Nature Reserve (CSNR) with the aim of enhancing tourism capacity of the CSNR by 50% and making tourism more ecologically responsible. The project is currently being implemented by Conservation International Suriname. To date no studies have been conducted to assess the environmental and social impacts of ecotourism.

Generally Indigenous groups have been consulted, but communication and participation could be better. Community members often do not fully understand what the project entails, how it will affect their daily lives, and what their involvement might be. Partially as a result, Indigenous communities have been skeptical towards the establishment of parks and the arrival of tourists, and some even have halted park and ecotourism development (e.g. at Kaboerie Kreek, West Suriname). While acknowledging that tourism may generate income, they are concerned about restrictions on their traditional livelihood activities such as hunting. For example, plans for tourism development in the Coesewijne area (Bigi Poika village) include a prohibition on hunting while tourists are present. It is informative and unfortunate that no single community member from Bigi Poika was invited to the signing of an agreement about the Coesewijne Reserve area between the Nature Conservation Division, WWF, and STINASU

The presence of large- and small-scale **mining operations** to harvest the valuable gold and bauxite deposits poses potentially conflicting demands on the Interior's resources, since it currently tends to have negative impacts on land and water resources in the Interior. **Large-scale gold mining** is dominated by multinational companies and activities in this sub-sector are expected to increase. Cambior operates in the Gros Rosebel Area and is expected to expand its ongoing extraction activities, making use of large quantities of cyanide, and Suralco, jointly with Newmont, is conducting exploration activities in the Nassau area. It is likely that the exploitation of the latter gold mine will disturb the vulnerable ecosystem of the Nassau Mountains. Monitoring of Cambior's activities has only recently started under the control

of a State environmental committee, composed of ATM, NIMOS, and other governmental departments. In contrast, **small-scale gold mining** is a major economic activity for local communities. Small-scale mining and the surrounding service economy (transport, commerce) have become the main source of cash income for many Maroon households and induced the migration of thousands of Brazilian *garimpeiros* to Suriname since the 1980s.

However, both mining activities – and particularly small-scale mining activities¹³ - negatively impact the network of **freshwater bodies** that originate in the Interior. All of Suriname's major rivers (see Figure 7) are related to four basins in the interior: the Coppename (21,700 sq. km), the Courantyne (67,700 sq. km), the Suriname (16,500 sq. km) and the Marowijne (68,700 sq. km). Most of the rivers and creeks have clear waters, characterized by high oxygen content, few suspended particles, and a low natural productivity. In addition to providing freshwater, the rivers carry nutrients and act as a discharge for effluent waste. Little is known about groundwater availability in the interior, but in the hilly and mountainous landscape it is expected that the water accumulates into the underlying rocks, alluvial deposits, and in rivers. Drinking water is usually collected from rainwater in the rainy season and from rivers and creeks in the dry season.

Local people consistently name water pollution as the main mining-induced problem. **Sedimentation**, brought about when tailings of mining operations are discharged into rivers and creeks, affects the overall quality of the aquatic ecosystem. The limnology of rivers in the isolated Suriname interior is poorly researched, and it is difficult to predict the net effects of sedimentation on aquatic communities. Possible effects include the destruction of fish breeding grounds and habitat, the reduction of oxygen levels, and the inhibition of fish foraging strategies. A recent study in Suriname suggests that streams affected by small-scale gold mining activity have lower species diversity, a lower proportion of young fish, and a low relative biomass of food fishes (Mol and Ouboter 2004).

Mercury pollution is another cause for concern. Small-scale miners may release between 10,000 to 20,000 kg of mercury into Suriname's air and aquatic ecosystem annually. Mercury levels in fish and water nearby mining areas exceed mercury levels in control studies. This is disconcerting, since mercury contamination in fish has been known to damage the central nervous system of fish consumers, with pregnant women and infants being most at risk. Studies comparing mercury-exposed Maroons with non-exposed Maroons report elevated mercury levels in blood, hair, and urine samples of the exposed group, though few people exceeded the WHO safe standards or "normal" levels in industrialized countries. In Suriname, there have not yet been proven cases of miscarriages and birth defects due to chronic mercury pollution (De Kom et al. 1998, Heemskerk 2001, De Kom et al. 1997, Mol et al. 2001, Pollack et al. 1998). Nevertheless, women often travel long distances to find drinking water, especially during the dry season, when water-related diseases are rampant. In the village of Nieuw Koffiekamp, clean water had to be bought from Paramaribo during the 2004 dry season.

Small-scale gold mining also correlates to negative impacts on the soil, for instance, **soil and landscape degradation** by open craters, creation of swamps, and soil pollution with mercury near the processing sites. In addition, open pits with standing water constitute a fertile habitat for disease-carrying mosquitoes. The frequent movement of miners facilitates **malaria transmission**, and the haphazard intake of medications breed drug-resistant malaria strains. Failing public health care aggravates the situation. Due to inadequate Government funding, forest clinics are short of beds, personnel, equipment, and medications.

¹³ The social and environmental impacts of small-scale gold mining have been described in detail in other reports, including: Greenstone Belt Regional Environmental Assessment 2003; Heemskerk, Mol and Ouboter; De Kom; and WWF studies.

Addressing the problems posed by small-scale mining activities would benefit from the self-organization and formalization of small-scale mining operations. The Geology and Mining Division (*Geologisch Mijnbouwkundige Dienst GMD*) of Suriname has received a grant from WWF to achieve this goal but, after an initial orientation study, done nothing to achieve this goal. As the GMD is virtually absent from the interior and fails to regulate and control mining, environmental problems can be expected to worsen in the coming years.

It is worth noting, however, that large-scale mining activities can also have considerable negative environmental and social impacts. In particular, the Suralco-BHP Billiton joint venture is currently exploring for **bauxite deposits in West-Suriname**. The proposed plans include the building of a hydropower plant to provide the necessary energy. A study is currently made to assess the environmental and social impacts in the area, thereby incorporating the lessons learned from an earlier experience with the construction of a man-made lake for energy generation. Also, the IDB recently approved a technical cooperation (ATN/CT-8811-SU; US\$132,000) with the objective of gathering information regarding the potential impacts of the proposed Alcoa/BHP Billiton project on indigenous communities in the area of influence, to provide information about the proposed project to these communities, and to build capacity among the indigenous communities in this area so that they can engage in dialogues with other stakeholders regarding their needs, concerns and interests. Indigenous organizations have expressed concern about the impacts of the expansion of bauxite mining and the proposed hydropower plant on the livelihoods of local Indigenous peoples.

D. PARAMARIBO URBAN AREA

Key Issues

- Ineffectively coordinated land use planning leading to sprawl and temporary flooding.
- Air pollution from vehicles and small industry
- Inadequate systems for managing waste water, stormwater and solid waste

The greater urban area of Paramaribo, which besides the district of Paramaribo covers parts of Wanica and Commewijne, houses approximately 65% of Suriname's population. With 1,338 people per square kilometer, the district of Paramaribo also has the highest population density of Suriname. The population is ethnically diverse, yet there are ethnic preferences for specific professions. (For example, Creoles have traditionally dominated political and public service positions, Hindustani are mainly active in business, Javanese tend to work in the service economy and catering industry, and many urban Maroons are active in the informal sector.) The capital city of Paramaribo lies in the Young Coastal Plain and is situated on the country's richest soils, within and near vulnerable and important ecosystems. As discussed in more detail in Section 3.B, conversion of land to agricultural and residential areas has led to the destruction of natural habitats. Other activities impacting the biological environment include poorly coordinated urban planning, transportation, inadequate wastewater and solid waste management, and industrial pollution.

Land-use planning for Paramaribo is generally ineffectively coordinated with responsible Ministries. There exists no urban development plan for greater Paramaribo and this is reflected in its chaotic spatial development. Construction activities are expanding and converting green zones in Paramaribo into concrete areas. Excess water and temporarily flooding occur due to decreasing capacity of the soil to store water. The government leasing of land in Northern Paramaribo, near the shoreline, exposes future residents to risk of flooding. However, efforts are underway to conduct a city plan for Paramaribo with the Ministry of Regional Development. A plan for rehabilitating Paramaribo's largest green zone in the historic city (UNESCO world heritage site), the Palmentuin, will be implemented soon.

With respect to **transportation**, international air traffic and domestic flights do not pose a serious threat to public health or the environment. However, the growing number of motorized vehicles, a consumer preference for high gasoline-use cars (SUVs and All-Terrain Vehicles), and the increasing number of traffic jams form an increasingly damaging non-point source of air pollution and health hazard to the urban population. There are no restrictions on the age or exhaust production of private cars, buses, and trucks. Civic attitudes that increase exhaust pollution include the habit of leaving the car run stationary when shopping or visiting friends. A recent law prohibits the import of cars older than eight years. This will partly reduce the problem, as newer cars are more likely to have cleaner engines. Moreover, during the last five years the government is rehabilitating roads with Surinamese and Chinese companies. However, efforts to do so were not subject to prior environmental assessments; and rehabilitation has led in several places to excessive erosion, drainage problems, dangerous height differences between roads and sidewalks, and roads without sidewalks. Timely planning of utilities (water, electricity, telephone) does generally not correspond with road development activities.

In addition to the pollution created by fuel-inefficient vehicles and poor driving habits, the approximately 5,000 small industries, dispersed throughout Paramaribo, are potential polluters. A study sponsored by IDB reported that noise pollution and air pollution (volatile gases, smoke, and dust) are commonly occurring (Pollution Inventory and Management of Pollution Sources in Suriname, 2003). Heavy metal pollution is evident in effluent streams near industries; for instance, gold processing activities in North-Paramaribo have contributed to the killing of fish. Due to limited regulation and monitoring, it is expected that pollution in Paramaribo will increase.

Paramaribo has grown beyond its capacity and the **drainage & sewage systems** need rehabilitation and expansion. For this, the “Master water drainage plan” will soon be implemented by the Water Supply Company (SWM); networks, designed after World War II will be rehabilitated with the support of Dutch funding for 5 years. Drinking water for Paramaribo is extracted from two aquifers: the Coesewijne formation aquifer (Zanderij) and the Burnside formation aquifer (Greater Paramaribo). Two years ago, bauxite mining in the Old Coastal Plain endangered this water supply, causing lowered water levels that resulted in an increased level of turbidity, manganese, and iron ions, and the formation of sludge at discharge points for drinking water.

Solid waste is not properly managed and illegal dumping along roads and burning in residential areas is common practice. Solid waste is collected in open dumpsites, enabling gases and particulate matter to reach surrounding residents by the wind. Efforts to improve the situation are ongoing with studies conducted under supervision of the Ministry of Public Works. Suriname does not have a national garbage-recycling plan, but there are a few private initiatives in this field. The bottling company Fernandes Bottling Co collects and grinds plastic PET bottles to sell abroad. Several schools have adopted plastic-saving campaigns to earn additional funding for school activities. Glass bottles (beer, soft drinks) are recycled for economic reasons by raising refunds when returned by customers. A small plastics’ recycling plant in Paramaribo collects empty crates, which it recycles to fabricate plastic items such as PVC-tubes and shower drainage tubes.

4. GOVERNMENT OF SURINAME DEVELOPMENT PRIORITIES

The analysis in this chapter is based on the Country's Five-year Plan, the Annual Plan 2005, and interviews with representatives of the Ministry of Planning and other responsible sector Ministries. The intent is to establish government development priorities for the short and medium term (to the extent that they are transparent), focusing on the scale and the extent of such planned activities in order to prepare an appropriate assessment of their potential environmental impacts.

A. THE 2001-2005 MULTIPLE YEAR DEVELOPMENT PLAN

The previous administration of the Government of Suriname stated its long-term vision in the Multi-year Development Plan (*Meerjaren Ontwikkelings Plan – MOP*) 2001-2005. The plan presents a national strategy for sustainable development and poverty reduction. It focuses on creating an environment for the redefinition of the role of government with less involvement in the private sector, where government retreats from the primary production sectors and undergoes an institutional and human reform process to ensure good governance and macro-economic stability. Development of the private sector would be facilitated, and their role in the development process strengthened. Foreign investment and technology would be attracted to develop a resource-based industry, thereby facilitating import-substitution, increasing export revenues, creating employment, and protecting the environment.

The MOP is outlined in detailed plans associated with budgets, which are to be approved by the National Assembly every year. The annual plan for 2005, for instance, was approved by the National Assembly in October 2004. The list of major projects with potential environmental impacts contained in the 2005 annual plan is presented in Figure 8. (The projects written in italics are newly developed projects, subjected to an EIA.) The annual plan is usually a collection of priorities from the various Ministries brought together, and therefore reflects a strict sectoral development view. This sectoral emphasis is apparent in the 'Responsible Organization' column of Table 8. Moreover, as elections approach, the focus is set on more visual development projects, such as roads, water supply, electricity etc. Hence, the 2005 plan is attuned to the prospects of the 2005 governmental general elections.

Being much less focused on new establishments, most development projects included in the 2005 Plan are related to rehabilitation and reconstruction. And even though the Government is making a conscious effort to attract foreign investment, few companies have taken up the invitation. The exceptions are mining projects, where the local mining companies are key collaborators for joint ventures with multinationals. This explains the large investment in mineral exploration throughout Suriname.

Environmental management aspects within the development plan are at a preliminary stage. The projects listed in Figure 8 have the potential for serious negative environmental consequences, and the MOP outlines various environmental focus areas (Figure 9). However, most government departments have neither specialized administrative units nor personnel to take care of social and environmental activities related to project implementation, there is poor coordination of sectoral departments with ATM and NIMOS, and corresponding policies, regulations and tools, as well as baseline data, still need to be developed for many issues (see also discussion in Chapter 2.) The Government of Suriname has used the existing tools to incorporate environmental assessments and management procedures into development projects, and despite the lack of legislation to support these procedures, they are often adopted on a voluntary basis by private enterprises. However, to integrate these complex environmental issues into the planning procedures of the various government sectors would require sound coordination and close collaboration, as well as an improved information flow between ATM and the other ministries.

Figure 8 2005 - Ongoing and proposed projects with potential environmental impacts

Zone	Development project	Organization	Category
Marine and coastal zone	<i>Exploration off-shore oil</i>	<i>Staatsolie, Repsol, Maersk</i>	<i>Mining</i>
	<i>Introduction of a Vessel Monitoring System and national coast guard</i>	<i>Ministry of Agriculture, Cattle Ranching, and Fisheries; Ministry of Defense; and Ministry of Police and Justice.</i>	<i>Fisheries</i>
Coastal plains	Expansion alumina processing near Paranam	Suralco/BHP Billiton	Mining
	Expansion bauxite mining near Paranam	Suralco/BHP Billiton	Mining
	Expansion oil exploration in Saramacca area	Staatsolie	Mining
	<i>Construction 161KV electric transmission cable between Paranam and Paramaribo</i>	<i>EBS</i>	<i>Energy</i>
	Rehabilitation roads in Nickerie, Para, Saramacca, Wanica, Coronie, Commewijne, and Marowijne	Ministry of Public Works	Infrastructure
	Rehabilitation roads Southdrain and bridges Oost-West verbinding	Ministry of Public Works	Infrastructure
	<i>Construction 15MW power house in Saramacca</i>	<i>EBS and Staatsolie</i>	<i>Energy</i>
	<i>Construction 33KV electric transmission cable in Nickerie</i>	<i>EBS</i>	<i>Energy</i>
	Rehabilitation bridges in Saramacca, Para, Wanica, and Commewijne	Ministry of Public Works	Infrastructure
	Rehabilitation of old watersheds and creation new watersheds; Improvement watershed management with enhanced farmer participation.	Ministry of Regional Development	Infrastructure
	Rehabilitation sluices Saramacca, Coronie, Nickerie, and Marowijne	Ministry of Public Works	Infrastructure
	Rehabilitation airport Zanderij	Ministry of Public works	Infrastructure
	<i>Construction coastal protection dyke in Coronie and Commewijne</i>	<i>Ministry of Public works</i>	<i>Infrastructure</i>
	Rehabilitation 2300 ha banana plantation	Stichting Behoud Bananensector; Ministry of Agriculture, Cattle Ranching, and Fisheries	Agriculture
	Support for banana production and marketing for domestic and international markets, e.g. production alternative and exotic species	Ministry of Agriculture, Cattle Ranching, and Fisheries	Agriculture
	<i>Development of a 1500 ha aquaculture project in Nickerie</i>	<i>NV. Monodon</i>	<i>Agriculture</i>
	<i>Pesticides management plan</i>	<i>Ministry of Agriculture, Cattle Ranching, and Fisheries</i>	<i>Agriculture</i>
	<i>Innovation agricultural production techniques, e.g. organic farming, seed development, and improvement</i>	<i>Ministry of Agriculture, Cattle Ranching, and Fisheries</i>	<i>Agriculture</i>
	<i>Formulation of long-term planning for rice farming with stakeholder consultation</i>	<i>Ministry of Agriculture, Cattle Ranching, and Fisheries</i>	<i>Agriculture</i>
	<i>Research and preparation for large-scale oil palm plantation with foreign investors</i>	<i>Ministry of Agriculture, Cattle Ranching, and Fisheries</i>	<i>Agriculture</i>
<i>Modernization of vegetable and fruit production</i>	<i>Ministry of Agriculture, Cattle Ranching, and Fisheries</i>	<i>Agriculture</i>	
<i>Support and professionalizing of local cattle and small-cattle (e.g. sheep) farming</i>	<i>Ministry of Agriculture, Cattle Ranching, and Fisheries</i>	<i>Cattle ranching</i>	

Zone	Development project	Organization	Category
Paramaribo	Rehabilitation bridges and sluices	Ministry of Public Works	Infrastructure
	<i>Low income shelter housing project</i>	<i>Ministry of Social Affairs</i>	<i>Housing</i>
	<i>Housing project China</i>	<i>Ministry of Social Affairs</i>	<i>Housing</i>
	Rehabilitation 275 km road	Ministry of Public Works	Infrastructure
	Rehabilitation harbor	Ministry of Transport	Infrastructure
	<i>Development of an urban development plan</i>	<i>Ministry of Regional Development</i>	<i>Infrastructure</i>
	<i>Rehabilitation of infrastructure of national Army, including buildings, roads, ammunition depots, and exercise areas</i>	<i>Ministry of Defense</i>	<i>Infrastructure</i>
Interior	<i>Hydro power generator in West Suriname</i>	<i>Suralco/BHP Billiton</i>	<i>Mining</i>
	<i>Alumina smelter in West Suriname</i>	<i>Suralco/BHP Billiton</i>	<i>Mining</i>
	<i>Exploration mining Rosebel Gold Mines</i>	<i>Cambior</i>	<i>Mining</i>
	<i>Exploration mining East Suriname Nassau area</i>	<i>Suralco/Newmont</i>	<i>Mining</i>
	<i>Construction of electrical power supply in Asidohopo, Botopasi, Pokigron, Stoelmanseiland, and Drietabbetje</i>	<i>EBS</i>	<i>Energy</i>
	<i>Oil palm cultivation and wood logging</i>	<i>China Zhong Heng Thai/ GOS</i>	<i>Agriculture</i>
	<i>Construction of bridges and roads in Brokopondo</i>	<i>Ministry of Public Works</i>	<i>Infrastructure</i>
	<i>Community development projects: Construction of drink water supply, electricity supply, schools etc.</i>	<i>Community Development Fund Suriname; Fund Development Interior</i>	<i>Infrastructure/energy</i>
	Restructuring land management with automated Global Land Information System (GLIS)	Ministry of Natural Resources	Administrative
Installation of a Forest and Nature Management Authority	Ministry of Natural Resources	Administrative	
Nationwide	Collection and publication of environmental statistics	Ministry of Panning; Ministry of Labor, Technology, and Environment	Administrative
	Control of business and industry, among others with GIS system and newly developed standards for air, water, and soil quality	Ministry of Trade and Industry; Ministry of Labor, Technology, and Environment	Administrative
	Environmental awareness	Ministry of Labor, Technology, and Environment; Dutch embassy; NIMOS	
	Implementation international environmental treaties; among other: National Bio-safety Framework project, Climate Assistance Program, Compliance Assistance Program (Montreal Protocol)	Ministry of Labor, Technology, and Environment; UNEP; Dutch government; NIMOS	Administrative
	Ratification international environmental treaties	Ministry of Labor, Technology, and Environment	Administrative
	Revision environmental law	Ministry of Labor, Technology, and Environment	Administrative
	Sustainable waste management	Ministry of Labor, Technology, and Environment	Infrastructure

In *italic*: newly developed projects, subjected to EIA

Moreover, land use planning has not been taken into consideration in the citing of new development project, even though some conflicts have already been observed. For instance, certain areas in Paramaribo and other zones designated for agriculture have been used for housing. One of the reasons for this kind of confliction situation is the lack of a functioning land use and management plan (As a potential first step to improving the current situation, the Council of Ministers approved the Land Policy Directives on March 17, 2005. These policy directives aim to address land management challenges in four key areas, namely Land Use Policy & Planning, Land Titling Regimes, Allocation & Valuation of State Land and Land Markets & Tenure Security for Inhabitants of the Interior Region.).

Figure 9 Environmental priority areas for the Government of Suriname (MOP 2001-2005)

Focus area	Ongoing activities
Formulate national regulations, set standards and guidelines to comply with international regulations	Preparation of Biosafety protocol, Kyoto protocol, promoting ISO14000, formulating environmental framework law
Use of sustainable agricultural practices and reduction of pesticides	Awareness raising and training
Formulate national regulations on climate change	Formulate policy, capacity assessment
Strengthening waste management systems	Awareness raising, development urban-sector policy plan
Sustainable development of natural resources and energy	Study mercury pollution in small-scale gold mining, EIA reviews of large-scale mining companies, development of non-urban sector policy plan, sustainable development management project
Sustainable water management; Watershed development.	Revision of the Law Regional Organs (Wet Regionale Organen) and the Watershed Law (waterschapswet) of 1931 has been presented to National Assemble for approval
Coastal resources management	Installation of a national coast guard has been prepared
Strengthening public participation systems for local communities	None
Decentralization and Local Government Program (DLGP)	Establishment of Higher Education for the Governance Sector (6 month training), which will deliver its first graduates (Higher officials in local government) in spring 2005
Sustainable urban development, in line with the DLGP	Baseline study for Paramaribo completed. Urban development plan will be developed with support from IDB (US\$ 250,000)
Land rights for Tribal and Indigenous peoples	Nothing; RO plans for 2005 to focus on consensus development with regard to this issue with support from UNDP
Poverty alleviation in the interior	Various community development projects through the Community Development Fund Suriname (CDFs), the Fund Development Suriname (FOB), and the project "Primary Health Care Centers in the Hinterland of Suriname"
Improved access to information and communication in the interior	Extension of the radio network, among others state radio Radio Boskopu will have a wider reach to include more interior regions. Development community radio stations in interior with aid of UNESCO
Good governance; improved data availability	Reactivation of Central Bureau of Statistics
Sustainable development agricultural sector	Completion of Agrarian Sector Plan; Formulation of long-term rice farming policy is in progress; Support for rehabilitation of banana industry (with EU); MOU signed with Chinese investors in oil palm industry; Law development (Seeds law; Pesticides law)- yet to be approved by parliament; Research and training in fruits and plants sector (with Dutch collaborators); Stimulate and professionalize bee-keepers
Sustainable development fisheries sector	Support expansion of catch (more species); Introduction of standards to agree with European quality and hygiene standards and US environmental standards; Modernize fisheries laws
Development of aquaculture	Support for local and foreign investors

B. DEVELOPMENT IN THE MARINE AND COASTAL ZONE

In the Marine and Coastal Zone, the government focuses primarily on two sectors: fisheries and off-shore oil exploration. The priority for the **fisheries** sector is to increase production while preserving the shrimp and fish populations. No concrete plans have been presented to stimulate production, although the fisheries department is establishing a modern laboratory for processing and research with the help of the Japan development fund (estimated cost of S\$ 6 million). In addition, the Ministry of Agriculture, Cattle Ranching and Fisheries (LVV) will introduce a modern vigilance system, the Vessel Monitoring System, in order to reduce unlicensed and irresponsible fishing. This system is to combine the forces of the Department of Fisheries with those of the Ministry of Defense, the Ministry of Justice, and Police, with a satellite system (estimated cost of US\$500,000). The plan also calls for the installation of a national coast guard and a consultation board with members from both the ministry and the marine industry.

In the oil sector, the Government supports the **off-shore exploration** activities of the state owned oil company NV Staatsolie Maatschappij Suriname, and encourages the activities of two foreign companies; Repsol and Maersk. As of the date of this report, no social or environmental impact assessments have been performed for any of the exploration locations.

C. DEVELOPMENT IN THE COASTAL PLAINS

Government policy for the Northern Plains prioritizes the development of **mining** (bauxite and oil), agriculture (rice, bananas, palm oil), and infrastructure. Priorities for the mining sector include the expansion of alumina processing at Paranam to 250,000 t/yr, the equivalent of US\$ 50 million at current prices (US\$200 per ton of alumina). The total cost of this project, with an expected completion during 2005, is estimated at US\$ 67 million. There are also plans for the expansion of bauxite mining; a projected US\$ 125 million will be invested in new mines near Paranam between 2005 and 2007. With respect to the oil sector, Staatsolie Maatschappij Suriname (State Oil) is exploring on-shore oil deposits (Saramacca district) to improve future oil production, and will drill 100 new production sources in the Tamaredjo field.

Plans for key **agricultural** sectors include financial and/or logistic support, the rehabilitation of a banana production plant by the local cooperative SBBS, the creation of an oil palm plantation by a Chinese investor; local cattle ranching; higher quality and quantity of fruit and vegetable production, and training to stimulate bee farming. Moreover, the Ministry of Agriculture placed emphasis on the development of a Pesticide Management Plan, which serves to ensure proper transboundary movement in accordance with the Rotterdam Convention and regulates issues as labeling, packaging, handling and transport. And while restructuring of the rice sector is frequently said to lead the priority list for the agricultural sector, few concrete plans are presented to achieve this goal.

In terms of **infrastructure** development, the Government is planning to continue the rehabilitation of roads, with the intent to have 248.6 km completed by the end of 2005. The rehabilitation of the 32 km road leading to the Nickerie-Guyana ferry and of three bridges on the East-West connection, among other improvements, should enhance transport to the East and West of Suriname and the neighboring countries. (These improvements are part of the IIRSA initiative.) The 2005 policy plan does not mention intentions to construct new roads, but there are plans for the construction of 29 new concrete bridges in the districts. In order to improve drainage and water management, the construction of 9 pumping stations will be completed in 2005 and preparation for the building of 9 additional ones will begin. Several projects are planned for coastal protection, including water defense works along the Suriname River (in the Commewijne district) and a sea wall in Coronie.

D. DEVELOPMENT IN THE INTERIOR

Development of the **large-scale mining** industry is high on the priority list for the interior. Foreseen activities in the gold sector include increased gold production by the Canadian mining company Cambior (Rosebel) and gold exploration by Suralco in East-Suriname (Nassau mountains). In the bauxite industry, Suralco plans completion of a feasibility study for bauxite mining, and the development of an associated hydropower plant and aluminum smelter in West Suriname.

A **new mining law** is waiting approval by parliament. This law should end the existing paucity of clear environmental and social regulations and standards. At present, large-scale mining companies usually voluntarily submit ESIA's for their activities to ATM/NIMOS. Yet because there is no legal standard or obligation, the quality of these assessments varies. The executive summary of the ESIA of the activities by the mining company Cambior, for example, lists no single negative socio-economic impact as a result of the company's mining activities. In the same report, however, community members express their concern about the loss of work for small-scale miners. Also, the ESIA in question does not include a plan to reduce the socio-economic stresses that may be expected after mine-closure. SURALCO has not yet conducted an EIA in the Nassau area where it is exploring gold reserves. Small-scale miners were forcefully removed from this area in 2003.

The 2005 policy plan does not mention formalization or legalization of the **small-scale gold mining** sector. In fact, small-scale mining is not at all mentioned. However, the Geology and Mining Service, with support from the World Wildlife Fund, has started working on the issue in 2004.

For the **timber** industry, the Council of Ministers a National Forest Policy that was funded by the IDB and developed with extensive stakeholder participation. The Government aims to improve forest management through the implementation of the National Forest policy and the installation of a Forest and Nature Management Authority. However, implementation plan foresees an increase of national wood production from 150,000 to 500,000 m³/yr. The plan does not say how potential environmental and social impacts resulting from increased timber production will be mitigated.

Several small-scale **community development projects** are planned in the interior by CDFS and FOB, including the construction of five new electricity generating centers. Probably few, if any of these projects, will focus on waste management.

E. DEVELOPMENT IN THE PARAMARIBO URBAN AREA

Urban planning for 2005 will focus on **infrastructure** development and **housing** availability. The rehabilitation of roads in Paramaribo is projected to continue, with the aim to have 366 km of road restored by the end of 2005. In addition, traffic safety is to be improved with the construction of two roundabouts, speed bumps, and the renovation of crossroads. One concrete bridge will be constructed. The construction of a dike around Paramaribo will be initiated.

The low-income housing shelter project will be continued, and a new housing project will start with technical and economic support from the People's Republic of China. A new waste products law, which would provide for the privatization of garbage collection and processing, is awaiting approval by Parliament. And in the first phase of a project aimed at improving drainage of Central Paramaribo, four pumping stations will be build in residential neighborhoods. In addition, two sluices will be rehabilitated as well as the drainage canals in four main streets.

5. DONOR-FUNDED DEVELOPMENT ACTIVITIES

A considerable number of project and programs in Suriname are currently underway or planned by international donors and NGOs. The various donor-funded development activities are presented and analyzed in this chapter. Major aid agencies and donors are IDB, the Dutch government, European Union, UNDP, WWF, the Islamic Development Bank, the Chinese government, OAS and EDF. The table below summarizes the thematic focus of each of these major donors. For 2005, contributions from international aid agencies for already approved programs and projects total about US\$ 70.2 million, focusing on urban infrastructure, energy, agriculture, governance, health care, poverty alleviation, natural resource management, and environmental management. These programs and their scope are listed in Figure 10 and described in more detail in the following sections.

<u>THEMATIC FOCUS</u>	<u>KEY DEVELOPMENT PARTNERS OF SURINAME</u>
Agriculture	EU(a), Netherlands (b), (c), and (d)
Commerce	EDF
Education	OAS, Netherlands (b), (c), and (d)
Energy/Power	IDB
Environment	IDB, UNDP, Netherlands (c), and (d)
Fisheries	Japan
Forestry	--
Governance	Netherlands (c), and (d), USA
HIV/AIDS	UNDP
Housing	Netherlands (b), (c), and (d)
Indigenous People	IDB
Judiciary	--
Land Management	IDB, Netherlands (b)
Military	China, USA
Poverty Alleviation	UNDP
Public Health	Netherlands (b), (c), and (d)
Public Sector Reform	IDB, UNDP
(Eco-) Tourism	IDB
Transportation	China, EDF
Water & Sanitation	IDB

- (a) EU Caribbean Regional Indicative Program, with focus on the rice sector and the banana sector
 (b) Dutch *Startfonds* program funded by the Suriname/ NL Treaty. Fund operational for 2.5 years and closing 31 May 2005.
 (c) Dutch *Sectorfondsen* program funded by the remainder of the Suriname/ NL Treaty, Gift Funds (*Schenkingsmiddelen*) of total 131 million Euro (US\$ 163 million)
 (d) Dutch *Sectorfondsen* program to be funded by the remainder of the Suriname/NL Treaty, Shared Funds (*Pariteitsmiddelen*) of total 145 million Euro (US \$181 million)

Figure 10 Main Technical and Financial Cooperation Programs

Agency	Program	Scope
IDB	Decentralization and Local Government Strengthening Program (Investment Loan SU0019)	Local government capacity building; small public works projects
	Strengthening of Public Sector Management Program (Investment Loan SU0027)	Reform of the public sector
	Community Development Fund of Suriname (Investment Loan SU0020)	Improving life conditions of local communities; small-scale projects
	Low Income Shelter Program (Investment Loan SU0017)	Improvement of housing policies and shelter conditions
	Support for the Implementation of Health Sector Reform (Investment Loan SU0028)	Institutional reform of health sector; improvement of water supply and sanitation conditions
	Sustainable Tourism Development (TC0209005)	Development and promotion of tourism products and services in Raleigh Falls
	Indigenous people and Mining in Suriname (TC SUT1005)	Fostering of effective community engagement in western Suriname
	Integrated coastal zone management (TC SUT1009)	Study on coastal zone environmental management methodology
	Diagnosis of the Power Sector (TC)	Alternatives for an electric power generation strategy
Urban Planning Paramaribo (TC0306019)	Preliminary study regarding the elaboration of the urban development plan	
Dutch Government	Land registration and information systems (GLIS) project	Actualizing and atomizing the land cadastre of Suriname
	Non-urban Environmental Sector Plan (NUES)	Management plan for non-urban environment (natural resources)
	Urban Environmental Sector Plan (UES)	Management plan for urban environment (waste, water, roads)
	Agricultural Sector Plan	Plan for agricultural sector development
	Health Sector Plan	Plan for the development of the Health sector
	Education Sector Plan	Plan for the development of the Education sector
	Fund for Development of the Interior	Facilitation of small community project to eradicate poverty in the interior
	Fund for technical assistance to the private sector	Stimulate private investment through technology transfer
	Fund for Non Governmental Organizations (NGOs)	Financing of small-scale activities in NGOs
	Water supply project Paramaribo	Rehabilitation of water supply network
Institutional strengthening (Ministry of Finance)	Technical assistance to the Ministry of Finance	

Agency	Program	Scope
European Union	Rehabilitation of the port of Paramaribo	Modernization of port facilities
	Transport Sector Plan	Definition of a comprehensive national transport sector policy and strategy
	Road to the Guyana Ferry	Rehabilitation of road
	Regional Rice Program	Study on, and plan for the improvement of rice exports
	Support to the Banana Sector	Improvement of banana industry competitiveness; irrigation works
	Business Forum	Platform for public-private partnership
	Micro Projects Program: Support to Ecotourism Development	Capacity building of Tourism Authority; training and environmental awareness activities
UNDP (Country Framework Program)	Strategic Plan for Public Sector Reform in Suriname	Preparation of a Strategic Plan for Public Sector Reform
	Strengthening of Democracy and Policy Development by Political Parties	Capacity building of political parties; formulation of development policy targeting human and income poverty
	Support to General Elections 2005 in Suriname	Financial and technical assistance for early preparatory activities
	Upgrading and poverty targeting for Suriname's Labour Training institutions consistent with globalization	Upgrading of labor force skills, creativity and flexibility for industrial restructuring to meet the competitive challenges of globalization
	Promotion of small and medium scale industries rooted in local talent and resources	Creation of opportunities to increase access to markets for small and medium sized entrepreneurs using local talents, capital and resources
	National Biodiversity Strategy (Suriname Conservation Foundation program – SCF)	Sustainable forest management; management of protected areas
WWF (Guianas Sustainable Forest Resource Management Projects)	Sustainable Forestry Management: Statistical Analysis of Forest Research Data; Sustainable Forest Management towards Certification; Short term capacity building for developing and implementing good forest practices in the forestry sector; Development of National Forest Certification Standard-Phase-II	Development and implementation of environmentally sound management of the forestry sector
	Gold mining Pollution Abatement	Improved of small and medium scale gold mining management
	Protected Areas Effective Management: Creation of the North Western Suriname Reserves; Improvement of database services at the National Zoological Collection (NZCS) and National Herbarium (BBS) of Suriname	Facilitation of fragile ecosystems sustainable protection
	Regional Integration, Collaboration and Networking	Establishment of systems for regional integration and exchange of information

A. IDB PROGRAMS RELEVANT TO THE ENVIRONMENT

The objective of the Bank's **Country Strategy** for Suriname, articulated in the Country Paper of March 2000 (GN-2080-1), is to support policy and institutional reforms in order to improve institutional and incentive frameworks. The 2000 strategy proposed five areas of strategic focus: (i) private sector development; (ii) improved governance and modernization of the state; (iii) human resource development and social inclusion; (iv) environmentally sustainable development; and (v) improved macroeconomic management. During the 2002 programming exercise, the Bank's strategic focus was narrowed to three areas: (i) private sector development and export-led growth; (ii) social sectors; and (iii) public sector reform.

With respect to **public sector reform**, a TC to prepare a public sector reform road map (ATN/SF-8664) was approved in 2004. This is an attempt to prepare a tailor-made action plan, by participation and consensus building among key stakeholders, to address the most important bottlenecks in the public sector. The road map, and its implementation, will have strong repercussions in several areas discussed in the document.

Also, the **Decentralization and Local Government Strengthening Program** is supported by a loan of US\$ 4.9 million. Its implementation has prepared five district administrations for fiscal self-management and established budget management systems for four of them. Training programs to enhance the capabilities of local officers have focused on public administration of the maintenance of local infrastructure systems, such as roads, drainage networks, and domestic waste management. Training on environmental management has also been provided. The elaboration of urban development plans and the financing of a number of small infrastructure projects are also programmed to prepare district administrations for future development initiatives. In spite of some delays, the program is considered to be fairly successful by its Managing Director.

From a social sector perspective, **property rights** in Suriname are an important focus, as they are currently not well defined, and in particular poor urban dwellers do not have proof of ownership over the land they occupy. This is a problem for the implementation of the Low Income Shelters Program, (1342/OC), where a large number of low income families that apply to the program do not qualify because they do not have proof of land ownership. An important step in improving this situation is the approval of the Land Policy Directives, which were one of the outputs in August 2003 of the Land TC (ATN/SF-7878-SU). The Council of Ministers approved the Land Policy Directives on March 17, 2005. These policy directives aim to address land management challenges in several key areas, and their implementation is likely to center on four components: (i) legislative drafting; (ii) a business plan for the Suriname Land Management Agency; (iii) studies on land tenure security for the interior; and (iv) a mechanism to promote land divestment. The Bank is preparing a Land Management Loan that will contribute to the government's efforts of improving land management in Suriname.

The main technical cooperation program on **environment**, implemented under the IDB country strategy from 1999 to 2003, was the Environmental Management Technical Cooperation for NIMOS institutional building (see Section 2.A.3 of this report). In addition, the program funded the study "Pollution inventory and management of pollution sources in Suriname" (2003). On-going technical cooperation activities comprise a number of small projects and reports on urban planning and power generation alternatives.

In terms of integrated environmental management, the Bank is carrying out a study on the methodological bases for coastal zone management, executed in response to a request of the Ministry of Natural Resources. Moreover, an Integrated Coastal Zone Management TC has been programmed. The objective

of this TC is to build upon the Government's efforts in planning for the coastal zone by examining the issues for integrated coastal zone management, including an identification of legal and institutional limitations for undertaking ICZM, the formulation of terms of reference to prepare an ICZM Master Plan, and the formulation of selected pilot projects that will assist the government in gaining experience in ICZM. This TC will also support the Bank's Country Strategy on the environment in that three of the four elements identified for support by the Bank, namely strengthening institutional capacity for environmental management, supporting protected areas, and improving land-use management and planning, will be applied here.

The Bank, in collaboration of the OAS, is also exploring the potential for an eco-tourism project to assist indigenous peoples as well as ecosystem management in the Interior. With the IDB as the GEF executing agency, the OAS is currently preparing the PDF-A for the project, "Sustainable Development and Bio-cultural Conservation in the Surinamese Trio Border Region", which would be working with the Trio indigenous communities in the border region of Brazil and Suriname with the goal to contribute to the conservation of their culture and the sustainable development of the natural resources within their territories, including conservation of biodiversity and headwaters. Specifically, the project seeks to strengthen the communities' internal, organizational and decision-making structures ("Shaman institution"), and promote capacity-building to develop management plans for the sustainable use of resources. Financial support will be requested for a medium-sized project (approximately US\$1 million).

In addition to this specific initiative, the Bank is also in the process of developing a framework for guiding its operations with respect to indigenous peoples issues. This framework current centers on two documents: *the Strategic Framework for Indigenous Development* and the draft of *the Operational Policy for Indigenous People*. Chapter 8 provides detail on this initiative.

B. DUTCH DEVELOPMENT SUPPORT RELEVANT TO THE ENVIRONMENT

Dutch development support in Suriname is very substantial and primarily from funds designated in the Independence Treaty Fund, established during Suriname's independence from the Netherlands in 1975. The Treaty Fund originally amounted to 1.6 billion Euros and was designed to provide funding for development projects through grants, guarantees, and matching grants. As of November 2004, the balances of the Treaty Fund were 120 million Euros in grants, and 140 million Euros in matching grants, with all guarantees fully utilized.

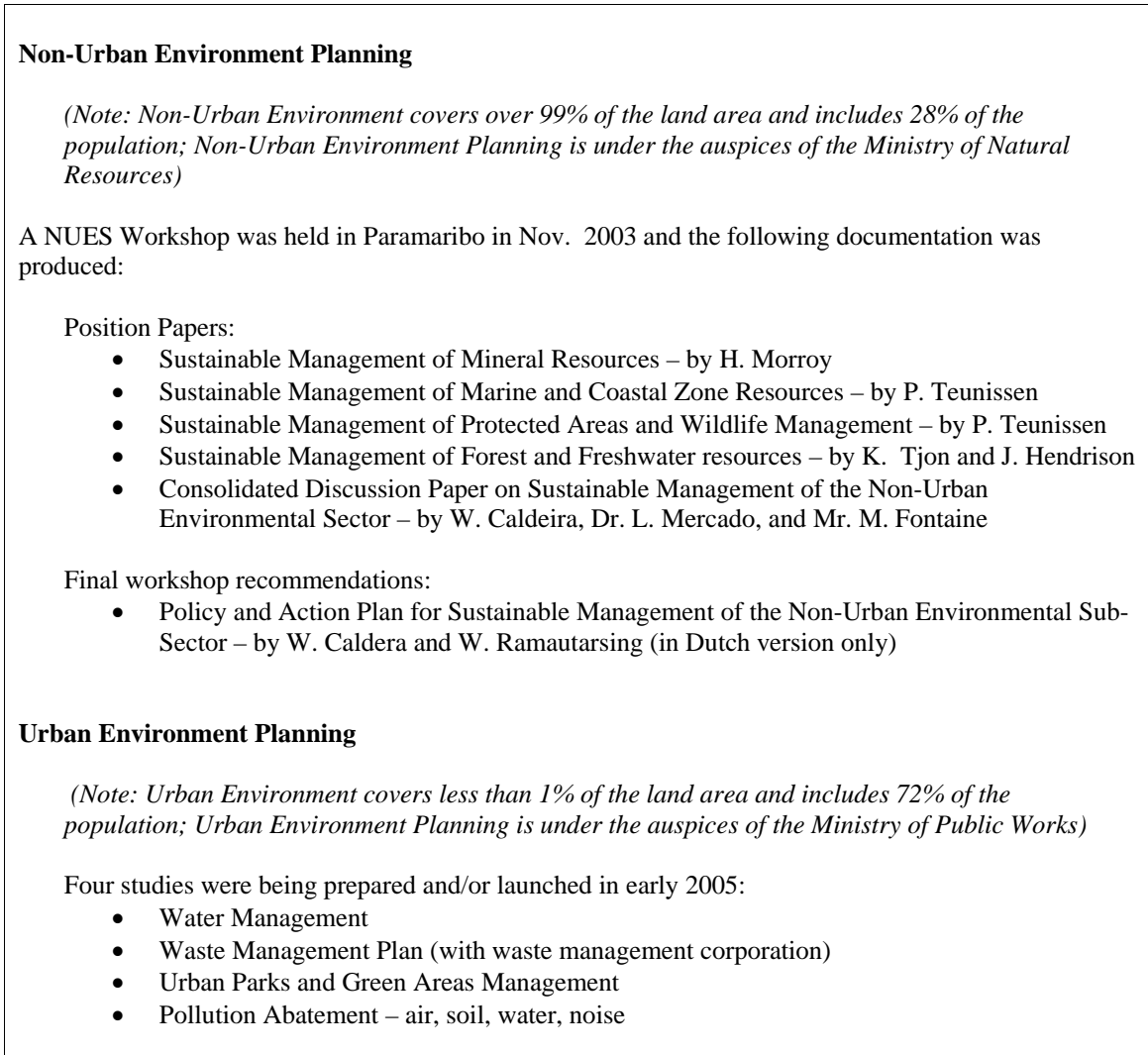
Grant funding, the largest original portion of the Treaty Fund, averaged 7% of GDP between 1975 and 2000. Since then, grant funding has decreased and now averages less than 2% of GDP per year. Moreover, as of 31 May 2005, all development projects have been administered in the *Sectorfondsen* program. The program is funded from the remainder of the Treaty's Grant Funds (*Schenkingsmiddelen*) of 1,225 million Euro (US\$ 1,837.5 million) and the Treaty's Shared Funds (*Pariteitsmiddelen*) of 136 million Euro (US\$ 170 million). Development efforts will focus on the following six sectors: Agriculture, Education, Environment, Governance, Housing, and Public Health. It is expected that the allocation of funds to the six sectors will be completed in 2005.

With regard to the five non-environment sectors funded under the *Sectorfondsen* program, the present analysis, based on quick sector scans, finds no indication that the proposed development activities will require environmental or social assessments.

With regard to the environment sector projects that are funded through the *Sectorfondsen* program, a process of project planning based on stakeholder consultation began in 2003 (i.e., prior to the point in

time when environmental responsibilities became part of ATM). For this process, the sector was divided into Non-Urban Environment (NUE) and Urban Environment (UE). The range of actions that have been considered under NUE planning process include the management of specific natural resources (mineral, forest, freshwater) and wildlife protection, and, under the UE planning process, the implementation of infrastructure projects (water supply, sanitation, waste management systems, soil protection) and urban facilities (parks). The final planning products are given in Figure 11.

Figure 11 Urban & Non-Urban Environment Planning Process



However, the process NUE/UE process has several weaknesses. First, little consideration is given to integrated environmental management actions. Second, none of the listed presentations focused on environmentally relevant social issues. Third, ATM, the ministry responsible for environmental policy implementation, has had a limited participation in the planning process and no influence in the decision recently made on the priorities for *Sectorfondsen* allocation (the established priorities are waste management, forest development, and mineral resources). Fourth, it is not clear whether the recommendations made through the for Policy and Action Plan for Sustainable Management of the Non-Urban Environmental Sub-Sector have been taken into closer consideration by the relevant authorities.

C. OTHER DEVELOPMENT SUPPORT RELEVANT TO THE ENVIRONMENT

The **European Union** (EU), through its technical cooperation program, has addressed three main development sectors; agriculture, transportation, and ecotourism. In addition, the program co-funded the NIMOS institutional building Environmental Management Technical Cooperation, together with the IDB. Support for agriculture development comprises a number of initiatives for improving irrigation systems and production technology (better crops, product certification for export, and appropriate agrochemical usage). For the transportation sector, the program includes the preparation of a national transport policy, the rehabilitation of roads, and rehabilitation of the port of Paramaribo. And with respect to ecotourism, the EU cooperation has resulted in draft legislation on permits and standards to be met by tourism agencies. Also, communication campaigns have been held to improve awareness for natural resource protection in schools. The tourism authority has benefited from an environmentally oriented capacity building project, which has included training activities to teachers and the development of an ecotourism demonstration project.

The **UNDP**'s collaboration with the Government of Suriname covers the period from 2002 to 2006 and is centered on financial and technical support for development and capacity building. Programs include a series of ongoing projects and actions related to support to the public sector reform, poverty reduction, democratic governance, and industrial development. In environmental protection, UNDP /GEF directly participate in the Suriname Conservation Foundation (SCF) program. The SCF program includes the preparation of the National Biodiversity Strategy and the Bio-Prospecting Legal Plan, as well as capacity and awareness building for the sustainable management of protected areas. In 2005, a new UNDP project was anticipated to start on the national assessment of institutional capacity for climate change studies.

The **World Wildlife Fund** (WWF) started in April 2002 a 4-year program on forest ecosystems and biodiversity protection within the Guianas. This program aims at maintaining the integrity of the different forest ecosystems in Guiana, Suriname, and French Guiana, and to sustain their ecological functions and processes while developing regional socio-economic processes. The program consists of four components; sustainable forest management, gold mining pollution abatement, protected area management, and regional integration, collaboration, and networking. The program is primarily funded by WWF (\$US 1.2 million) and co-funded by the **French Government** (French Fund for Global Environment – \$US 1.6 million) and the **Directorate General for International Cooperation** (DGIS – \$US 2.4 million).

In areas that are indirectly related to environmental issues, the **Islamic Development Bank** (ISDB) has been involved in funding the establishment of primary health centers in the Interior to provide the much-needed medical assistance to the people living in remote areas. ISDB has also funded technical assistance in education and human resource development in the petroleum sector. And the N.V. Havenbeheer expects funding from ISDB for the rehabilitation of the Nickerie harbor. In addition, the **Chinese government** has provided support for mining, infrastructure (roads, housing), and tourism development programs, **OAS** for education projects, and **EDF** for commerce improvement.

A summary of completed and ongoing technical cooperation programs concerning integrated environmental management is presented in Figure 12. Analyzing these programs in light of the findings presented in Chapters 2, 3 and 4, two particular areas of donor support that would fit well with the programs presented above but not currently funded are:

- **Environmental Quality Standards:** The basis for the implementation of an environmental impact assessment (EIA) system has been created under the Environmental Management Technical Cooperation program; however, resources are needed to complement the proposed EIA regulations with criteria and guidelines for the assessment of certain development sectors and the establishment of environmental quality standards.

- NIMOS Environmental Planning and Information Office:** Environmental planning is crucial as a policy tool, especially in an institutional system where the various environmental protection responsibilities are spread among multiple ministries and government agencies. Such planning requires strong coordination and technical capacity. For example, the environmental management plan proposed in the Greenstone Belt Regional Assessment has failed to improve NIMOS technical capacity in the subject. The ongoing study on integrated coastal management is merely the first step to a methodological planning approach, and has been prepared under the guidance of the Ministry of Natural Resources. Technical cooperation is imperative for the establishment of NIMOS Environmental Planning and Information Office, the unit responsible for the coordination of environmental management plans in the country. This will require the provision of equipment, training and qualified personnel.

Figure 12 Technical Cooperation Environmental Programs

Environmental management issues	Main Technical Cooperation Agencies				
	IDB	Dutch Government	European Union	UNDP	WWF ¹⁴
Biodiversity and nature conservation		SCF Program		Protected areas management (SCF ¹⁵) Biodiversity action plan Bio-prospecting legal action plan	Sustainable forest management Protected areas management
Environmental planning	Integrated coastal zone management Greenstone Belt Regional Assessment				
Environmental impact assessment	NIMOS Program Indigenous People and Mining Project (SU-T1005)		NIMOS Program		
Pollution control	Pollution inventory and management of pollution sources				Gold mining pollution abatement
Forest development and control	National Forest Policy;	Foundation for Forest Management and Production Control (SBB) Tropenbos Tropical Forest Foundation			

¹⁴ Guyana's Sustainable Forest Resource Management Projects

¹⁵ Suriname Conservation Foundation program

6. POTENTIAL ENVIRONMENTAL ISSUES, IMPACTS AND OPPORTUNITIES

This chapter presents an overview of potential environmental issues, impacts and opportunities associated with the planned development activities identified and analyzed in previous chapters. It is important to note, that a detailed assessment of environmental impacts of specific development activities is not only difficult based on the currently limited amount of publicly available information, but it is also beyond the scope of the Country Environmental Assessment. Instead, we here identify potentially vulnerable components of the environment, including stakeholders, as well as critical potential environmental and social impacts (positive or negative) relating to future economic development. Where appropriate, the likely cumulative environmental impacts of different projects and actions in a specific area or ecosystem are discussed. In addition, mutual impacts and potential conflicts that may arise from the development of different sectoral activities are considered. The chapter further analyzes risks and opportunities for environmental management in relation to development projects, as well as gaps in environmental management that are not being addressed in development planning. The analyses of development projects are organized according to four regions also used in Chapters 3 and 4: the Marine and Coastal zone, the Coastal Plains, the Interior, and the Paramaribo Urban Area. . For each of the four zones, comprehensive tables provide a summary overview of the key development projects with potential environmental consequences mentioned in the 2005 Annual Plan, the affected areas, the potential environmental and social impacts, as well as the environmental risks and opportunities.

SPECIFIC PROJECTS WITH POTENTIALLY SIGNIFICANT NEGATIVE ENVTL. IMPACTS

Development Project	Key Potential Impacts
Expansion of bauxite mining/ alumina processing	Land degradation; water pollution; (hazardous) waste generation
Expansion of oil exploration & exploitation	Soil and ground water contamination; (hazardous) waste generation; marine water contamination; risk of disruption of ecosystems and fishing activities
Coastal protection dykes	Change in sea currents and sedimentation (risk: acceleration of siltation and erosion processes elsewhere along coast)
Aquaculture projects	Disruption of coastal ecosystems; water pollution introduction of exotic species
Hydropower generator & alumina smelter in West SU	Flooding of indigenous people's use areas; potential conflict with Guyana over water use
Expansion of large-scale gold mining	Soil, water and air pollution; solid waste generation; biodiversity loss
Oil palm cultivation & forest clearing	Deforestation; soil erosion and compaction;
Rehabilitation of Paramaribo Harbour	Increased industrial waste generation; risk of petrochemical spills at oil & gasoline terminals

A. PROJECTS IN THE MARINE AND COASTAL ZONE

In the Marine and Coastal Zone, two key development projects have been proposed: the exploration of offshore oil, already initiated, and the creation of the Vessel Monitoring System and National Coast Guard.

The right to explore **offshore oil** was conceded to a consortium formed by the State Oil Company and two foreign private enterprises. The two conceded exploration areas are blocks 30 and 31, which are located in front of Suriname's western shoreline, about 30 km from shore. Block 30 corresponds to an area of 80,000 sq. km and block 31 covers 14,000 sq. km. The main project actions are seismic surveys and the mobilization and demobilization of survey equipments. These actions will directly affect the blocks themselves as well as the on-shore areas used for support services. Areas indirectly affected by the exploration activities may extend along the entire coast of Suriname. Environmental conditions in the potentially affected areas are generally good..

Potential social and environmental impacts of offshore exploration include disturbance of biota and aquatic fauna migration routes due to boat and equipment noise and light. Shipping traffic to and from the blocks can substantially impact nesting birds and turtles, fish breeding and spawning grounds, and fishing and shipping activities. Furthermore, exploration may result in water pollution by boat operations, generation of solid wastes, and in-land overburdening of service equipment. On the other hand some positive socioeconomic impacts may occur, in terms of a minor increase of state revenues and generation of direct and indirect employment. These potential impacts, however, have not been considered important in the regional context.

A serious indirect effect of the exploration activities is the likelihood of subsequent offshore oil exploitation. The occurrence and scale of exploitation activities will of course depend on the exploration results. However, it must be stressed that off-shore oil exploitation has a high environmental and social impact and risk potential and should be preceded by a detailed environmental impact assessment. This is especially important since most of Suriname's population is concentrated within a narrow strip along the coast and Suriname's fisheries, the second most important source of state revenues after mining, could be severely affected by any environmental impacts resulting from off-shore oil exploitation. The Petroleum Act of 1990 provides for the prevention of adverse environmental impacts of oil exploitation activities. And State Oil, the main project promoter, has stated the intention of preparing environmental impact assessments for any future offshore exploitation activity. However, no environmental impact assessment has preceded the beginning of the exploration activities in blocks 30 and 31. Moreover, two critical conditions for adequate environmental management of the project, namely a sound database and appropriate enforcement to ensure impact mitigation and monitoring are at present both missing.

The planned creation of the **Vessel Monitoring System and National Coast Guard** is intended as a first step toward addressing the problem of over-fishing, excessive by-catch, and the associated depletion of fish and shrimp populations (see Chapter 3). The project will comprise the acquisition of boats and the operation of a monitoring system, although it has not yet been defined in terms of the number of boats, scope of the monitoring system, and financial mechanisms to sustain the operational costs. The project's real effect will depend on the Government commitment to enforce the related legislation and the availability of financial resources for the Coast Guard operations. Its likely direct positive impacts may help to reduce over-fishing and by-catch, limit disturbance of shrimp breeding grounds, and promote the effective control of unlicensed boats, all of which will help secure the long-term livelihood of the fish industry.

Figure 13 Environmental impacts and opportunities of development projects in the Marine and Coastal Zone

Development project (main actions)	Affected area (environmental situation)	Likely impacts	Environmental and social risks/opportunities
<p>Off-shore oil exploration* (ongoing) (concessions to State Oil + 2 companies)</p> <p>Main Actions:</p> <ul style="list-style-type: none"> ▪ seismic survey ▪ demobilization <p>* A project preliminary environmental assessment was presented to NIMOS</p>	<p>Directly affected area: Block 31 (14,000 km²); Block 30 (80,000 km²); – 30 km off of the western coast of Suriname</p> <p>Indirectly affected area: entire coast of Suriname</p> <p>Environmental situation:</p> <ul style="list-style-type: none"> ▪ shrimp and fish populations at risk of depletion ▪ no water pollution observed 	<p>Positive impacts:</p> <ul style="list-style-type: none"> ▪ small increase in state revenues <p>Negative impacts:</p> <p>No negative significant effect on the environment</p>	<p>Opportunities:</p> <p>Future oil exploitation with significant social and environmental impacts as well as risk of pollution accidents (oil spills) and potential conflicts with fishing activities</p>
<p>Introduction of a Vessel Monitoring System and National Coast Guard (Ministry of Defense; Ministry of Agriculture, Fisheries, and Animal Husbandry; and Marine Authority Suriname)</p> <p>Main Actions:</p> <ul style="list-style-type: none"> ▪ patrolling of the coast by boats ▪ installation of satellite monitoring system ▪ administrative facilities 	<p>Directly affected area: fishery zones in almost the entire coast (Shallow and Deep Sea Zones)</p> <p>Indirectly affected area: Suriname coast and fishery zones of neighboring countries</p> <p>Environmental situation</p> <ul style="list-style-type: none"> ▪ shrimp and fish populations at risk of depletion ▪ no water pollution observed 	<p>Positive impacts:</p> <ul style="list-style-type: none"> ▪ reduction of over-fishing and by-catch ▪ control of unlicensed boats, reduction of disturbance of shrimp breeding grounds ▪ indirect and long-term securing livelihoods of the fish industry <p>Negative impacts:</p> <p>No negative significant effect on the environment</p>	<p>Opportunities:</p> <p>Better environmental management and conservation of fisheries</p>

Although applicable to managing Suriname's coastal areas (both land and water), the approach of Integrated Coastal Zone Management (ICZM) has not yet been applied. Immediate problems tend to be ameliorated with short-term solutions. Also, there is no plan to protect the Suriname shoreline from climate change and a possible rise in sea level. A coastal management study had been planned for 2005 by the Ministry of Natural Resources with the support of IDB, but has not yet been included in the Government priorities. The scope of this study would include the development of a coastal zone management approach appropriate to Suriname's institutional context, the formulation of terms of reference for an ICZM master plan, and the identification of pilot projects to be implemented in the coastal area. Although the Ministry of Natural Resources has taken this initiative, it is important to note that ATM and NIMOS are the Government institutions responsible for promoting integrated environmental management and action coordination. Figure 13 summarizes the environmental issues in the Marine and Coastal Zone.

B. PROJECTS IN THE COASTAL PLAINS

The most significant impacts in the Northern and Coastal Plains are due to bauxite mining and processing, as described in more detail below. Other ongoing and planned development projects that may cause environmental impacts include expansion of oil exploitation, electric generation and transmission activities, rehabilitation of the transportation network and drainage structures, construction of coast protection dykes, and aquaculture (Figure 17).

Critical environmental issues in the Northern Coastal Plan are the **conservation of water resources, the protection of coastal lands from sea erosion and the management of pesticides**. The 2005 Action Plan proposes the rehabilitation of old watersheds, creation of new watersheds, and improvement of watershed management with enhanced farmer participation. This is an important initiative to help solve productivity problems identified in the agricultural sector. However, conflicts with oil exploitation activities are a potential problem. If oil exploitation is to be expanded, a water management plan for that area will be required. With respect to coastal lands, their protection has not been managed systematically; rather, it has been limited to the planning of specific projects for the solution of the most significant cases of sea erosion and soil loss. This issue is related to the integrated management of the coastal areas and should be considered in the development of the coastal environmental management initiative. The third critical environmental issue is the management of pesticides. The implementation of existing pesticide management plans has not yet generated satisfactory results. Internationally forbidden pesticides continue to be used by farmers, with potential risks of health and environmental contamination. A proposed pesticide management law has been awaiting approval for several years. However, the 2005 Annual Plan has not included any action related to this issue.

Suralco, the Alcoa-related **bauxite** company, has plans to expand its activities in the zone, replacing the mines Coermotibo (near Mungo) and Lelydorp (near Paranam) by exploiting bauxite in two other concession areas: Kaaimangrasi and Klaverblad, in the south-west of Commewijne district. In addition to the opening of new mines, Suralco intends to build a road linking them to the existing alumina plant in Paranam and a bridge to be able to cross the Suriname River. BHP Billiton is developing the projects on behalf of the mining joint venture with Suralco, is running the actual mining process and will eventually operate the two mines.

Both Kaaimangrasi and Klaverblad were previously plantations and consist of secondary savanna forest, where patches of primary forest can be found. There are potable ground water reserves along the border to the Para District. Moreover, remains of ancient Indigenous settlements have been identified in the area and investigated by archaeological surveys, including excavation where necessary. At those sites where

important remains have been identified, no disturbance is allowed and sites are cordoned off. Some remains have been discovered during construction operations and have been protected and investigated. All future archaeological finds will be reported to the relevant District Commissioner. At present, human occupation in the areas directly affected by mining or associated infrastructure is limited to a few small-scale farmers (all with land property rights) and a timber concession near the Suriname River, with whom a financial agreement has been reached.

BHP Billiton has presented a detailed interim environmental assessment for both mining areas, which is under review by NIMOS, the Geological and Mining Division of the Ministry of Natural Resource, SBB, and the Bauxite Institute. A final report will be submitted to NIMOS in June 2005. The main identified negative impacts comprise land degradation by deforestation and opening of mining pits, changes in the local hydrological features and ground water conditions, surface water impacts, soil and air pollution, generation of mining solid wastes, degradation of agricultural land (current and potential), and disturbance of local communities. Positive impacts are related to the increase of indirect job offers, state revenues, and export taxes; another benefit will be a better accessibility to the direct and indirectly affected areas, which will bring the opportunity of agricultural development and growth of local business and small entrepreneurship after the decommission of both mines. As environmental regulations are not in force, however, the implementation of mitigation measures and other environmental management actions will depend on BHP Billiton's environmental policies. As stated by the company representative, review of this project is rigorous and requires full compliance with commitments and mitigation measures.

Another activity by Suralco in this zone is the expansion of the existing **alumina processing** plant in the Paranam mining area by altering the process technology. Environmental management in the existing plant has been followed by NIMOS and no complaints have been received from local communities. The main concern is the storage of used lubricant oil containing PCBs in the plant premises while waiting for a final disposal solution (probably the transportation to a PCB treatment plant abroad). Alumina production increase will not significantly alter the environmental quality in Paranam, although some increase in water pollution and hazardous waste generation is expected. With respect to air pollution, the company reports that they will continue to comply with United States Environmental Protection (EPA) and Alcoa international standards. And the risk of ground water contamination in the case of Suralco in Paraman is considered low; a contingency plan has been devised and implemented since 1999 for ground water pollution.

State Oil will expand **oil exploration** in the already exploited Saramacca concession area. Projected activities include the drilling of approximately 100 wells in Tambaredjo, new drilling in the Calcuta and Caledonia fields, and rehabilitation of exploited areas, directly affecting the northern part of the East-West road in Saramacca district. Environmental features in the concession area, already altered by ongoing oil exploitation, include swamps and degraded mangrove ecosystem in the northern fringe and small-scale peanuts and rice plantations next to the Tambaredjo fields. Complaints by local communities regarding water well capacity reduction as a consequence of current State Oil activities in the same area have already been received. Further exhaustion and contamination of ground water reserve, as well as soil contamination from the disposal of sludge from well drilling works, are the main potential negative environmental impacts of the new oil exploration. Other potential impacts are noise generation, generation of solid wastes, and an increased risk of oil spill during drilling of wells, transport, storage, and unloading operations.

Projects related to the **electric sector** in the Northern and Coastal Plains comprise the construction of two transmission lines by EBS, and a small power plant by State Oil. Neither of these projects is considered to cause significant environmental impacts. The implementation of the transmission line (161 kV) from Paranam to Paramaribo will include the construction of poles parallel and in the same service track as an

existing line. This track is covered with already changed grassland and secondary woods, and crosses a few urban areas. The project's social impacts are mostly positive, comprising the improvement of energy supply to Paramaribo and employment generation; negative impacts, such as traffic disturbance, noise, and dust during construction, are probably small. The other transmission line project (33 kV), to be constructed in Nickerie, and the generation power plant project, to be built in the concession area of Saramacca (15 MW), have not yet been planned. As both projects dimensions are small, their impacts will probably not be significant.

The Ministry of Public Works is the promoter of a five infrastructure projects in the Northern Coastal Zone. Besides the **construction of dykes** to protect the coastal areas in Coronie and Commewijne districts, all projects are related to rehabilitation of bridges, roads, and drainage structures. The dyke projects have not yet been developed, though there are indications that an extension of 30 km of dyke is needed in Coronie, and 2 km in Commewijne. Areas to be affected by the implementation of both projects are the fringes of land from the shoreline to the rice fields south of the East-West connection road, in the mentioned districts. Most of these lands were originally covered with mangrove ecosystems, the remainder of which is degraded. The benefits of implementing the dykes would include an effective protection of the coastal land from seawater erosion and the remediation of current damages to farms and infrastructures. Potential negative impacts have to be identified during project preparation, but would likely stem from radical changes in the shoreline: remaining mangroves and land biota would be strongly affected during the construction phase with consequences for the shoreline equilibrium; changes in shoreline would also affect sea currents and the sand sedimentation process in shallow waters. Moreover, the dykes will certainly require expensive maintenance activities after construction, in order to correct unavoidable coast erosion and sedimentation problems. All these changes in the natural sea and shoreline dynamics should be assessed during the planning phase of the dyke projects to minimize negative impacts, identify appropriate measures for their mitigation, and avoid the risks related to mangrove depletion, coast erosion and sand sedimentation in other nearby shoreline areas.

Three projects on the **rehabilitation of roads and bridges** will be implemented: (i) filling of potholes, scrapping, leveling, repaving, and cleaning the drainage structures of the existing network in Nickerie, Para, Saramacca, Wanica, Coronie, Commewijne, and Marowijne districts, (ii) treatment of 400 km of roads and repair of six bridges in the Southdrain East-West connection, and (iii) engineering works for the repairing or rebuilding of bridges in Saramacca, Para, Wanica, and Commewijne districts. The location of these projects is in grassland and urbanized areas without any relevant environmental problems. Likely negative impacts (temporary traffic obstruction and the generation of dust and noise) of these projects is clearly outweighed by the generated benefits (improvement of accessibility and transportation of goods and people).

Suralco has proposed a plan for **dredging** the Suriname River from the river mouth to its processing plant at Paranam. The Nickerie River will also be dredged from the harbor to the river mouth in the last quarter of 2008. Both projects will affect the flow pattern of the target-rivers and lead to large sediments discharge at the time of dredging.

The project "Improvement of **Drainage Structures**" will be implemented in Saramacca, Coronie, Nickerie, and Marowijne districts. Project actions will include civil engineering and mechanical works for rehabilitation of sluices and constructing new sluices and pumping stations. Although no relevant environmental problem has been observed, rice plantation fields, as well as houses and roads in the mentioned districts, have been frequently flooded. This project will bring about a number of social and environmental positive impacts, such as flood control, improvement, and control of salt water intrusion in irrigation and drainage systems, increase of agricultural yields, and decrease of nuisances due to water problems and water-borne diseases. It is unlikely that this project will affect the mangrove forests

A private company has plans to implement an **aquaculture** project in the South Drain, Nickerie District. No project characteristics are known yet. In general, aquaculture activities cause impacts on the natural environment; in the South Drain area, where mangroves and wetlands in different stages of degradation can be found together with rice fields, the disruption of water distribution in irrigation systems will probably add to other negative impacts, such as disruption of coastal ecosystems, soil compaction, discharge of nutrient-rich water in natural habitats, and introduction of exotic species. The company has not yet contacted NIMOS to discuss the presentation of an environmental impact assessment. However, until the proposed environmental legislation is approved, an EIA is not mandatory.

Figure 14 Environmental impacts and opportunities of development projects in the Coastal Plains

Development project (main actions)	Affected area (environmental situation)	Likely impacts	Environmental and social risks/opportunities
<p>Expansion of bauxite mining* (Suralco - Alcoa and BHP Billiton)</p> <p>Main Actions:</p> <ul style="list-style-type: none"> ▪ replacement of two current mines (Coermotibo and Lelydorp III) by two new bauxite mines ▪ building of a bridge over Suriname river and a road linking alumina plant to concession areas ▪ exploitation of archeological sites and recovering of objects ▪ decommissioning <p><i>* preliminary EIA presented to NIMOS now under review, complete EIA expected to be presented in June 2005</i></p>	<p>Directly affected area: Klaverblad and Kaaimangrasi concession areas</p> <p>Indirectly affected area: Paranam, South-west Commewijne district</p> <p>Environmental situation:</p> <ul style="list-style-type: none"> ▪ mostly secondary savanna forest with patches of primary forest ▪ old plantations mostly neglected ▪ few people living in concession areas, with regular property titles ▪ potable ground water reserves with potential for future use ▪ archeological findings from presence of ancient Indigenous tribes 	<p>Positive impacts:</p> <ul style="list-style-type: none"> ▪ generation of indirect employments ▪ increase in state revenues and export taxes ▪ improvement of accessibility to agricultural areas <p>Negative impacts:</p> <ul style="list-style-type: none"> ▪ land degradation ▪ change in local hydrology and water quality ▪ soil, superficial and ground water, and air pollution ▪ industrial waste generation ▪ degradation of potential and currently used agricultural land ▪ disturbance of local communities 	<p>Opportunity: opening of accessibility of communities to new areas and for future development of those areas after mine decommissioning</p>
<p>Expansion of alumina processing (Suralco; finished in January 2005)</p> <p>Main Actions:</p> <ul style="list-style-type: none"> ▪ changes in processing technology 	<p>Directly affected area: Paranam Suralco concession area</p> <p>Indirectly affected area: Para district</p> <p>Environmental situation:</p> <ul style="list-style-type: none"> ▪ existing plant considered is well managed (no complaints from neighbor population) ▪ lubricant oil wastes contaminated with PCBs generated by the plant and stored in barrels for future disposal 	<p>Positive impacts:</p> <ul style="list-style-type: none"> ▪ increase of export taxes <p>Negative impacts:</p> <ul style="list-style-type: none"> ▪ disturbance of the drainage area ▪ increase of water pollution ▪ increase of air pollution (CO₂)* ▪ increase of hazardous wastes <p><i>* (EPA/US and international ALCOA standards have been complied with)</i></p>	<p>Risk: groundwater risk assessment placed the plant in a low risk category; contingency plan implemented since 1999</p>
<p>Expansion of oil exploration in Saramacca area (State Oil)</p> <p>Main actions:</p> <ul style="list-style-type: none"> ▪ drilling of 100 new production wells in Tambaredjo field ▪ new drillings in Calcuta and Caledonia fields ▪ rehabilitation of exploited areas 	<p>Directly affected area: Calcutta, Caledonia and Tambaredjo, north of the east-west road (Oost-West verbinding) in Saramacca district</p> <p>Indirectly affected area: Saramacca district</p> <p>Environmental situation:</p> <ul style="list-style-type: none"> ▪ swamp (degraded mangrove) in the north part of concession area; grassland in the rest ▪ small-scale agriculture (rice, peanuts) next to Tambaredjo field ▪ villages and small communities ▪ complaints from villagers of reduction of water well production 	<p>Positive impacts:</p> <ul style="list-style-type: none"> ▪ increase of revenues and export taxes ▪ generation of direct and indirect employment <p>Negative impacts:</p> <ul style="list-style-type: none"> ▪ disturbance and contamination of ground water reserves ▪ generation of sludge: soil contamination with hydrocarbons and drill fluids ▪ noise ▪ generation of solid waste ▪ (others?) 	<p>Risk Oil spills during drilling, transport, unloading at terminals, storage and distribution</p>

Development project (main actions)	Affected area (environmental situation)	Likely impacts	Environmental and social risks/opportunities
<p>Construction 161KV electric transmission line (EBS) Main Actions*</p> <ul style="list-style-type: none"> ▪ placing of poles ▪ Installation of power transmission cables <p><i>* Exiting service track and other infrastructure will be used</i></p>	<p>Affected area: strip of land running from Paranam to Paramaribo; track of existing transmission line Environmental situation:</p> <ul style="list-style-type: none"> ▪ degraded grassland, secondary woods, and fully urbanizes areas ▪ No environmental problem observed 	<p>Positive impacts:</p> <ul style="list-style-type: none"> ▪ improvement of electric power supply to Paramaribo ▪ Temporary generation of employment <p>Negative impacts:</p> <ul style="list-style-type: none"> ▪ minor disturbance of traffic ▪ negligible generation of dust and noise 	<p>Risks: NIMOS has required the adoption of measures to prevent magnetic fields as possible impacts</p>
<p>Rehabilitation of roads* (Ministry of Public Works) Main Actions:</p> <ul style="list-style-type: none"> ▪ filling potholes ▪ scrapping ▪ leveling and repaving ▪ cleaning of drainage structures <p><i>* not all roads to be rehabilitated have yet been selected.</i></p>	<p>Directly affected areas: at least a strip of ten meters along both sides of the roads Indirectly affected areas: Nickerie, Para, Saramacca, Wanica, Coronie, Commewijne, and Marowijne districts Environmental situation:</p> <ul style="list-style-type: none"> ▪ traditional agriculture and urbanized areas ▪ no relevant environmental problem observed in these districts 	<p>Positive impacts:</p> <ul style="list-style-type: none"> ▪ temporary employment generation ▪ improvement of accessibility and transportation of goods and people <p>Negative impacts:</p> <ul style="list-style-type: none"> ▪ temporary traffic obstruction ▪ minor generation of dust and noise 	<p>Risk: Increase of road accident due to vehicle speeding</p>
<p>Rehabilitation of road and bridges* Southdrain Oost-West verbinding (Ministry of Public Works) Main Actions:</p> <ul style="list-style-type: none"> ▪ filling potholes ▪ scrapping, leveling, and repaving of 400 km existing roads ▪ engineering works for rehabilitation of six bridges <p><i>* There are no plans for road and bridges rehabilitation</i></p>	<p>Directly affected areas a strip of ten meters along both sides of the roads. Indirectly affected area: districts crossed by the road Environmental situation:</p> <ul style="list-style-type: none"> ▪ degraded grassland and urbanized areas ▪ no observed significant environmental problem 	<p>Positive impacts:</p> <ul style="list-style-type: none"> ▪ temporary employment generation ▪ improvement of accessibility and transportation of goods and people <p>Negative impacts:</p> <ul style="list-style-type: none"> ▪ temporary traffic obstruction ▪ minor generation of dust and noise 	<p>Risk: Increase of road accident due to vehicle speeding</p>
<p>15MW power plant in Saramacca (State Oil) Main Actions:</p> <ul style="list-style-type: none"> ▪ Construction of a new generation unit ▪ Operation of the power plant 	<p>Affected area: area surrounding State Oil current installations Environmental situation:</p> <ul style="list-style-type: none"> ▪ degraded grassland and swamps ▪ no environmental problem observed 	<p>Positive impacts:</p> <ul style="list-style-type: none"> ▪ offer of temporary and permanent employment <p>Negative impacts:</p> <ul style="list-style-type: none"> ▪ noise ▪ minor air and water pollution 	<p>Opportunity: improved power supply for development in Saramacca district</p>
<p>Construction 33KV electric transmission cable* (EBS) <i>* project not yet developed</i></p>	<p>Directly Affected area; to be determined after project completion Indirectly affected area: Nickerie district</p>	<p>Only minor positive and negative impacts may be expected, on account of the low impact potential of projects of the same type and dimension</p>	<p>None</p>

Development project (main actions)	Affected area (environmental situation)	Likely impacts	Environmental and social risks/opportunities
Rehabilitation of bridges (Ministry of Public Works) Main Actions: <ul style="list-style-type: none"> ▪ civil engineering works 	Directly affected area: road network in Saramacca, Para, Wanica, and Commewijne Indirectly affected areas: Saramacca, Para, Wanica, and Commewijne districts Environmental situation: <ul style="list-style-type: none"> ▪ mainly occupied areas (villages and agriculture) ▪ No significant environmental problem 	Positive impacts: <ul style="list-style-type: none"> ▪ temporary employment generation ▪ improvement of accessibility and transportation of goods and people Negative impacts <ul style="list-style-type: none"> ▪ no major negative impact ▪ temporary traffic obstruction ▪ minor generation of dust and noise 	Risk: Increase of road accident due to vehicle speeding
Improvement of drainage structures (Ministry of Public Works) Main Actions: <ul style="list-style-type: none"> ▪ civil engineering and mechanical works for rehabilitation of sluices ▪ building of sluices and pumping stations 	Directly affected areas: watersheds in Saramacca, Coronie, Nickerie, and Marowijne Indirectly affected areas: agriculture areas (rice plantations) in the above mentioned districts Environmental situation: <ul style="list-style-type: none"> ▪ frequent occurrence of flooding affecting roads and houses ▪ no other significant environmental problem 	Positive impacts: <ul style="list-style-type: none"> ▪ flood control ▪ improvement of irrigation and drainage ▪ control of salt water intrusion in irrigation and drainage systems ▪ Increase of agricultural yields ▪ decrease of nuisance due to water problems ▪ less water-born deceases Negative impacts: <ul style="list-style-type: none"> ▪ minor disturbance from noise and traffic increase 	None
Coastal protection dykes* (Ministry of Public Works) Main Actions: <ul style="list-style-type: none"> ▪ vegetation clearing and digging in coastal land ▪ around 30 km of dyke construction in Coronie ▪ about 2 km in Commewijne <i>* Projects not yet developed</i>	Affected areas: Coronie: From the shoreline to the rice fields south of the Oost-West verbinding road; Commewijne: from the shoreline several km land inwards Environmental situation: <ul style="list-style-type: none"> ▪ original mangrove vegetation already degraded 	Positive impacts: <ul style="list-style-type: none"> ▪ protection of farm fields from salt water ▪ decrease of damage to land and infrastructure from sea erosion Negative impacts: <ul style="list-style-type: none"> ▪ change in sea currents and sedimentation 	Risk: change of sea dynamics may cause other unforeseen problems, such as the acceleration of the natural siltation and erosion processes
Aquaculture project * (private company) Main Actions: <ul style="list-style-type: none"> ▪ vegetation clearing and land leveling ▪ Construction of 1400 ha aquaculture ponds ▪ Fish-farming operations <i>* No environmental assessment has yet been presented to NIMOS</i>	Affected area: South Drain area in Nickerie Environmental situation: <ul style="list-style-type: none"> ▪ Mangrove and wetlands in different degrees of degradation 	Positive impacts: <ul style="list-style-type: none"> ▪ Generation of direct and indirect employment ▪ increase state revenues and exports Negative impacts: <ul style="list-style-type: none"> ▪ disruption of coastal ecosystems ▪ soil compaction ▪ discharge of nutrient-rich water in natural habitats ▪ introduction of exotic species ▪ disruption of water distribution in rice fields 	Risk: Increased vulnerability to fish disease.

C. PROJECTS IN THE INTERIOR

The summary of potential impacts of projects to be implemented in the Interior Zone is given in Figure 18.

The interior and the people who use its resources to sustain their livelihoods are most strongly affected by developments in the large-scale mining industry.

In the **gold mining sector**, the Canadian mining company Cambior will continue to expand the exploitation of gold reserves in the Gross Rosebel area. This area is naturally covered with mixed forest and savanna, most of which is secondary growth. Several Maroon communities are located in the immediate surroundings of the mine and the community of Nieuw Koffiekamp is located within the concession area. In East Suriname, Suralco – a Surinamese subsidiary of ALCOA – is continuing exploration activities in the Nassau Mountains. This area is a vulnerable biodiversity hotspot and used by nearby Paramaka Maroon communities for subsistence agriculture, gathering, hunting, and small-scale mining.

Exploitation in both areas generates direct and indirect employment and infrastructural improvements (e.g. road maintenance). The gold mine developments in the Gross Rosebel area also contribute to state revenues and taxes and stimulate local businesses. Yet large-scale gold mining has many severe environmental impacts, including landscape alteration, land degradation, a loss of habitat for wildlife, the generation of solid waste, and air and water pollution among other impacts. Cambior's production cycle will rely on heap leaching, a process that makes use of cyanide, which is discharged in tailing ponds to degenerate. The risk associated with this method is the leakage of cyanide into local streams or, in the worst-case scenario, a cyanide spill. Exploration in the Nassau Mountains is causing soil erosion, ecosystem disturbance, and biodiversity loss. In addition, at both concession sites (Rosebel and Nassau), local Maroon gold miners and Brazilian migrant miners have lost their work place after being removed from the concession areas.

Cambior has conducted a detailed EIA for its activities, which included community consultation. NIMOS only received this document after the project had been approved by the Government and initiated by the company. Suralco will conduct an EIA if research results support the development of a gold mine. In that case, ALCOA will further develop the project in collaboration with the US-based large-scale mining company Newmont. Risks associated with the development of a large-scale gold mine in this area include, in addition to the mentioned environmental impacts, the violation of Indigenous landrights.

In order to secure sufficient energy for its **bauxite operations**, Suralco is considering the development of a hydropower plant in West Suriname. This project is of interest to the Government of Suriname because it could help supply other regions and the city with much needed power. Projected activities would include the construction of two dams, subsequent flooding of the Kabalebo River basin, and diversion of the Lucie River. Pristine, minimally impacted tropical rainforest covers the target area. Moreover, four Indigenous communities (Apura, Washabo, Section and Wanapan) will have their lands and cultural activities substantially affected by the flooding associated with the new reservoir, as they use the river basins for fishing, hunting, and the collection of forest products. In addition, the Kabalebo River is popular among sport fishermen. At present, Suralco is conducting an environmental inventory of the affected river basins and a feasibility study. The main impacts associated with the construction of service roads and base camps, which are required for this work, are land degradation, biodiversity loss, and potential for uncontrolled settlements. Risks associated with potential development of the hydropower

plant include biodiversity loss and the loss of user area for Indigenous peoples. An EIA will be conducted if the development of a hydropower plant in this area is deemed feasible.

Another project that would affect the same area in West Suriname is the construction of an **alumina smelter**. It is very uncertain, however, if and where Suralco will develop this smelter.

The Inter-American Development Bank, with financing from the Canadian Technical Assistance Program, is supporting a technical cooperation (SU-T1005) to gather information regarding the potential impacts of the proposed bauxite exploitation, hydroelectric dam and associated projects on the Indigenous communities in the area of influence. The project is also providing information about the proposed projects to these communities and their representative organizations, and builds capacity among the communities to engage in a dialogue with the Government of Suriname and the mining companies involved, regarding their needs, concerns and interests.

The **small-scale gold mining** sector produces the majority of Suriname gold and creates significant environmental damage. The World Wildlife Fund program on gold mining pollution abatement has generated several studies and released a situation analysis on small-scale gold mining in June 2005. Activities to promote the implementation of programs and/or policy strategies have not yet been initiated.

The draft revised Mining act of 2002 does oblige large-scale mining companies to conduct an environmental impact assessment and develop an environmental management system. Yet there are no provisions for occupational health and safety, or public safety. The document also has been developed without consultation with small-scale miners and Indigenous and Maroon groups. As a result, suggested policies do not provide for effective management of small-scale mining in a way that reflects the actual situation.

A non-mining related project poses an environmental risk in the interior. Closer to the coastal zone in the Patamacca area, the Chinese firm China Zhong Heng Tai is planning to develop an **oil palm plantation** with a gross area of 52,500 ha. The target area, Victoria, is covered with mixed secondary and primary forest. There are no people living in the immediately affected area, but the area is sporadically used for subsistence agriculture by people from nearby settlements. In order to prepare for planting, the company has obtained Government permission to clear-cut the entire plantation area in stages, including species under protection. Under the agreement between the Government of Suriname and the company, signed in 2004, China Zhong Heng Tai is allowed to sell this timber to generate revenues for the development of oil palm cultivation. As a result of the clear cutting, the area will most likely experience erosion and sedimentation, soil compacting, surface water pollution, severe deforestation, loss of soil productivity, and biodiversity loss. Moreover, a number of local groups have voiced their concern that the company will remove and sell all timber without further developing the oil palm plantation.

Minimal environmental and social impacts and risks are associated with other planned and ongoing projects in the interior, such as the construction of small electrical power plants in the district of Sipaliwini and the rehabilitation and construction of roads in Brokopondo district.

Figure 15 Environmental impacts and opportunities of development projects in the Interior

Development project (main actions)	Affected area (environmental situation)	Likely impacts	Environmental and social risks/opportunities
<p>Hydro power generator in West Suriname* (Suralco)</p> <p>Main Actions:</p> <ul style="list-style-type: none"> ▪ opening of service routes ▪ construction of dams (Tijger and Avanavero rapids) ▪ creation of water reservoir (1200 km²) ▪ Diversion of Lucie river flow to Kabalebo river ▪ installation of generators (600 MW) <p><i>* project not yet developed; current studies: environmental inventory of affected river basins and feasibility study</i></p>	<p>Directly affected area: Lucie and Kabalebo river basins, West Suriname</p> <p>Indirectly affected area: entire Courantin river basin</p> <p>Environmental situation:</p> <ul style="list-style-type: none"> ▪ biodiversity conservation ▪ pristine forests ▪ little to no occupation ▪ indigenous use of the area ▪ sport fishing ▪ no environmental problems observed ▪ four Indigenous communities (Apura, Washabo, Section and Wanapan) live in the area 	<p>Positive impacts:</p> <p>Negative impacts:</p> <ul style="list-style-type: none"> ▪ flooding of Indigenous land ▪ loss of user area for indigenous groups 	<p>Risk: political conflicts with Guyana over water and land</p> <p>Opportunities: supply other areas (Paramaribo) with electricity</p>
<p>Alumina smelter in West Suriname* (Suralco)</p> <p><i>* Uncertain if project will be developed,</i></p>	<p>Affected area: depending on final decision on project location</p> <p>Environmental situation:</p>		
<p>Exploitation of gold mining* (ongoing) (Rosebel Gold Mines)</p> <p>Main Actions:</p> <ul style="list-style-type: none"> ▪ mine construction ▪ heap leaching ▪ ore processing ▪ decommissioning <p><i>* a complete EIA was prepared by the company</i></p>	<p>Directly affected area: Gross Rosebel concession area</p> <p>Indirectly affected area: surrounding communities, Mindrineti and Saramaca river basins</p> <p>Environmental situation:</p> <ul style="list-style-type: none"> ▪ biodiversity conservation ▪ swampy grassland, shrub savanna rainforest, dryland forest, savanna forest, marsh forest ▪ presence of Amerindian and Maroon communities ▪ subsistence and small-scale agricultural activities ▪ relevant small-scale gold mining activities 	<p>Positive impacts:</p> <ul style="list-style-type: none"> ▪ direct and indirect employment generation ▪ minimal state revenues ▪ infrastructure improvements ▪ Increase in tax revenue and income, ▪ Improvement of local skill levels <p>Negative impacts:</p> <ul style="list-style-type: none"> ▪ air quality change: TSP, PM₁₀, CO, NO_x, SO₂, and visible emissions (dust and visible stack plumes); noise ▪ climate change ▪ alteration of landscape, loss of soil and vegetation ▪ land and aquatic habitat loss, wildlife loss ▪ water: flow alteration, sedimentation and chemical pollution ▪ generation of solid waste ▪ loss of employment for local small-scale miners ▪ loss of heritage resources 	<p>Risk: Cyanide spill in river waters (operational procedures include emergency response plans for potential cyanide releases)</p> <p>Opportunities: implementation of community development projects; increase of state revenues in future</p>

Development project (main actions)	Affected area (environmental situation)	Likely impacts	Environmental and social risks/opportunities
<p>Exploration of gold mining East Suriname Nassau area. (Suralco + Newmont Mining Co.) Main Actions:</p> <ul style="list-style-type: none"> ▪ Opening up service roads and tracks ▪ collection of samples, ▪ construction of base camp with communication facilities ▪ drilling of holes 	<p>Affected areas: concession area in Nassau mountains, Paramaka, and communities along the river opposite from the mountains Environmental situation:</p> <ul style="list-style-type: none"> ▪ extremely vulnerable biodiversity hotspot ▪ water contamination and soil degradation from mining ▪ social problems associated with the presence of small-scale miners 	<p>Positive impacts:</p> <ul style="list-style-type: none"> ▪ direct and indirect employment generation <p>Negative:</p> <ul style="list-style-type: none"> ▪ soil erosion ▪ ecosystem disturbance ▪ expulsion of local small-scale miners ▪ loss of employment for local small-scale miners ▪ loss of biodiversity 	<p>Risk: Violation of indigenous rights</p>
<p>Construction of five electrical power plants* (CDFS) Main Actions:</p> <ul style="list-style-type: none"> ▪ construction of small hydropower plants (to supply small local communities) <p><i>* No further information; project not yet developed; study has been developed for a hydroelectric power plant in Asidonhopo</i></p>	<p>Affected areas: Asidonhopo, Botopasi, Pokigron, Stoelmanseiland, Drietabbetje Environmental situation:</p>	<p>Will depend upon type of power source (hydro, solar)</p>	
<p>Oil palm cultivation and wood logging (ongoing) (China) Main Actions:</p> <ul style="list-style-type: none"> ▪ Clearing of forest ▪ Planting oil palm trees ▪ Building of processing plant <p><i>No EIA was conducted (NIMOS)</i></p>	<p>Affected area: Victoria area in Patamacca Environmental situation:</p> <ul style="list-style-type: none"> ▪ mixed secondary and primary forest ▪ no human occupation ▪ no pollution problems observed ▪ old agricultural fields 	<p>Positive impacts:</p> <ul style="list-style-type: none"> ▪ direct and indirect employment generations <p>Negative impacts:</p> <ul style="list-style-type: none"> ▪ erosion and sedimentation ▪ soil compactin ▪ surface waters pollution ▪ deforestation ▪ loss of soil productivity ▪ biodiversity loss 	<p>Risk: Wood is taken but no revenues will be generated from oil plantation</p>
<p>Construction of bridge and roads in Brokopondo (Ministry of Public Works) Main Actions:</p> <ul style="list-style-type: none"> ▪ engineering works for the renovation of bridge over Carolina Creek ▪ road rehabilitation works: filling potholes, scrapping, leveling, and repaving ▪ cleaning of drainage structures 	<p>Affected area: Brokopondo Village Environmental situation:</p> <ul style="list-style-type: none"> ▪ mixed urban and rural area ▪ no relevant environmental problem 	<p>Positive impacts:</p> <ul style="list-style-type: none"> ▪ improvement of accessibility and transportation <p>Negative impacts:</p> <ul style="list-style-type: none"> ▪ minor temporary traffic obstruction ▪ minor generation of dust and noise 	<p>Risk: Increase of road accidents due to increased vehicle speeding</p>

D. PROJECTS IN THE PARAMARIBO URBAN AREA

In the city of Paramaribo, activities have been proposed that focus on the 1) rehabilitation of roads; 2) rehabilitation of bridges, sluices, and pumping stations; 3) the development of housing projects; and 4) the renovation and expansion of the Paramaribo harbor (see Figure 19). Construction projects in Paramaribo are not obliged to undergo an EIA. The major environmental and social impacts are described below.

The **rehabilitation of 275 km of roads** within Paramaribo affects both the inner city and the residential areas surrounding the inner city. Road rehabilitation can occur in either two ways: roads are selected for filling the potholes with asphalt, or for paving after assessing the drainage system, scraping, and leveling. Potential social and environmental impacts for rehabilitation of roads within Paramaribo are expected to be negligible. This type of reconstruction is expected to cause insignificant temporary traffic obstruction, noise, and dust generation. On the other hand, road rehabilitation in Paramaribo may improve the accessibility of many offices, businesses, and houses and provide improved transport routes from the inner city to the suburbs.

Projects for **rehabilitation of bridges (1), sluices (5), and pumping stations (4)** are mainly concentrated in the inner city of Paramaribo and North-Paramaribo. Both these areas are prone to excessive flooding with high rainfall resulting in an increased occurrence of illness (waterborne diseases, vector-transmitted diseases) and bad odor. Potential social and environmental impacts of rehabilitation of bridges, sluices, and pumping stations identified so far are of minor concern. The positive outcome of such projects is the creation of temporary employment in Paramaribo. One concern with these types of projects is that they need to be planned properly; bad planning will lead to excess water standing in residential areas.

The construction of **large-scale housing projects** in the suburbs of Paramaribo provides great opportunity for housing of low-income groups. The areas concerned are in the outer-parts of Paramaribo, bordering the rural areas of the various surrounding districts. Construction of houses may lead to increased noise and dust, especially if services are crossing residential areas. Vulnerable roads can also be degraded by heavy traffic. In general, the potential social and environmental impacts of housing projects in- and bordering Paramaribo are negligible.

The rehabilitation of the **Paramaribo harbor** is the largest construction project in Paramaribo. The port is primarily used for the import of goods. Virtually all export occurs through private harbors along the Suriname River, except for wood and vegetables. For example, Suralco and BHP Billiton, and State Oil have their own harbor facilities from which they load and fuel the ships. Also rice is transported directly from Nickerie. The new harbor will be used for the export of shrimp, rice, fish and fish products, bananas, wood and woodproducts, and plants. Although the project has not yet been fully developed, the activities planned include repairing and reinforcing of the deck, increasing of storage capacity, the dredging of the port canal, and the renovation of a gasoline terminal. Although no impact assessment has yet been undertaken, initial activities do not seem to have potential negative impacts on the sea and land area surrounding the port. Their direct positive impacts are the improvement of port safety and the facilitation of import and export processing. The project for renovation of the harbor has been developed and is ready for tendering. The Harbor Authority is also building a new oil terminal, which is almost finished.

As soon as the actions for the canal dredging and reparation of oil terminals have been detailed, environmental impact assessments should be prepared to prevent and mitigate their likely impacts. The impacts of dredging may include relevant changes in sea sediment transportation process and marine biota, and sea water pollution. Oil terminal reparation work are not likely to cause significant impacts,

the risk of oil, gasoline, and other fuel spills should be assessed and prevented. In terms of opportunities, the rehabilitation of Paramaribo harbor will allow its compliance with international harbor regulations and promote industrial development.

The generation of wastes in the harbor has been identified as the main current environmental problem in the area. The port authority and NIMOS have already begun to discuss the scope of a waste management plan to solve this problem, to be developed and implemented in 2005.

Generally, there is a potential conflict in Paramaribo about the spatial planning of development projects. Due to the current limitations of the planning process, which hinders adequate coordination between activities, development projects might interfere with one another in various locations. The 2005 Annual Plan proposes the creation of an urban development plan for Paramaribo. A land use and management study has been conducted in 2002, with support of the IDB, but the development of implementation activities has been rather slow. Efforts to coherently and effectively plan the land use and management have already begun. The Ministry of Regional Development with the support of IDB held a workshop on the urban development planning of Paramaribo in January 2005. Three consultants have already been hired to prepare a preliminary study regarding the elaboration of the urban development plan. The initial ideas discussed during the workshop are related to the rehabilitation of the historical area and waterfront urban structures, and the improvement of the social, economic, and commercial conditions of the city. In addition, the Government is considering to implement a land management project in collaboration with the IDB.

Figure 16 Environmental impacts and opportunities of development projects in the Paramaribo Urban Area

Development project (main actions)	Affected area (environmental situation)	Likely impacts	Environmental and social risks/opportunities
Rehabilitation of bridges and sluices (Ministry of Public Works) Main Actions: <ul style="list-style-type: none"> ▪ civil works for building 4 pumping stations, 5 sluices, and one bridge 	Affected areas: by sluices: Boomskreek, Morgenstond, Jodenbreestraat, Weg-naar-zee, Limesgracht; bridge: Spoorloot near Nieuwweergevondenweg Environmental situation <ul style="list-style-type: none"> ▪ urban area affected by floods due to poor drainage 	Positive impacts: <ul style="list-style-type: none"> ▪ creation of temporary employment ▪ improvement of land drainage ▪ prevention of floods Negative impacts: <ul style="list-style-type: none"> ▪ minor disturbance of traffic ▪ flooding due to poor planning ▪ increase of water-born diseases ▪ odor 	Opportunity: reduced risk of disease outbreak
Low income shelter housing project (Ministry of Social Affairs and Housing) Main Actions: Construction subsidies for: <ul style="list-style-type: none"> ▪ Building new houses ▪ Renovation and expansion of existing houses 	Affected areas: Paramaribo, Para, Coronie, Wanica, and Commewijne districts. Environmental situation: <ul style="list-style-type: none"> ▪ no major environmental problem besides the current situation of urban areas in the above mentioned districts 	Positive impacts: <ul style="list-style-type: none"> ▪ access to better housing for low-income groups ▪ temporary employment Negative impacts: <ul style="list-style-type: none"> ▪ minor nuisance from noise and dust ▪ minor degradation of roads form heavy traffic 	None
Low cost housing project* (Ministry of Social Affairs and Housing) Main Actions: <ul style="list-style-type: none"> ▪ Building construction <i>No information available on number and location of houses to be built</i>	Affected areas: Paramaribo districts Environmental situation: <ul style="list-style-type: none"> ▪ no major environmental problem besides the current ones observed in Paramaribo urban areas 	Positive impacts: <ul style="list-style-type: none"> ▪ access to housing for low-income groups ▪ temporary employment Negative impacts: <ul style="list-style-type: none"> ▪ minor nuisance from noise and dust ▪ minor degradation of roads form heavy traffic 	No significant risks or opportunities
Rehabilitation of 275 km streets (Ministry of Public Works) Main Actions: <ul style="list-style-type: none"> ▪ filling potholes ▪ scraping ▪ leveling and repaving 	Affected area: Paramaribo inner-city and suburbs Environmental situation: <ul style="list-style-type: none"> ▪ no major environmental problem besides the current situation of Paramaribo urban areas 	Positive impacts: <ul style="list-style-type: none"> ▪ improvement of accessibility and transportation ▪ temporary employment Negative impacts: <ul style="list-style-type: none"> ▪ temporary traffic obstruction ▪ minor generation of dust and noise 	Risk: Increased illegal migration and urban uncontrolled growth

Development project (main actions)	Affected area (environmental situation)	Likely impacts	Environmental and social risks/opportunities
<p>Rehabilitation of Paramaribo Harbor* (Harbor Authority - <i>N. Havenbeheer Suriname</i>)</p> <p>Main Actions:</p> <ul style="list-style-type: none"> ▪ repairing and reinforcing the decks ▪ renovation of oil and gasoline terminals ▪ improvement of infrastructure (transportation) ▪ increasing the storage capacity ▪ dredging of the port canal ▪ creation of an industrial complex <p>* <i>the project has not yet been fully developed (dredging, industrial complex, renovation of terminals)</i></p>	<p>Affected area: Port sea and land influence areas</p> <p>Environmental situation:</p> <ul style="list-style-type: none"> ▪ no sea water pollution has been observed next to port installations ▪ environmental problems due to poor solid waste disposal 	<p>Positive impacts:</p> <ul style="list-style-type: none"> ▪ temporary and permanent employment generation ▪ improvement of port safety ▪ facilitation of import and export processing ▪ increase of revenues and export taxes <p>Negative impacts:</p> <ul style="list-style-type: none"> ▪ increase of solid wastes ▪ minor disturbance from traffic and noise increase from construction works ▪ potential changes in sea sediment transportation process and marine biota, and sea water pollution from dredging activities 	<p>Opportunity: compliance with international harbor regulations; potential industrial development after implementation of industrial complex</p> <p>Risks: oil, gasoline, and other fuel spills in terminals</p>

E. COUNTRY-WIDE PROGRAMS

Most of the Government actions of national scope for 2005 are related to environmental matters; implementation of international agreements, creation of environmental awareness, development of pollution standards, revision of environmental laws, and sustainable waste management, all of them beneficial to environmental protection.

Actions for the creation of a sustainable waste management system are already underway. A bill proposing its creation has already been drafted and is waiting for approval by the National Assembly. The main disposition of the bill relates to creating a state company responsible for managing the sustainable waste management system in the whole country. The company will be responsible, among others, for planning and implementing domestic, health, and industrial solid waste collection, as well as for treatment and final disposal of these wastes. Three studies are under way, with the support of the Dutch Government (part of Urban Environment Plan – UES), to prepare the system's implementation, respectively considering a landfill project for Paramaribo, solid waste collection measures, and a business plan for the institution to be created.

Although the 2005 Annual Plan includes a project on the revision of environmental laws, their final approval by the National Assembly is not anticipated in the near future. As fully described in Chapter 3, technical and political support are urgently needed to promote the approval of these laws and the issuance of complementary regulations for environmental protection and pollution control.

7. ENVIRONMENTAL ACTION STRATEGY: RECOMMENDED PRIORITY ACTIONS FOR ENVIRONMENTAL MANAGEMENT

On the basis of the diagnosis of the current and planned project situation as presented in previous chapters, the main environmental concerns are analyzed here as well as an indication of the areas where the Bank can support Suriname in its objective of reaching sustainable development¹⁶. The recommendations are meant to be an analytical tool for both the Government and the Bank in their evaluation of development projects and strategies for Suriname. The recommendations for improved environmental management are presented here in the form of an Environmental Action Strategy. The Strategy comprises five elements:

1. A summary of critical environmental and social issues;
2. Priority environmental and social action to address the issues;
3. Implementation of the recommendations of the Strategy;
4. Comprehensive Plan of Environmental Action,
5. Recommendations for IDB support in environmental management.

The five elements of the Environmental Action Strategy are discussed below.

A. CRITICAL ENVIRONMENTAL ISSUES

The critical environmental and social issues were identified from among the numerous issues analyzed in chapters 4 and 7. The critical issues were determined on the basis of the following criteria:

- Affected area is unique or valuable for its biodiversity and/or cultural heritage;
- Affected area shows few signs of previous human impacts;
- Affected area and population are important in terms of size;
- Impacts are irreversible or difficult/costly to restore.

The analysis of critical environmental issues is based on an assessment of their importance and urgency and furthermore relates the issue to Suriname's four ecological zones: (1) Marine and coastal zone, (2) Coastal plain/savanna belt, (3) Interior, (4) Paramaribo urban area.

1. Critical environmental issues in the marine and coastal zone

Issue 1 Degradation of marine and coastal ecosystems (estuaries, mangrove forest, shoreline); risk of fisheries depletion by over-fishing

The main economic activity in the marine zone is fishing for shrimp and several commercial fish species. Since 1996, over-fishing is depleting fish and shrimp populations.

Fisheries management is hindered by two main factors. First, a lack of data makes it impossible to monitor the fish stock and document the impact of certain fishing techniques. The last biomass survey was conducted in 1988. Second, control mechanisms are lacking. There is no efficient reporting center in the Marine Authority Suriname (MAS) or alarm number to call in case someone witnesses illegal acts; furthermore, MAS does not have the resources to stop violators.

¹⁶ See also: Kates, Robert W., Parris Th. M. and Leiserowitz, A.A. What is Sustainable Development? Goals, indicators, values, and practice. *Environment*, Vol. 47, nr. 3. April 2005.

2. Critical environmental issues in the coastal plain/savanna belt

Issue 2 Excessive and in appropriate use of agricultural chemicals, in particular in rice farm industry and large scale banana plantations

The rice sector is the most important agricultural sub-sector, representing 60% of agricultural land and labor. In addition to rice, large-scale agriculture on the Coastal Plains includes banana production. In the districts of Saramacca, Wanica, and Commewijne, small agriculture is the main economic activity and fruits and vegetables produced are sold on the Paramaribo markets. Inappropriate handling and use of agrochemicals have exposed laborers to contamination and health hazards, and polluted fresh and brackish water and soil. In Nickerie and Saramacca, for instance, residues of agricultural chemicals applied near fresh and brackish water systems have been toxic to fish and birds. The Directory of Agricultural Planning and Development of LVV does not currently have the capacity to adequately deal with environmental issues. The Ministry of Agriculture is in the process of developing a Pesticide Management Plan, which is to be based upon international standards for use and transboundary movement of pesticides.

3. Critical environmental issues in the Interior

Issue 3 Uncontrolled deforestation and logging, with loss of biodiversity and soil erosion as a consequence.

Logging concessions cover more than 40% (2.2 million ha) of Suriname's land mass. Sixty percent of Indigenous and Maroon communities are located within these concessions. A lack of consultations with these parties and other stakeholders, combined with poor regulation and control, are a source of tension and conflict about forest user rights.

About 435,000 ha of the forests in concession are in communal *Houtkapvergunning* (HKV) areas. The original purpose of the HKV was to provide the timber needs of interior populations – Indigenous people and Maroons. Since 1992, commercial timber extraction in these areas has been permitted, and about 25,000 ha are now being logged commercially every year.

The government has proposed to improve forest management through the installation of a Forest and Nature Management Authority and through the national forest policy that was developed in 2003 with support of the IDB. Neither of these plans has materialized into a strategic action plan and actions on the ground.

Issue 4 Small-scale gold mining-related land degradation, resource pollution, and social problems;

Small-scale gold mining and the supporting service economy (transport, commerce) have become the main source of cash income for many Maroon households and induced the migration of tens of thousands of Brazilian *garimpeiros* to Suriname since the 1980s. The environmental and social impacts of small-scale gold mining include mercury pollution, water contamination, soil degradation and destruction, and the increased spread of malaria and sexually transmitted diseases including HIV AIDS. Limited access to public health care aggravates the situation.

Issue 5 Large-scale mining impacts

Mining projects involve mining, transportation, and processing of minerals and construction materials. Large-scale gold mining is taking place at Gross Rosebell, and bauxite mining at various locations in Suriname. Large-scale mining may involve the removal of vegetation and soil, degradation and contamination of surface waters and aquifers (including the effects of toxic chemicals such as cyanides used in processing), habitat modification affecting wildlife, land use conflicts, and road damage and

accidents. To date, few revegetation programs on abandoned mine sites have been successful. Little outside monitoring of environmental effects of mining operations is taking place. Even though mining companies have adopted their own standards, monitoring and emergency system, independent monitoring of their environmental management by Government is required, and usually welcomed by mining companies.

Issue 6 Illegal trade in wildlife and bush meat

Demand for bush meat, live (exotic) pet animals, and animal products for consumption (e.g. eggs) and ornamental purposes (e.g. colored feathers) are increasingly placing pressure on wildlife populations. There are no data on the catch and market potential for wild animals and animal products, nor is there an effective monitoring system in place. The human and material resources of the Nature Conservation Division are inadequate to control hunting, particularly further in the interior. WWF-Guianas is providing monitoring training to game wardens and is working with the University of Suriname to study the wildlife market in Paramaribo.

Issue 7 Lack of specific rights to land and other natural resources of Indigenous peoples and Maroons

Approximately 13% of the Suriname population consists of Indigenous peoples and Maroons. By signing various international agreements and by its own rhetoric, the Government of Suriname has taken on the obligation to respecting the dignity, human rights, and cultural uniqueness of these ethnic minority groups in the development process. In practice, however, tribal societies and their customary rights are seldom considered in planning for large-scale industrial development (e.g. mining, logging, power plant construction). Tourism projects tend to be more considerate about Indigenous peoples and Maroons, who are frequently involved as guides and other workers in the operations. The neglect of Indigenous peoples and Maroons and their customary rights will continue as long as the national Constitution lacks clauses to ensure that these tribal groups do not suffer adverse effects during the development process, and that they receive culturally compatible social and economic benefits.

4. Critical environmental issues in the Paramaribo urban area

Issue 8 Lack of adequate sanitation (drainage and sewage disposal, water supply, solid waste management)

Public health and safety are concerns in the Paramaribo urban area. The city has substantial problems with excess water. The city has outgrown its drainage capacity and its wastewater disposal systems, which need rehabilitation and expansion. To address this problem, it is anticipated that the “Master water drainage plan” will soon be implemented by the Water Supply Company (SWM) and that the networks, designed after World War II, will be rehabilitated as part of this effort. Wastewater is not treated prior to disposal and there are no plans to do so in the near future. As a result, water polluted by domestic and industrial use flows directly into the Suriname River.

Drinking water for Paramaribo is extracted from two aquifers: the Coesewijne formation aquifer (Zanderij) and the Burnside formation aquifer (Greater Paramaribo). Two years ago, bauxite mining in the Old Coastal Plain endangered this water supply, causing lowered water levels that resulted in an increased level of turbidity, manganese, and iron ions, and the formation of sludge at discharge points for drinking water.

Waste is not properly managed and illegal dumping along roads and burning in residential areas is common practice. Solid waste is collected in open dumpsites, enabling gases and particulate matter to reach surrounding residents by the wind. Efforts to improve the situation are ongoing with studies conducted under supervision of the Ministry of Public Works. The IDB assigned a consultant to prepare a diagnosis of the sanitary situation in Paramaribo and recommendation on sanitation priority actions. This recently completed study was not available to the CEA consultant team.

B. PRIORITY ENVIRONMENTAL AND SOCIAL ACTIONS

A number of environmental and social actions is required to address the eight critical environmental issues identified above. In fact, the issues can best be addressed through a combination of General Actions and Specific Actions, which we call priority actions, as follows:

- 1) General priority actions; these are national environmental management framework actions that are critical in addressing almost all critical issues, and
- 2) Specific priority actions; these are actions that apply to a specific critical environmental-issue.

These two kinds of actions are presented and discussed below.

1. General environmental and social priority actions

The general environmental management framework actions that are required to help address most of the critical, and also the non-critical issues, are in two categories: (1) legal measures, and (2) awareness building, as follows:

General Action A. Adopt modern environmental legislation

Environmental legislation is essential to the promotion of sustainable development in the country as well as for the efficient use of environmental management tools, such as environmental impact assessment of development projects, environmental management plans, and pollution control.

The highest priority from an environmental perspective is the approval of the environmental bills that were initially developed by NIMOS and are now being reviewed by ATM: the Environmental Management Act and the Institutional Responsibilities Act. They should be approved as soon as possible in order to provide a basis for environmental management in Suriname. The sequence of actions is: a) conclusion of the final versions of both bills by the appointed commission composed of public servants of NIMOS and ATM and representatives of the National Council for the Environment; b) placing both acts on the national agenda for Parliament.

General Action B. Develop regulations to implement environmental legislation

Once both laws are adopted, environmental regulations must be reviewed and finalized. In particular, EIA draft regulations already formulated by NIMOS staff should be finalized and applied immediately. These regulations must be brought in line with possible changes made in the original environmental act proposal. Also, criteria and guidelines must be devised to provide better environmental management and monitoring of development projects. Specific regulations are also required to comply with international convention obligations.

General Action C. Prepare an Environmental Awareness and Public Participation Program

Environmental awareness and public participation in environmental decision making are essential to sustainable environmental management. Promoting awareness and public participation have been on the national agenda for many years, but with limited results. A recent survey showed that most youngsters between the age of 16 and 30 were unaware of the international environmental treaties adopted by Suriname and the national institutions handling environmental issues in Suriname.

An earlier draft of the Environmental legislation guaranteed the participation of civil society, NGOs, the private sector, and other stakeholders in environmental management. In the revised draft, however, these sections have been removed and provisions for public participation are weak.

It is recommended that an Environmental Awareness and Public Participation Program be developed, beginning with a comprehensive baseline study on environmental awareness among top-level decision makers and politicians, then the general public, civil servants, small-scale industry, and large-scale industry. The baseline study should serve to develop an environmental awareness and education strategy. Possible program activities should include: development of curricula for schools, the training of teachers, and implementation of educational demonstration projects; creation of a school yearly award for the best environmental project. The strategy for improving public participation should include the identification of the range of situations and development projects where stakeholders may be involved; development of participatory procedures; and implementation of a “pilot project” to test the proposed strategy. Key government departments to be involved are: the Geological and Mining Service, Suriname Forest Service, and Fisheries Service. A group of consultants working under the supervision of ATM and NIMOS would be responsible for program formulation and execution.

2. Specific environmental and social priority actions

The specific environmental and social actions that are necessary to address the critical environmental issues are summarized in the table (Figure 1) and discussed below.

Figure 17 Critical environmental issues and specific priority actions

ID of Issue and Action	Critical Environmental Issue	Specific Environmental Priority Action
1.	Degradation of marine and coastal ecosystems	a. Develop a database on fish diversity and abundance b. Support the implementation of the Vessel Monitoring System
2.	Excessive and inappropriate use of agricultural chemicals	a. Prepare a National Pest Management Plan b. Conduct an agrochemicals awareness campaign
3.	Uncontrolled deforestation and logging	a. Implement the Forest policy b. Create a coordinating body for public natural resources management
4.	Small-scale gold mining-related degradation and pollution	a. Implement PLANTPROP report ¹⁷ recommendations b. Conduct an environmental awareness campaign in gold mining areas c. Organize a stakeholders workshop on the proposed mining law
5.	Large-scale mining impacts	a. Monitor the environmental management of large mining operations b. Organize a stakeholders workshop on the proposed mining law
6.	Illegal trade in wildlife and bush meat	a. Create a coordinating body for public natural resources management b. Conduct a national baseline study in wildlife and bush meat trade c. Support WWF activities in controlling illegal trade practices
7.	Lack of rights to land and other natural resources for the Indigenous and Maroon population	a. Apply the IDB Indigenous Peoples' Policy to all projects involving Indigenous peoples b. Support the mapping of lands used for Indigenous peoples' livelihood activities c. Promote official Government recognition of the Indigenous Peoples' land and land use rights
8.	Lack of adequate sanitation in urban areas	a. Implement the recommendations Water Supply and Sanitation Sector diagnostic study. b. Support implementation of the Urban Environmental Sector Plan.

¹⁷ Ministry of Labour, Technological Development and Environment. National Institute for Environment and Development in Suriname. PLANTPROP. *Greenstone belt gold mining - Regional Environmental Assessment*. September 2003. Paramaribo, Suriname.

Specific Action 1a. Develop a baseline database on fish diversity and abundance

Initiatives to tackle coastal and marine management are in the beginning, and comprise:

- (i) the project Integrated Coastal Zone Management, a study supported by IDB;
- (ii) in the context of the Non-Urban Environmental Planning process a policy and action plan for sustainable management including marine and coastal zone resources management; and
- (iii) the Vessel Monitoring System, a vigilance system to prevent the depletion of fisheries and to control fish stocks (although no data exist on marine fish diversity and stocks) together with the creation of a National Coast Guard.

The recommended action is the financing of a project for building up a baseline database on fish diversity and abundance; the project would be coordinated by the Department of Fisheries in cooperation with NIMOS and the University of Paramaribo. Consultancy by experts on computer system analysis and salt water fish ecology will be needed to formulate and develop the data base. Implementation will also require purchase of equipment, software, and training of staffs. Training of local fishermen, to be organized after the identification of the training demands and implemented, under the supervision of the Department of Fisheries, by ADEK University, with the involvement of NIMOS, local fisher communities, and the Fisheries Service Industry. The database could be integrated with the environmental information system to be developed by NIMOS.

Specific Action 1b. Support the implementation of the Vessel Monitoring System

The action is designed to counter the degradation of coastal ecosystems and to monitor fish stocks. Support for material and expertise is required for a Vessel Monitoring System proposed by the Ministry of Agriculture, Cattle Ranching, and Fisheries (Department of Fisheries), Ministry of Defense, and Ministry of Police and Justice. Meetings with representatives of these organizations and foreign experts would be a first requirement to establish the various system design options and needs.

Specific Action 2a. Prepare a National Pest Management Plan

Recently, LVV developed a pesticide management strategy, which resulted in the agreement between the ministry and importers of pesticides on a pesticide sales registration system. A recent adjustment to the Pesticides Law (*Bestrijdingsmiddelenwet*) provides legal backing to the proposed management strategy.

It is recommended to develop a pest management plan, a comprehensive plan to address all pest management issues. Such issues arise in Suriname as a result of increased use of agricultural chemicals, fertilizers and pesticides in the following situations:

- new land-use development or changed cultivation practices in an area,
- significant expansion into new areas,
- diversification into new crops in agriculture,
- intensification of existing low-technology systems,
- procurement of relatively hazardous pest control products or methods.

The issues are of particular environmental and health concern in the proximity of protected areas or important aquatic resources and in relation to worker safety.

At present LVV is developing a pesticide management plan, which includes transboundary movement, labeling, packaging, tracing, handling and storage of agricultural chemicals. It is recommended to support the completion of this plan in the broader context of a pest management plan which includes Integrated Pest Management activities as a means to reduce pesticide use.

The first phase of the pest management plan is an initial reconnaissance to identify the main pest problems and their contexts (ecological, agricultural, public health, economic, and institutional) and to

define broad parameters for improved management. The second phase of the pest management plan involves the development of specific operational plans to address the pest problems identified. This should include the establishment of labs to conduct residue analyses.

Specific Action 2b. Conduct an agrochemicals awareness campaign

In order to address the concerns about excessive and in appropriate use of agricultural chemicals, it is recommended to develop and conduct a chemicals awareness campaign in agricultural communities. The campaign should be concentrated in the rice farming and large-scale banana plantations, notably Nickerie. Activities would include TV flashlights, a radio discussion program, folders, and so forth. The campaign could be led by the Ministry of Agriculture, with the participation of ATM and NIMOS, and executed by expert consultants (social communication and agrochemical).

Specific Action 3a. Implement the Forest Policy

Effective prevention and mitigation of environmental impacts and risks from the implementation of forest exploitation and wood logging projects depend on the improvement of the environmental institutional and legal framework. A new Forest Policy was drafted and approved by the stakeholders, including Indigenous groups and Maroons. At present the draft Policy is awaiting approval.

Specific Action 3b. Create a coordinating body for public natural resources management I

Improved forest management has been the object of a number of technical cooperation programs (Sustainable Forestry Management, Protection Areas Effective Management and Regional Integration, Collaboration and Networking projects, as part of the Guyana's Sustainable Forest Resource Management Program supported by WWF; and the Suriname Conservation Foundation programs, supported by UNDP).

It is recommended to establish an umbrella organization that coordinates the activities of the various government organizations responsible for natural resources management. The creation of such an organization has been approved by the Council of Ministers.

Specific Action 4a. Implement the recommendations of the PLANTPROP report¹⁸ on Small-scale gold mining

In order to mitigate the negative impacts of small scale mining, the NIMOS/IDB initiated PLANTPROP report proposed a series of activities designed to remediate past damage of gold mining, control current environmental impacts, prevent and minimize the incidence of new damage. The activities have been organized in an environmental management plan that aims at the capacity building for mining development, including coordinated action among government and non-government organizations, and improvement of health care and other social conditions of communities engaged in small-scale gold mining. The proposed activities are:

- Capacity building for environmental management;
- Mining site rehabilitation in Brownsberg Nature Park;
- Mining pollution control;
- Improvement of access to health care for inhabitants of the Green Stone Belt; and
- Mercury contamination research.

Specific Action 4b. Conduct an environmental awareness campaign in gold mining areas

To contribute to the immediate alleviation of environmental problems brought by small-scale gold mining, a recommended priority action is the development and implementation of an environmental

¹⁸ Ministry of Labour, Technological Development and Environment. National Institute for Environment and Development in Suriname. PLANTPROP. *Greenstone belt gold mining - Regional Environmental Assessment*. September 2003. Paramaribo, Suriname.

awareness campaign in small-scale gold mines and surrounding communities; WWF-Guianas has conducted a study on the current state of the mining sector that can be used as a guideline for this work, hence collaboration with WWF is recommended.

Specific Action 4c. Organize a stakeholders workshop on the proposed mining law

The Mining Code is a necessary basis for regulation of the sector and control of environmental pollution. The current draft, which has been in draft form for some years now, does not reflect the realities in the field, and has already been rejected by Indigenous and Maroon representatives. The organization and facilitation of a workshop with various stakeholders in the small-scale mining industry to discuss the mining law is recommended as an urgent measure to control degradation and pollution. Participants should include the minister of Natural Resources or his delegate, officials from GMD, small-scale gold miners, concession holders, Maroon and Indigenous representatives, and authorities of villages positively and negatively affected by mining activity. The already mentioned study developed by WWF-Guianas could serve as a basis for discussion. The workshop facilitator should be independent and have no financial interests in the mining industry.

Specific Action 5a. Monitor the Environmental Management of Large Mining Operations

It is recommended to design and implement a project, which would permit the effective assessment and monitoring of the environmental management activities of large gold mining companies. Its main activities would be:

- technical cooperation and information exchange agreements between NIMOS and each one of the mining companies;
- the transfer of environmental technology and procedures
- joint review of feasibility and environmental studies and environmental management plans; follow-up of mining exploitation and impact monitoring activities;
- joint formulation of guidelines and pollution control standards for environmental impact assessment and environmental audit of gold mining and processing activities;
- design and implementation of training events for public officials (NIMOS and GMD) on environmental control and management; and

The recommendation is that the project “Large Gold Mining Environmental Management”, proposed in the environmental management plan of the PLANTPROP report, be expanded to include all mining areas. The monitoring program should be conducted under responsibility of NIMOS.

Specific Action 5b. Organize a stakeholders workshop on the proposed mining law

See Specific Action 4.c above.

Specific Action 6a. Create a coordinating body for public natural resources management

See Specific Action 8.b

Specific Action 6b. Conduct a national baseline study in wildlife and bush meat trade

It is recommended to conduct a national baseline study on wildlife and bush meat trade. This study should cover the following topics:

- Size of bush meat trade in various regions of Suriname;
- Types of animals and animal products being traded (special attention paid to rare and endangered species);
- Marketing chain, including prices;
- Causes;
- Estimated effects on local wildlife populations; and
- Opportunities for wildlife management.

Specific Action 6c. Support WWF activities in controlling illegal trade practices

WWF is active in the areas of capacity building among game wardens and awareness among local hunters. Additional support to this significant program is recommended.

Specific Action 7a. Apply the IDB Indigenous Peoples' Policy to all projects involving Indigenous peoples

The IDB Indigenous Peoples Policy and Strategy will be approved by the end of 2005. The Policy, in particular, will be applied to all IDB projects that either directly or indirectly affect Indigenous populations. In addition to the standards contained in the Indigenous Peoples' policy, IDB member governments should also be encouraged to meet the obligations in the various international instruments that they have signed.

In order to assist with the implementation of the Indigenous Peoples policy, an assessment of the legal framework concerning Indigenous peoples and Maroons might be useful.

Specific Action 7b. Support the mapping of lands used by Indigenous peoples

An important activity to help implement an Indigenous peoples' policy is the mapping of the land used by Indigenous people. Indigenous and Maroon groups in various parts of the Suriname are already involved in ongoing mapping exercises. However, poor communication between NGOs is leading to project overlap, while some regions or ethnic groups are left out. It is advisable that the various parties involved in mapping hold a central workshop to exchange information and develop a coherent approach. Also, additional mapping will require funds for surveys, production of maps, equipment, training of indigenous peoples organizations, and participatory and consultation events. Local Indigenous and Maroon organizations could manage the activities, with the support of NGOs.

Specific Action 7c. Promote formal Government recognition of Indigenous Peoples' land resource and land use rights

The formulation of a Policy and mapping of land use by/for Indigenous and Maroon groups is of limited value unless the Policy, including the formulation of legal rights, and the state of land use and plans are formally recognized by the Government and Indigenous and Maroon groups as legal instruments. Lack of communication and misunderstandings currently are hampering constructive dialogue about land rights. We recommend the establishment of a work group for discussion about land rights and the drafting of guidelines for legal reform. Such dialogue between the various stakeholder groups is currently lacking, causing misunderstanding and mistrust, and subsequently obstructing progress towards the development of policy measures for the protection of Indigenous peoples and Maroons. The commission should include representatives of all Indigenous and Maroon groups (incl. translators); government representatives including the district administrations of Sipaliwini and Brokopondo; local indigenous organizations (e.g. VIDS); international NGOs active in Suriname; national and international human rights lawyers; and other stakeholders. Media representatives should be invited to all meetings to spread awareness about the issue and increase public pressure.

Specific Action 8a. Implement the recommendations of the Water Supply and Sanitation Sector Diagnostic Study

The IDB supported a recent Technical Cooperation study, the Water Supply and Sanitation Sector Diagnostic Study, which made specific recommendations for action.

Specific Action 8b. Support implementation of the Urban Environmental Sector Plan

The Urban Environmental Sector Plan, supported by the Dutch Government, foresees the implementation of several infrastructure projects (water supply, sanitation, waste management systems, soil protection).

C. IMPROVED IMPLEMENTATION OF ENVIRONMENTAL AND SOCIAL ACTION

In order to ensure effective implementation of the actions proposed here, certain measures would be required to strengthen existing institutions with environmental responsibilities.

A number of Government agencies, private organizations and individual citizens are normally involved in implementing or coordinating environmental actions in Suriname. Here we first discuss the organizations that are best suited to have an implementing or coordinating role in the priority environmental actions. Then, we give recommendations regarding institutional strengthening of these institutions.

1. Implementing agencies

The organizations best suited for an implementing or coordinating role in the priority environmental actions identified in the previous section are summarized in Figure 2.

The adoption of a modern environmental legislation, promotion of environmental awareness and public participation, implementation of the Greenstone Belt environmental management plan and the environmental management of large mining companies would be under the coordination of ATM, and jointly developed by ATM Environmental Division and NIMOS. Technical assistance and guidance of consulting firms would be needed in most actions, except for the adoption of the environmental legislation, where ATM needs to finish the text of the bills, and present them to the National Assembly.

Likewise, the Ministry of LVV, through the Department of Fisheries, would coordinate the development of the database on fish diversity and abundance and the implementation of the Vessel Monitoring System. The Department Research, Marketing, and Processing in the same ministry would coordinate the agrochemical awareness campaign and prepare of the National Pest Management Plan. The Ministry of Regional Development would coordinate the actions related to the right of Indigenous peoples. All actions will require technical guidance by consultants.

Figure 18 Implementation of environmental actions

Action ID	Environmental Priority Action	Coordinating / Implementing Organization
General Action A	Adopt modern environmental legislation	ATM, NIMOS
General Action B	Develop regulations to implement environmental legislation.	ATM, NIMOS/ Consultants
General Action C	Prepare an Environmental Awareness and Public Participation Program	ATM, NIMOS/ Consulting firm
Specific Action 1	a. Develop a baseline database on fish diversity and abundance c. Support the implementation of the Vessel Monitoring System	Ministry of Agriculture/, /Department of Fisheries/ Consulting firm
Specific Action 2	a. Prepare a National Pest Management Plan b. Conduct an agrochemicals awareness campaign	Ministry of Agriculture/ Department of Research, Marketing, and Processing (<i>Onderzoek, Afzet, en Verwerking</i>) Consulting firm
Specific Action 3	a. Implement the Forest policy d. Create a coordinating body for public natural resources management	Ministry of Natural Resources, Nature Conservation Division
Specific Action 4	a. Implement PLANTPROP report ¹⁹ recommendations b. Conduct an environmental awareness campaign in gold mining areas d. Organize a stakeholders workshop on the proposed mining law	ATM, NIMOS/ NGO and Consulting firms
Specific Action 5	a. Monitor the environmental management of large mining operations e. Organize a stakeholders workshop on the proposed mining law	ATM, NIMOS/ Consulting firm
Specific Action 6	a. Create a coordinating body for public natural resources management b. Conduct a national baseline study in wildlife and bush meat trade d. Support WWF activities in controlling illegal trade practices	Ministry of Natural Resources, WWF-Guianas
Specific Action 7	a. Apply the IDB Indigenous Peoples' Policy to all projects involving Indigenous peoples b. Support the mapping of lands used for Indigenous peoples' livelihood activities c. Promote official Government recognition of Indigenous Peoples' land and land use rights	Ministry of Regional Development/ NGOs/ Consulting firm
Specific Action 8	a. Implement the recommendations Water Supply and Sanitation Sector diagnostic study. d. Support implementation of the Urban Environmental Sector Plan.	Ministry of Public Works

¹⁹ Ministry of Labour, Technological Development and Environment. National Institute for Environment and Development in Suriname. PLANTPROP. *Greenstone belt gold mining - Regional Environmental Assessment*. September 2003. Paramaribo, Suriname.

2. Institutional strengthening actions

The effective and timely implementation of environmental actions, projects, programs, or otherwise, is not an easy undertaking in Suriname, for the simple reason that responsible government entities are often understaffed and ill-equipped and interested private sector parties often lack the necessary technical expertise and management skills. This situation is in part due to a limited pool of skilled workers available in a country with a total population that is limited. It is therefore important to strengthen existing institutional capabilities, and to do so in the widest possible sense, Government and private sector.

An important issue that has weakened the coordinating role of ATM and NIMOS is the imprecise and ambiguous division of functions between both institutions. Since the supervision of NIMOS was given to ATM overlaps of tasks have occurred, and uncertainty about the role of NIMOS has grown. In addition, the ATM Environmental Division has not yet been fully organized, though a significant number of activities have been assigned to its staff, without any systematic capacity building or strategic planning to identify work programs, defining of priorities, and setting of environmental objectives.

Insufficient technical capacity has been identified in Chapter 3, as an important issue to be addressed with regard to the performance improvement of the National Council for Environment (NCE) and the Inter-ministerial Advisory Commission (IMAC). The lack of appropriate administrative support by NIMOS and adequate budgetary provisions from the government are at the root of NCE's and IMAC's weakness. IMAC, a commission in charge of action coordination and cooperation among NIMOS and other ministries regarding the implementation of sectoral environmental management, has never been fully implemented.

NIMOS institutional capacity also is a concern. In spite of the technical advances achieved with the implementation of the Environmental Management Technical Cooperation program, financed by IDB and the European Union from 1999 to 2003, additional support is still needed, as described in Chapter 3. A proposal for the second phase of the program was elaborated in 2002, and contained a broad survey of the institutional and financial requirements for NIMOS strengthening. In particular, the Environmental Planning and Information Office, although a part of the NIMOS organizational structure, has not yet been put into service due to the lack of financial resources and technical capability. One of its functions would be the coordination, design and implementation of the National Environmental Management Plan and other specific programs.

Against this background, two main actions for environmental strengthening are recommended.

Institutional Action 1. Improve the performance of ATM Environmental Division and its relationships with NIMOS

The recommendation here is to organize two workshops by ATM and NIMOS with IDB technical support. The first workshop would be held with the objective of discussing and clearly defining the roles and functions of each institution; the second, in which representatives of key ministries (Natural Resources, Health, Regional Development, Planning, and Public Works) would be invited to participate, would aim at starting a strategic planning process to orient the activities of ATM and NIMOS, as well as defining coordination mechanisms with other governmental departments.

Institutional Action 2. Formulate and implement a National Environmental Institutional Strengthening Program

The general objective of the program will be to strengthen the key functions of key national institutions, NIMOS, NCE, and IMAC to carry out their assigned tasks. Its specific objectives should include the provision of an effective administrative support for NCE and IMAC; capacity building and installation of NIMOS Environmental Planning and Information Office; review and complementation of EIA regulations, norms, and environmental standards; and training of key government department officers and Indigenous peoples organizations on environmental management. The implementation of the Environmental Planning and Information Office should be the main program activity, comprising: provision of staff; development of a training program on environmental management and planning; creation of an environmental information system; execution of a pilot environmental management. Program formulation and implementation would be coordinated by ATM, and jointly developed by ATM Environmental Division and NIMOS, with technical guidance of a consulting firm and the financial support of IDB.

Institutional Action 3. Strengthen the capacity for environmental management in the Ministries of Agriculture and Public Works

In view of the important environmental actions identified above that need to be undertaken under responsibility of the Ministries of Agriculture and Public Works in particular, it is recommended to set up environmental units in these ministries staffed by persons trained to manage the resolution of the specific environmental issues of concern to each ministry.

D. COMPREHENSIVE PLAN OF ENVIRONMENTAL ACTION

Our analysis above demonstrates that a series of actions is needed to address eight specific environmental priority issues in Suriname: these are (1) specific actions geared to the specific issue, (2) general framework actions designed to provide the essential legal framework and public awareness, and (3) institutional actions necessary to ensure effective implementation. An overview of all these actions is given in Figure 3 below. The same figure also gives an indication of the urgency of implementation of the environmental and social actions in question. The urgency of the environmental and social actions is determined by (1) the affected area and people, (2) environmental impact, and (3) the economic importance of the threatened environmental resource. We distinguish between the urgently needed actions and those of somewhat less urgency, as follows: 1 = very urgent, 2 = urgent, and 3 = somewhat urgent.

The first and foremost priority action is the approval of the two environmental bills, thus creating a legal framework and background for the implementation of environmental management tools. Legal reform is a requirement both for the implementation of a modern and efficient environmental management system, and for the effectiveness of many of the other specific environmental and social priority actions.

The proposed institutional action related to the definition of the roles of ATM and NIMOS should be implemented before any other institutional strengthening measures, as it affects the good performance of environmental management all over Suriname.

Figure 19 Comprehensive Plan of Environmental Action

Priority Issue	Action ID	Environmental Priority Action	Urgency
	General Action A	Adopt modern environmental legislation	1
	General Action B	Develop regulations to implement environmental legislation.	1
	General Action C	Prepare an Environmental Awareness and Public Participation Program	1
1. Degradation of marine and coastal ecosystems	Specific Action 1	a. Develop a baseline database on fish diversity and abundance b. Support the implementation of the Vessel Monitoring System	2 1
2. Excessive and inappropriate use of agricultural chemicals	Specific Action 2	a. Prepare a National Pest Management Plan b. Conduct an agrochemicals awareness campaign	2 3
3. Uncontrolled deforestation and logging	Specific Action 3	a. Implement the Forest policy b. Support creation of a coordinating body for public natural resources management	2 2
4. Small-scale gold mining-related degradation and pollution	Specific Action 4	a. Implement PLANTPROP report ²⁰ recommendations b. Conduct an environmental awareness campaign in gold mining areas c. Organize a stakeholders workshop on the proposed mining law	2 2 1
5. Large-scale mining impacts	Specific Action 5	a. Monitor the environmental management of large mining operations b. Organize a stakeholders workshop on the proposed mining law	2 1
6. Illegal trade in wildlife and bush meat	Specific Action 6	a. Support creation of a coordinating body for public natural resources management b. Conduct a national baseline study in wildlife and bush meat trade c. Support WWF activities in controlling illegal trade practices	2 3 2
7. Lack of rights to land and other natural resources for the Indigenous and Maroon population	Specific Action 7	a. Apply the IDB Indigenous Peoples' Policy to all projects involving Indigenous peoples b. Support the mapping of lands used for Indigenous peoples' livelihood activities c. Promote official Government recognition of Indigenous Peoples' land and land use rights	1 3 2
8. Lack of adequate sanitation in urban areas	Specific Action 8	a. Implement the Water Supply and Sanitation Sector diagnostic recommendations b. Support the Urban Environmental Sector Plan NA	2 3
	Institutional Action 1	Improve the performance of ATM Environmental Division and its relationships with NIMOS	2
	Institutional Action 2	Formulate and implement a National Environmental Institutional Strengthening Program	1
	Institutional Action 3	Strengthen the capacity for environmental management of the Ministries of Agriculture and Public Works.	1

* In the column "urgency" 1 = very urgent, 2 = urgency, and 3 = somewhat urgent

²⁰ Ministry of Labour, Technological Development and Environment. National Institute for Environment and Development in Suriname. PLANTPROP. *Greenstone belt gold mining - Regional Environmental Assessment*. September 2003. Paramaribo, Suriname.

E. RECOMMENDATIONS FOR IDB ENVIRONMENTAL SUPPORT

In addition to the various stakeholders listed in the implementation table, we recommend that IDB take an active role in carrying out some of the recommended actions presented in Table 19. The actions that appear particularly suited for IDB participation are listed in the table and discussed in the text below.

Figure 20 Possibilities for IDB support to Suriname in environmental and social action

Action ID	Environmental Priority Action	Potential IDB support
General Action A	Adopt modern environmental legislation	Political support
General Action B	Develop regulations to implement environmental legislation.	Financing, in the context of the Institutional Strengthening Program
General Action C	Prepare an Environmental Awareness and Public Participation Program	Program formulation; coordination of actions by other donors, such as WWF, UE and UNDP, involved in awareness activities
Specific Action 1	a. Develop a baseline database on fish diversity and abundance b. Support the implementation of the Vessel Monitoring System	Financial support (individual TC project), perhaps associated with the Institutional Strengthening Program
Specific Action 2	a. Prepare a National Pest Management Plan b. Conduct an agrochemicals awareness campaign	Fund preparation of the Plan in a TC Fund consultant to conduct campaign
Specific Action 3	a. Implement the Forest policy b. Support creation of a coordinating body for public natural resources management	Provide financial support to ongoing activities
Specific Action 4	a. Implement PLANTPROP report ²¹ recommendations b. Conduct an environmental awareness campaign in gold mining areas c. Organize a stakeholders workshop on the proposed mining law	a. Financial support for the implementation of Program Capacity building for Environmental management, and Mining Pollution Control Project; and help identifying other donors and financial sources b & c. Direct financial support (TC individual project)
Specific Action 5	a. Monitor the environmental management of large mining operations b. Organize a stakeholders workshop on the proposed mining law	a. Financial support to come from large mining companies. No IDB support recommended b. Direct financial support (TC individual project)
Specific Action 6	a. Support creation of a coordinating body for public natural resources management b. Conduct a national baseline study in wildlife and bush meat trade c. Support WWF activities in controlling illegal trade practices	Direct financial support (TC individual project)

²¹ Ministry of Labour, Technological Development and Environment. National Institute for Environment and Development in Suriname. PLANTPROP. *Greenstone belt gold mining - Regional Environmental Assessment*. September 2003. Paramaribo, Suriname.

Action ID	Environmental Priority Action	Potential IDB support
Specific Action 7	<ul style="list-style-type: none"> a. Apply the IDB Indigenous Peoples' Policy to all projects involving Indigenous peoples b. Support the mapping of lands used for Indigenous peoples' livelihood activities c. Promote official Government recognition of Indigenous Peoples' land and land use rights 	<ul style="list-style-type: none"> a and b.: Training and financial support (individual TC project) c. Political support and awareness building
Specific Action 8	<ul style="list-style-type: none"> a. Implement the Water Supply and Sanitation Sector diagnostic recommendations b. Support the Urban Environmental Sector Plan NA 	Possibly project support in conjunction with Dutch assistance
Institutional Action 1	Improve the performance of ATM Environmental Division and its relationships with NIMOS	Political influence and financing of workshops (individual TC project)
Institutional Action 2	Formulate and implement a National Environmental Institutional Strengthening Program	Financing, in the context of the Institutional Strengthening Program
Institutional Action 3	Strengthen the capacity for environmental management of the Ministries of Agriculture and Public Works.	Financing, in the context of the Institutional Strengthening Program

IDB could have a significant role in the implementation of the environmental priority actions proposed in the present chapter. Most important is the opportunity to provide political motivation and incentive for the adoption of a modern environmental legislation, a first order priority for the promotion of sustainable development in the country (General Action A). Note that Suriname is the only country in the region that has not yet edited a framework environmental law and corresponding regulations.

For General Action C, the development of an Environmental awareness and public participation program, IDB's contribution could be limited to a technical cooperation project on the formulation of the program. As a number of other donors are supporting environmental awareness activities associated with tourism development (European Union), mining and forest development (WWF), protected areas (UNDP), program formulation would be an opportunity to coordinate and maximize the outputs of these activities.

An IDB Technical Cooperation project is recommended to carry out the proposed Institutional Strengthening Program, which could be considered a second phase of the Environmental Management Technical Cooperation for NIMOS institutional building. As mentioned above, the program objectives would include the provision of an effective administrative support for NCE and IMAC; capacity building and installation of NIMOS Environmental Planning and Information Office; building up of an environmental information system; review and complementation of EIA regulations, norms, and environmental standards; and training of key government department officers and Indigenous peoples organizations on environmental management. The program would integrate in an organized way, the following priority actions: Review and approval of related regulations (General Action B) and Strengthen key functions of NIMOS, NCE and IMAC and other stakeholders (Institutional Action 2); Specific Action 1.a, the creation of a database on fish diversity and abundance, could also be supported in the context of the Institutional Strengthening Program, as a part of the environmental information system.

Another priority, the better definition of roles of ATM Environmental Division and NIMOS (Institutional Action 1), to be implemented through the organization of two workshops, could be financially supported by IDB, but would also allow for IDB managerial support to the solution of the present relationship problems of both institutions.

Specific Actions 4.b and 4.c (Environmental awareness campaign in the small-scale gold mining areas and Workshop on the proposed mining law) could be the object of a technical cooperation project financed by IDB. As for 4.a (Implementation of the environmental management plan recommended in the PLANTPROP report), the suggestion is that IDB would consider the possibility of financing two of the recommended projects: Capacity building for Environmental management and Mining Pollution Control Project; IDB could also help ATM and NIMOS in the identification of possible other donors and financial sources that are already supporting mining pollution abatement for the implementation of the other projects recommended in the PLANTPROP report.

Specific Actions 7a, 7b, and 7c concerning Indigenous peoples could well be supported by a TC financed by IDB. This action, the first in the order of priorities for the implementation of the specific actions, is consistent with IDB Indigenous peoples' policy directive.

With regard to Specific Action 8.c., concerning official Government recognition of Indigenous Peoples' land and land use rights, IDB support is critical to promote change and to ensure that the aspirations of the indigenous population can be met. Support to the establishment of a work group about land rights and the drafting of guidelines for legal reform would be meaningful as well as the provision of relevant information from other countries elsewhere in the region.

IDB support to all proposed actions under Action 8 would be fully in line with the Bank's mandatory Environmental Safeguard Policy Framework, in particular with the draft of **the Indigenous Peoples Policy**, which calls for two sets of directives to achieve its fundamental objectives:

The first set of directives would be aimed at positively seeking opportunities to include indigenous development issues in the Bank's project pipeline, and to support member countries in mainstreaming indigenous issues in their development agenda. The second set of directives would establish safeguards to protect indigenous peoples from the potential negative impacts of Bank projects.

In the future, the effectiveness of the proposed IDB interventions in environmental management in Suriname will be difficult to assess in view of the fact that valid data on the current baseline situation are either non-existent or not reliable and key indicators are therefore somewhat meaningless. This is evident from the State of the Environment report²² produced in 2000. In order to determine adequate baseline data in various environmental fields, NIMOS has developed plans to set up an environmental information system. The NIMOS system will define the environmental issues and relevant indicators for each issue for which baseline data are available or required, and determine what needs to be done to develop new baseline data from new observations.

Some of the actions proposed above in the Plan of Environmental Action specifically address the issue of baseline information, in other actions it is implied. Based on this information indicators can then be established. It is strongly recommended to expand this effort and promote a comprehensive approach to the development of baseline data and environmental indicators in Suriname. With possible funding to be provided in the second TC for its institutional support, NIMOS will be in a position to take on this task.

²² *Final Report on the State of the Environment, 2000*. Republic of Suriname.

8. IDB POLICIES ON ENVIRONMENT AND INDIGENOUS PEOPLES

The Environmental Action Strategy outlined in the previous chapter is designed to support preparation of the IDB's Country Strategy for Suriname and to identify areas in which the Bank can support Suriname in its objective of reaching sustainable growth. All development efforts of the Bank in Suriname and elsewhere in the Region are governed by the Bank's Policies, which are considered vital to its efforts to promote poverty reduction and sustainable development.

With regard to the **environment**, the IDB adopted an Environment Policy (OP-703) in 1979, broadly mandating the institution to ensure the environmental quality of its operations and support environmental projects in the region. The Policy is still in effect. More recently, in 2003, the Board of Executive Directors endorsed a new Environment Strategy²³, which set forth a course of action for enhancing sustainability outcomes, particularly by mainstreaming environment as a crosscutting dimension of social and sustainable development. In line with the Bank's Environment Strategy, an IDB Environment and Safeguards Compliance Policy is being developed, with Board approval of the policy expected in late 2005. The Environment and Safeguards Compliance Policy, once approved by the Board, will replace in its entirety the Bank's 1979 Environment Policy.

With regard to **Indigenous Peoples**, the IDB is in the process of finalizing the Operational Policy for Indigenous Peoples and the Strategy for Indigenous Development. Drafts of both documents were approved for public information and consultation in June 2005.

New project activities in Suriname, when financed by the IDB, will be subject to these and other Bank policies. . Given the importance of both the Environment and Safeguards Compliance Policy and the Indigenous Peoples Policy to the issues discussed in this CEA, we here present a brief overview of the main directives of the Policies. It is worth noting that the policies pertains to all parts of a project in which the Bank is involved, irrespective of whether the Bank is itself financing the part of the project that may have a negative environmental or social effect. For details and specific assessments of applicability of the various directives to a specific project funded by the IDB, please consult the actual policies on the Bank's website (Environment: http://www.iadb.org/sds/env/site_5512_e.htm; Indigenous Peoples: http://www.iadb.org/sds/IND/site_401_e.htm).

A. ENVIRONMENT AND SAFEGUARDS COMPLIANCE POLICY

The directives of this policy are structures under two major categories, namely mainstreaming the environment, and safeguarding the environment and managing risks.

The concept of **environmental mainstreaming** refers to addressing environmental issues strategically as a cross-cutting dimension of development in order to enhance overall economic and social development through the efficient use of natural resources and environmental sustainability. Mainstreaming environment implies moving beyond environmental impact mitigation to a more encompassing and strategic view of environmental management. The Bank will focus its mainstreaming efforts in its borrowing member countries on:

- Pursuing environmental activities that reduce poverty, enhance social and economic development and increase overall quality of life.

²³ Source: IDB 2003, *Environment Strategy Document*, (GN-2208-4, 2003); www.iadb.org/exr/topics/env.

- Developing effective environmental management frameworks and transparent governance mechanisms that strengthen institutions, involve civil society, make use of effective environmental management instruments, and address critical policy issues.
- Preserving and improving the Region’s natural resource base, enhancing competitiveness, facilitating market development for environmental goods and services, and promoting private sector participation in environment-related activities.
- Strengthening regional integration, including regional environmental institutions and their ability to protect and manage environmental public goods..

The seven mainstreaming directives are paraphrased in Figure 23.

Figure 21 IDB draft directives to Mainstream Environment

Paraphrased Directives (for exact wording, please see actual Policy)	
A1	In its country level programming, the Bank will identify key potential environmental opportunities and risks associated with development, assess the state of enabling conditions for environmental management, and establish a set of strategic priorities for Bank action.
A2	The Bank will proactively support operations to enhance environmental governance, reverse environmental deterioration, and promote sustainable use of environmental resources.
A3	The Bank will finance environmental and natural resources management components beyond required mitigation actions to increase value added and long-term sustainability.
A4	The Bank will support regional and transboundary environmental and natural resources management initiatives, and assist member countries, on request, with meeting their agreed national obligations under ratified international environmental agreements.
A5	Programming documents will incorporate relevant indicators to track the Bank’s effectiveness in pursuing environmental goals as well as general country-level environmental performance.
A6	The Bank will seek to identify early-on potentially highly sensitive programs/projects or sectors in order to plan for possible courses of action to manage risk.
A7	The Bank will promote corporate environmental responsibility actions within its own facilities.

Environmental Safeguards are applied throughout the project cycle and are necessary conditions for managing the overall risks associated with the execution of the Bank’s portfolio. There are 16 directives defined in the category of Safeguarding the environment (B1-B16), which are summarized in Figure 24. Of particular importance to Suriname are three Safeguard policies of Directive B1, namely *The Involuntary Resettlement Policy* (OP -710), *The Indigenous Peoples Policy* (see below) and *The Environmental Mandates of the Eighth Replenishment*. In addition, Directive B4 is relevant to protect Suriname’s critical habitats.

B. OPERATIONAL POLICY FOR INDIGENOUS PEOPLES

The objective of this policy is to impel the Bank’s contribution to the development of Indigenous Peoples through support to regional governments and the indigenous communities in achieving two major objectives:

- Support Development with Identity of the Indigenous Peoples, including self-governing capacity.
- Safeguard Indigenous Peoples and their rights from potential adverse impacts and from the exclusion from development projects financed by the Bank.

With respect to the first objectives, the policy mandates the inclusion of specific indigenous topics in the development agenda through independent operations, and the mainstreaming of indigenous issues in projects with a general focus. Development with Identity in this context is defined in detail by the policy, but proposed actions in supporting such development may include, for example:

- Support for the culture, identity, language, traditional knowledge, cultural resources and intellectual property of Indigenous Peoples
- Development of socio-culturally appropriate solutions to improve availability and quality of social services, as well as to improve access to financial, economic and technological services
- Recognition, articulation and implementation of indigenous rights
- Support for the governance of Indigenous Peoples, including the strengthening of processes to legalize and physically administer the territories, lands and natural resources traditionally occupied or used by Indigenous Peoples.
- Promotion of appropriate consultation and public participation mechanisms
- Strengthening of institutional capacity of Indigenous Peoples, governmental entities, the private sector, civil society and the Bank itself to attend to indigenous issues

The safeguards specified with respect to the second objective cover a variety of areas, including Adverse impacts; Territories, Lands and Natural Resources; Indigenous Rights; Prevention of Discrimination for Ethnic Reasons; Culture, Identity, Language and Traditional Knowledge of Indigenous Peoples; Transborder Indigenous Peoples; and Uncontacted Indigenous Peoples.

Figure 22 IDB draft directives to Safeguard the Environment

Paraphrased Directives <i>(for exact wording, please see actual Policy)</i>	
B1	The Bank will support only operations and activities that are environmentally viable. Environmentally viable operations comply with the directives of this and the following Bank policies, which together form the Bank's mandatory Environmental Safeguard Policy Framework: <ol style="list-style-type: none"> a) The Disclosure of Information Policy (OP-102). b) The Involuntary Resettlement Policy (OP -710). c) The Natural and Unexpected Disasters Policy (OP -704). d) The environmental mandates of the Eighth Replenishment. e) The Indigenous Peoples Policy [under preparation]. f) The relevant provisions of existing Bank Sector Policies.
B2	All Bank-financed operations must comply with in-country environmental laws, regulations, standards and environmental assessment procedures.
B3	The Bank may accept using the borrowing member's in-country systems to identify and manage the environmental and social safeguard risks associated with proposed projects
B4	The Bank will not support operations and activities that will significantly convert or degrade critical cultural sites and/or critical conservation areas.
B5	The Bank will minimize adverse impacts occurring from the production and use of hazardous material, including toxic substances, pesticides, and POPs.
B6-16	A series of policies mostly concerned with environmental assessment standards and procedures for different types of loans.

9. ANNEXES

A. BIBLIOGRAPHY

Author	Title	City	Year
Buursink Internat Consultants in Env Mngt	<i>Environmental management technical cooperation, Proposal for phase II. NIMOS</i>	McLean, VA	2001
Buursink Internat Consultants in Env Mngt,	Environmental management technical cooperation. <i>Project preparation report. IDB</i>	McLean, VA	1997
Buursink Internat Consultants in Env Mngt,	<i>Environmental and Social Impact Review. Agriculture and Trade Policy Reform Loan, IDB/Suriname.</i>	McLean, VA	1998
Buursink Internat Consultants in Env Mngt,	<i>Enhancing the capacity of Suriname to conserve biodiversity. UNDP.</i>	McLean, VA	1999
Buursink Internat Consultants in Env Mngt,	<i>Formulation of a national biodiversity action plan for the implementation of the national biodiversity strategy. UNDP</i>	McLean, VA	2001
Buursink Internat Consultants in Env Mngt,	<i>Proposal for Suriname land management project. IDB</i>	McLean, VA	2002
Colchester, M.	Forest politics in Suriname. International Books, Utrecht, in collaboration with the World Rainforest Movement, Forest Peoples Programme.. 96 pp.	Chadlington England	1995
Inter-American Development Bank. Regional Operation Department 3, Country Division 6. SU-CSS-03; SU-P1001.	Suriname. An overview of indigenous and tribal people	Washington, DC	August 2004
Kambel, E-R & F. MacKay	The rights of indigenous peoples and maroons in Suriname. IWGIA Document No 96.. 265 pp.	Copenhagen	1999
Kanhai, E. en J. Nelson (Eds)	Strijd om grond in Suriname. Verkenning van het probleem der grondenrechten van Indianen en Bosnegers.	Paramaribo	1993
Ministry Of ATM and Nationaal Instituut voor Milieu en Ontwikkeling in Suriname (NIMOS)	Draft Environmental Law Wet Milieuautoriteit	Paramaribo	2004
Ministry Of ATM and Nationaal Instituut voor Milieu en Ontwikkeling in Suriname (NIMOS)	Greenstone Belt Gold Mining Regional Environmental Assessment	Paramaribo	2002
Nahar, E.R., C.A.F. Pigot, J.H. Pinas and Teunissen (Eds)	Suriname Planatlas. National Planning Office of Suriname (SPS), Regional Development and Physical Planning Department HARPRO) / Organization of American States. 33 pp, 25 maps.	Washington DC.	1988
Nationaal Instituut voor Milieu en Ontwikkeling in Suriname (NIMOS)	Environmental Laboratory Survey 2003	Paramaribo	2003
Nationaal Instituut voor Milieu en Ontwikkeling in Suriname (NIMOS)	State of the Environment Report	Paramaribo	2001
Nationaal Instituut voor Milieu en Ontwikkeling in Suriname (NIMOS)	Draft Environmental Impact Assessment Regulations Draft Pollution Control Regulations	Paramaribo	2003

Author	Title	City	Year
OAS Special Mission to Suriname	Natural resources, foreign concessions and land rights: a report on the village of Nieuw Koffiekamp. OAS, General Secretary, Unit for the promotion of Democracy. 124 pp + 7 pp appendices.	Washington DC.	1997
Republiek van Suriname Ministry of Planning and Development Corporation	Donormatrix voor Investerings 2000 t/m 2004	Paramaribo	2004
Regering Republiek Suriname, het Jungle Commando en de Tucayana Amazones	Akkoord van 8 augustus 1992. 16 pp + 15 pp appendices (3 protocols). (This agreement is frequently cited as : "Agreement for National Reconciliation and Development", "Peace Agreement", or "Vredes-akkoord").	Paramaribo	1992
Regering van de Republiek Suriname	Jaarrede van de President van de Repuiblek Suriname 2005 en bijlage	Paramaribo	2004
Republic Suriname European Community	Country Strategy Paper and National Indicative Program 2001 to 2007	Paramaribo	2000
Republiek van Suriname Ministry of Planning and Development Corporation	Jaarverslag 2003	Paramaribo	2004
Republiek van Suriname, Ministry of Public Works	Project proposal on Selected Anchor Projects of Suriname, IIRSA	Paramaribo	2004
Teunissen, P.A..	Coastal management plan for the North Corone area in Suriname. RAMSAR Convention Small Grants Fund, Gland Switserland /LBB-NB, Paramaribo. 117 pp. + 22 pp appendices.	Paramaribo	2000
UNESCO	A look at the World Fresh Water resources	Paris	2003
Trio communities of the Tapanahony darinage basin, CBL, ACT and NL.	Land use by the Trio and Wayana Peoples of the Tapanahoni drainage basin in southern Suriname / Landgebruik door de Trio's en Wajana's van het Tapanahoni stroomgebied in zuid Suriname / Nono iponohto Taponani pontomoja, soirë Surinan pontomoja, Tarënotomoja, Wajanatomoja marë. Map scale 1:284 000. Amazon Conservation Team (ACT) and the Center for the Support of Native Lands, Washington DC.	Paramaribo	2001
Werkgroep Ecologisch-Economische Zonering	Eerste Nationale Workshop Ekologisch-Economische Zonering. Hotel Krasnapolsky, 6 december 1994. ACT/UNDP/Stichting Planbureau Suriname. 49 pp.	Paramaribo	1994
Werkgroep Ecologisch-Economische Zonering	Verslag van de Tweede Nationale Workshop Ekologisch-Economische Zonering. Instrument voor duurzame ontwikkeling. 16 pp + 6 pp. Carilho, S.T. (SPS): Enkele aspecten van de landgebruiksplanning in Suriname. 5 pp. Kemble, O.E. (RO): De ontwikkeling van het binnenland. 4 pp.	Paramaribo	1996
World Wildlife Fund	Giuanas Sustainable Forest Resources Management Project	Paramaribo	2002

B. PERSONS INTERVIEWED IN PREPARATION OF CEA

Date	Organization	Person contacted	Main subject
28 Nov 04	Private consultant	Sylvia Ang	Technical input for assessment
29 Nov 04	IDB	William Grisley - Operations specialist	Briefing. Overview of IDB project interventions
		Silvano Tjong-Ahin - Operations specialist	Decentralization project
	Planbureau	Mr. Lont - Vice Director	Environmental section of Planbureau (dismantled)
	Ministry of Regional Development	Monica Drenten	Social issues
30 Nov 04	NIMOS	Cedric Nelom - Director Environmental Monitoring	Briefing NIMOS data base, references, and reports
	Min of Natural Resources - GLIS	Eric Schalkwijk Harold Struiken	Land registration and administration
	Ministry of Natural Resources	Muriel Held - Coordinator Environment	Environmental planning of projects
	Cabinet of the President	Mr. Pigot	Policy plan 2005
	Conservation International Suriname	Monique Pool	Conservation priorities
	Ministry of Regional Development	Rudi Strijk - District Commissioner Sipaliwini	Social issues
1 Dec 04	Min of Public Works	A. Gajadien - Deputy Director Civil Technical Works S. Mohan - Deputy Head of Drainage Namdar - Head planning	Briefing Program of Infrastructure construction
	Ministry of Agriculture	Debipersad	Aquaculture project Nickerie
	Ministry of Natural Resources	Ferdinand Baal - Head of Nature Conservation	Coastal Zone Management, NUES
	Ministry of Agriculture	Ir. M. Mahedew - Deputy Director Fisheries Shanti Shiamrai	Fisheries priorities
2 Dec 04	UNDP	Cristine de Rooj - Environmental coordinator Maximilliaan Ooft - Assistant resident representative	Briefing ongoing projects
	Dutch Embassy	Sheila Bhairo - Environmental advisor	NUES, UES and other environmental plans
	ESRI Nederland	Dick Visser - President	Mapping of Suriname
	GISSAT – Geographic Information Systems	Henny Tjong Tjin Joe - President	
	GISSAT – Geographic Information Systems	Stef de Ridder - Director	Coastal Zone Management
3 Dec 04	European Union	Helena Laakso - acting Head of the Delagation Dorinda Brons - Program manager	Briefing ongoing projects
	Rosebel Goldmines	Soetjijto Verkuijl - Environmental coordinator	Gold mining, NIMOS
	Private consultant	Dr. Chris Healy - anthropologist	SCF, bauxite mining
4 Dec 04	Ministry of ATM	Shirley Defares - acting Director Henna Uiterloo - Coordinator Environment	Ongoing activities and Government priorities
	Decentralization Progam (DLGP)	Dr. Bas Ahmadali - Program Managing Director	Information on DLGP activities and current results
7 Dec 04	Ministry of Planning and Development Corporation	Philip Tjang A Tjoi, acting Deputy Director Development Corporation	Briefing donor activities and Government priorities
	NIMOS	Nancy Del Prado - Director Legal Affairs	Environmental framework law
10 Dec 04	World Wildlife Fund	Gerold Zondervan - Forestry officer	WWF ongoing projects

Date	Organization	Person contacted	Main subject
20 Dec 04	Fernandes Bottling Co.	Ellen der Kinderen	Recycling Strategy
21 Dec 04	Conservation International	Annete Tjon Sie Fat	Ci Strategy
	Private Consultant	Martin Misiedjan - Marroon human rights lawyer	Land right issues
	Ministry of Natural Resources	Brian Drakenstein - Nature Conservation	Threats to natural resources
22 Dec 04	Committee Corone Coastal Protection	Maureen Silos Alex Feller	Threats to Corone land
	Ministry of Agriculture	Patricia Milton - Director Research	Pesticides
	Ministry of Agriculture	Planning Division	Pesticides
12-Jan-05	Amazon Conservation Team	Ms. Monsorat	Indigenous maps
14-Jan-05	Stichting voor een Schoon Suriname	Mr. Waagmeester	Activities of environmental NGO
	Mr. Kreb	Ecosysteem 2000	Activities of environmental NGO
16-Jan-05	NIMOS	Administration	Obtain indigenous petition against draft new Mining code
18 Jan 05	Suralco	Director Warren Pederson	Plans in West Suriname
	NV. Havenbeheer	John Defares	Rehabilitation Harbor Paramaribo
21-Jan-05	District Commissioner Sipaliwini	Mr. Rudi Strijk	Main environmental issues in Sipaliwini district
21-Jan 05	Saramaka Maroon representative	Mr. Sabini	Indigenous maps
22-Jan-05	Director NIMOS	Ms. Ang	Comments on draft report

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